ZEITSCHRIFT FÜR VERKEHRSWISSENSCHAFT

INHALT DES HEFTES:

Vorwort der federführenden Herausgeber

Hinweise auf Veränderungen bei der Zeitschrift für Verkehrswissenschaft

Sehr geehrte Leserinnen und Leser der Zeitschrift für Verkehrswissenschaft,

Anfang 2013 hatte Prof. Dr. Herbert Baum seine langjährige Tätigkeit als alleiniger Herausgeber der Zeitschrift für Verkehrswissenschaft (ZfV) beendet und wir, Bernhard Wieland und Thorsten Beckers, haben von ihm federführend die Aufgabe der Herausgabe dieser traditionsreichen Zeitschrift übernommen. Damals hatten wir bereits einige vorsichtige Veränderungen bei der ZfV vorgenommen, u.a. bei der Qualitätsprüfung der Artikel und mit der Etablierung eines breiten Herausgeberkreises und eines Herausgeberbeirats. Nun werden wir erneut einige kleinere Reformen durchführen, über die wir Sie im Folgenden kurz informieren möchten.

Zunächst haben wir den Kreis der Herausgeber um folgende Personen erweitert:

- Herr Prof. Dr. Alexander Eisenkopf (Zeppelin Universität - Lehrstuhl für Wirtschafts- und Verkehrspolitik). Herr Prof. Eisenkopf forscht schwerpunktmäßig zur Ordnungs- und Regulierungspolitik im Verkehrswesen; er ist Mitglied des Wissenschaftlichen Beirates beim Bundesminister für Verkehr und digitale Infrastruktur (BMVI).

- Herr Prof. Dr. Christos Evangelinos (Internationale Hochschule Bad Honnef · Bonn). Herr Prof. Evangelinos arbeitet vorrangig mit quantitativen Methoden und insbesondere zu Themen des Luftverkehrs. Zahlreiche Veröffentlichungen, auch in anderen Bereichen, zeichnen ihn aus.

- Herr Dr. Hendrik Haßheider (Bundesministerium für Verkehr und digitale Infrastruktur (BMVI)). Dr. Haßheider ist im BMVI in den vergangenen Jahren für das Thema Bundesverkehrswegeplanung zuständig gewesen. In dieser Funktion war er an der Konzeption und der Begleitung der dem aktuellen Bundesverkehrswegeplan vorangegangenen Forschungsprojekte beteiligt. Zu nennen wären hier insbesondere die Studien zur Weiterentwicklung des Verfahrens zur gesamtwirtschaftlichen Bewertung.

- Herr Prof. Dr. Christoph Walther (Bauhaus-Universität Weimar - Lehrgebiet Gesamtwirtschaftliche Bewertung von Netzinfrastrukturen, und PTV AG). Prof. Walther kann langjährige Erfahrungen als Hauptverantwortlicher für die verkehrsökonomische Forschung der PTV AG vorweisen. Darüber hinaus fungierte er ex-

terner Fachkoordinator für die Bundesverkehrswegeplanung des BVMI. Seit 2011 ist Herr Walther auch Honorarprofessor an der Bauhaus-Universität Weimar.

Herr Prof. Dr. Kai Nagel, der bereits bislang zu den Herausgebern gehört hat, wird sich zukünftig als dritter federführender Herausgeber stärker für die ZfV engagieren. Ferner haben wir den Herausgeberbeirat erweitert und Herrn Prof. Dr. Matthias Finger (Ecole polytechnique fédérale de Lausanne (EPFL)), Herrn Prof. Dr. Frank Fichert (FH Worms) und Herrn Dr. Martin Winter (TU Berlin - Fachgebiet Wirtschafts- und Infrastrukturpolitik (WIP)) in diesen Kreis aufgenommen.

Bei der Qualitätsprüfung der eingereichten Artikel haben wir bislang einzig den im Wissenschaftsbetrieb üblichen Ansatz der Doppel-Blind-Begutachtung angewendet. Zukünftig werden wir zusätzlich auch auf einen (Alternativ-)Ansatz zur Qualitätssicherung zurückgreifen, der sich an einen Vorschlag von KIESER / OSTERLOH anlehnt (vgl. Forschung & Lehre, Heft 2015/2, S. 106 f.). Demnach kann die Veröffentlichung eines eingereichten Artikels erfolgen, wenn ein renommierter Wissenschaftler eine positive Stellungnahme hinsichtlich der Veröffentlichungsfähigkeit des Artikels abgibt. Diese Stellungnahme, die auch eine kurze Diskussion des Artikels beinhalten sollte, wird dann unter Nennung ihres Verfassers zusammen mit dem Artikel veröffentlicht werden. Wir streben an, dass durch diesen alternativen Qualitätsprüfungsansatz nicht nur eine stärkere Transparenz hinsichtlich der Qualitätsprüfung gewährleistet wird, sondern dass auch der wissenschaftliche Diskurs über die zentralen Aussagen des entsprechenden Artikels gefördert wird. Eine genauere Darstellung dieses (Alternativ-)Ansatzes finden Sie auf der Homepage der ZfV (www.z-f-v.de) in der Rubrik „Einreichung von Beiträgen und Begutachtung / Qualitätsprüfung".

Dresden, Berlin, Oktober 2016

Bernhard Wieland und Thorsten Beckers

New trends in cost-benefit assessment of public investments – findings from the Quinet Report in France and the BVWP[1] 2030 in Germany

Contribution to the HEARTS conference Copenhagen 2015

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1. Introduction

In 2005 the HEATCO-project (Developing Harmonised Approaches for Transport Costing and Project Assessment) gave an overview on current practice in project appraisal in Europe, showing considerable variation between national practices. The project aimed at proposing harmonised guidelines for project assessment for trans-national projects like the TEN-T corridors.

Nevertheless, national assessment guidelines are often bound to a national development path, incorporating national specifics like the geographic structure or the political system. Still today quite different assessment procedures can be examined in European countries. Mackie, Worsley et al. (2013) picked up some European countries and added the US, New Zeeland, and New South Wales (Australia) to the selection of countries to be compared. Finally they stated that the framework of economic appraisal in transport is well-established practice in all countries considered and the results provide input into the decision making

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[1] German.: Bundesverkehrswegeplan (BVWP); Engl.: Federal Transport Infrastructure Plan (FTIP)

process on whether to realize a project idea or not. However, the steps and calculation procedures of the assessment are not fully transparent in all countries.

A general guideline to cost-benefit analysis (CBA) of investment projects is given by the EC with the "Economic appraisal tool for cohesion policy 2014-2020" as update of the previous version dated 2008. The main objective of the guideline is to illustrate common principles and rules for application of the CBA approach into the practice of civil servants, beneficiaries and consultants preparing project appraisals. Transport is one sector of interest beside environment, energy, broadband as well as research and development. For the transport sector topics of overriding importance like target system, demand forecast, definition of indicators and economic analysis are addressed, but calculation formulae for certain indicators are not presented.

We present in this paper an in-depth analysis of two different appraisal procedures in France and Germany, thus providing an extension of the Mackie and Worsley study, since France does not belong to its portfolio. This comparison briefly describes the historical development of appraisal practice and puts emphasis on recent developments, mainly in CBA national guidelines. The comparison exercise is developed on these recent evolutions and enlarged in order to include some other key – although recently unmodified – methodological elements. The bi-national contribution is completed by discussing the influence of national governance framework and national attitudes towards transport infrastructures on scope, rationale, and enhancement of CBA guidelines.

2.   CBA framework in France: recent changes

Beginning with the seminal works of Jules Dupuit (1844), France has a long tradition of infrastructure project appraisal. Assessment studies are structured by national methodologies, which are defined according to guidelines set by ad hoc commissions and apply to all transport projects of national level, whatever the modes. These commissions are established under the aegis of the Prime Minister's offices in charge of mid- and long-term strategies; their conclusions are then transformed into official guidelines by the administrations directly concerned. Up to 2014, these guidelines were based on the recommendations of two commissions both chaired, the first one in 1994 (Boiteux M. 1994) and the second one in 2001 (Boiteux M. 2001). Their general recommendations were complemented on specific points by other Commissions dealing with the collective value of carbon (Quinet A. 2008), and on risk issues in project appraisal (Gollier C. 2011).

In 2014, after the recommendations of a new Commission, those guidelines were deeply modified, and the purpose of this section is to explain the reasons of these changes, their nature, and their consequences on project appraisal. A first sub-section will briefly summarise the content of the previous guidelines and explain the reasons why a new Commission was set up. The second one will present its recommendations as regards socio-economic assessment methodologies, reference values and governance. The third sub-section will describe how these recommendations have been implemented in the new guidelines and

document changes in projects' net present value (NPV) and its components induced by the adaptations of the former guidelines.

2.1 The previous guidelines

The previous guidelines dated back to 2004. They were based on the classical partial analysis limited to transport: the main ingredient was the travel time savings, monetized through the value of time (distinguished according to the mode, to the trip purpose, and increasing with distance). This value of time was multiplied by ad-hoc coefficients to take into account, rather coarsely though, comfort and reliability. Established environmental costs were also monetized: air pollution, noise, CO_2 emissions. The opportunity cost of public funds was fixed at 1.3. Those ingredients were embedded in popular indicators such as the Net Present Value, the Benefit per Cost unit, the Internal Rate of Return, using a standardized discount rate of 4%. This discount rate was supposed to be risk free, implying that a risk premium could be added to it. But this part of the procedure was not detailed in operational terms in the guidelines. As a result, this risk premium adjustment has never been implemented, and risk analysis was undertaken by defining scenarios. The different assumptions of scenarios made it impossible to compare project results belonging to different scenarios.

Several reasons suggested to update these guidelines, both from the technical point of view and from the governance point of view.

From the technical point of view, the last guidelines (Ministère de l'équipement 2005) dating back to almost ten years required the revision of numerical values (many of them are valid for about a decade) and to take into account developments in our society as well as current expectations. The modalities for using the data must also be specified, to make them more consistent and to adapt them to new developments. Finally, the traditional cost-benefit analysis should benefit from advances in economic theory in several domains where decision makers have particularly strong expectations, such as industrial economics, risk analysis or spatial economics.

The assessment methods should also take proper account of the changes in the general situation of the present period. Our times are marked by two major transitions which we are committed to: energy and ecology, with the rising level of risk attached to this situation. This makes it both more difficult and more imperative to develop a long-term strategy which cannot take the shape of extrapolation, as it was the case, at least implicitly, in the past. The situation is also, especially in France, marked by the limitation of public budgets and the loss of competitiveness of our economy.

Yet, despite these arguments, which should support an expanded application of cost-benefit analysis, it appears that its use is limited. Experience shows that in France this assessment is used with wide variations in its implementation, thus making comparisons between projects difficult. The results also lack transparency and clarity, and are therefore ill-suited to advise decision makers and inform the public. As a result, decision-making processes rarely

use these calculations, as vividly demonstrated during public debates. As stated in the explanatory memorandum to the law which, among other things, changed the governance of project assessment (LPPFP of 31 December 2012): "Public investment is a key factor driving growth and competitiveness. Because it is also a guarantee of high-quality public service, decisions concerning public investment must be made with attention to reconciling development with the control of public finances. Investment choices today are insufficiently justified. The evaluation and decision-making procedures do not always make it possible to prioritise projects and retain the ones that will be most useful to the community."

2.2 The recent Commission and its recommendations

These reasons explain why a new Commission was appointed in 2012 to revise the procedures of project assessment. As it was the case for the previous ones, the new Commission was composed of the main stakeholders: public servants, transport operators, environmental associations, as well as public decision-makers. It delivered a report in 2013 (Quinet 2013) and reached unanimous agreement on almost all of its recommendations, which concerned both the technical processes and the governance of project assessment. The report concerns all types of public investment, and the transport guidelines issued in 2014 apply not only to transport infrastructure projects but also possibly to projects such as, for example, new traffic regulation systems.

2.2.1   Recommendations on technical issues

Unit value[2], comfort, reliability

We will not present here all the detailed unit values, but just insist on key elements, beginning with values of time. These values of time have been derived from a survey of stated and revealed preference studies and traffic models outputs, mainly from French sources. This progress gave new values that tend to be a bit lower than the "Boiteux II" – set in 1994, updated 2010 – values, about 10% lower. What explanations could be offered for this decrease? Besides more informed and improved knowledge on the value of time, it could be interpreted as a result of the fact that travelers are now able to better manage their travel time, especially using new information and communication technologies. Indeed, when travel time is not purely "wasted" and may be used more fruitfully, it is plausible that the disutility of time spent in transportation decrease.

Besides, the values of time have become more differentiated for travellers, distinguishing between trip purposes both for urban and interurban trips, and varying – normally increasing – with the interurban distance range, all this for each mode. Specific (higher) urban values are given for the Parisian region. Waiting time and connecting times are taken into account, and all these values of time are supposed to evolve as GDP per capita with an elasticity of 0.7. Furthermore, the values are differentiated according to the comfort level in

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[2] This part builds heavily on Meunier et al. 2014

public transport, and to the reliability of travel time for both public transport and passenger cars.

More precisely, public transport comfort is taken into account depending on the density of persons standing up in the vehicle, which corresponds to multiplication factors applied to travel time in the vehicle and used for generalized cost computations. Reliability is treated also in time equivalents, depending on the magnitude of delays and the probability of delay for public transport and on an aggregate indicator of travel time dispersion for passenger cars. The values are transferring the probability of delay (for delays exceeding 6 minutes and delays exceeding 16 minutes for urban and suburban transport; for delays above 10 minutes for interurban transport) into a number of equivalent minutes lost. The values used for public transport comfort and reliability have been derived from data gathered by the main operators in France. For passenger car travel time reliability, the indicator taken into account is the difference between 90th percentile and median travel time, divided by the median (as in Markowitch 2009), which applies to a "reliability penalty" (2.5 times the value of time for constrained trip purposes, i.e. professional or commuting trips; one time the value of time for other purposes).

The value of statistical life and value of life year have been sharply increased in the new guidelines, from around 1.9 to 3.0 Million Euro (2010 values). This increase is due to the results of new surveys (especially the OECD 2012 survey). It means approximately a 50% increase for the unit valuation of transport fatalities and a more specific increase of 120% for road fatalities, for which a reduced unit value was applied previously.

As another consequence, several external costs increase compared to the previous guidelines, but not necessarily in due proportion. For instance, the values of environmental effects per vehicle-km linked to health issues such as local air pollution and noise increase only by about 30%. This lower percentage comes from the decreasing emissions per vehicle due to technical progress, which partly counterbalances the increase in the value of statistical life. Similar counteracting evolutions are observed for road safety impact ratios per vehicle-km, due to the very sharp decrease in road fatalities observed over the last twelve years: fatalities where approximately divided by two, which leads as a whole to a small net increase of the value of road safety external cost per vehicle-km.

Among other environmental unit values, noise and CO_2 emissions should be mentioned. For noise nuisances, two methods are given, the first one gives values per decibel (dB) per person-year exposed, depending on noise levels. It may be used when project design is precise enough and noise studies are available. For more preliminary stages, approximate values are given per vehicle-km, differentiated according to local conditions (time of day, traffic and population densities). For CO_2 a sequence of values is defined, beginning in 2010 with 32€/t, reaching 100€/t in 2030, applying from then on a Hotelling-like rule, with a 4.5 % geometric annual increase.

Extending the coverage of effects

Another set of recommendations concerns the extension of the scope captured by appraisal. Besides comfort and reliability effects which are directly experienced by users, there are several effects which are important issues for decision-makers, and which the classical CBA does not address. Many attempts are made in various countries to take them into account, see for instance the wider economic effects in the UK. The commission selected four topics: effects on macroeconomics (growth, employment), effects on market power and competition, spatial consequences, and redistribution and equity consequences.

Recommendations concerning macro-economic effects such as effects on employment or economic growth are rather limited, and are mainly composed of caveats about those effects, which are not firmly established. In the short run, the main effects are of a Keynesian type, dubious in case of full employment; in the long run, the inter-sectoral relationships and the way which public money has been raised through (taxation, debt increase...) comes into picture. Are these effects larger than what stems from the gain of productivity and competitiveness induced by the abatement of transport costs due to the investment, as estimated through classical CBA?

In fact, classical CBA basically estimates savings in transport costs under the assumption of perfect markets. It presents results as if these transport cost savings were integrally transmitted to other agents. Within such a framework, at the end of the day, these cost gains are translated into productivity gains accruing to the final consumers, as well as gains in intangibles such as external effects or non-marketable goods. However, this equivalence between transport costs savings and gains in productivity or intangibles is challenged in presence of market imperfections. That is why these phenomena need to be carefully addressed.

For market power, the recommendations are that it is necessary to analyse them, take them into account and assess the changes that the project may induce in this field. The report insists on the importance of the potential consequences of market power within the transport sector (pricing, market segmentation, frequency and level of service, etc.). Illustrative simulations of order and magnitude of pricing effects are given for the competition between air transport and high speed rail services. As regards market power effects downstream of transport, no systematic correction is introduced, but a sensitivity analysis is highly recommended.

The most elaborated recommendations are those which deal with spatial effects; they first suggest, for the major projects, to use land-use and transport interaction (LUTI) models in order to at least visualise the spatial consequences of the projects. They also give qualitative indications on the effects of both urban and interurban investments on the spatial repartition of populations and employment. They recommend to estimate the agglomeration externalities and to add them to the welfare calculation. For this purpose, they give precise rules (the elasticity of productivity vis-à-vis the density of employment is 2.4 %, as estimated from thorough econometric studies).

For the redistribution issue, an indicative index is proposed in order to take into account distributive effects on user's surplus. New feedback from research and studies will be needed in the future for designing more precise methodologies.

The extension of environmental effects has also been considered. As regards biodiversity, although studies are increasing in number, variety and quality, it was not judged possible at this stage to include general unit values. Still, as for all environmental effects, the report insists on a proper inclusion of the cost of avoidance, reduction or compensation measures within the project's cost estimates. Concerning upstream and downstream pollution effects, it has been possible to issue recommendations on unit values only for upstream energy production impacts ("from well-to-tank"), following CE-Delft (2008) and (2011).

Risk and uncertainty

An important part of the commission's report aims at adapting the appraisal to the situation of modern economies and societies. It deals mainly with risk analysis and long-term considerations. We will first summarise the recommendations on risk analysis. The successive systemic crisis we have seen in the last decades has made clearer, that risks, at all scales, are an increasingly important issue for our societies. The report insists on this point; it reminds of the importance of estimation biases and recommends several counter-measures, which rely on expertise and organised feedbacks.

A review of risk sources, combined with sensitivity analyses may help to estimate expected values of costs and advantages. Using the expected value is valid for risks which are not correlated with macro-economic evolutions, such as errors in input data, parameter calibration, geological risks, etc. But the newest contribution brought by the report regarding risks in transport CBA, is that we should take into account carefully the systemic risk, the risk resulting from the more or less strong links between the benefits of an investment and the economic growth. Schematically, imagine an investment which advantages are positively correlated with GDP: in 20 years from now, if by chance the economic situation is good, the investment will have made the community even better-off, but if it has turned bad, the investment won't bring in as much as in the first situation. Conversely, if the investment is negatively correlated with GDP, it will play a role similar to an insurance for hard times, and therefore should be more valued for that role in appraisal.

The systemic risk may be estimated using two kinds of methods. One consists in valuing risk by correcting the value of each monetised component (e.g. time gains, safety, pollution, etc.) for their risk premiums, which will increase the project's value if the advantage component is negatively correlated to GDP, reduce it if the correlation is positive, and let it unchanged if there is no correlation. These corrected components remain discounted with a single "no risk" discount rate. The other method consists in keeping the mean value of each of the components as in usual CBA, but having it discounted with a rate adjusted accordingly to the project's risk characteristics. The discount rate will be increased if the invest-

ment's advantages are positively correlated with GDP or, otherwise, decreased (Quinet 2013, Gollier 2011).

Each method has its advantages and drawbacks. The first one may give rich information to decision-makers and stakeholders as regards the distribution of outcomes, but needs much information and a thorough definition of scenarios. The second method is a lot easier to implement, the difficulty residing in the choice of an appropriate correction for the discount rate. We will detail it a little: to put it simply, using an approach which presents formal analogies with financial asset valuation, the discount rate that gives the present value of a future item exposed to risk is the sum of the risk-free rate and a risk premium. Following analyses of real market rates and perspectives of economic growth, combined with theoretical analyses for the long term, the risk-free rate ρ was set at 2.5% (then 1.5% after 2070). The risk premium is the product of a specific coefficient (the "β-value", which should be chosen consistently with the correlation between the investment's effects and the economic growth) and the general risk premium of the economy, φ, set at 2% in the report (3% after 2070). Hence, the risk-adjusted rate follows: $r = \rho + \beta \varphi$.

According to negative, positive, or no correlation, a project will have its net present value computed with a discount rate, which will be lower, higher, or equal to the risk-free discount rate, respectively.

For investment programming, the rule of decision is now similar to deciding when to exercise an option, corresponding in financial technique to calculating a stopping time. Such a calculus has complex formulations and very often has to go through mathematical simulations[3]: we cannot develop here this important issue. Besides risk and not independent from it, another key issue is how to deal with long-term aspects.

Long-term issues

Infrastructure projects are costly long-term investments and their effects are largely irreversible. They modify existing infrastructure networks and contribute to structuring during several decades, possibly several centuries, the territories, the economic competitiveness and the quality of environment. In the last decades, the attention given to long term issues has increased; technically also, we have observed in parallel a decrease of the discount rates used for project appraisal in many countries. Therefore, it is not possible any more to disregard in project appraisal, what happens between, say, 50 to 100 years of infrastructure operation.

In order to meet both natural resources limits – especially energy resources – and environmental requirements such as the reduction of greenhouse gas (GHG) emissions or the stop-

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[3] When outcomes are not uncertain, the decision rule is simple: under quite general assumptions (mainly: advantages independent from the date the infrastructure is put into operation, advantages growing with time), the infrastructure is to be built when the first year's advantage divided by the cost equals the discount rate – as long as NPV in this situation is positive.

ping of land take and sealing, major strategic changes will be required in a near future, about two or three decades from now. These new strategies imply changes in modal split, more or less rapid development of innovative transport services, technological mutations, or changes in urban development logics. The various sets of measures that will be chosen for implementing these strategies may highly and differently impact costs, externalities or advantages of transport projects. We must therefore place project appraisal within a frame of scenarios which need prospective analysis and political choices.

Technically, monetising the effects of a project over its appraisal period presupposes having made assumptions on the long-term evolution of diverse kinds of key parameters, which are interdependent (see Fig. 1), such as:

- General socio-economic indicators (GDP, population, petrol price, etc.);

- average growth of demand;

- relative prices of unit components of NPV;

- "Performance ratios" used for estimating impacts, such as unit vehicle emissions or road fatality rates.

Besides, it is necessary to make assumptions on network evolution since for long-term horizons it would be unrealistic to assume that the network will have been kept unchanged. This should lead to the definition of an explicit scenario at the national level (e.g. a list of projects and main regulatory measures), common for all projects subject to individual appraisal.

Public expenses and surplus calculation

The report addresses also the issue of the marginal cost of public funds. Building on a literature review and a specific study commissioned by the Department of Ecology, it suggests the value of 1.2 (multiplying each public Euro), while the previous value was 1.3. It also raises the question of methodologies for investment selection in the case of fund shortage, for example public budget shortage. Built on works by Maurice, Sauvant and Quinet (2007), the report recommends a procedure of linear programming in order to optimise the NPV of the programme under the constraints of budget for each year of the programming exercise. It comes out that this procedure boils down to adding to each invested Euro another shadow price, named "scarcity cost of public funds" which is reckoned to be approximately 1.05 in the present French situation. In programming exercises, this factor adds to the marginal cost of public funds, which is linked to the structure and the level of the taxes, while the scarcity cost is linked to the global amount of public money that the Government intends to allocate to the investments in the sector concerned.

Now leaving aside the question of public expenses, surplus variations are, in practice, not as easy to compute and straightforward as in a basic theoretical exercise. At the individual

scale, in the simple case where the project implies no major behaviour change, surplus variation may be captured by simple generalized cost variations, given the accurate sources of surplus are taken into account, with correct values. The improvements in this regard deal naturally with making the coverage of surplus sources more complete (see for instance above, reliability and comfort) and differentiating the unit values for these surpluses (see above values of time or environmental values).

However, progress has to be made for capturing - more accurately- surplus variations when more important behaviour changes are at stake. When travellers change mode for instance, specific unobserved sources of surplus which influence the modal choice become a problem (this problem is related to the "modal constants" used by traffic models, see below). Other problems may arise; for instance, using reference "average" values of time without precautions may end up, for some users, in computing negative surplus variations in contradiction with their behaviour choice.

When more major changes are at stake, e.g. changes in trip origin or destination, or, even more, changes in the number of trips, which leads us to the question of induced traffic, we should consider the final utility of the trips also, because it may differ. These difficulties have been discussed and the recommendations issued are certainly not "the final best solutions" but rather practical advices which are hopefully not too much subject to bias risk. It would be too lengthy here to state them in detail, but their main orientations are to use as much as possible the information given by traffic models, to correct generalized costs when it is needed for a better approximation of consumer surplus variation (e.g. using "modal constants" which are often used in multimodal traffic models, and may be interpreted as a kind of average differential utility of modes). An impetus is also given in view of improving the economic consistency of traffic models so that surplus calculations using the model's utility functions may be made and compared with the application of CBA rules for consumer surplus. In any case, this often neglected complex issue would need more attention from applied research.

The recommendations consider not only consumer surplus, but also producer surplus in case of imperfect competition, advising to consider strategic reactions of transport competitors, infrastructure managers as operators, and to make a sensitivity analysis by adding 10% of all trips linked to professional activities including freight transport.

Recommendations on governance

A first set of recommendations aims at improving integration of appraisal with decision making on infrastructure projects. The report proposes a series of measures intended to reduce these defaults. Since they are tightly linked to specific decision processes and judicial rules valid in France, we will not go through them. We will only indicate that the report advocates for more transparency and accountability, so that decision makers should be able to understand the aims and scope of each model and to have a clear view of their level of reliability. An external audit is recommended for all important projects. Furthermore, ex

post studies, which are regularly implemented in France, should be made more comparable and more comprehensive, and aimed at providing useful conclusions for the improvement of CBA methodology.

Other recommendations concern the need to:

- enhance ex-post analyses and structure the governance so that they can be followed by correcting actions,

- organise methodological updating in a more continuous process

- consider deciding on the precise ranking of projects in the framework of medium term programs rather than project by project, contrarily to the frequent result of the political decision making process. This is recommended because projects' consequences are often not independent, i.e. building such or such other project may increase or decrease the assessed project's net present value, making then a purely individual assessment inaccurate when the inter-relation is not negligible.

2.3 The implementation of the recommendations

2.3.1 Technical implementation

In 2014 new guidelines were issued (Ministère de l'écologie 2014), which endorsed almost all the technical recommendations of the report. The totality of new valuations were made official. Risk assessment did not fully follow the recommendations, as the most preferred option taken by the directive was the use of scenarios, which are now fully standardized, allowing for a better comparability between projects. Also, sensitivity checks are introduced which, in case they conclude that the project's sensitivity to economic growth fluctuations is low, allow to use a simpler risk-adjusted discount rate of 4.5%. The process of setting long-term common perspectives is going on. As for the use of models such as LUTI models or General Equilibrium models, the directive is prudent, as such a model neither exists nor is operational in France at present. Let us mention the on-going studies made in the framework of the "Grand Paris" project, where three LUTI models are in an on-going process of calibration and comparison.

The new directives have been implemented for several projects. In general, the increase in environmental unit values induces an increase in the proportion of environment in the advantages. This effect is enhanced by the decrease in the unit values of time. Two points have conflicting effects: the increase in the horizon of estimation is counter-balanced by the frequent increase in the discount rate (in the new framework, the discount rate is specific to each project, and is quite generally above the common discount rate of the previous directives, which was set at 4%, slowly diminishing on the long term).

On the whole, the Net Present Value (NPV) may come out a bit lower or a bit higher than under the previous directives, depending on the project's specific characteristics and impacts. The Internal Rate of Return (IRR) may also come out higher or lower, but its definition itself is problematic in this representation of risk, and its meaning becomes quite unclear, because under the risk assessment method used here, the discount rate has to correspond precisely to the project's risk characteristics. Another point deserves some comments: the introduction of new effects such as the agglomeration externalities. In the case of a public transport project inducing an increase in density, the statistically induced increase in productivity can represent a non-negligible item. This can be seen in the following table, showing the differences in results for the project of automated metro ring in Ile de France, the "Grand Paris Express". These results are in line with the estimations made in the UK for the CrossRail project. This kind of effects is not to be expected in the case of an inter-urban motorway project. It appears that in such an investment, the decrease in time savings valuation is partially counter-balanced by the increase in value of life.

Table 1: Breakdown of estimated advantages provided by the "Grand Paris Express" (Source: Quinet 2014)

Advantages in Euro Discounted in 2010	According to the present directives	According to the new recommendations
Time savings	27.6	21.8
Reliability Comfort	-	3.1
Pollution	0.3	-0.9
Safety	0.5	1
Carbon emissions	2.9	6.5
Noise	0	0.2
Urban effects	-	5.7
Agglomeration externalities	-	10
Total	31.3	48.4

2.3.1 Governance recommendations

Since they are tightly linked to specific decision-making processes and judicial rules valid in France, we will not go through them. We will only indicate a few points:

- One of the main recommendations of the report, relative to the audit of project assessments, has been enforced through a law (LPPFP 2012) which makes such audit by independent experts compulsory for projects over 100 million Euros.

- The recommendation that methodological updating should be implemented in a more continuous process has been translated in practice through permanent working groups aiming at monitoring the research, bridging the gap between research and practice, and building especially on ex-post analysis of already implemented projects.

3. CBA framework in Germany: recent changes

Germany has a long tradition in developing appraisal procedures for possible transport infrastructure investments. The Federal Ministry for Transport and Digital Infrastructure (BMVI) is currently finalizing the BVWP for the year 2015. On one hand, basics like the traffic demand forecast were adapted to the assumed frame conditions of the year 2030 as horizon for BVWP. On the other hand, it was considered to be essential to check and optimize the methodology of the decision-making process. The development includes all aspects of decision-making: firstly, the target system in regard of the prioritizing strategy was assimilated to the social and political developments. Secondly, the evaluation methodology was aligned with respect to international standards, progress in research, extended knowledge, and the efficiency of its application. In this context the BMVI commissioned research projects concerning several topics.

3.1 Overall process

In BVWP 2030, four evaluation modules are used for evaluating and assessing the impacts of considered projects (see Fig. 1). As far as possible, all monetisable effects need to be captured in the cost-benefit analysis (CBA). As a result, it provides an economic benefit-cost ratio (BCR), which reflects the profitability of the used financial means.

Figure 1: Overall process of the BVWP 2030 (own illustration on the basis of BMVI 2014)
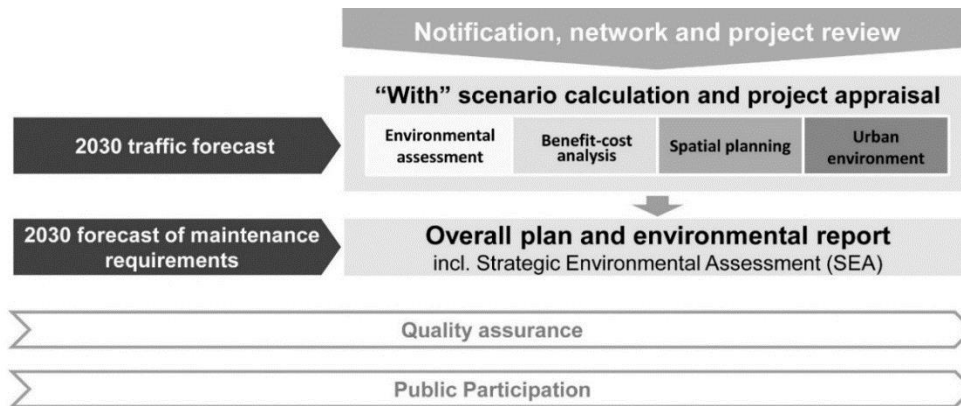
However, some targets and their range of achievement can still not be depicted within CBA. To these cases belong the additional environmental effects, spatial impacts and urban development. These indicators and impacts are considered in further assessment modules (environmental and nature-focused evaluation, spatial impact assessment and urban development evaluation).

During the preparation of the BVWP 2030 several research projects were initiated by the BMVI in order to review and improve assessment procedures of all four modules. Although this paper mainly deals with improvements of CBA, the basic assessment approaches of the other modules are also described.

3.2 General review of CBA

The indicators "reliability" and "life cycle emissions of greenhouse gases during the construction and operation of transport infrastructure" were freshly added to the set of relevant indicators. Moreover, in the future benefits from transport time savings in freight transport (for example due to reduced capital binding costs) will be considered as well. Furthermore, induced and diverted traffic and their impacts on benefits will be taken much better into account, following the internationally applied approach of consumers and producers surplus. Some indicators out of the BVWP 2003 could be abandoned. In particular, the consideration of employment endowing effects has been dropped, since the scenario for the transport demand forecast 2030 already assumes full employment.

The mentioned improvements are influencing the numerator of the cost-benefit-ratio. To enhance the quality of this final criterion, the denominator has to be calculated as precisely as possible. Therefore, a procedure to check the plausibility of investment costs has been

added to the CBA approach. This procedure is mainly based on reference values of completed transport infrastructure projects. In addition, it includes estimates on the impact of planned safety and environmental regulations on investment cost.

3.2.1 Development of new benefit component "reliability" and integration into the concept of CBA

For some years, the term "reliability" in transport or reliable transport system has been discussed regularly and accordingly claims towards political stakeholders have been made to take action for more reliable transport systems. In this respect, it was essential to consider this topic during the revision of the methodology for the BVWP 2030. Reliability is usually defined as the deviation from an expected mean of the travel or transport time, or the deviation from an expected arrival time, whereby both delays and early arrivals have to be considered. Deviations from the expected travel time can be mathematically described by a distribution of travel times or arrival times.

For specific transport carriers as well as for the differentiation between passenger and freight transport the different characteristics of reliability have to be adapted, too. Unreliability in traffic systems affects at a first level the means of transportation, e.g. cars, trains etc. Passenger and freight carried by these means of transport are affected at a second level. In the framework of the new BVWP, only the effects on the second level are taken into account, meaning that a focus is set on the effects on passenger and freight by the unreliability of the chosen means of transport. For example, a train-operated relation with major time variations has no relevant impact on the indicator "unreliability", if the trains serving this relation only feature low occupancy rates. Additionally, it is obvious that the evaluation process for an infrastructure plan like BVWP can only consider improvements of reliability due to infrastructure measures. This is especially problematic in the railway sector, since unreliability often occurs due to problems with the rolling stock, through deficiencies in the existing technical infrastructure or through delays on "upstream" sectors.

In general, three approaches for measuring and assessing reliability or unreliability, respectively, for one route can be used (Significance, Goudappel Goffeng, NEA, page 14 and following):

- Standard deviation of travel time distribution (or other aggregated indicator of travel time distribution)

- (Anticipated) buffer times to avoid delays

- Deviations from contracted arrival times in schedule bound systems (schedule delay) in frequency (percentage of arrivals) and extent (delays measured by e.g. minutes).

The applied approach of BVWP 2030 for the transport carrier road is based on the first alternative. It uses a functional determination of the standard deviation for travel times as indicator of reliability. A RP-/SP-survey provided reference values for one-hour standard deviation for different trip purposes.

For rail passenger or freight transport, the third alternative is not easy to implement, since BVWP rail network 2030 does not contain a schedule. For that reason, the modelling of reliability can only be realised by an artificial schedule for passenger transport and an endogenous train line system between marshalling yards for freight transport. Then, the number of delayed arrivals and the mean of the delays are gathered. De facto, the transport industry uses buffer times for transport planning. Buffer times transform delay risks – meaning possibly arising time losses – into definite time losses compared to an undisrupted journey/transport. These are the costs of the risk reduction. The buffer times are calculated in such a way that – together with the mean travel time – they cover the travel and transport time distribution up to a very small quantile, i.e. arrivals after the scheduled time should remain exceptional (see Fig. 2).

For the transport carrier inland waterway, reliability is only defined by the water level fluctuations. There are special transport insurances, which pay for alternative transports (road or rail) in case of low water level. A high number of low water level incidents may reduce the profit of insurances. These costs are already considered within the CBA as part of the operational costs (and benefits will occur, if operational costs can be reduced because of improved infrastructure). Therefore, there is no need for further consideration of reliability for inland waterways.

Figure 2: Buffer time overlapping the density function of travel time
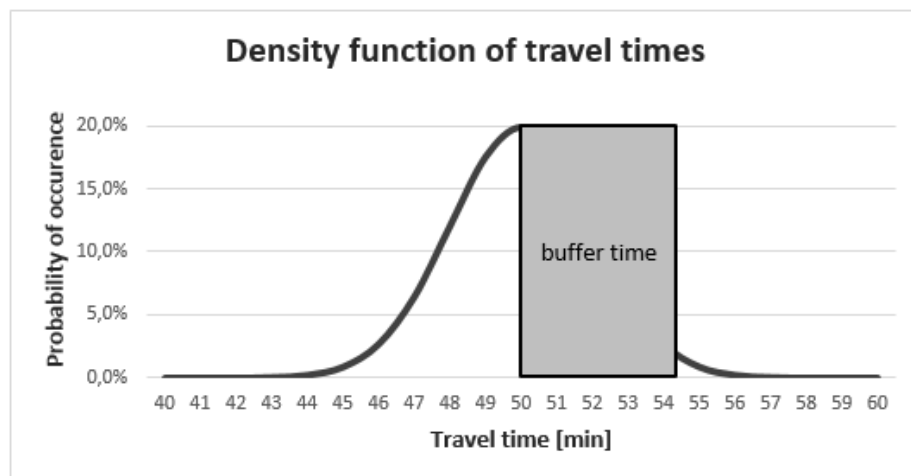
3.2.2 Enhanced consideration of induced traffic and modal shift in the concept of CBA

CBA approaches are based on the concept of welfare change. On the international level this concept is put into practice by measuring changes in the consumer's and producer's surplus due to new or modified transport infrastructures. These changes represent the benefits of the respective transport infrastructure and are brought into relation to the construction and maintenance costs. Within this concept, impacts of induced and diverted traffic are considered by applying the so-called rule-of-half. For the time being the BVWP considered diverted and induced traffic and their impacts on benefits only roughly. Regionally differentiated factors were statistically derived to cover additional resource consumption of the "switched to-mode" and the induced traffic. During the general examination of the BVWP methodology it became clear that improvements on this issue were necessary to catch up with international standards. As a baseline, German BVWP measures welfare changes by changes in resource consumption. Therefore, benefits of transport infrastructure are measured by changes in operational and maintenance costs, clean air, time and others. Due to this conceptual difference the rule of half cannot be applied directly to the CBA of BVWP. Therefore a new approach[4] has been developed by introducing a new benefit component "difference of implicit benefits" which allows to keep the relevant elements of the former approach but to beyond it, in order to make it more comparable with international practice of using economic surplus measures.

The "difference of implicit benefit" and its meaning can be explained with a simple example as follows. An accelerated rail connection (option b) still remains slower than the competing road connection (option a). Travel times[5] (or more generally: generalised user costs) of option b decrease from t_0^b (GC_0^b) to t_1^b (GC_1^b) due to the acceleration, whereas all user costs and operational costs are assumed to remain constant.

Nevertheless one can observe (and predict by models) some users (Δx) switching from road to rail. It is plausible to assume that these behavioral changes are caused by a difference in generalised user costs which are not part of travel times and user costs. These generalised user costs are unobserved, implicit costs of the rail and road connections. According to Nagel et al. (2012) implicit costs can easily be calculated for switching users. Figure 3 shows the situation. Corresponding to the assumptions underlying the rule-of-half concept, the demand curve for option b between x_0 and x_1 is assumed linear. It is obvious that travel time costs plus user costs for option b are higher than those for option a for all users, including the marginal users between x_0 and x_1. However, these users would only switch from option a to b in case the generalised user costs of both options are equal or costs of option b are less than those of option a. This is only the case if implicit costs or rather their

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[4] Nagel et al. (2012)

[5] To simplify the explanation, an average value of time (VoT), weighted across all distances and trip purposes, is used. Mean VoT are provided by TNS Infratest & IVT (ETH Zürich), 2015.

difference is taken into account. In Figure 3 the difference of these implicit costs are shown on the left hand site both for the marginal user at x_0 and x_1.

Figure 3: Demand curves and generalised user costs for option a and b for the marginal users at x_0 and x_1 (own illustration based on Intraplan, Planco, TU Berlin, 2014)
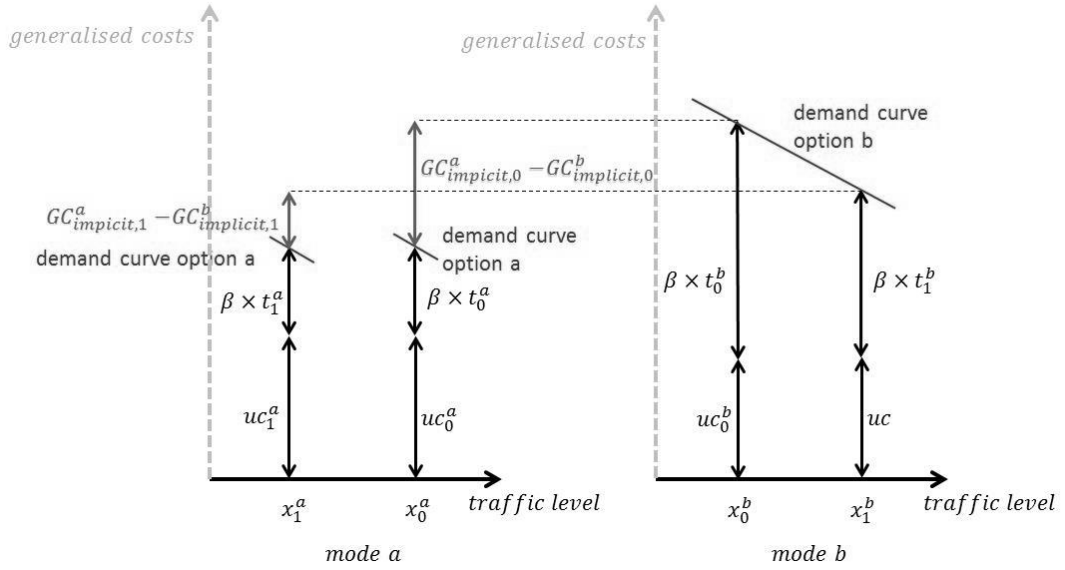
According to Figure 3 the generalised user costs can be described as follows for the average switching user between x_0 and x_1:

$$uc^a + \beta \times t^a + \left(GC^a_{implicit} - \overline{GC^b_{implicit}}\right) = \overline{uc^b} + \beta \times \overline{t^b} \tag{1}$$

being

uc^a user costs for option a

$\overline{uc^b}$ average user costs for option b, $\overline{uc^b} = \frac{1}{2} \times (uc^b_0 + uc^b_1)$

t^a travel time for option a

$\overline{t^b}$ average travel time for option b, $\overline{t^b} = \frac{1}{2}(t^b_0 + t^b_1)$

β value of time

$GC^a_{implicit}$ implicit generalised costs for option a

$\overline{GC^b_{implicit}}$ average implicit generalised costs for option b, $GC^b_{implicit} = \frac{1}{2}(GC^b_{implicit,0} + GC^b_{implicit,1})$

From this, equitation (1), we get

$$\overline{GC^b_{implicit}} - GC^a_{implicit} = (uc^a + \beta \times t^a) - (\overline{uc^b} + \beta \times \overline{t^b}) \tag{2}$$

Switching from implicit user costs of the average switching user to implicit benefits of all switching users, equation (2) - being Δx the number of switching users - becomes:

$$\Delta U_{implicit,total} = (\overline{U^b_{implicit}} - U^a_{implicit}) \times \Delta x$$

$$= [(\overline{uc^b} + \beta \times \overline{t^b}) - (uc^a + \beta \times t^a)] \times \Delta x \tag{3}$$

As developed in appendix 1, this difference of implicit benefits is added to those benefits, which have already been considered by the methodology of BVWP before: i.e. benefits arising from differences of resource consumption. The sum of both benefits produce the same result as the calculation based on consumers' and producers' surplus. Following this example, changes in consumers' and producers' surplus depend on demand changes, induced by changes in travel time costs as the chosen example refers to the acceleration of a rail connection. Generally spoken, the total benefits of a project can be calculated by considering changes of generalized costs with respect either to the concept of consumers' and producers' surplus or to the concept of resource consumption with its additional component "difference of implicit benefits".

3.2.3 Valuation of travel time savings (VTTS) for passenger and freight transport

Within the scope of the new BVWP methodology, two research projects for the determination of valuation approaches for travel or transport times and reliability were initiated. One study focused on passenger, the other on freight transport. In both studies, revealed (RP) and stated preference (SP) surveys were conducted. In the passenger transport survey about 3.200 people and in the freight transport survey about 450 companies participated.

In accordance to this exercise in passenger transport, the Value of Time (VoT) will from now on be determined as a function of the travel distance (see Fig. 4). With increasing travel distance between origin and destination the valuation for time savings increases. This applies to all trip purposes in passenger transport. The results of the study suggest that time rates depend significantly on the trip purpose; therefore in BVWP 2030 a differentiation for

trip purposes is aimed at. Because of the usually short student and shopping trip distances the samples only support distances of <70 km for a separate travel time value.

Figure 4: Distance-dependent time values of non-economic passenger transport (results based on TNS Infratest & IVT (ETH Zürich), 2015)
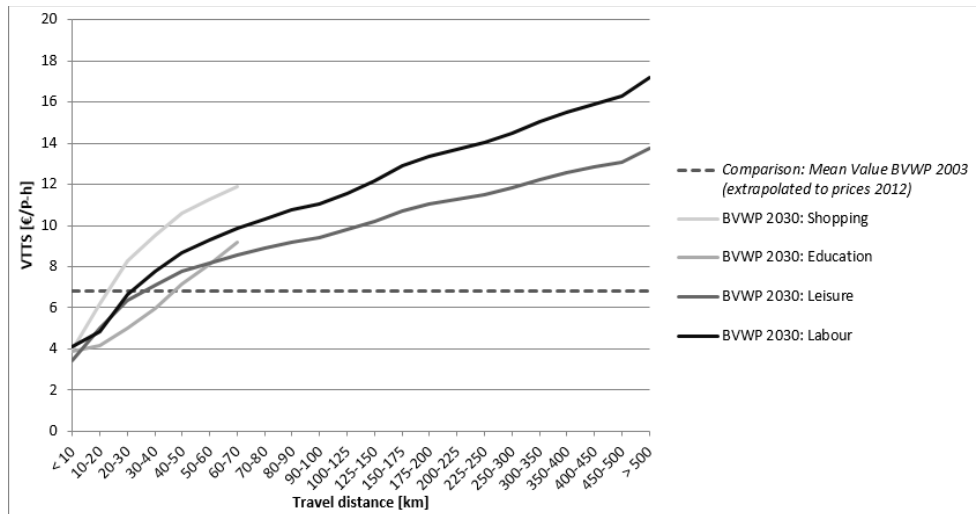
Furthermore, it was found out that travel time values depend on the household income (see Fig. 5). The calculation of travel times in sections or corridors does not allow to make use of this progress, as the income distribution of the drivers passing this section is not known. Therefore, in BVWP 2030 this correlation will not be considered.

Figure 5: Income-dependent factor for time values (results based on TNS Infratest & IVT (ETH Zürich), 2015)
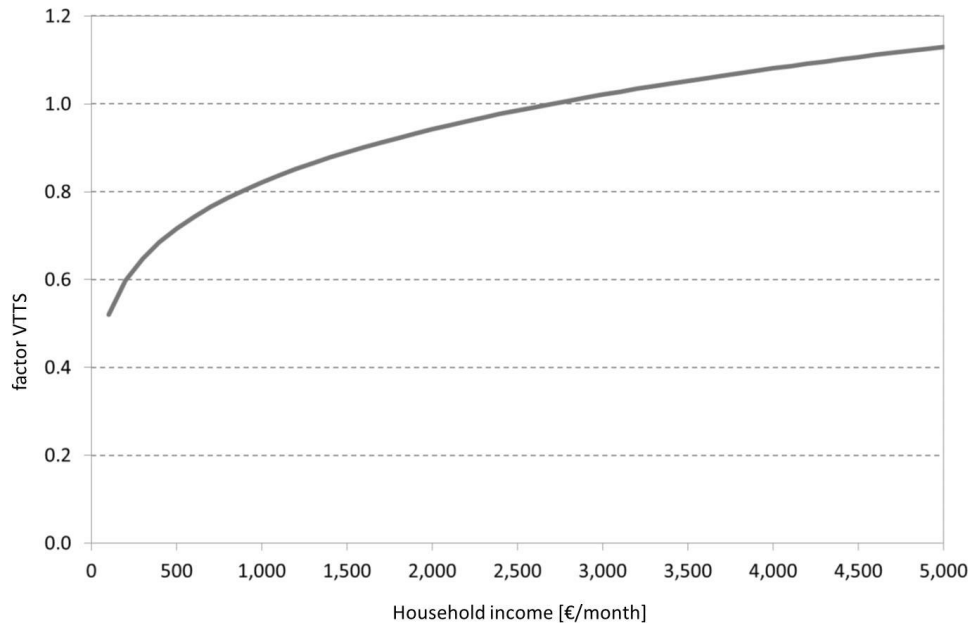
BVWP 2030 will include a VoT for goods during transport for the first time. Until now only the potential cost savings for vehicles and staff in case of transport time savings were considered. From now on decreased capital costs and logistic advantages on the receiver's side because of transport time savings are also considered. The VoT in freight transport depends on the travel distance and the category of goods.

3.3 Further evaluation modules

3.3.1 Environmental and nature-focused evaluation

The environmental and nature-focused evaluation (see. Fig. 1) focuses on the assessment of additional environmental effects. This evaluation module fulfils the requirement of the EU-Directive 2001/42/EC for Strategic Environmental Assessments aiming to ensure that environmental and possibly other sustainability aspects are considered effectively in policy, plan and programme making. In order to set up corresponding reports environmental assessments are carried out on both project and programme level. Several indicators like the impairment of non-fragmented regions or nature conservation areas are considered.

3.3.2   Spatial impact assessment

The third evaluation module covering the spatial impact assessment includes the quality of accessibility and connectivity for different regions. In this process, the deficiencies in the connection between regional centres and metropolitan centres are measured. Furthermore, the accessibility of regions with regard to the closest infrastructure access (motorway junction, airport, long distance traffic train station etc.) is evaluated. In contrast to CBA, which captures network-wide accessibility improvements in terms of time savings (allowance advantage), the spatial impact assessment considers distributive advantages like the aspects of optimised accessibilities to regions.

3.3.3   Urban development evaluation

The fourth and last module is the urban development evaluation of transport infrastructure projects. Therein specified is the aim to relieve developed areas and people living within them, specifically through road bypass projects. The urban development evaluation considers several indicators like effects on the utilisation of released road spaces.

3.4 Decision making

The new general guidelines for the BVWP 2030 provide prioritizing rules for the allocation of the available budget to the positively assessed projects (see Fig. 6):

1. Determination of necessary financial means for maintenance and replacement:
   The condition of the federal transport network shows significant deficiencies. Accordingly, it was determined that maintenance and replacement of infrastructure have priority over expansion and new construction projects. Therefore, the maintenance and replacement requirements and their financial needs until 2030 have been assessed based on extrapolations of the current situation (conditions of roads, tracks, bridges etc.). These financial needs – counting for nearly 70% of the available budget for infrastructure investment – are subtracted from the overall budget of the BVWP 2030. The remaining funds are available for expanding the network. The following prioritisation steps deal with the distribution of these remaining funds on all projects in the context of network expansion and new constructions. Projects, which have been nominated for implementation within BVWP 2003 but have not been started yet, will be examined again within BVWP 2030.

2. The distribution of the remaining financial means to the three transport carriers: road, railway, and waterway follows superordinate targets like bottleneck avoidance, CO_2-reduction, and energy efficiency. For the latter the political enthusiasm is limited, since the main target of a transport infrastructure plan is to enable mobility, whereas negative impacts on nature have to be kept at minimum. The resource allocation for expansion and new construction projects is based on the as-

sessment of strategic investment scenarios that are deduced from the mentioned targets. A strategic investment scenario can be defined, for example, by the fact that it favours the most economical solution and only orientates itself on the cost-benefit analysis. Within the budget left after maintenance investments, a combination of projects of all three transport carriers has to be found, which mostly achieve the target set. Interactions between road projects are checked mainly for close-by located projects. For the rail sector corridor studies complement the individual project assessment. Following this approach, the final decision on the second step of prioritization is based on single project evaluations, but crosschecked by the benefit of the overall plan.

3. Urgency classification of projects for each transport mode follows mainly the results of CBA but also takes into account the relevance for dissolving bottlenecks or preserving the nature. On the third prioritisation step, the urgency sequence for each transport carrier is determined (see Fig. 6). The CBA-module includes the major part of the project effects. For that reason BCR serves as the central criterion for the distinction between "urgent needs" (German: Vordringlicher Bedarf, VB) and "additional needs" (German: Weiterer Bedarf, WB). The other evaluation modules allow deviation from the efficiency criterion in individual cases. Projects with critical environmental and nature conservation assessment or with outstanding spatial impact can be correspondingly down- or upgraded.

4. Projects contributing essentially to the elimination of bottlenecks (German: Engpass, E) with impacts on main parts of the network are main candidates for an upgrade. Significantly urgent projects of the first category VB will be labelled accordingly (VB/E) and should be realized at the first possibility.

The prioritizing scheme uses all evaluation modules in an integrative manner, while avoiding complex regulations or weighting procedures. The decision-finding is based on a small set of prioritizing rules, which can be easily validated and adjusted if necessary. To emphasize the transparency of the process, it is standard to display the results of each single indicator for all considered projects in its original unit and thus to provide a multi-criteria analysis.

Figure 6: Classification of urgency according to of the third prioritizing step (BMVI 2014)

Note: VB/E: first priority projects including bottleneck elimination
      VB: first priority projects
      WB: second priority projects
      WB*: second priority projects with allowance for sectoral planning
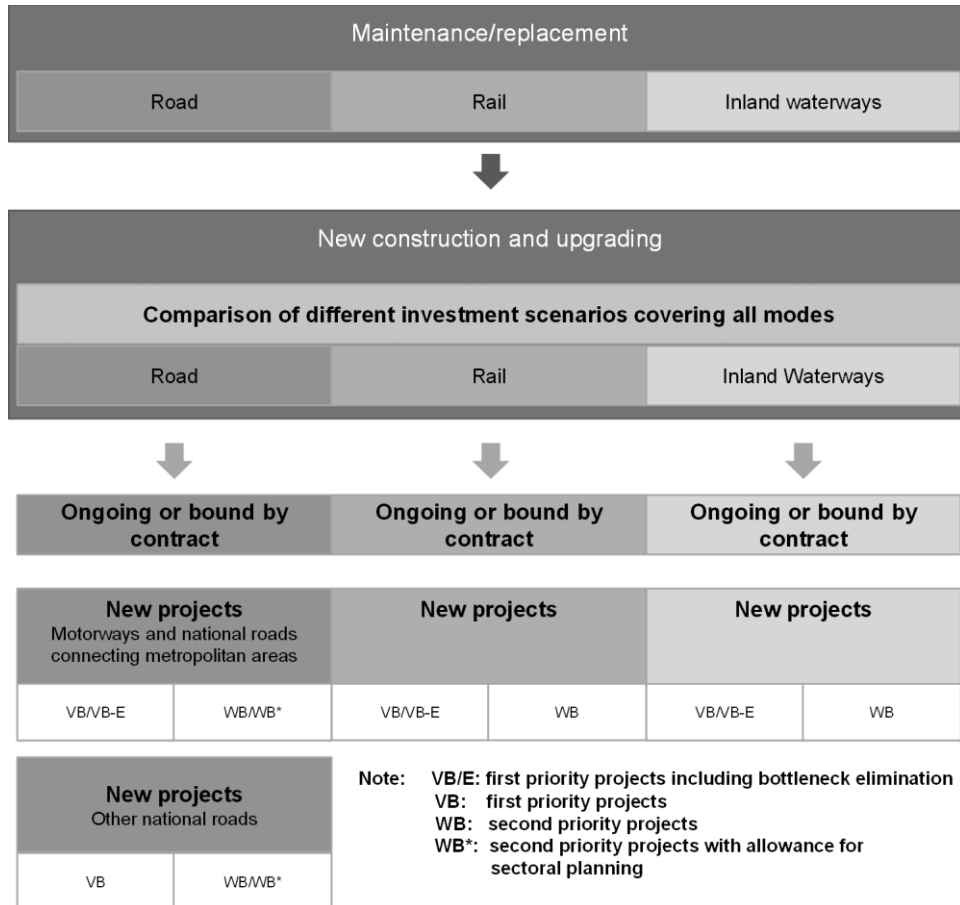
4. Comparisons and conclusion

We will now comment on the main convergences and differences between the two approaches, including some key topics kept unchanged in the national guidelines and therefore not appearing in the previous part.

4.1 General aspects

4.1.1 Discount rate

In several German appraisal methods for transport infrastructure investments the discount rate has been fixed to 3 %. During the improvement of CBA recent developments on financial markets and methodological backgrounds for the determination of a discount rate have been discussed, especially approaches based on opportunity costs and social time preference rates. For Germany empirical analyses for both approaches show that discount rates between 1.0% and 2.0% are plausible. Based on these discussions, the discount rate for BVWP 2030 has been reduced significantly to 1.7%.

As mentioned in the previous part, in France the risk-free discount rate is similarly low (2.5% for years up to 2070, 1.5% afterwards) and the methods for dealing with risks may impact the final discount rate used (see below).

4.1.2 Treatment of risk/uncertainty

In Germany, risks and uncertainties in terms of the forecasted impacts of projects are handled by sensitivity analyses. Sensitivity analyses are carried out regarding:

- The rate of economic growth and demographic development (e.g. running demand forecast and CBA – underlying a low rate of economic growth for all projects as "lower bound"),

- The discount rate for investment costs (higher value for calculations of net present values of investment costs for all projects),

- Demographic development of structurally weak areas.

Furthermore, a new approach is applied for ensuring the range of investment costs of projects. This approach provides plausibility checks of investment costs. Therefore, additional sensitivity checks of investment costs are not deemed necessary.

In French guidelines, as exposed above, methods for taking account of risks and uncertainties are given based on recent theories, expertise and lessons learned from ex-post analyses. Adjusted discount rates are used in Germany only for infrastructure costs' in the course of sensitivity analyses, whereas French guidelines are somewhat more complex than in Germany, due to the special attention they pay to systemic risks i.e. to the correlation between project risks and macro-economic evolutions. Both national approaches are methodologically similar when scenarios and sensitivity analyses[6] are used instead of risk-adjusted

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[6] The Guide to Cost-Benefit-Analysis of Investment Projects, European Commission (2014), also distinguishes between a financial and economical discount rate.

discount rates. Nevertheless, when using highly contrary "extreme" scenarios or risk-adjusted discount rates as in the French guidelines, the risk issues may have a much more discriminating role.

4.1.3   Time span, long-term and residual values

In the BVWP 2030 guidelines, time span starts for all projects in 2015. It consists of the planning period, construction period, and operating period. As far as there are no individual specifications for planning and construction period, the BVWP provides tabulated values. The operating period is separately calculated for each project. It is based on the average lifetime and the investment costs of the components of the project (without consideration of land acquisition costs). Therefore, residual values must only be considered for land values.

Within the planning, construction and operating period, costs and benefits for each year are determined and discounted with respect to the first year of the time span (2015). The duration of the operating period depends on the expected lifetimes of construction components, since the decisive averaged lifetime of a project is calculated on base of annuities and investment costs of its construction components. Hence, technically ambitious and costly projects often have long operating periods to generate benefits over a longer time and to compensate the higher investment costs this way.

French guidelines put more stress on long-term issues, their relation to key public policies and to the treatment of risks in CBA. They consider quite long economic lives for transport infrastructures, since the assessment period extends to 2070 in general and includes a residual value computed over 70 additional years. This is also meant to compare projects on more homogeneous grounds, although these reference periods are of course to be reduced, would the physical lifetime or the operation period of the infrastructure be shorter.

4.1.4   Treatment of surplus / traffic shifts and induced traffic

As regards surplus calculations, both national guidelines have identified the complexity and inconsistency problems of simple generalized cost calculations. The corrective measures have common features too:

- Enlarging the sources of surplus encompassed by CBA (reliability, comfort,…),

- Increasing the accuracy of surplus calculations: besides updating previous values, both guidelines tend to increase the differentiation of these values (value of time by trip distance for instance).

It should also be noted that the developments introduced in CBA guidelines need accurate traffic modelling design and output refinement.

Inconsistency problems occur, when the traffic model predicts a modal shift, but CBA estimates an increase of generalized cost for users switching from mode a to b. German former guidelines (BVWP 2003) introduced corrective factors for this situation. The 2030 update integrates approaches, which are based on the concept of producers and consumers surplus (see above and appendix 1). This rule should solve many inconsistencies. But this calculation raises the question of the choice of value of time to be taken when modal differentiation is adopted. It also supposes that traffic models properly take into account all the surplus sources so that the number of shifting users is correctly estimated.

French guidelines consider the mode-specific values of time but do not propose a simple corrective measure for inconsistency problems, but practical advices depending on the information given by the traffic model so as to make the best use of it, in a case by case approach. They also consider a mid-term measure consisting in a convergent improvement of CBA rules and of traffic models – which should become more consistent from an economic point of view.

In any case, both guidelines presuppose that traffic models properly take into account all the meaningful surplus sources so that the shifting and the induced traffic are correctly estimated. The impression emerging from all these developments is that applied research and feedback on practical surplus estimation should be developed, so as to reduce the risks of bias in surplus estimations.

4.1.5 Partial equilibrium analysis and wider effects

In Germany, following Anglo-Saxon practices, costs of public funds are not considered within the BVWP. There are mainly two arguments leading to this approach: Firstly, there are uncertainties about the scale of welfare impacts resulting from costs of public funds. Secondly, the relative advantageousness of investment projects – which is the focus of the BVWP – is not influenced by the question whether impacts of costs of public funds are considered or not, at least when the key indicator used for decision-making is a benefit / net public cost ratio.

In France, cost of public funds is considered, building on a recent thorough study on the scale of welfare impacts. The Quinet report advocates an approach where, ideally, the net present value of a program of projects should be maximised under constraints (introducing thus a budget-scarcity component to the purely economic cost of public funds).

Wider economic effects – like productivity increases or reduction of imperfect competition – are more discussed in the French guidelines - e.g. introducing for the first time agglomeration effects and trying to delimitate the cases where they could appear. These effects are not ignored by the German guidelines, but as full employment 2030 is an assumption of the base scenario for BVWP project assessment, impacts of new infrastructure on labour market can't occur. However, indirect economic effects may appear through the multi-disciplinary studies and assessment modules (see. Fig. 1). For instance, spatial

and urban effects on the mid-term and long-term, when significant, do not appear in German CBA but they do in other assessment modules of the BVWP-methodology, whereas in France a progressive method using notably LUTI models is exposed in the Quinet report for identifying and in some relevant cases integrating some of their economic consequences in the project's net present value.

4.2   Comparison of details

4.2.1   Value of travel time savings

Both guidelines introduce or extend a differentiation of values of time, according to distance and trip purpose. The positive relationship between value of time and income level is acknowledged in both approaches but does not lead to explicit differentiation, due to limits of traffic modelling precision and probably as well to equity considerations. Nevertheless, some differentiations may partially and indirectly capture this kind of effect: French values include a higher urban value for the Parisian region, and the modal differentiation of values of time captures auto-selection phenomena which have to do with income levels.

4.2.2   Reliability and comfort for passenger transport

Reliability in passenger travel time has been introduced in both guidelines, but with different methodological choices in detail. For passenger cars, aggregate indicators of travel time distribution are used and multiplied by specific values differentiated by trip purposes: standard time deviation for Germany and a delay distribution indicator time for France. For long distance public transport (the relevant demand sector for BVWP), the German guidelines do not consider reliability, as time schedules are supposed to be designed including sufficient buffer times and passenger transport has right of way over freight transport, whereas the French ones use the magnitude of delays and their probabilities.

Comfort is taken into account explicitly only in the French guidelines, using time multipliers depending on the comfort level, but it can be argued that German guidelines may partially and indirectly capture them too, only for traffic shifts and induced traffic, when using the surplus corrective term (see 3.2.2 and 4.1.4).

4.2.3   Externalities (CO_2, environment, safety)

Both approaches consider externalities resulting out of accidents as well as emissions of greenhouse gases, air pollutants and noise. The following section exemplifies French and German reference values applied for assessing accidents and CO_2-emissions and discusses the differences.

In Germany, accidents cost rates include replacement costs, costs due to loss of resources and components for considering immaterial damages. In contrast to other European coun-

tries, the latter component was not considered in any CBA approach for assessing transport infrastructure projects in Germany until BVWP 2030. This circumstance is probably due to German history of the twentieth century and the resulting ethical doubts concerning the valuation of human lives. For BVWP 2030 this component was determined by assessing the willingness to pay of users for reducing the risk being harmed by accidents (themselves or rather relatives and friends). Due to the additional consideration of this component accident cost rates raise significantly by above 100% and more depending on the degree of injury. Accordingly, the cost rate applied for assessing fatalities is about 2.48 Million Euros (2012 values). Nevertheless, the German cost rates are below the French ones. The explanation may be, that the German approach and its component for considering immaterial damages are based on values of the HEATCO-project, whereas the French guidelines consider results of new surveys (OECD 2012 survey).

In terms of CO_2-emissions French value increases from 32 to 100 €/ton in 2030 whereas in Germany a constant cost rate, 145 €/ton, is applied. The German value is determined for 2030 but should be used for the entire assessment period. Having the large range of published values in mind, it can be said, that the German and French value for 2030 are very close to each other[7].

Beyond the above mentioned externalities each approach considers additional impacts which are not part of the other one. In case of the French guidelines up- and downstream effects belong to these additional impacts whereas the German BVWP additionally considers separating effects of transport infrastructure within urban areas and CO_2-emissions due to constructing, operating and deconstructing of transport infrastructures.

4.3 Governance, integration of CBA guidelines/studies with decision-process (planning procedures) and stakeholder consultation

4.3.1 Evaluation across all transport modes or assessment of single transport modes

The BVWP evaluates transport infrastructure investment across the transport modes road, railway and inland waterways. The assessment approaches for all three transport modes are similar or even identical.

French guidelines are also common to all modes, with some specificities.

4.3.2 CBA focus or homogenous integration of further evaluation aspects

Both guidelines consider supplementary assessment studies in addition to CBA but with different focuses. In Germany, an aggregation process for combining different assessment modules with explicit decision rules (see Fig. 6) is established whereas the Quinet report

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[7] CE Delft-INFRAS (2011)

and French guidelines rather develop some methodological and practical coordination issues (see chapters 3.1, 3.3 and 3.4).

4.3.3   Place of CBA in the national decision process with its specificities

The BVWP forms the basis for the development and upgrading of transport infrastructure. It is prepared by the Federal Ministry of Transport and Digital Infrastructure (BMVI) and is adopted by the Federal Cabinet. Thereby it is a non-legislative act of intent and not a funding plan or program. Usually the BVWP is valid for 10 to 15 years or until a new federal transport infrastructure plan is published. Within this period the BVWP is reviewed usually every five years. The parliament decides about the BVWP by passing bills for the extension of the federal transport network. These extension acts are the basis for further administrative and more detailed planning steps.

In parallel the parliament decides about the general medium-term financial planning and the annual budget of the federal government. The medium-term financial planning includes an investment framework plan for the federal transport network and the next five years. Both annual budget and investment framework plan are indispensable for the annual construction planning which is of course also influenced by the planning status and the prioritisation of the projects.

France had such a national planning process every five years, for about fifty years beginning after the Second World War. The mandate of the Quinet report did not include the definition of official decision rules. In practice, the five year plans were accompanied from time to time by national infrastructure schemes (modal, then intermodal), issued by the State. More recently, a national Commission was set up for proposing a more selective program of projects, taking into account the crisis and the related stringent budget constraints. But, since about 1990, there is no regularity in the timing of these infrastructure schemes, nor regular medium term plans. As a matter of consequence, the French guidelines provide no indication on how to prioritize the projects inside a comprehensive plan (apart from the recommendation to maximize the Net Present Value of the program), while the German guidelines provide recommendations for setting medium and long term programmes.

Official procedures are found at the individual project's level, beginning with public debates focusing on a project's opportunity or, rarely, more broadly on a transport problem (e.g. Vallée du Rhône transports, development and congestion), then developing all studies, stakeholder and public discussions, and public enquiries. What is specific to France is the compulsory ex-post studies made a few years after the project is implemented; results of these studies were quite useful for the Quinet report. The role of Parliament may be seen rather as budgetary regulation but they do not endorse lists of projects. A recent development, still underway, is the reflection on "participative democracy" which should improve stakeholder participation, upstream and in a more continuous way during the project's life.

5. Conclusion

As a whole, we see that the scope of CBA guidelines depends on the national decision framework and on the themes public debates are focused on. But the methodological issues addressed prove to be quite convergent, and confirm the needs for research on traditional topics such as externalities and value of time differentiation. They also show renewed interest on topics like the treatment of risks and uncertainties, or like the often disregarded issues of surplus calculation. Another feature is that CBA is not anymore considered in isolation but in interaction with other kinds of studies, and that its long relationship with traffic modelling is evolving, in search for better global consistency. Finally, the variety of choices made for some of the methodological issues, after trying to make out what is due to national specificities and what is not, may inspire interesting ideas for the methodological debate.

Abstract

Cost benefit analysis of investments is an ongoing preoccupation for public authorities in France and Germany, as in many other countries.

In Germany, the set-up of the Federal Transport Infrastructure Plan (FTIP) / Bundesverkehrswegeplan (BVWP) is based on project assessment methodologies for which the state of art is updated regularly. The most recent revision was finalised in summer 2016.

In France, the requirement for cost-benefit analysis has long been enshrined in the legislation concerning transportation, and it has been quite recently extended by the law to all public investment in civil projects.

The paper reviews the recent methodological updates and compares the main methodological choices made in each national approach, reflecting the different political and administrative requirements.

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APPENDIX 1   German guidelines – Details on the corrective term for modal shift or induced traffic (difference of implicit benefit)

From equitation (1) (see chapter 3.2) we get

$$\overline{GC^b_{implicit}} - GC^a_{implicit} = (uc^a + \beta \times t^a) - (\overline{uc^b} + \beta \times \overline{t^b}) \qquad (2)$$

Switching from implicit user costs of the average switching user to implicit benefits of all switching users, equation (2) becomes

$$
\begin{aligned}
\Delta U_{implicit,total} \quad &= \left(\overline{U^b_{implicit}} - U^a_{implicit}\right) \times \Delta x \\
&= \left[\left(\overline{uc^b} + \beta \times \overline{t^b}\right) - (uc^a + \beta \times t^a)\right] \times \Delta x \qquad (3)
\end{aligned}
$$

being

$\Delta U_{implicit,total}$ difference of implicit benefits of all switching users

$U^a_{implicit}$ implicit benefit of option a and the average switching user

$\overline{U^b_{implicit}}$ average implicit benefit of option b and the average switching user

Δx number of switching users.

This difference of implicit benefits is added to those benefits which have already been considered by the methodology of BVWP before. These benefits consist of differences of operational costs and travel time costs:

$$U_{operational} + U_{travel\ time} = (rk^a - rk^b) \times \Delta x + (\beta \times t^a - \beta \times t^b_1) \times \Delta x \qquad (4)$$

$U_{operational}$ benefits from operational cost savings

$U_{travel\ time}$ benefits from travel time savings

rk^a specific operational costs of option a

rk^b specific operational costs of option b

t^b_1 travel time of option b after implementation of infrastructural investment

Therefore, the total benefits U_{total} become

$$U_{total} = \Delta U_{implicit,total} + U_{operational} + U_{travel\ time}$$

$$U_{total} = \begin{bmatrix} (rk^a - rk^b) + (\beta \times t^a - \beta \times t_1^b) \\ + (\overline{uc^b} + \beta \times \overline{t^b}) - (uc^a + \beta \times t^a) \end{bmatrix} \times \Delta x \tag{5}$$

$$U_{total} = [\beta \times (\overline{t^b} - t_1^b) + (\overline{uc^b} - rk^b) - (uc^a - rk^a)] \times \Delta x \tag{6}$$

This is exactly the calculation resulting out of the welfare concept:

$$U_{total} = \Delta CS + \Delta PS$$

$$\Delta CS = \beta \times (\overline{t^b} - t_1^b) \times \Delta x = \beta \times (t_0^b - t_1^b) \times \frac{1}{2} \times \Delta x$$

$$\Delta PS = [(\overline{uc^b} - rk^b) - (uc^a - rk^a)] \times \Delta x$$

being:

U_{total} total benefits of infrastructural investment

ΔCS change in consumer surplus due to infrastructural investment

ΔPS change in producer surplus due to infrastructural investment

Vergabepraxis von Taxikonzessionen in Deutschland

VON THORSTEN HEILKER, MÜNSTER

1. Einleitung

Der Taximarkt ist einer der am strengsten regulierten Märkte in Deutschland. Laut Personenbeförderungsgesetz sind die Taxitarife fixiert und Behörden können Vorgaben zur Betriebs- und Beförderungspflicht erlassen sowie die Anzahl der ausgegebenen Taxikonzessionen in einem Gebiet begrenzen. Mit dem letztgenannten Teilaspekt der Regulierung befasst sich diese Arbeit.

Zur bundesweiten Vergabepraxis von Taxikonzessionen sind lediglich wenige Informationen vorhanden. Die Genehmigungsbehörden einiger Städte wie Berlin, Hamburg oder Lübeck verzichten im Gegensatz zu vielen anderen Regionen auf eine Obergrenze für Taxikonzessionen.[1] Eine deutschlandweite Datenbasis über die tatsächliche Vergabepraxis existiert nicht. Um herauszufinden, wie die Konzessionsvergabe in der Praxis von den Behörden gehandhabt wird, wurden die zuständigen Mitarbeiterinnen und Mitarbeiter hierzu befragt. Ziel war es zu ermitteln, in welchen und in wie vielen Regionen der Bundesrepublik aktuell eine mengenmäßige Beschränkung des Marktzutritts vorliegt.

Als Ergebnis ist ein sehr heterogenes Vergabeverhalten erkennbar. Es kristallisierte sich heraus, dass Berlin, Hamburg und Lübeck nicht die einzigen Orte sind, in denen es keine Beschränkung der Anzahl an Taxen gibt. In vielen weiteren Regionen besteht unter anderem aufgrund der geringen Nachfrage nach Konzessionen keine Notwendigkeit, eine Begrenzung vorzunehmen. Neben dieser Unterscheidung sind ebenfalls starke Differenzen bei den praktizierten Vergabemethoden ersichtlich. Einige Kommunen der Bundesrepublik geben Gutachten in Auftrag, um eine konkrete Obergrenze festzusetzen. Teilweise konnten ebenfalls sehr pragmatische Herangehensweisen – wie das Koppeln der Lizenzenanzahl an die Einwohnerzahl – festgestellt werden.

Nach der Vorstellung des rechtlichen Rahmens folgt eine Darstellung der Ergebnisse der Umfragen zur Konzessionsvergabe. Abschließend verweist das Fazit auf die aktuelle Dis-

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[1] Vgl. Pape / Wein 2015, S. 378.

kussion, ob eine Liberalisierung des Taximarktes und damit einhergehend eine Aufhebung der Konzessionsbeschränkungen umzusetzen ist.

2.   Rechtlicher Rahmen

Der rechtliche Rahmen spielt für die konkrete Ausgestaltung der Konzessionsvergabe eine entscheidende Rolle. Als gesetzliche Grundlagen für den Taximarkt dienen das Personenbeförderungsgesetz (PBefG) und die Verordnung über den Betrieb von Kraftfahrzeugunternehmen im Personenverkehr (BO-Kraft).[2] Abbildung 1 veranschaulicht den Ablauf einer Konzessionserteilung und somit, welche Schritte notwendig sind und welche Kriterien erfüllt werden müssen, um eine Genehmigung für eine Taxikonzession in der Bundesrepublik zu erhalten.

Abbildung 1: Ablauf einer Konzessionserteilung

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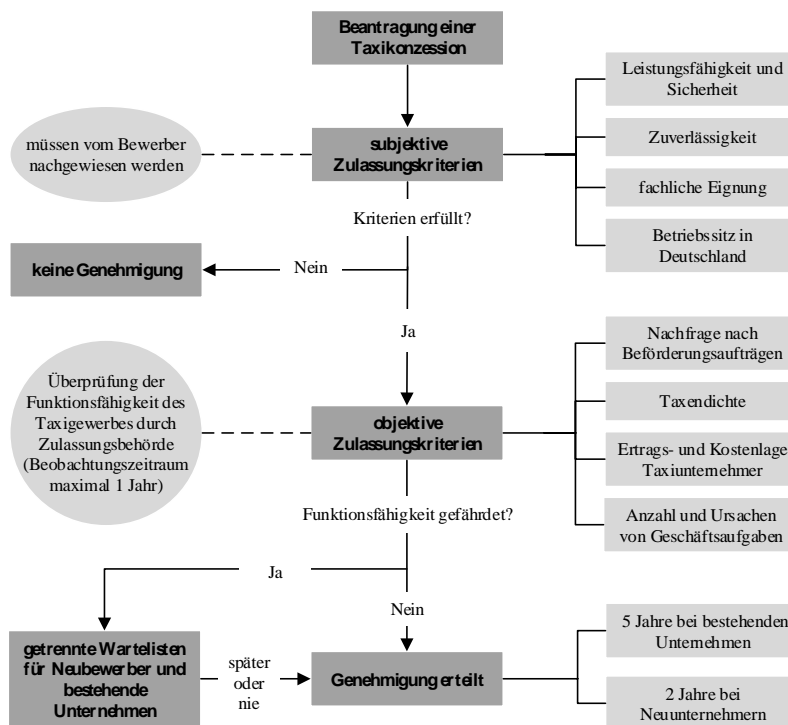
[2]   Vgl. Monopolkommission der Bundesregierung 2012/2013, S. 114-116; Pape / Wein 2015, S. 365.

Die in Abbildung 1 aufgeführten vier subjektiven Zulassungskriterien sind von jedem Taxiunternehmer während der gesamten Betriebsdauer zu erfüllen. Diese werden von der zuständigen Behörde – einer von der Landesregierung bestimmten örtlichen Institution[3] – überprüft.[4]

Das erste der vier Kriterien ist die *Leistungsfähigkeit und Sicherheit* des Bewerbers.[5] Hierfür wird eine korrekte Betriebsführung[6] sowie die Haltung der Fahrzeuge in einem betriebssicheren Zustand vorausgesetzt.[7]

Ein weiteres Kriterium ist die *Zuverlässigkeit* des Unternehmers oder gegebenenfalls seines Geschäftsführers.[8] Laut Gesetz muss Unzuverlässigkeit nachgewiesen werden, um einer Person den Zugang zum Taximarkt zu verwehren.[9]

Das dritte subjektive Zulassungskriterium ist die *fachliche Eignung* des Antragstellers oder des Geschäftsführers.[10] Diese kann durch eine angemessene Vortätigkeit oder durch eine Fachkundeprüfung bei der Industrie- und Handelskammer nachgewiesen werden.[11]

Als letztes wird vom Gesetzgeber gefordert, dass das Unternehmen seinen *Betriebssitz oder eine Niederlassung in Deutschland* hat.[12]

Ein Bewerber, der diese Kriterien nicht nachweisen kann, erhält keine Genehmigung. Auch wenn die subjektiven Zulassungsbeschränkungen erfüllt sind, kann die Genehmigungsbehörde einem Bewerber die Taxilizenz verwehren. Da Taxen einen Bestandteil des öffentlichen Personennahverkehrs (ÖPNV) darstellen, darf dies geschehen, wenn die öffentlichen Verkehrsinteressen beeinträchtigt werden, weil die „Funktionsfähigkeit des Taxigewerbes gefährdet ist."[13] An dieser Stelle ist es wichtig zu erwähnen, dass bei der Beurteilung jeweils das gesamte Taxigewerbe betrachtet werden soll[14] und die Verweigerung neuer Genehmigungen nicht das Ziel haben darf, dem vorhandenen örtlichen Taxigewerbe eine angemessene wirtschaftliche Existenz zu gewährleisten.[15] Im Zuge einer Konzessionsbe-

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[3] Dies sind zumeist die Behörden auf Kreisebene, in Hessen auf Gemeindeebene. In Rheinland-Pfalz und Niedersachsen gibt es einige kreisangehörige Städte, die eigene Zuständigkeiten besitzen. Eine Besonderheit ist zudem in Schwerin zu finden. Die Regulierung der Taxikonzessionen für die kreisfreie Stadt Schwerin wird vom angrenzenden Landkreis Ludwigslust-Parchim übernommen.
[4] Vgl. Personenbeförderungsgesetz (PBefG) §11 Absatz 1.
[5] Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 1.
[6] Vgl. Fielitz / Grätz 2016, §13 Rn. 8.
[7] Vgl. Bardarsky 1998, S. 71.
[8] Vgl. Fielitz / Grätz 2016, §13 Rn. 7.
[9] Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 1; Fielitz / Grätz 2016, §13 Rn. 10.
[10] Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 1.
[11] Vgl. Bardarsky 1998, S. 71; Fielitz / Grätz 2016, §13 Rn. 20; Bidinger 2011, §13 Rn. 27c-g; Industrie- und Handelskammer zu Leipzig 2014, S. 2: Es müssen eine 30-minütige mündliche und zwei einstündige schriftliche Prüfungen absolviert werden.
[12] Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 1.
[13] Personenbeförderungsgesetz (PBefG) §13 Absatz 4.
[14] Vgl. Fielitz / Grätz 2016, §13 Rn. 56.
[15] Vgl. Fromm et al. 2000, S. 35; Bardarsky 1998, S. 73; Bidinger 2011, §13 Rn. 86b; ISUP GmbH 2014, S. 4.

schränkung muss stets eine Abwägung zwischen dem Grundrecht der Berufsfreiheit und der Funktionsfähigkeit des örtlichen Taxigewerbes als Element des öffentlichen Verkehrsinteresses stattfinden.[16] Um eine angemessene Anzahl von Konzessionen festzulegen und um festzustellen, ob und wann die Funktionsfähigkeit des Taxigewerbes gefährdet ist, sind im Personenbeförderungsgesetz seit 1983 vier Kriterien aufgeführt, die durch weitere – vor allem örtliche – Besonderheiten ergänzt werden sollen.[17]

Zunächst ist die *Nachfrage nach Beförderungsaufträgen* zu beachten, da das Fahrgastaufkommen für den Unternehmer die Existenzgrundlage ist und seine Einnahmemöglichkeit darstellt.

Darüber hinaus soll die Kennzahl der *Taxendichte* berechnet werden, die jedoch nur ein grober Orientierungswert ist und erst in Zusammenhang mit weiteren Faktoren, wie zum Beispiel dem Vorliegen von Messegeländen, Fremdenverkehrsattraktionen, Flughäfen oder der Einbeziehung der Qualität des öffentlichen Personennahverkehrs, an Aussagekraft gewinnt.[18]

Das dritte Kriterium ist die *Ertrags- und Kostenlage* der Taxiunternehmer. Zur Überprüfung dieses Kriteriums kann beispielsweise von Sachverständigen im Auftrag der Genehmigungsbehörde ein Gutachten erstellt werden, für das die Unternehmer ihre Geschäftsunterlagen bereitstellen müssen.[19]

Als letztes werden *Anzahl und Ursachen von Geschäftsaufgaben* untersucht. Da nur selten Geschäftsaufgaben zu konstatieren sind, ist die Anwendung dieses Kriteriums schwierig.[20]

Um die Vergabe neuer Taxikonzessionen zu prüfen und die Auswirkungen früherer Genehmigungen zu erfassen, steht der Behörde laut Gesetz ein Beobachtungszeitraum von höchstens einem Jahr zur Verfügung.[21] Falls daraufhin keine Gefährdung der Funktionsfähigkeit zu vermuten ist, wird eine Genehmigung erteilt. Bei der Vergabe neuer Lizenzen muss zudem eine angemessene Berücksichtigung von Neubewerbern und etablierten Unternehmen gewährleistet sein (z.B. 2:1 zugunsten der Neubewerber).[22] Insgesamt sind die Behörden nach einer Prüfung der genannten Kriterien nicht an eine konkrete Höchstgrenze gebunden. Die Geltungsdauer einer Taxikonzession beträgt maximal fünf Jahre. Genehmigungen für Neuunternehmer sind hingegen auf zwei Jahre befristet. [23]

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[16]   Vgl. Bidinger 2011, §13 Rn. 86b.
[17]   Vgl. Bardarsky 1998, S. 73; Bidinger 2011, §13 Rn. 86c. Im Landkreis Mittelsachsen beispielsweise wird hierbei neben den vier Kriterien die Erreichbarkeit eines Ortes mit öffentlichen Verkehrsmitteln und im Erzgebirgskreis der Anteil der Bevölkerungsfahrten berücksichtigt.
[18]   Vgl. Bidinger 2011, §13 Rn. 89.
[19]   Vgl. Bidinger 2011, §13 Rn. 89.
[20]   Vgl. Bidinger 2011, §13 Rn. 89.
[21]   Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 4; Bardarsky 1998, S. 74; Bidinger 2011, §13 Rn. 90.
[22]   Vgl. Personenbeförderungsgesetz (PBefG) §13 Absatz 5; Fromm et al. 2000, S. 36.
[23]   Vgl. Personenbeförderungsgesetz (PBefG) §16 Absatz 4; Bidinger 2011, §13 Rn. 92.

Für den Fall, dass die Genehmigungsbehörde zu dem Ergebnis kommt, dass eine Gefährdung der Funktionsfähigkeit des Taxigewerbes vorliegt, werden für Bewerber zwei getrennte Wartelisten geführt, eine für Neubewerber und eine für bestehende Unternehmen, die sich vergrößern möchten. Unternehmen außerhalb der Wartelisten dürfen in diesem Fall keine Konzessionen erhalten.[24] In Gesprächen mit Mitarbeitern der Genehmigungsbehörden wurde deutlich, dass Unternehmer in einigen Regionen Deutschlands mehrere Jahre warten müssen, um eine Konzession zu erhalten. Lediglich bei einer Rückgabe von Konzessionen oder sobald keine Gefährdung der Funktionsfähigkeit mehr vorliegt, können Lizenzen an Bewerber auf den Wartelisten vergeben werden.

Eine andere Möglichkeit für Unternehmen, Taxilizenzen zu erwerben, ist die Übertragung von Konzessionen eines anderen Betriebs. Dies ist vom Gesetzgeber zwar eingeschränkt worden; es ist jedoch immer noch möglich, ein ganzes Unternehmen inklusive der vorhandenen Konzessionen zu übernehmen.[25] Hiervon wird besonders in Regionen mit großer Nachfrage Gebrauch gemacht, sodass in Städten oftmals nur sehr wenige Konzessionen an die Behörde zurückgegeben werden, was eine Regulierung erschwert.

In vielen Regionen stellt das Mietwagengewerbe einen Wettbewerber für das örtliche Taxigewerbe dar.[26] Es bestehen jedoch zum Teil andere gesetzliche Vorgaben, die im folgenden kurz aufgezeigt werden. Der Mietwagenverkehr zählt im Gegensatz zum Taxiverkehr nicht zum öffentlicher Personennahverkehr.[27] Mietwagenfahrer besitzen daher keine Privilegien im Straßenverkehr wie das Nutzen von Busspuren. Es ist zudem keine Begrenzung der Mietwagenkonzessionen vorgesehen. Die Betriebspflicht (Bereithaltungszeiten), Beförderungspflicht (keine Ablehnung von Fahrten im Pflichtfahrbezirk) und Tarifpflicht finden ausschließlich im Taximarkt Anwendung.[28] Eine weitere Unterscheidung ist, dass Mietwagenunternehmer ausschließlich auf dem Bestellmarkt aktiv werden dürfen, wohingegen Taxifahrer auch Kunden am Straßenrand aufnehmen und Taxihalteplätze nutzen können. Hierzu ist im Personenbeförderungsgesetz die Rückkehrpflicht für Mietwagen verankert, welche besagt, dass Aufträge ausschließlich vom Betriebs- oder Wohnsitz des Mietwagenunternehmers angenommen werden dürfen.[29] In Kommunen unter 50.000 Einwohnern können ebenfalls sogenannte Mischkonzessionen vergeben werden. In diesem Fall darf ein Fahrzeug sowohl als Taxi als auch als Mietwagen genutzt werden. Dies ist nur zulässig, wenn „in kleineren Gemeinden einem Taxiunternehmer keine Lebensexistenz aus dem Taxigewerbe allein gewährt werden kann."[30] Da Mischkonzessionen lediglich in Gebieten mit geringer Nachfrage und somit zumeist ohne Konzessionsbeschränkung auftreten, haben sie keine Auswirkung auf eine Limitierung der Anzahl der Lizenzen.

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[24] Vgl. Fromm et al. 2000, S. 36.
[25] Vgl. Personenbeförderungsgesetz (PBefG) §2 Absatz 3.
[26] Vgl. Heinze 2007, S. 416; Fielitz / Grätz 2016, §49 Rn. 13.
[27] Vgl. Fielitz / Grätz 2016, §46 Rn. 10 und §49 Rn. 20; Baake / von Schlippenbach 2014, S. 752.
[28] Vgl. Heinze 2007, S. 416; Fielitz / Grätz 2016, §49 Rn. 20.
[29] Vgl. Personenbeförderungsgesetz (PBefG) §49 Absatz 4; Fielitz / Grätz 2016, §46 Rn. 14 und §49 Rn. 13 und 22.
[30] Fielitz / Grätz 2016, §46 Rn. 11.

3. Vergabepraxis von Taxikonzessionen auf Kreisebene

Um einen Überblick über die Umsetzung des rechtlichen Rahmens in der Praxis zu erhalten, wurden die zuständigen Mitarbeiterinnen und Mitarbeiter der Genehmigungsbehörden hierzu deutschlandweit schriftlich befragt. Dieses Kapitel befasst sich mit den Ergebnissen einer Umfrage auf Kreisebene. In fast allen Bundesländern werden Taxikonzessionen auf Kreisebene vergeben. Lediglich in Hessen sind die Gemeinde- bzw. Stadtverwaltungen für die Genehmigung von Taxilizenzen zuständig. Für Hessen wurde daher eine separate Umfrage auf Gemeindeebene durchgeführt, welche in Kapitel 4 ausgewertet wird. Bei beiden Umfragen sollte angegeben werden, ob es in der jeweiligen Region eine konkrete Obergrenze für die Anzahl an Taxikonzessionen gibt und bereits alle Lizenzen vergeben sind. Dies bedeutet, dass eine faktische Konzessionsbeschränkung vorliegt und infolgedessen zumeist Wartelisten geführt werden. Falls dies nicht der Fall ist, können Unternehmen bei Erfüllung der subjektiven Zulassungsvoraussetzungen direkt eine Taxilizenz erhalten. Insgesamt wurden 376 Kreise und kreisfreie Städte befragt. Im folgenden Unterkapitel stehen zunächst die unterschiedlichen Konzepte der Konzessionsvergabe im Vordergrund, bevor eine grafische Auswertung der Umfrageergebnisse anschließt.

3.1 Konzessionsvergabekonzepte auf Kreisebene

Als Ergebnis der Umfrage auf Kreisebene lässt sich in der deutschlandweiten Praxis der Konzessionsvergabe eine sehr uneinheitliche Anwendung konstatieren. Das Spektrum reicht, wie in Tabelle 1 dargestellt, von Regionen, in denen seit Jahren keine Konzessionen trotz langer Warteliste mehr vergeben wurden, bis hin zu Kreisen, in denen seit langer Zeit keine Nachfrage nach Konzessionen besteht und eine Beschränkung nicht nötig ist.

Tabelle 1: Überblick über einige Konzessionsvergabekonzepte auf Kreisebene

faktische Konzessions-beschränkung	teilweise Konzessions-beschränkung	keine Konzessions-beschränkung
Wartelisten	Beschränkung nach Einwohnerzahlen	keine Insolvenzen als Indikator
Absage mit Verweis auf Taxidichte	Bewerber muss Bedarf nachweisen	nur sehr geringe Nachfrage
Absage in Gespräch mit Unternehmen	Einzelfallprüfung je Region	froh über jeden Unternehmer
	Auswertung eines Fragebogens	Markt regelt sich von alleine
	bestehendes Unternehmen auf Warteliste	„Hamburger Modell"

Die Rückmeldungen wurden jeweils einer der drei Kategorien *faktische Konzessionsbeschränkung*, *teilweise Konzessionsbeschränkung* und *keine Konzessionsbeschränkung* zugeordnet, auf die im Folgenden eingegangen wird.

Faktische Konzessionsbeschränkung

In vielen Städten und auch in einigen Landkreisen können nicht sämtliche Anfragen für eine Taxikonzession bedient werden, da bei einer Genehmigung die Funktionsfähigkeit des Taxigewerbes als gefährdet eingestuft wird. Aus diesem Grund werden Wartelisten geführt. In Münster datiert beispielsweise der erste Platz auf der Warteliste aus dem Jahr 1972, ob dieser Bewerber aktuell noch Interesse hat, ist jedoch anzuzweifeln. Erfurt, Nürnberg (seit 1992) und Dresden (seit 1996) vergeben ebenfalls seit Jahren keine Konzessionen mehr.

Die Länge der Wartelisten ist jedoch sehr unterschiedlich.[31] So existieren zum Befragungszeitpunkt Juni 2015 einige Kreise mit nur sehr wenigen Unternehmen auf der Warteliste. Als Beispiele sind der Landkreis Sonneberg mit einem Bewerber sowie die Landkreise Dillingen an der Donau und Potsdam-Mittelmark mit jeweils zwei Bewerbern zu nennen. Demgegenüber sind in einigen kreisfreien Städten die Listen sehr lang. Besonderen Umfang haben diese in Köln mit 475 (1217 Konzessionen), München mit mehr als 400 (3.400 Konzessionen), Münster mit 300 (270 Konzessionen) oder Stuttgart mit 180 Bewerbern (703 Konzessionen). Die Nachfrage nach Taxikonzessionen ist in diesen boomenden Ballungsregionen offensichtlich besonders hoch. In Münster übersteigt die Anzahl der Unternehmen auf der Warteliste die Zahl der ausgegebenen Lizenzen. Die Existenz von Nachfragepotenzialen wie Unternehmenszentralen, Kultureinrichtungen, Touristenattraktionen und öffentlichen Einrichtungen sowie eine höhere Kaufkraft führen zu einer hohen Attraktivität der Städte für Taxiunternehmen.

Wie genau die örtlichen Behörden jeweils feststellen, ob die Funktionsfähigkeit des Taxigewerbes gefährdet ist, ist sehr unterschiedlich. Zumeist werden konkrete Höchstzahlen an Taxilizenzen festgeschrieben, die teilweise durch entsprechende Gutachten über die Funktionsfähigkeit des Taxigewerbes ermittelt werden. Die Rechtsverbindlichkeit und der tatsächliche Nutzen dieser Gutachten sind jedoch umstritten. Eine etwas abweichende Handhabung ist beispielsweise im Unstrut-Hainich-Kreis zu finden. Hier werden keine weiteren Konzessionen mehr herausgegeben, aber auch keine Warteliste geführt. In einem Gespräch mit den Unternehmen, die eine Konzession erhalten möchten, erläutert die Behörde die konkrete Situation und erteilt eine Absage. Ein ähnliches Verfahren ist ebenfalls in den Landkreisen Aschaffenburg und Sömmerda vorhanden. Im Landkreis Friesland werden Anträge mit Verweis auf die hohe Taxidichte umgehend abgelehnt.

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[31] Die Länge hängt ebenfalls von der Praxis der Wartelistenführung ab. In einigen Städten (Hagen, Dortmund) werden die Wartelisten beispielsweise jedes Jahr aktualisiert und sind daher kürzer, da nur Bewerber aufgeführt werden, die tatsächlich noch Interesse besitzen.

Teilweise Konzessionsbeschränkung

Eine einheitliche Höchstgrenze auf Kreisebene ist nicht in allen Regionen erstrebenswert. Dies ist besonders bei ländlicheren Flächenkreisen der Fall, in denen es größere Städte gibt. Die Nachfrage nach Lizenzen ist innerhalb des Kreises sehr ungleich verteilt. Eine Konzession muss stets in der jeweiligen Betriebssitzgemeinde beantragt werden. Während in Städten ein hoher Bedarf an Konzessionen besteht, ist die Nachfrage in ländlicheren Regionen des Kreises zum Teil sehr gering. Neben Städten kann auch die Lage eines Flughafens auf dem Gebiet des Kreises zu einer regional konzentrierten hohen Anzahl an Bewerbern für Taxilizenzen führen.[32] In diesen Verwaltungseinheiten kann es vorkommen, dass es für einige Regionen des Kreises, die für Taxiunternehmen lukrativ sind, Wartelisten gibt und für andere Gebiete – zumeist rein ländliche Landstriche – keine Wartelisten geführt werden. Je nachdem, in welcher Betriebssitzgemeinde eine Konzession beantragt wird, kann eine Einzelfallprüfung durchgeführt werden.

Da im Allgemeinen schwer zu überprüfen ist, wann die Funktionsfähigkeit des Taxigewerbes bedroht ist und für die Erstellung eines Gutachtens erhebliche finanzielle Mittel benötigt werden, haben die Kreise unterschiedliche eigene Methoden entwickelt, um dies zu kontrollieren. Die im Gesetz genannten Kriterien sind schwer zu erfassen und eine umfassende Analyse ist sehr arbeitsintensiv. Im Landkreis Sächsische Schweiz-Osterzgebirge wird an die Antragsteller jeweils ein Fragebogen geschickt. Anhand einer Auswertung mit Hilfe des Gutachtens zur Funktionsfähigkeit des Taxigewerbes, das der Behörde vorliegt, wird über den Antrag entschieden. Die Genehmigungsbehörde des Saalekreises fordert jedes Jahr eine Leistungsentwicklung der Taxiunternehmer an und zieht daraus Schlüsse für die Vergabe neuer Konzessionen. In einigen Kreisen wird eine sehr pragmatische Herangehensweise vorgenommen. Es wird zum Teil eine Beschränkung pro Ort nach Einwohnerzahlen praktiziert.[33] Im Rems-Murr-Kreis werden nur bei nachweisbarem Bedarf zusätzliche Konzessionen vergeben oder lediglich eine Ansiedlung in Gemeinden ohne Taxigewerbe gestattet. Im Zollernalbkreis wird jeweils eine Konzession pro Jahr neu erteilt, wenn ein bestehendes Unternehmen eine Erweiterung beantragt. Es wird davon ausgegangen, dass der Unternehmer den einheimischen Taximarkt kennt und aus der genauen Marktkenntnis heraus sicher ist, das Gewerbe vertrage ein weiteres Taxi, weswegen die Funktionsfähigkeit somit nicht bedroht sei.

Keine Konzessionsbeschränkung

Eine weitere Gruppe von Kreisen vollzieht keine quantitative Beschränkung der Taxikonzessionen. Dies ist besonders bei ländlichen Kreisen mit geringer Nachfrage nach Taxidienstleistungen der Fall. Wenn in diesen Kreisen eine Konzession beantragt wird, erteilt die Genehmigungsbehörde diese, sofern die subjektiven Voraussetzungen erfüllt sind.

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[32]   Als Beispiele sind Teile der Kreise Esslingen, Paderborn und Erding zu nennen. In den Städten beziehungsweise Gemeinden, in denen die Flughäfen lokalisiert sind, gibt es viele Bewerber um Taxilizenzen.

[33]   Es werden beispielsweise maximal eine Konzession pro 1000 Einwohner im Landkreis Emmendingen und eine Konzession pro 2000 Einwohner in den Kreisen Steinfurt und Gütersloh ausgegeben.

Im Schwarzwald-Baar-Kreis wird argumentiert, die Tatsache fehlender Insolvenzen im Taxigewerbe weise offensichtlich darauf hin, dass die Funktionsfähigkeit nicht bedroht sei und somit weitere Lizenzen vergeben werden könnten. Die Genehmigungsbehörden sind gelegentlich, wie zum Beispiel im Landkreis Trier-Saarburg, froh über jeden Taxiunternehmer in ihrem Kreis. Im Landkreis Herzogtum Lauenburg wurde seit 15 Jahren jede Anfrage positiv beschieden. In einigen Landkreisen sind insgesamt nur sehr wenige Konzessionen vergeben. Im Landkreis Wunsiedel im Fichtelgebirge wurden beispielsweise bisher maximal zwei Konzessionen nachgefragt. Faktoren wie eine höhere PKW-Dichte und eine generell geringe Nachfrage nach Taxidienstleistungen sowie hohe Anfahrtskosten durch weitere Wege machen diese dünn besiedelten Regionen für den Betrieb eines Taxiunternehmens unattraktiv.

Neben Berlin, Hamburg und Lübeck gibt es außerdem weitere kreisfreie Städte, die keine Beschränkung der Konzessionsanzahl festsetzen. Als Beispiele können Cottbus, Kiel, Wilhelmshaven oder Brandenburg an der Havel genannt werden. In einigen dieser Städte wird das sogenannte „Hamburger Modell" verfolgt und infolgedessen anstelle einer Höchstgrenze eine strengere Prüfung und Kontrolle der subjektiven Zulassungsbeschränkungen in regelmäßigen Abständen durchgeführt.

Falls ein Unternehmer die Ablehnung seines Antrags nicht akzeptiert, kann es zu Widerspruchsverfahren kommen. Eine Möglichkeit, Rechtsstreitigkeiten aus dem Weg zu gehen, ist eine jährliche Beratung über die Notwendigkeit zusätzlicher Konzessionen, wie es der Kreis Unna praktiziert. Alle Beteiligten (Vertreter der Behörden und der Taxiverbände usw.) setzen sich zusammen und einigen sich auf eine Vergabepraxis für das kommende Jahr.

Die Auswertung der Befragung der Kreise ergab eine sehr heterogene Vergabepraxis von Taxikonzessionen. Aufgrund von finanziell und personell differenzierten Ressourcen sowie unterschiedlicher Siedlungsstruktur und Nachfrage erweisen sich jeweils verschiedene Vergabepraxen als praktikabel.

3.2 Auswertung der Umfrageergebnisse auf Kreisebene

Eine repräsentative Datengrundlage ist aufgrund erfolgreicher Datenakquise gegeben. Alle 376 schriftlich kontaktierten Behörden haben nach einigen Rückfragen die Anfrage beantwortet. Da die Landkreise Bayreuth, Deggendorf und Mainz-Bingen aus Datenschutzgründen nicht bereit waren, die Fragen zu beantworten und die Landkreise Cochem-Zell und Coburg derzeit ihre Regulierung überarbeiten und deshalb ebenfalls nicht in die Auswertung aufgenommen werden konnten, standen insgesamt 371 Datenpunkte für die Analyse zur Verfügung. Abbildung 2 stellt die Ergebnisse grafisch dar. Die oberen drei Balken in der Abbildung zeigen eine gesamtheitliche Auswertung für Deutschland und nach kreisfreien Städten und Flächenkreisen differenziert. Die restlichen Balken stellen die Ergebnisse nach Bundesländern getrennt dar.

Abbildung 2: Vergabe von Taxikonzessionen in Deutschland in Prozent
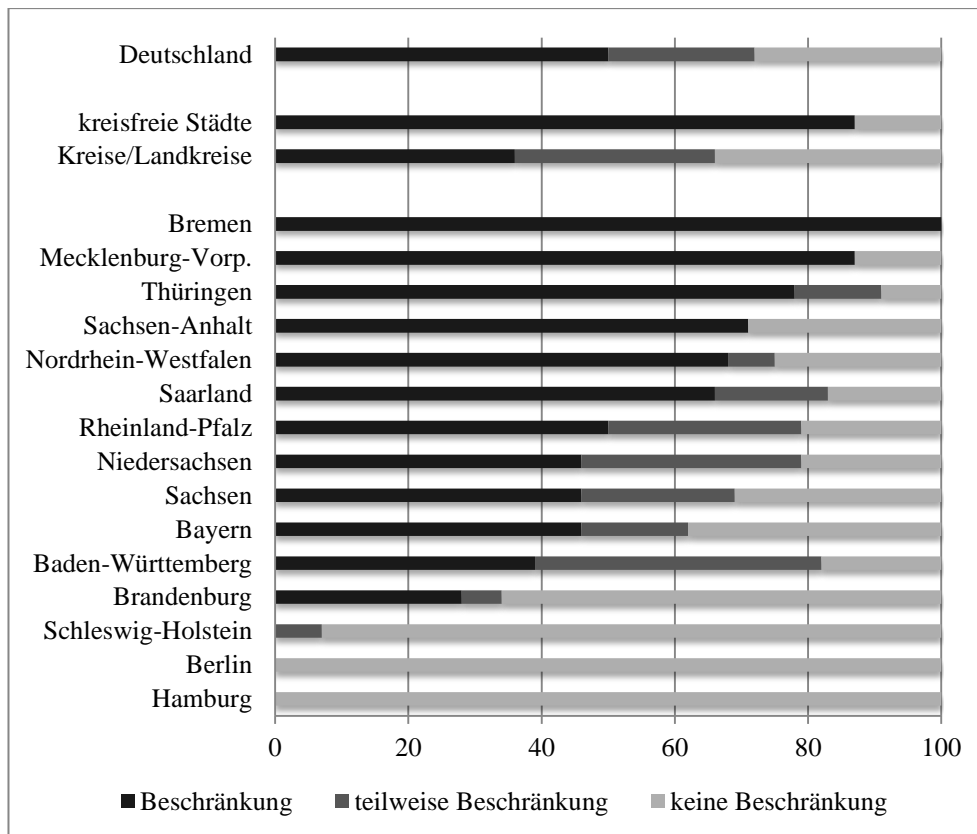
Auffällig ist, dass lediglich bei der Hälfte der teilnehmenden Kreise insgesamt bindende Beschränkungen und somit (zumeist) Wartelisten vorhanden sind. Ein großer Anteil der Kreise (28 Prozent) besitzt keine Beschränkung der Konzessionsanzahl. Dieser Wert liegt deutlich über den Erwartungen. Er zeigt, dass in vielen Regionen eine sehr geringe Nachfrage nach Konzessionen vorhanden ist und eine Gefährdung der Funktionsfähigkeit des Taxigewerbes nicht festgestellt werden kann. Eine strengere Regulierung ist nicht notwendig, der Markt regelt sich somit selbst. 22 Prozent der Kreise besitzen Teilgebiete mit einer Beschränkung sowie Teilbereiche, in denen noch weitere Konzessionen vergeben werden könnten.
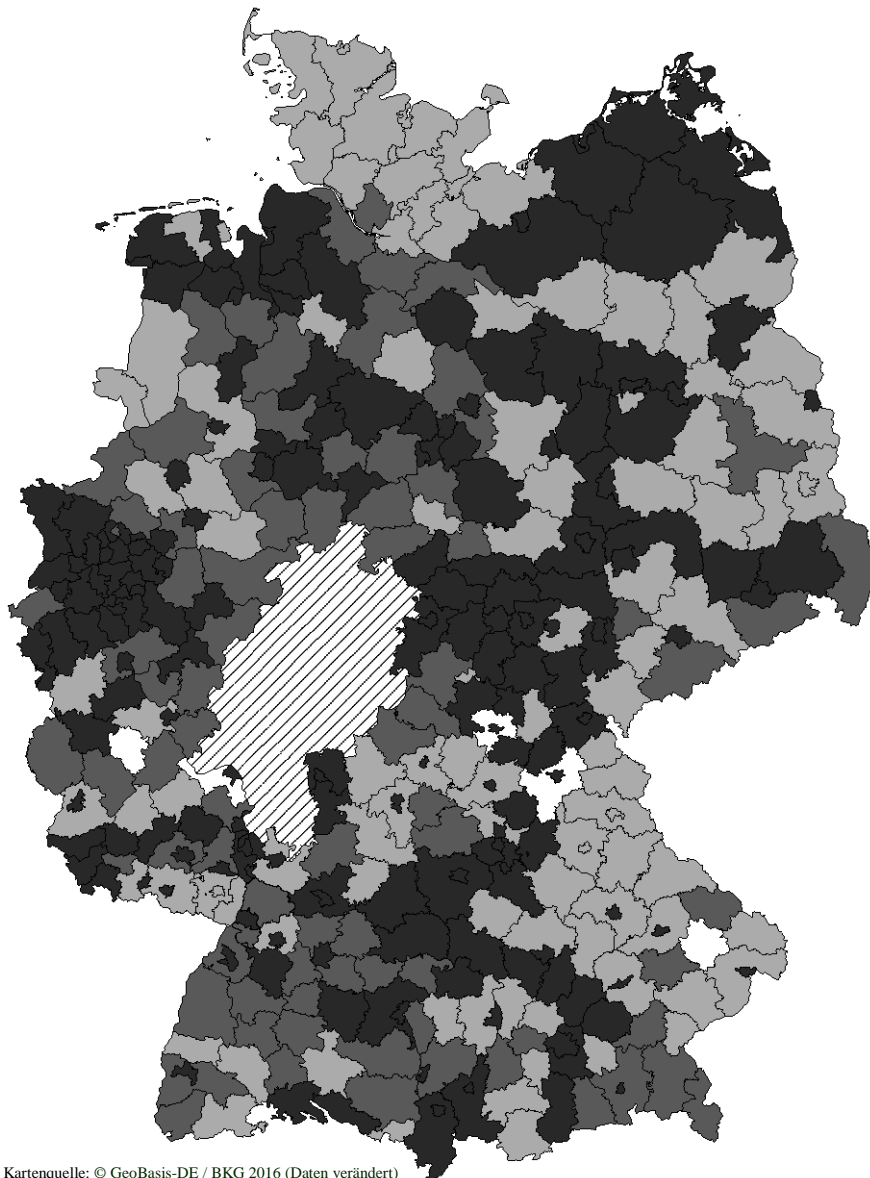
Bei einer Betrachtung der Gruppen Landkreise/Kreise und kreisfreie Städte sind deutliche Unterschiede in der Vergabepraxis zwischen Flächenkreisen und Städten erkennbar. Während in den kreisfreien Städten zu 87 Prozent eine mengenmäßige Beschränkung vorliegt, ist dies bei den Landkreisen/Kreisen nur in gut einem Drittel der Fall. Dies lässt sich zum

Teil damit erklären, dass Taxiunternehmer in dünn besiedelten Gebieten häufig nur im Bestellmarkt tätig sind. In größeren Städten kommen noch der Markt der Taxihalteplätze und der Winkmarkt hinzu. Diese Faktoren sowie zum Teil geringere Anfahrtskosten sorgen dafür, dass sich Taxiunternehmer bei der Standortwahl häufig für einen Ballungszentrum entscheiden. Die Flächenkreise verteilen sich mit annähernd gleichen Anteilen auf die drei Kategorien. Der Kategorie ‚teilweise Beschränkung' sind – wie erkennbar – keine kreisfreien Städte zugeordnet, was darauf zurückzuführen ist, dass diese von der Nachfragestruktur nicht derart heterogen sind wie Flächenkreise und nicht eine Vielzahl von Betriebssitzgemeinden vorhanden ist.

Neben diesen strukturellen Unterschieden können die Umfrageergebnisse ebenfalls im Hinblick auf die geographische Lage der Regionen untersucht werden. Die Vergabepraxis von Taxikonzessionen variiert innerhalb der Bundesländer sehr stark. Einen hohen Anteil an Beschränkungen (68 Prozent) besitzt Nordrhein-Westfalen. Dies ist vermutlich durch die hohe Bevölkerungsdichte und die große Anzahl an kreisfreien Städten im bevölkerungsreichsten Bundesland der Republik zu erklären. In den neuen Bundesländern Mecklenburg-Vorpommern (87 Prozent), Thüringen (78 Prozent) und Sachsen-Anhalt (71 Prozent) sind ebenfalls häufig keine freien Lizenzen vorhanden. Zahlreiche Kreise mit teilweiser Beschränkung der Vergabe von Konzessionen liegen besonders in den Bundesländern Niedersachsen, Baden-Württemberg und Rheinland-Pfalz. In Schleswig-Holstein besteht hingegen in 93 Prozent der Regionen keine Beschränkung. In Brandenburg mit 66 Prozent und in Bayern mit 38 Prozent ist der Anteil von Kommunen ohne Beschränkung ebenfalls überdurchschnittlich.

Abbildung 3 stellt die Umfrageergebnisse mit Hilfe einer Karte dar. Es zeigt sich das beschriebene sehr heterogene Bild innerhalb der Bundesrepublik mit einigen zusammenhängenden Regionen, in denen eine faktische Begrenzung existiert und anderen, in denen Taxikonzessionen zu bekommen sind, ohne dass die Unternehmen zunächst einen Platz auf der Warteliste erhalten. Zusammenhängende Regionen mit einer flächendeckenden Beschränkung sind beispielsweise neben dem Ruhrgebiet an der Nord- und Ostseeküste sowie in einigen Teilen Thüringens und Sachsen-Anhalts zu finden. Eine Beschränkung in Regionen an den Küsten lässt sich möglicherweise dadurch erklären, dass sich viele Taxiunternehmer aufgrund der hohen Touristenzahlen in diesen Kreisen ansiedeln wollen. Das Vorliegen einer Beschränkung in einigen recht dünn besiedelten Kreisen in den neuen Bundesländern ist darauf zurückzuführen, dass im Zuge der Wiedervereinigung für eine kurze Zeit ein quasi rechtsfreier Raum vorlag. Während dieser Zeit haben sich in einigen Regionen viele Taxiunternehmen gebildet, die daraufhin einen Bestandsschutz hatten. Sie existieren zum großen Teil auch heute noch, was dafür sorgt, dass teilweise keine weiteren Konzessionen erteilt werden, weil die vergebenen Lizenzen bereits die Nachfrage abdecken. Im Osten Bayerns an der tschechischen Grenze sowie in Teilen Brandenburgs und Schleswig-Holsteins sind größere Flächen ohne eine Mengenbeschränkung vorhanden. Strukturschwächere Regionen müssen von dem Instrument der Konzessionsbeschränkung keinen Gebrauch machen. Eine teilweise Beschränkung ist recht verstreut vor allem in den alten Bundesländern zu finden.

Abbildung 3: Karte zur Konzessionsvergabepraxis in deutschen Kreisen und kreis-freien Städten

Kartenquelle: © GeoBasis-DE / BKG 2016 (Daten verändert)

▪ Beschränkung	▪ keine Beschränkung
▪ teilweise Beschränkung	▫ keine Daten vorhanden
▨ Karte Hessen siehe Abbildung 4	
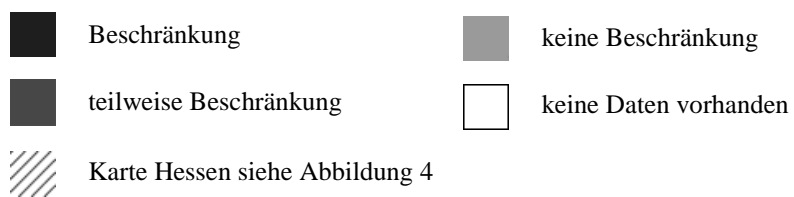
4. Vergabepraxis von Taxikonzessionen auf Gemeindeebene

Die Vergabepraxis von Taxikonzessionen in Hessen war ebenfalls Grundlage einer Umfrage. Im Gegensatz zum übrigen Bundesgebiet findet die Vergabe von Konzessionen in Hessen auf Gemeindeebene statt. Dies gilt für alle Städte und Gemeinden mit über 7.500 Einwohnern. Für die kleineren Kommunen ist die jeweilige Kreisbehörde verantwortlich.[34] Neben den fünf kreisfreien Städten wurden daher die 21 Kreisämter sowie insgesamt 218 Städte und Gemeinden mit über 7.500 Einwohnern angeschrieben. Sie wurden ebenfalls dazu befragt, ob potenzielle Unternehmen weitere Konzessionen von der Behörde bekommen können, wenn sie alle subjektiven Zulassungsvoraussetzungen erfüllen. Wie im vorherigen Kapitel werden zunächst die Vergabekonzepte beschrieben und anschließend die Ergebnisse ausgewertet.

4.1 Konzessionsvergabekonzepte auf Gemeindeebene

Die Vergabepraxis der Kommunen in Hessen unterscheidet sich von der im vorigen Kapitel beschriebenen in den anderen Bundesländern, was durch die Regulierung auf Gemeindeebene zu erklären ist. Die Kategorie „teilweise Beschränkung" besitzt aus diesem Grund in Hessen keine Relevanz, da es innerhalb einer Gemeinde beziehungsweise Stadt keine Gebiete mit unterschiedlicher Regulierung gibt. Daher können die Kommunen den Kategorien *keine Konzessionsbeschränkung* und *faktische Konzessionsbeschränkung* zugewiesen werden.

Tabelle 2 listet einige Vergabekonzepte in Hessen auf, die im Folgenden näher erläutert werden. Außerdem werden am Ende dieses Unterkapitels einige Besonderheiten beschrieben, die bei den Rückmeldungen der Kommunen aufgefallen sind.

Tabelle 2: Überblick über einige Konzessionsvergabekonzepte auf Gemeindeebene in Hessen

faktische Konzessionsbeschränkung	keine Konzessionsbeschränkung
Wartelisten	keine Taxiunternehmen ansässig
keine zusätzlichen Anfragen	ausschließlich Mietwagen
Unternehmen wird Lage erläutert	wenige Taxiunternehmen
Fragebogen, aber kein Rücklauf	„Hamburger Modell"

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[34] Verordnung über die Zuständigkeiten nach dem Personenbeförderungsgesetz – Landesrecht Hessen (PBefG-ZustV,HE) §1 Absatz 4.

Faktische Konzessionsbeschränkung

Wie bei den Kreisen existieren auf Gemeindeebene ebenfalls Kommunen mit einer Konzessionsbeschränkung. Zumeist sind in diesen Fällen Wartelisten vorhanden, in die sich Bewerber eintragen lassen können. Die Stadt Frankfurt am Main hat mit insgesamt 1.712 die meisten Konzessionen in Hessen ausgegeben und führt Wartelisten.

In einigen Kommunen ist die maximale Anzahl an Lizenzen bereits erteilt, sodass eine Beschränkung vorliegt. Trotzdem werden keine Wartelisten benötigt, da keine weiteren Anfragen vorhanden sind. Ein Unternehmer, der eine Lizenz beantragt, würde auf die dann eingeführte Warteliste gesetzt werden. Dies ist beispielsweise in Hungen oder Laubach der Fall.

Einige weitere Behörden wie Gedern oder Butzbach führen keine Warteliste, obwohl eine faktische Beschränkung vorliegt und weitere Anfragen vorhanden sind. Den potenziellen Bewerbern wird erläutert, dass der Bedarf gedeckt ist, aktuell keine weiteren Lizenzen vergeben werden und eine Bewerbung demnach keine Aussicht auf Erfolg hat.

In Rodgau bestehen grundsätzlich sowohl eine Beschränkung als auch eine Warteliste. Es wird jedoch jedes Jahr ein Fragebogen an die ansässigen Unternehmen geschickt und nach der Auswertung der Ergebnisse eine Entscheidung über die Vergabe von zusätzlichen Konzessionen gefällt. Da es jedoch in den letzten Jahren keine Rückmeldungen auf den Fragebogen gegeben hat, wurde geschlussfolgert, dass die Funktionsfähigkeit des Taxigewerbes nicht bedroht sei. Daher wurde pro Jahr eine weitere Lizenz an einen Unternehmer auf der Warteliste vergeben. Neue Bewerber müssen sich allerdings ans Ende der Wartelisten setzen lassen, sodass für sie zunächst eine Beschränkung vorhanden ist.

Keine Konzessionsbeschränkung

Der zweiten Kategorie bei der Umfrage in Hessen sind die Gemeinden und Städte ohne Konzessionsbeschränkung zugeordnet. Viele Gemeinden gaben an, dass es dort keine Taxiunternehmen und demnach auch keine Beschränkung der Konzessionsanzahl gebe. Dies verdeutlicht, dass es in ländlichen Regionen häufig nur eine sehr geringe Nachfrage nach Taxidienstleistungen gibt und es für Taxiunternehmen nicht lohnend ist, sich in diesen Gebieten anzusiedeln. Die Bewohner dieser Kommunen werden teilweise von den Taxiunternehmen von Nachbargemeinden und -städten mitversorgt. Dennoch ist zu befürchten, dass eine ausreichende Versorgung nicht gewährleistet ist.

Die Gemeinden Fuldatal und Sinntal stellen Beispiele für Kommunen dar, in denen ausschließlich Mietwagenunternehmen und keine Taxiunternehmen angesiedelt sind. Dies lässt sich wie in Kapitel 2 beschrieben unter anderem dadurch erklären, dass etwa die Beförderungspflicht nicht für Mietwagenunternehmen gilt und somit unrentable Fahrten (kurze Stecken, Nachtfahrten) abgelehnt werden können. Infolgedessen ist zu beobachten, dass in ländlichen Gebieten einige Taxiunternehmer auf das Mietwagengewerbe wechseln. Die

Beantragung einer Mietwagenlizenz kann ebenfalls in Gebieten mit einer Beschränkung sinnvoll sein, da deren Anzahl nicht limitiert ist.

Da in einigen Gemeinden nur sehr wenige Konzessionen nachgefragt werden, ist auch die Anzahl an Unternehmen gering. Beispielsweise ist dies in Wehrheim, Braunfels und Bad Endbach der Fall, wo nur ein einziges Unternehmen den Markt bedient. Die Anzahl der Taxikonzessionen dieses alleinigen Unternehmens ist dabei unterschiedlich. Während in Heringen (Werra) nur eine Konzession vergeben wurde, besitzt das einzige Taxiunternehmen in der Stadt Melsungen 17, in der Gemeinde Ditzenbach 14 und in der Gemeinde Hofgeismer 12 Konzessionen. Das Existieren von lediglich einem Unternehmen im Markt birgt das Risiko, dass dieses seine Monopolstellung beispielsweise durch Qualitätsverringerung zu Ungunsten der Fahrgäste ausnutzt. Eine Disziplinierung kann durch Unternehmen aus angrenzenden Regionen und Mietwagen erfolgen.

Im Gegensatz zu Frankfurt am Main ist die Vergabe von Konzessionen in der Landeshauptstadt Wiesbaden (aktuell 361 Konzessionen) nicht beschränkt. Die Regulierung folgt dem „Hamburger Modell". Jeder Unternehmer, der die subjektiven Zulassungsvoraussetzungen erfüllt, bekommt eine Taxilizenz zugesprochen. Es findet jedoch in regelmäßigen Abständen eine Prüfung durch ein externes Gutachterunternehmen statt. Bei Fehlverhalten der Unternehmen kann diesen die Taxilizenz wieder entzogen werden.

Bei den Rückmeldungen der Kommunen fielen zudem einige Besonderheiten auf. In drei Fällen findet die Vergabe von Konzessionen gemeinsam mit einer anderen Gemeinde statt. Dies lässt sich möglicherweise mit einer geringen Anzahl an Taxilizenzen begründen. Im Fall der Gemeinden Schauenburg und Edermünde liegen diese sogar in unterschiedlichen Kreisen (Landkreis Kassel und Schwalm-Eder-Kreis). Trotzdem wird die Taximarktregulierung gemeinsam durchgeführt.

Durch den Ausbau des Flughafens Kassel-Calden vereinbarte die Gemeinde Calden im Jahr 2013 einen gemeinsamen Pflichtfahrbezirk mit der Stadt Kassel. In Calden waren bis dahin und sind noch immer zwei Taxiunternehmen ansässig. Bislang gab es keine Warteliste. Allerdings war auch nie ein Mehrbedarf zu erkennen. Durch den gemeinsamen Fahrbezirk sind die Caldener Unternehmen berechtigt, sich in Kassel bereit zu halten, ebenso die Kasseler Unternehmen in Calden. Die Praxis zeigt jedoch, dass es sich für die Kasseler Unternehmen aufgrund des geringen Passagieraufkommens in Calden nicht lohnt, sich dort bereit zu halten.

Insgesamt zeigen die Rückmeldungen aus den hessischen Kommunen, dass es ebenfalls eine große Varianz bei der Vergabepraxis von Taxikonzessionen gibt und die Behörden unterschiedliche Vergabemethoden verfolgen.

4.2 Auswertung der Umfrageergebnisse auf Gemeindeebene

Die Rückmeldequote der Kommunen in Hessen ist mit gut 96 Prozent auf einem hohen Niveau. Da die Stadt Bad Hersfeld und die Gemeinde Fürth aus Datenschutzgründen keine Angaben gemacht haben, konnten 408 der 426 Gemeinden und Städte in die Auswertung aufgenommen werden. Von diesen besitzen lediglich 25 Prozent eine faktische Konzessionsbeschränkung. Die Mehrzahl der Kommunen besitzt keine Beschränkung, was sich auch mit der geringen Bevölkerungsdichte in großen Teilen des Bundeslandes erklären lässt. Bei einer Fokussierung auf alle Städte und Gemeinden über 7.500 Einwohner liegt eine Beschränkung bei einem höheren Anteil von gut 47 Prozent vor. Besonders in Gemeinden spielt eine Begrenzung der Taxilizenzen selten eine Rolle. In diesen, die in der Regel strukturschwächer sind, liegt wie erwartet nur bei einem kleinen Anteil von knapp neun Prozent eine Beschränkung vor. In den übrigen Gemeinden ist zum Teil – wie beschrieben – kein Taxiunternehmen ansässig und häufig keine Nachfrage nach (zusätzlichen) Konzessionen vorhanden. In den Zuständigkeitsbereichen der Kreisverwaltungen sind in Hessen nur sehr wenige Taxiunternehmen vorhanden. Eine faktische Beschränkung liegt lediglich in vier Kommunen unter 7.500 Einwohnern vor.[35] Ein Beispiel hierfür ist Willingen. Hohe Touristenzahlen in diesem Wintersportort sorgen für eine hohe Nachfrage und dafür, dass eine Beschränkung notwendig ist. In den Städten stellen hingegen knapp 46 Prozent der Behörden eine Gefährdung der Funktionsfähigkeit des lokalen Taxigewerbes fest, sodass keine weiteren Lizenzen ausgegeben werden. Städte sind nicht nur aufgrund einer zumeist höheren Einwohnerzahl für Taxiunternehmen lukrativer als Gemeinden. In ländlicheren Gebieten, zu denen die meisten Gemeinden gezählt werden können, besitzt ein größerer Anteil der Bevölkerung einen eigenen PKW, sodass die Anzahl der potenziellen Kunden geringer ist.

Um geographische Schlussfolgerungen zu ziehen, wurde für das Bundesland Hessen ebenfalls eine Karte angefertigt. Abbildung 4 verdeutlicht, wo innerhalb von Hessen faktische Konzessionsbeschränkungen verortet sind. Es fällt auf, dass hauptsächlich im Umland der Städte Frankfurt am Main, Wiesbaden und Offenbach im Süden des Landes Beschränkungen vorliegen. Besonders von Frankfurt am Main mit dem größten deutschen Flughafen und dem großen Bankensektor (Geschäftsfahrten) geht eine große Nachfrage nach Taxidienstleistungen aus, was durch die beachtliche Zahl an Lizenzen in der Stadt unterstrichen wird. Aber auch das Umland profitiert hiervon, da ebenfalls viele Taxifahrten vom Umland in die Stadt und umgekehrt stattfinden. Einige Gebiete mit Beschränkungen sind zudem im Großraum Kassel im Norden zu finden. In den anderen Regionen des Bundeslandes sind nur wenige Kommunen mit einer faktischen Beschränkung vorhanden. In ländlichen Gebieten kommen die Vorteile und Privilegien des Taxigewerbes gegenüber dem Mietwagengewerbe weniger zum Tragen. Die Beförderungsnachfrage wird dann zum großen Teil von Mietwagen abgedeckt.

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[35]   Dies betrifft Willingen, Zwingenberg, Stockstadt und Biebesheim. Im Zuständigkeitsbereich des Landkreises Hersfeld-Rotenburg werden ebenfalls gelegentlich Anträge abgelehnt. Die Behörde teilte jedoch nicht mit, in welchen Städten und Gemeinden unter 7.500 Einwohnern dies konkret der Fall ist.

Abbildung 4: Karte zur Konzessionsvergabepraxis in Hessen
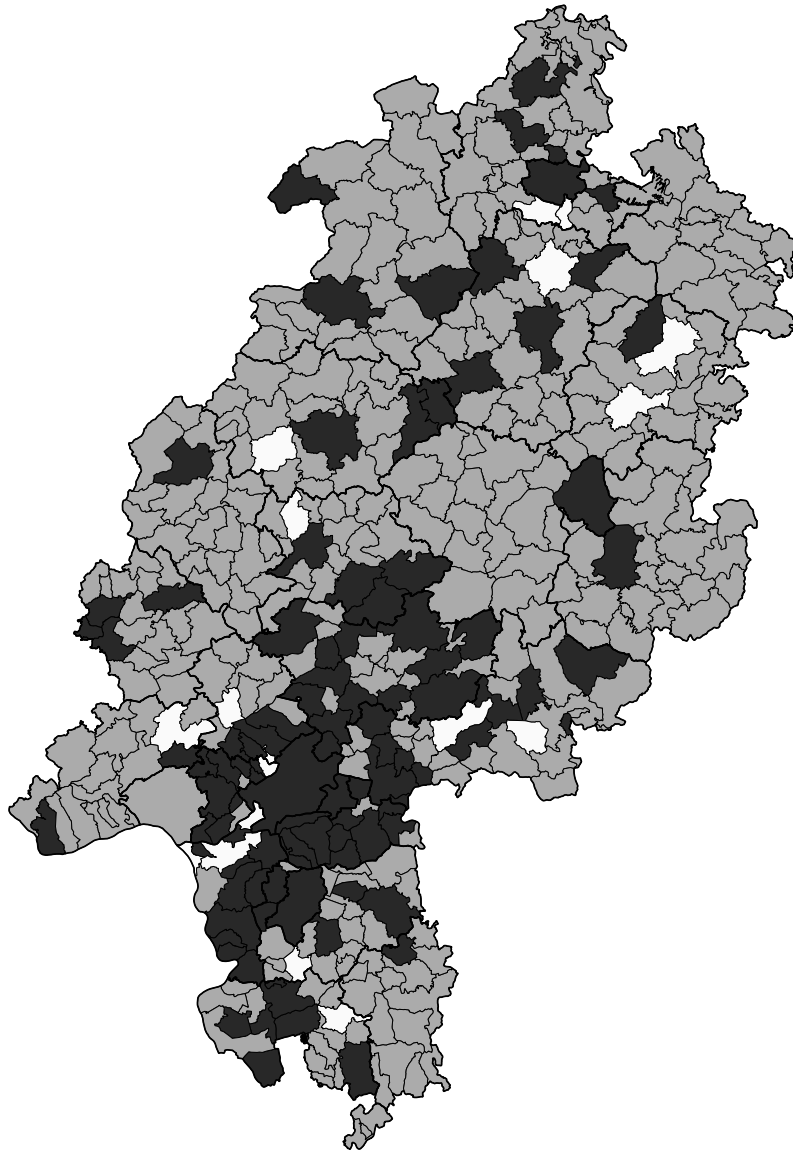
Kartenquelle: © GeoBasis-DE / BKG 2016 (Daten verändert)

■ Beschränkung

□ keine Daten vorhanden

■ keine Beschränkung

5. Fazit

Alles in allem liefern die Umfrageergebnisse einen Überblick über die Praxis der Konzessionsvergabe in Deutschland. Es wird deutlich, dass der rechtliche Rahmen in Deutschland einen Spielraum für unterschiedliche Vergabemethoden bietet. Je nach Gegebenheit werden unterschiedliche Konzepte von den Behörden verwendet. In lediglich der Hälfte aller Kreise und kreisfreien Städte in der Bundesrepublik liegt eine faktische Konzessionsbeschränkung vor. Auch einige kreisfreie Städte verzichten auf eine Mengenbeschränkung. Im Bundesland Hessen findet eine Genehmigung auf Gemeindeebene statt. Hier ist festzustellen, dass vor allem Kommunen in der Nähe der Städte Frankfurt am Main und Wiesbaden Konzessionsbeschränkungen aufweisen, während diese in den anderen Landesteilen nur selten vorzufinden sind.

Derzeit wird eine Liberalisierung des gesamten Taximarktes diskutiert. Im Zuge dessen kann die aktuelle Konzessionsbeschränkung hinterfragt werden. Die Begrenzung der Anbieterzahl wird in der Literatur mit einigen Besonderheiten des Taximarktes gerechtfertigt. Das Angebot und die Nachfrage haben im Taximarkt über die Veränderung der Wartezeit jeweils Auswirkungen aufeinander. Die Wartezeit wird vom Angebot und von der Nachfrage bestimmt. Denn jeder Kunde, der in ein leeres Taxi einsteigt, verlängert die Wartezeit aller anderen Kunden. Die Nachfrage wiederum hängt neben dem Preis auch von der Wartezeit als Qualitätsparameter ab.[36] Aufgrund dieser Interdependenzen sind mehrere Marktgleichgewichte möglich und eine Regulierung kann sicherstellen, dass das effizienteste Gleichgewicht realisiert wird.[37] Informationsasymmetrien in Bezug auf die Qualität des Wagens und der fachlichen Eignung des Fahrers sowie der Schutz vor Überkapazitäten können ebenfalls als Gründe für eine Regulierung angeführt werden.[38]

In ihrem 20. Hauptgutachten spricht sich die Monopolkommission der Bundesregierung für eine starke Deregulierung des Marktes aus. Im Hinblick auf die vorhandene Regulierung der Konzessionsvergabe wird eine Aufhebung der Mengenbeschränkung gefordert, da diese einen Eingriff in die Berufsfreiheit und ein Schutz der etablierten Unternehmen vor Wettbewerb darstelle. Ein Wegfall der Beschränkung könnte zu einer Marktbereinigung führen.[39] Einige ökonomische Studien beispielsweise aus Großbritannien oder Irland können keine negativen Auswirkungen einer Deregulierung wie Qualitätseinbußen feststellen.[40] Besonders der Bestellmarkt weist viele Eigenschaften wie Reputationselemente auf, die eine Deregulierung des Marktzutritts in diesem Teilmarkt ermöglichen können.[41]

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[36] Vgl. Salanova et. al 2011 S. 151; Flores-Guri 2005, S. 156; Carins / Liston-Heyes 1996, S. 2.
[37] Vgl. Baake / von Schlippenbach 2014, S. 753-754.
[38] Vgl. Pape / Wein 2015, S. 363-364; Baake / von Schlippenbach 2014, S. 752; Monopolkommission der Bundesregierung 2012/2013, S. 117.
[39] Vgl. Monopolkommission der Bundesregierung 2012/2013, S. 117-118.
[40] Vgl. Aquilina 2011, S. 195; Barrett 2003, S. 39.
[41] Vgl. Schaller 2007, S. 499.

Das bereits beschriebene Hamburger Modell sieht ebenfalls eine Aufhebung der Mengenbeschränkung vor. Bei unrechtmäßigem Verhalten eines Taxiunternehmers kann diesem jedoch die Konzession wieder entzogen werden. Zudem sollen stärkere Kontrollen die Steuerhinterziehung und Schwarzarbeit im Taxigewerbe eindämmen. In Hamburg weisen die Auswertungsergebnisse des Jahres 2014 auf eine Verbesserung der Qualität der Kundenbedienung sowie der Fahrzeuge seit Einführung des Modells hin. Die Einführung von sogenannten Fiskaltaxametern erleichtert zudem die Kontrolle der Taxiunternehmer.[42] Ein Wechsel von starren Mengenbeschränkungen zu intensiveren Kontrollen könnte in Zukunft in weiteren Regionen stattfinden und möglicherweise die bisher vorherrschende heterogene Regulierung des Marktzutritts ersetzen. Eine Studie aus Berlin zeigt jedoch, dass bei diesem Modell auch Probleme auftreten können, wenn die Behörden beispielsweise nicht mit genügend Personal ausgestattet sind, um eine effiziente Kontrolle durchführen zu können.[43] Es ist allgemein unsicher, wie sich das Modell aus Hamburg auf andere Städte und Flächenkreise mit geringerer Taxendichte übertragen lässt.

Bisher sind keine gesetzliche Änderungen der Regulierung des Taximarktes in Deutschland vorgesehen, sodass die vorgestellte heterogene Konzessionsvergabe zunächst bestehen bleibt.

Danksagung

Abstract

There is only little information available about the licence allocations at the German taxi market. This article introduces the results of a survey among the decentralized licensing autorities at this market and presents the licensing procedure in Germany. Results show that in only half of all regions at the district level the number of taxi licenses is restricted. In the federal state of Hesse the local authorities are responsible for the allocation of taxi licenses. Almost all local authority districts neighbouring the cities of Frankfurt am Main and Wiesbaden have license limits, while there are only few in other areas.

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[42] Vgl. Statistisches Amt für Hamburg und Schleswig Holstein 2015, S. 2.
[43] Vgl. Linne + Krause 2016, S. 110.

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Book Review: The Economics of Infrastructure Provisioning, The Changing Role of the State

BY BERNHARD WIELAND, DRESDEN

Arnold Picot, Massimo Florio, Nico Grove, Johann Kranz (Editors): The Economics of Infrastructure Provisioning, The Changing Role of the State, CESifo Seminar Series, MIT Press, Cambridge, Massachusetts, USA, and London, England, 2015, 516 pages, Price: 32,10€.

This book grew out of an interdisciplinary seminar organized by CESifo in Venice in summer 2013. It contains 16 papers by infrastructure experts from Europe, the American continent, and Asia, covering theoretical and historical aspects of infrastructure provision as well as empirical studies in the energy-, telecommunications-, water-, and transport-sectors. The following review focuses primarily on the chapters relevant for transportation.

After a brief introduction by the editors, Hugh Goldsmith, an infrastructure economist with the European Investment Bank (EIB), takes us on a *tour de force* through the history of infrastructure provision from 9000 BCE to the present. The chapter is lengthy (69 pages) but very worth reading. In order to wet the reader's appetite I shall deal with it and a related chapter by Hofmann in somewhat more detail than with the other papers. Readers who are solely interested in the economic parts of the book may immediately jump forward to page 6 of this review.

Goldsmith's narrative begins with a piece of "religious infrastructure", namely Göbekli Tepe, probably the world's first temple, built around 9000 BCE in Upper Mesopotamia (6000 years before work began in Stonehenge!) and then continues with the infrastructural achievements in Mediterranean antiquity. The description makes it abundantly clear, that know-how about irrigation, water supply, sanitary systems, libraries, and roads was already surprisingly well developed long before the era of the Greeks and the Roman Empire. The chapter continues with the decay of the Roman road infrastructure in the Middle-Ages until its revival with the rise of city-states in Flanders and Northern Italy. The amazing capabilities of the Romans in infrastructure construction are too well known to need much elaboration here. Goldsmith covers them at some length. It is still almost unbelievable that at its

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peak the paved part of the Roman road network had a length of 30 000 km, whereas the unpaved secondary network spanned a further 320 000 km and reached to the most distant parts of the empire.

How was the system built and paid for? What were the roles of the state and private industry? In general it can be said that the road network was built by the military and private contractors with financing from general taxation. Before Augustus, the construction of long distance roads was organized by the state under the responsibility of a military consul. Within towns, in contrast, each municipality financed roads out of a mixture of taxes and gifts by wealthy persons (Julius Caesar being one of them). Under Augustus the system was reformed and responsibility went to a commission of senators, the Supervisors for Roads, which was responsible not only for construction but for maintenance too and which made ample use of private contracting. Thus, private involvement in infrastructure provision was already substantial in the times of the Roman Empire. Slavery, of course, played a large role in the supply of the necessary workforce. Passenger travel on roads was free, but transport of goods was subject to tolls levied at bridges and town gates. The ensuing revenues, however, were not exclusively used for maintenance but rather as a convenient way to raise local taxes.

As Goldsmith states, the roads, aqueducts, sewer systems, public baths and public spaces of the Romans constituted an infrastructure "that would not be matched again in Europe until after 1800". The reason for this large stand-still was a change in the economic paradigm. Whereas the Roman infrastructure reflected the needs of a more or less market driven economy (and military needs too, of course), feudalism of the middle-ages relied more heavily on "castles and cathedrals". Civil infrastructure was largely neglected. As Goldsmith puts it, "… it is hard to point to any great achievements in infrastructure before 1000 CE." The Roman road infrastructure slowly decayed. Frequently the paving material was stolen and used for the construction of other buildings.

With the rise of the city-states in Flanders and Italy roughly after 1000 CE the focus of infrastructure building shifted back to the needs of trade and industry. But the real change, according to Goldsmith occurred around 1500 EC when the role of private capital and private initiative in the provision of public infrastructure increased dramatically, particularly in Britain and primarily in transport and water supply. Goldsmith spends some time on the water supply projects in London around 1500 CE when the role of private capital and private initiative in the provision of public infrastructure increased dramatically. He proceeds to the more familiar story of the turnpike roads and railroads in England and ends with the host of new technologies in transportation (motorways, tramways) and telecommunications (telephone, telegraph, internet) which the second half of the 19th century and the 20th century brought forth.

In line with the theme of the conference and the title of the book, Goldsmith focuses on the changing division of labour between the public and the private sector in the supply of infrastructure. This distinguishes his article from other comparable overviews. In the early an-

cient times in Asia there was naturally very little involvement of the private sector (if a "private sector" in the modern sense existed at all). In the author's own words, "Command-and-control policies built civilizations" (Picot et al. (2005), p. 61.).

As time moved on, however, private initiative became more important. The Greeks were already quite sophisticated in drawing up contracts for the private provision of infrastructure. Goldsmith reproduces a contract between the Greek town of Eritrea and a foreign contractor named Chairephanes, which is amazingly modern in its terms, for instance with respect to the provisions covering risk allocation. The contract was carved on a marble stele which was on public display, in order to increase the transparency of the deal for the citizens. German readers may remember how difficult it was, even for members of the parliament, to obtain any detailed information on the contract between Toll Collect, the provider of the German tolling system for highways, and the federal government. As of late, however, the contract can be found in the internet, the modern equivalent of the technology of *steles*.

As mentioned before, the big structural break with respect to the involvement of the private sector occurred around 1500 CE with the big water supply projects in England. Suddenly the classic entrepreneur begins to emerge, who develops "grand" projects and who succeeds in persuading investors to contribute large sums to his projects (in the case of the New Canal even the King himself). Note that this is also the time where the East India Company and similar ventures are being formed.

The second even greater leap with respect to private sector participation happened alongside the railway revolution. It has often been pointed out that there was a close complementarity between the development of railways and the development of modern financial markets. To quote just one interesting number, 90 percent of all stocks and bonds traded at the New York Stock Exchange in 1880 were related to the railway sector. Rating firms like Moody's (John Moody) or Standard and Poor's (Henry Varnum Poor) trace their origins back to railway investment guides. Goldsmith points out that railways created modern financial mass markets and that without these markets railways hardly would have developed, notwithstanding the various bubbles and "manias" that temporarily slowed down the development and destroyed a huge amount of private savings (like the "turnpike mania", the "canal mania", or the two railway manias in the 1830s and 1840s). Analogies to our times immediately come to mind.

In Goldsmith's view, infrastructure development before 1800 was mainly driven by the state, by institutional innovations, and by private capital. After 1800 the development becomes mainly technology driven and is pushed forward by private entrepreneurs like Edison, Bell, Marconi, and similar personalities. The role of the state in this historical stage is more the role of a "midwife". To quote Goldsmith, "If a new infrastructure was perceived as strategic, the state would try to get it built, first with private capital and then, if that failed, with guarantees, other incentive mechanisms, or eventually public ownership" (ibid., p. 65.). It is possible, that this picture reflects too much of an Anglo-Saxon perspective. On

the European continent, state involvement seems to have been far greater. Belgium, for instance, did not rely on the private sector to develop its railway network. It embarked right from the beginning on a governmental master-plan. Private capital was admitted only in the later stages of development. In Germany the railroad network was built privately at first, but later under a regime of competition between private and public railway firms.

These remarks bring us to the more theoretical parts of Goldsmith's chapter in which he tries to draw lessons from his historical sketch. What has mainstream economic theory to offer to explain the history of infrastructure development? Goldsmith screens the "usual suspects" and finds very little to satisfy him. To him neoclassical theory (including endogenous growth theory) does not really capture the essence of long-term growth which, in his view, is not just "more of the same" but contains discontinuous jumps and radical disruptions. Grübler's evolutionary diffusion models (Grübler (1990)) seem to be the most to his liking. Interestingly, Grübler, from his point of view, finds similarities between the growth-patterns of infrastructure in the United States and the former USSR. He concludes that infrastructure growth is not necessarily correlated with a particular economic system, a claim that Goldsmith endorses, but which is certain to be disputed by others. Where he criticises Grübler, and where therefore is still room for neoclassical analysis, is Grübler's disregard of relative prices and quality differences. As Adam Smith already pointed out in 1776, mode choice, be it in passenger or freight transport, depends crucially on price and quality. It transpires from Goldsmith's text that nevertheless his sympathies are primarily (a) with approaches taken from the economics of innovation, and (b) interdisciplinary approaches that are able to do justice to the strong interplay of technological and institutional drivers of infrastructure development.

Is there anything to be critical about in Goldsmith's long essay? It must be left to specialists in economic history to pass final verdict on Goldsmith's historical narrative. In comprising 11 000 years of history into 70 pages it is inevitable, that sometimes the painting becomes a little sketchy and that some complex issues are simplified. It is to be hoped that Goldsmith's essay will arouse the reader's interest enough to consult standard references like Fritz Voigt's (1965) classic treatise to get a fuller picture. As already mentioned, in the present reviewer's view there is sometimes too strong a focus on the developments in the Anglo-Saxon world. This is certainly justified given the importance of the industrial revolution and the important role of England and the United States in the 19th and 20th century. Still, the reader might have been interested in hearing something about the role that transport infrastructure played in Colbert's Mercantilism in the 17th century in France, like the *Canal du Midi*, or about the competition between state owned and private railway companies in Prussia during the 19th century. Both episodes were in many aspects different from the developments in the Anglo-Saxon world. Still, I can only recommend Goldsmith's contribution to this book. Among the many lessons history can teach us, is certainly the one that many things are not as new as they seem to be at first glance, and Goldsmith's essay certainly bears this out.

I advise the reader after having digested Goldsmith's chapter to jump immediately forward to Chapter 8 entitled "Connecting People – An Evolutionary Perspective on Infraculture", which has many interesting connections to Goldsmith's analysis. This chapter was written by Klaus Markus Hofmann, a consultant in Berlin, who is closely related to Deutsche Bahn AG. Hofmann argues for an interdisciplinary approach to infrastructure theory. In fact, the very term infraculture reflects this perspective and is intended to convey the notion that "… it is not possible to evaluate an infrastructure project separate from its systemic effects in relation to existing structures, the natural environment, and economic and social structures, that is the entire cultural context" (ibid., p. 246.). As Hofmann says, the chapter "… follows the sociologist perspective on infrastructure and technology of Popitz …. and Toynbee … in describing distinct epochs of infracultural co-evolutionary development in socioeconomic history" (ibid., p. 239.). As can be expected from this introductory remark, the reader has to fight his way through a lot of sociological jargon, at least in the first few sections of Hofmann's essay, but is rewarded from Section 8.3. onwards with an interesting and thought-provoking division of history into nine "infracultural epochs", beginning around 6000 BCE. These infracultural epochs are: the epoch of agrarian communities, of urban melting pots, of transurban networks, of infracultural network nodes, of intellectual networks, of industrialized networks, of automation networks, of interactive networks, and of transformative networks. The discussion here goes beyond Goldsmith's perspective in so far as it puts the development of infrastructure in a particular epoch in the context of other simultaneously evolving cultural technologies (for instance the development of movable type printing). By looking at developments in this way it becomes evident that, for instance, Goldsmith's view of the Middle-Ages may be too bleak. According to Hofmann, monasteries and convents were important "infracultural network nodes" (epoch number four), where scriptures were preserved and where human capital was created through teaching the rural population to read and write. Ironically, it was largely the church which preserved the old Roman know-how of infrastructure construction, a fact that is mentioned by Voigt in his treatise too.

Of course, any division of history into "epochs" or "eras" like this always carries an amount of arbitrariness with it. Nevertheless, schemes like Hofmann's are useful to organize thought on an apparently chaotic stream of events.

Hofmann closes his article with a plea for "…. an orchestrated transdisciplinary initiative for systemic research of the infrastructure system and comprehensive infracultural education for engineers and economists in the sector" (ibid., p. 257.). Much of what he says in this last section of his paper for me smacks too much of "gee-whiz" managerial "megatrend" talk, but it's up to the reader to decide.

I now turn to the more transportation economics oriented contributions in the volume.

The editors' introduction and Goldsmith's long essay constitute Part I of the book. Part II turns to investment, growth and policy issues. Chapter 3, entitled "Population Density, Optimal Infrastructure, and Economic Growth", is written by Sumit S. Deole and Asmae El

Gallaa, two young researchers related to the Aix Marseille School of Economics. They develop an endogenous growth model, which links improvements in transportation infrastructure to the fertility and education decisions of parents and tests the predictions of the model with time-series data on India for the period 1961 to 2012. The model is an overlapping-generations model in which the utility of a household depends on the household's consumption, the number of children, and the human capital of the children. The parents in the household divide their time between work and rearing children. Total income is spent on consumption, education and the transportation of children. The cost of the latter is dependent on the distance of a household's residence to educational facilities. The authors deduce within the framework of their model that transportation costs negatively influence the number of children parents wish to have. Accordingly, a denser spacing of transportation infrastructure (railway stations, in the authors' paper) should influence fertility in a region or country and, consequently, its growth rate. A railway-company, however, will invest only according to profitability. But profitability depends on population density because of agglomeration effects. Thus, railway authorities should tend to invest in more densely populated areas so that the whole mechanism results in a self-reinforcing growth process.

The authors offer a first test of their model by looking at time-series of GDP per capita in Indian provinces, population density, and net-revenues of Indian Railways between 1961 and 2012. In this model the variation of GDP per capita seems to be well explained by past values of population density and railway revenues.

The authors claim that their paper offers a compromise between models of the physical capital approach variety and the human capital approach variety in endogenous growth theory. Indeed, the analysis seems to show that both approaches are needed. Growth is stimulated by investments in human capital, but investments in human capital are a function of the availability of transport infrastructure.

In the opinion of the present reviewer, the paper certainly offers an interesting perspective on the complementarity of physical and human capital in economic growth-processes and contains attractive modelling ideas. From the perspective of a transportation economist it has to be reminded, however, that transportation expenses in a typical household rarely exceed 15% of income. In the early 60s the share was even less. Furthermore, the transportation cost of children to school is only a fraction even of this percentage. The authors do not give any information in how far these numbers apply in India too. If this were true, however, it stretches credibility that transportation costs are critical for a family's decision to bear children or to invest in their education. Perhaps it may be possible to interpret "transportation costs" in a wider sense that makes them more relevant, especially in the context of very backward countries (for instance, when one considers the opportunity cost of travel in these countries). But even then, motives like provision for old age seem far more important. Other endogenous growth models, like Bröcker's (2013), focus on the human capital reinforcing effects of transport infrastructure too, but offer a more plausible

causal link between (long-distance) transport and human capital, namely the reduced cost of face-to-face communication.

Concerning the empirical part of the article, it is not clear to me why the authors have used revenues as an indicator of profitability. Also, data from the annual reports of railways usually are highly aggregated and have to be taken with great care.

I don't want to be overly critical about the model of Deole and El Gallaa, but the doubts about their results seem to be reinforced by Sumedha Bajar's Chapter 7 on the "Infrastructure-Output Nexus – Regional Experience from India". Bajar is currently a post-doc associate at the National Institute for Advanced Studies in Bangalore and at the time of writing of this paper was at the Institute for Social and Economic Change in the same city. Bajar addresses the output effects of infrastructure in a more traditional manner using basically a macroeconomic production function approach. She analyses panel data from 17 major Indian states over the time period from 1980 to 2010 and finds an output elasticity of transport of around 0.10 which is approximately in the order of what other studies find in developed countries (see e.g. Wieland in Heft 1/2015 of this journal). The coefficient is, however, statistically insignificant. This result seems to contradict the empirical findings of Deole and El Gallaa who find a substantial effect, at least of railway infrastructure (more precisely the spacing of terminals). Bajar cites several explanations from the literature to account for her surprising result. First, it may be the case that infrastructure investments are not primarily driven by economic considerations but rather by criteria which are decisive for the re-election of the responsible politicians. Thus, investments may occur primarily in areas which are likely to generate most votes. Second, and relatedly, re-election considerations may lead to overinvestment in transportation infrastructure and negative marginal returns. Third, quality may play an important role. Roads are built, but their quality and accordingly their productivity effects may be low.

It is clear that the growth model by Deole and El Gallaa takes a longer perspective than Bajar's paper. The time period they consider ranges from 1962 to 2012, whereas Bajar considers the period from 1980 to 2010. Still, the difference is only 20 years and the discrepancy in the results is too large to make the result of Deole and El Gallaa credible.

In a sense the traditional macroeconomic approaches like the one in Bajar's article represent a dead end. It seems that it is hard to gain really new insights into the relationship between a country's or region's GDP and its investment in infrastructure along these lines. Stéphane Straub, a professor at the Toulouse School of Economics, in a concise and lucid overview (Chapter 9 of the book) describes the direction in which new research has developed to overcome the deadlock.

It is well known that the traditional approach, based on macroeconomic production or cost functions, is plagued by three econometric problems: reverse causality, unobserved effects, and measurement error problems. "Reverse causality" here refers to the problem that it is not clear whether countries or regions are rich (or grow fast) because they have invested

heavily in infrastructure or whether they invest heavily in infrastructure because they are rich. The term "unobserved effects" refers to unobserved differences at the country or regional level which are affecting growth and infrastructure investment at the same time. The notion of "measurement errors" refers mainly to the variables used to quantify the stock of transport infrastructure. In principle all three problems could be dealt with by selecting appropriate instrumental variables. An instrumental variable is a variable which can be used as a proxy for an unobserved or error-prone variable in an econometric estimation, but for which reversed causality and measurement errors can be excluded. This means that in using instrumental variables feed-back effects can be ruled out. In macroeconomic infrastructure studies this strategy has proven difficult. In the last years, however, researchers have used spatially disaggregated and geocoded data (GIS data) to construct suitable instrumental variables. Some studies, for instance, use historical maps and plans. As Straub points out, "The underlying logic is that these maps should reflect the priorities of earlier periods, and that these should not be affected by contemporary economic outcomes such as changes in population, employment, or output" (ibid., p. 272.). In line with the type of data used, these studies no longer refer to the national economy as a whole but rather to the level of regions or counties. Another ingenious strategy has been developed independently in papers by Banerjee, Duflo, and Qian in 2004 (revised version 2012) on the impacts of road building in China, and by Atack et al. on railroads in the USA in the 19th century. The strategy consists in drawing straight lines between historically important cities and then measuring the distance of a region or county to these straight lines. ("Historically important" means independent of economic importance, if this is possible.) If it is true that railroads did have a substantial effect on economic growth, then *ceteris paribus* regions, counties, or provinces which are farther away from these straight lines should exhibit slower growth than those situated closer to them.

Straub reviews the literature which has developed along this new line of research and concludes that this literature "…represents a big step forward" because it allows to deduce conclusions which are " …directly policy relevant for population growth, output, trade, and firm spatial patterns" (ibid., p. 279.). In how far this optimistic view will come true remains to be seen. Robust policy conclusions can only be drawn when the results of studies converge to some extent. Past experience with econometric advances, however, has been that the greater sophistication of methods has led to divergence rather than to convergence. The traditional research programme in this field, based on macroeconomic production or cost functions, is a good example. Furthermore, there is the danger that the very micro-approach, with its focus on specialized data and its concentration on selected regions or even counties, may dissolve the whole approach into a selection of case studies or econometric "stories", just as it has been the case in Industrial Organization, where it appears that no clear cut policy recommendations can be derived anymore. Finally, on another level, there is the risk that politicians may use the results to further the interests of their local or regional constituency and that therefore many studies will be written to reflect these political preferences, increasing the diversity of results even more.

The book also contains two papers on the renegotiation of PPP contracts in infrastructure provision. The first paper by Laure Athias, an Associate Professor at the University of Lausanne, and by Antonio Nunez from LET at the University of Lyon focuses on toll-road concessions and deals with the question in how far the possibility of renegotiation influences a bidder's behaviour in an auction of a concession contract right from the start (ex ante). Obviously, when a bidding firm believes that it will be easy to renegotiate ex post, it will bid more aggressively than otherwise. Credibility, of course, sets a limit to this strategy, but especially with respect to toll-road concessions the uncertainty of traffic-forecasts makes it difficult to differentiate credible from incredible bids. Thus, Athias and Nunez hit on the idea to use the ratio between actual and forecasted traffic as a proxy for a firms' ex ante bidding behaviour in their econometric work. Using a (very heterogeneous) dataset of 49 toll road concession contracts (highways, bridges, tunnels, in the period 1989 to 2003) from countries all over the world, they confirm three hypotheses which they derive from a theoretic common value auction model, namely:

(1) The greater the number of bidders the more cautious the bids that they will submit. In other words, in an auction with many participants bidders will tend to revise traffic forecasts downwards.

(2) The greater the degree of common uncertainty about the project the more conservative bidders will be as the number of bidders increases.

(3) The higher the chances of renegotiation, the less conservative bidders will be when competition increases.

In testing these hypotheses the authors control in their regression, apart from the number of bidders, for other variables like the amount of experience of a regulatory agency with tendering or the wealth of a country. In the authors' view both factors should affect the probability of renegotiation negatively. Of course, as always with econometric exercises, there are several open questions left (heterogeneity of the data set, endogeneity of the number of bidders, specification of variables, like physical length of the infrastructure object as a proxy for uncertainty, or the use of the variable "common law") but this does not make the authors' approach less interesting.

The novelty of this paper's results lies in the fact that they contradict a standard wisdom of auction theory, namely the phenomenon of "the winners' curse". The winner's curse refers to the empirically observable fact that the winner of an auction tends to be the bidder with the most optimistic and therefore frequently mistaken estimation of the contract's value. The results of Athias and Nunez seem to imply that the possibility of renegotiation has an important effect on the likelihood with which the winner's curse occurs. The authors therefore seem justified when they conclude that in judging the efficiency of auctions it is necessary to consider the tendering process as a whole, not just the auction itself.

A comparable result, from the perspective of the positive theory of regulation, is reached by the second paper on renegotiation by Julio Aguirre, an associate researcher and part time professor at the Universidad del Pacifico in Peru, who investigates the relationship between electoral cycles and renegotiations of concession contracts in Peru. In Peru, the Board of Directors of the transport infrastructure regulator changes every five years, following the election of the President of the Republic. Aguirre uses a database of 27 transport infrastructure concession contracts awarded after 1999 to test whether the rate of renegotiation rises during electoral periods. The infrastructure projects in question contain airports, roads, railways, and ports. Aguirre is able to confirm his hypothesis which he explains by the weakened authority of the regulatory agency during election periods. When their jobs are at stake, regulators are apparently more willing to submit to firms' demand for renegotiation. Accordingly, Aguirre proposes to disentangle the election of the regulatory body's Board of Directors from the general elections and to move it to a later or earlier time period. As it occurs often in studies on the positive theory of regulation, Aguirre is not able to prove his hypotheses directly. To do this, he would need data that show the political influence on the selection of the regulatory agency's staff directly. But such data are usually not at hand.

There is one last paper on transportation policy that has to be mentioned, and this is the paper by Biswa Nath Bhattacharyay on connectivity policies for the Asian-Pacific region. The author was formerly at the Asian Development Bank and is now at the University of South Pacific, Fiji, and the University of International Business and Economics, Beijing. His paper in this volume is in a sense an outlier, since it has more the character of a policy paper than of a technical paper like the other articles in the book. Nevertheless, the chapter is worth reading to get an insight in the transportation policy problems Asia is facing. As the author reminds us in his opening paragraph, Asia has 4.1 billion habitants and thereby accounts for more than 60 percent of the world's population. Its economy is approximately equal to the economies of Europe and North America and will be even more important in the future. Europeans therefore have good reason to be interested in the developments on this heterogeneous continent. Bhattacharyay's paper is very long (44 pages) and contains too much material to be summarized here in a few sentences. Suffice it to say that the author offers a comprehensive development plan for Asia's transport and communications infrastructure and discusses issues like governance, prioritization of projects, financing needs and instruments, and sustainable development. Concerning financing needs Bhattacharyay identifies 1.202 projects in the period from 2010 to 2020 amounting to an estimated US$ 229 billion (or US$ 20.8 billion per year).

The rest of the papers in the volume do not have their main focus on transportation infrastructures. They are, however, in several cases related to transportation issues. For instance, I found the paper by Santandrea, Bailey, and Giorgino about the financing of PPPs useful and interesting. They distinguish between funding and financing of a PPP, where funding refers to the up-front investments for the provision of the respective infrastructure object and financing to the revenues needed to compensate the private investors for their capital and operating costs. What seems to be a purely semantic distinction at first glance turns out to be quite useful when discussing the financial structuring of a PPP.

Égert gives a concise and useful overview over the interdependence between the regulation of infrastructure monopolies and their investment and produces empirical evidence from OECD member countries. It turns out that the move from rate-of-return regulation to price-capping or the establishment of an independent regulator do not have a substantial effect on investment if taken individually. If implemented jointly, however, they may stimulate investment significantly. In this way the other papers in the volume too certainly are worth reading, even if they have not been treated in this review in detail.

To sum up, the volume makes interesting reading and gives a good introduction to the current scientific discussion in infrastructure economics. Sometimes the selection of articles seems a little bit arbitrary, and some of the papers could have been shortened substantially. Also, it is regrettable that the discussants' remarks were not reprinted. As a minor matter, proof reading was not as accurate as it could have been. Some readers may miss important topics like Cost-Benefit-Analysis, New Economic Geography, or Wider Economic Benefits. Nevertheless, I found this book a lot more interesting than other conference volumes which I have read and also a welcome and instructive break from the sometimes ideological and simplistic arguments that dominate current policy discussions, especially in infrastructure economics.

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