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Rolf Bergs
RolfB@prac.de

Commuting as a threat to climate: Is there a potentially effective regulating screw for policy?

Living Lab Frankfurt/Rhein-Main, Germany

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1. Introduction

PRAC has published a short empirical paper on “Less commuting and climate protection” (Issa and Bergs, 2020). Several data were used within this study like data on out-commuting at district and functional area level as well as different empirical parameter for vehicle-specific emissions, single-driver versus ride sharing, rebound effects and more.

The rural-urban context is essentially one of functional division of space. The region consists of a major urban node characterized by strong in-commuting and rural and peri-urban parts with agricultural, residential and recreational functions. Commuter balance in those areas is mostly negative. The study also includes a chapter illustrating potential saving effects of greenhouse gas (GHG) emissions at the level of functional space. This chapter draws on a former ROBUST study (Budde 2018).

The relevance of this topic lies in the thematic focus of public infrastructure. Data of the Federal Labour Agency (Bundesagentur für Arbeit) show that gross out-commuting in the region of the Regionalverband Frankfurt-Rhein-Main (i.e. the total number of commuters using various transportations) ranges to about 530,000. Out of those, the out-commuting net or those commuters who use their private (or company-owned) vehicles, range to about 350,000 with a daily congestion every morning and evening along the major traffic

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routes. Hence, less commuting will essentially lead to a more sustainable use of roads but will require a secure and sufficient broadband connection in all parts of the region. For the Rhein-Main region this precondition seems to be ensured. Data provided by the broadband atlas reveal a high level of access to fast internet with a low spatial variation. Nevertheless, at a first glimpse, the relative effect of a 20 percent reduction of commuting appears rather moderate (<.5 percent). The simple reason for that is that vehicle fuel makes up only about 15-25 percent of all CO_2 emissions (Frankfurt 17 percent, Offenbach 25 percent, Main-Kinzig 19 percent). Other bigger emission sources are coal, mineral oil, and gas, notably for heating and production. But this differentiation does not account for the spatial variation of economic activity and output across a country like Germany or the EU as such.

Even though the relative GHG saving effect appears rather moderate for the region itself it is important to stress that the global relative effect is substantially higher as compared with less populated regions of the same areal size. In addition to that, saving fuel with less commuting will also imply saving energy in producing the fuel, vehicles and other upstream inputs from production. In fact, such saving effects need to be added to the balance. Such an extended study can only be based on a well specified macro-economic or macro-econometric model and a differentiated sectoral and small-scale spatial database. This was not possible in the context of a small limited data study.

2. Description of thematic relevance / Research Question

- The subject is of utmost importance and actuality in the Frankfurt/Rhein-Main area. The region is one of Germany's most rapidly growing regions. The risk of urban sprawl and negative agglomeration effects is growing and policy and the private sector are obliged to intervene with feasible and effective measures.
- A majority of people work in the city while living in rural or peri-urban areas around. This necessitates commuting. If there is more work done by telecommuting, the functional division between urban and rural will change. There is anyway a global trend of automatization in production and services besides a lot of prevailing inefficiency in human resource allocation in working life (so-called "bullshit jobs") and a culturally induced fear of unemployment (cf. Brynjolfson and McAfee 2010, Graeber 2018; for a further outlook see Issa and Bergs (2020, 18f)).
- There should be a broad dialogue among stakeholders of the civil society on sound and evidence-based research outcome and its implications for policy and individual behavior in working life and commuting. The Industrie- und Handelskammer (IHK) Darmstadt in addition to the Regionalverband Frankfurt/Rhein-Main can facilitate such a process of information and sensitization or to contribute to it.
- The study shows that there are relatively minor effects for the region itself. But globally, reducing commuting in agglomeration regions will have a substantial effect on climate protection.

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- There are no governance arrangements so far. It is envisaged to disseminate the paper and, if possible, to launch a (critical) debate among public entities, the private sector and non-governmental actors.
- Interaction is expected between the local and regional economy (private sector, trade unions, employer associations), the civil society and the local and regional administrations.
- It is hoped that either own empirical research within ROBUST or the assessment and reworking of existing research will lead to more exchange, sensitization and, at times, learning.

3. Main Description

The tracing of the various thematic aspects with regard to rural-urban challenges (spatial and resource implications, core action(s), actors and networks, related policies, etc.) is not yet possible. Likewise, a conclusion on internal learning aspects and "transferable" results needs more empirical exploration, especially with respect to the transmission mechanisms of such learning and the creation of added value.

The debate of the subject is still at an early stage. At the moment (April 2020) the topic has become rather actual in the context of the Covid-19 crisis since evidence suggests that there is quite a big scope of using telework for parts of employment and the labour input. The idea to reflect on the relation between less commuting and the Covid19-forced experiences in the Rhein-Main region was discussed with the Regionalverband. Empirical analysis has also been initiated on this relationship in Germany showing that regions with a higher share of jobs that are suitable for teleworking have had a lower infection and lethality density.

A recent study by Harald Fadinger and Jan Schymik, researchers of the University of Mannheim, shows that the area of the Regionalverband Frankfurt/Rhein-Main, as part of the Regierungsbezirk Darmstadt (NUTS-2-level), exhibits a relatively low level of exposition to Covid-19 threats with just 1.7 deaths per 100,000 inhabitants. The potential share of home office is given with 44 percent for the Regierungsbezirk Darmstadt. For other, more rural regions with less opportunity of teleworking (less than 40 percent), such as several Bavarian NUTS-2 regions with a rural focus, between 3 and up to more than eleven fatalities per 100,000 inhabitants are recorded (Fadinger and Schymik 2020).

As for an empirical complementation of the original commuter study within ROBUST there was an exchange with the Regionalverband Frankfurt/Rhein-Main, but it was agreed to refrain from further such examination, simply because of the highly dynamic process of the pandemic and the still insufficient reliability of data for forecasts and policy and planning decisions at this point of time. The uncertainty around dark figures of infection, the high confidence intervals around low percentage numbers in local studies (e.g. Heinsberg, Diamond Princess)

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and the strong error variance in the estimation of lethality rates does not suggest more detailed empirical research for the Rhein-Main region at this stage.

Reflection, a fair and critical debate, a further improvement of the knowledge base with reliable data at a sufficient spatial resolution level and, eventually, a public sensitization process could have the potential of more evidence-based decision making in future local policies.

4. References

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