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Collective public-transport tickets and anticipated majority choice: A model of student tickets ☆

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ABSTRACT

In Germany, many universities have student tickets that are bargained for between student representatives and public transport companies, approved by referendum, and mandatory for all students. They allow the use of public transport at no additional cost. I analyze such a scenario in a theoretical model as an example of a flat-rate ticket for public transport which is implemented by majority decision. The mandatory character of the ticket reduces transaction costs like marketing and ticket inspection, reducing the ticket price and thus the students' commuting expenses. However, there is a countervailing effect. Students face and rationally expect zero marginal monetary commuting costs, so that new students choose a place of residence which is relatively far from the university. This in turn raises the equilibrium ticket price. It may even be the case that students would be better off if such a ticket had never existed. Nonetheless, they always vote for it in referenda, because accepting the high price is optimal *given their place of residence*. After laying out the model, I analyze an optimal policy, which consists, for example, of subsidizing student dorms at an efficient distance to the city center.

1. Introduction

In many parts of Germany, a "Semesterticket" is one of the advantages of being a student. For this kind of transit pass, all students pay at the beginning of the semester and may then use public transport free of additional cost. This includes bus usage in the university city, but at many universities, it covers much more, including trains in the region, or even the complete public transport network in the State (e.g. North Rhine-Westphalia). The Semesterticket – which I refer to simply as "student ticket" in the following analysis – has developed in the German tradition of student self-administration. It was originally proposed by student councils, it is bargained between them and the bus and train companies, and regularly has to be approved by a referendum.[1]

Originally, these tickets were controversial, because once introduced, they are mandatory for all students at the respective university. Nonetheless, a large majority of students usually favors the ticket in referenda. Moreover, courts have backed their legitimacy. In 2000, the German Federal High Court rejected a constitutional complaint against the student ticket

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[1] At least, this summarizes the typical case. Details may vary; see Section 2.

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(BVerfG, 2000). According to the court, the aim of reducing students' living expenses is a cogent justification for making the ticket mandatory. In particular, the court accepted the intuitively appealing idea that bargaining for a large number of tickets enables the student representatives to obtain a high discount. The large, guaranteed demand in turn depends on the mandatory character.

This justification, however, is worthy of a closer analysis. For the students to have bargaining power, there must be something for the transport companies to gain through such an agreement. A simple threat not to buy any tickets would hardly be credible. After all, public transport is essential for most students, so that without a student ticket, they will have to buy ordinary tickets individually.

So what can the public-transport companies gain from an obligatory ticket? One important aspect is clearly that of redistribution. The student ticket implies that students who own and use a car are forced to pay for buses and trains. Part of these non-user payments are additional revenues for the transport companies, and the remainder reduces costs for the other students. Courts and student committees justify every student having to pay without directly benefiting from the ticket by referring to the *principle of solidarity* inherent to the student community.[2]

However, outright redistribution is never referred to as a justification for the ticket, but merely as a disadvantage that has to be accepted to make the student ticket possible. In this paper, I therefore focus on a different point. If all students have to pay for the ticket without explicitly purchasing it, some forms of transaction cost can be eliminated. For instance, specific marketing is no longer necessary, and ticket-control costs and fare evasion can be reduced. Such transaction-cost savings can be achieved if the students and the transport companies agree on a student-ticket contract. The student benefit from the ticket agreement is that some of the transaction-cost savings are passed on to them, potentially reducing the commuting costs of all students.

A student-ticket deal would thus be beneficial for both sides, although this does not seem to be the end of the story. After the student ticket has been introduced, a usual pattern is that student usage of public transport grows strongly, accompanied by marked price increases (see Section 2 and Weichbrodt, 2001: 8–10). It is easy to find a reason for this. A flat-rate ticket implies that students do not take marginal transportation costs into account. This can be expected to increase their public-transport usage, which in turn raises costs. Thus, the ticket price will have to include this cost increase, which in turn raises some questions. Under which circumstances are collective flat-rate tickets still beneficial for students? Is it possible that students still support them if they are in some sense not really beneficial to them? And would a political intervention definitely increase efficiency?

In this paper, I use a simple model to consider these questions. I argue that it is natural that students benefit in the time immediately after the student ticket is introduced, due to the transaction-cost savings. Later cohorts of students, however, benefit less and may even be worse off, compared to a situation without a student ticket. The reason for this is that expectations of the flat-rate ticket's existence alter new students' choice of their place of residence, which increases the commuting distance, and thus, the equilibrium student-ticket price.

The introduction of a mandatory ticket enforces a uniform price by majority decision, so that the framework is that of a political-economy model of location and commuting choices. The student ticket has the direct beneficial effect of reducing costs. At the same time, it creates an externality; commuting costs become exogenous to the individual. When choosing a place of residence, new students anticipate the existence of a student ticket and thus live relatively far from the university to save rent. Afterwards, when voting on the ticket, they support it at the high costs that their commuting distance creates, because their place of residence would induce high transport costs anyway.

If the externality effect is stronger than the transaction-cost savings effect, the result may be a situation in which all students would prefer the collective ticket not to exist if they were asked before choosing their apartment. However, if those students who have already chosen their place of residence would announce their intention to vote against it in the future, so as to influence the location decision of new students, this announcement would be time-inconsistent. Under these circumstances, a rule by the local government forbidding the ticket in the first place would make students better off than the discretion to decide on the ticket by majority decision. This, however, would not be first-best optimal, as it would prevent the transaction-cost savings from being realized. Instead, an optimal policy implies exerting an influence on the students' choice of abode.

To the best of my knowledge, this dynamic problem has not been formally analyzed in the literature on decisions relating to collective tickets, public transport or location choice in general. More generally, the student ticket is an interesting example of a collective decision that has common gains, but comes with adverse side-effects. It increases economic efficiency by implementing a collective, obligatory purchase and thus doing away with costs that would otherwise be necessary to bring about individual demand. This decision, however, suppresses the incentive to take the costs of individual behavior into account, so that an externality is created as a side-effect. Individuals adjust to the expectation of zero marginal cost, and the net gain may be positive or negative, depending on the magnitude of avoidable costs.

In this context, the location of an apartment has two important characteristics. Firstly, location is a state variable that is costly to change. Secondly, the location of an individual determines her demand for transportation, so that her optimal location changes with her expected marginal transportation costs. Together, these characteristics imply that individuals may support the collective ticket in a referendum even if the adverse side-effect creates high costs. During the referendum,

[2] For details concerning this term, see Section 2.