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Transport Accessibility as Merit Good

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Abstract

In the transport investment assessment, accessibility is often regarded as an equal playing field among the various investment objectives. However, we now need to ask: Is the increase and improvement of accessibility a main priority of transport investments? And if so, why are transport investments not compared in relation to the accessibility that they achieve?

In the present paper we argue for government intervention in the provision of transport accessibility against individual preferences. Such an intervention is not based on market failure arguments or distributional effects, but rather on the specific nature of the transport accessibility good, which is “objectively valuable, i.e., it represents a sacrifice of subjective value theory” (Besley, 1988). Transport accessibility is examined as a merit good and we assume the necessity for government intervention in its provision. However, transport accessibility may be achieved through different levels of merit good values, as for instance, rail intervention versus road intervention. Some transport systems achieve greater fairness in accessibility, thus attaining a higher merit good value, which implies that social planners need to discriminate various levels of subsidy and investment in relation to fairness in transport accessibility.

JEL classification: H20, R40

Keywords: transport, accessibility, merit goods

Introduction

When we consider transport investments, accessibility is often believed to be an equal playing field among the various investment objectives. A road or rail-link connecting origin A to destination B achieves the accessibility required, and thus the accessibility of the road allowing me to travel from A to B is commensurable with that obtained by using the rail service. However, such is not the case. The road will indeed allow me to access the destination, but I will need a *device*, for instance, a car, to make that trip. Conversely, I will not have this problem if I use the rail system. In general, the conceptual notion of accessibility is often merely related to the operational notion of connecting nodes in a network.

The questions that we need to ask at this point are: Is the increase and improvement of accessibility a main priority of transport investments? And if so, why are transport investments not compared in relation to the accessibility that they achieve?

The individual's perception of transport goods usually does not include the full social cost of transport, as in for instance, its global environmental effects. Under this view, we observe a mismatch between individual perception and social welfare. In order to direct our attention to this mismatch, transport accessibility should be evaluated as a *merit good* as defined by Musgrave (1959). We therefore argue for government intervention in the provision of transport accessibility against individual preferences. Such an intervention is not based on market failure arguments or distributional effects but rather on the specific nature of the transport accessibility good, which is "objectively valuable, i.e. it represents a sacrifice of subjective value theory" (Besley, 1988). Consequently, we need to induce a shift from the limited individualistic perspective to a more socio-economic view, whereby ethical judgments play a role in the transport economic decision-making process. By following this line of thought, government can encourage individuals to make decisions that enhance social welfare.

Significantly, transport accessibility goods are not only valued differently between the social planner and the private consumer, that is, transport accessibility is a merit good; but also different transport interventions such as road and rail achieve different levels of merit good value, thus arguing for a scaling approach of the merit good (Besley, 1988; Feeham, 1990). In particular, as observed previously, the road will indeed allow access to a destination, but for instance the consumer must own the means of transport. Conversely, one does not have this problem when using the rail system. So we can certainly argue that road and rail both aim to increase access to the various facets and activities of our lives, but with different, not similar, accessibility emphases. This implies that merit good value of rail accessibility should be higher than the merit good value of road, because rail accessibility does not require any consumer device to achieve it as in the case of road; when we talk about transport investment, rail therefore has a higher fairness level in relation to consumers, because it allows for greater equality of accessibility than road.

By using the model developed by Schroyen (2005) and introducing the scaling approach we identify in the next section the specific subsidy rate for various transport accessibility interventions.

First-best policies

Given the aforementioned rationale, in order to evaluate transport accessibility as merit good we assume full information between government and consumer. Consumer utility is expressed over a *numeraire* commodity z , a non-merit good, x ; and the transport accessibility good is considered the merit good, y . The prices of these goods are denoted respectively, by 1, p_x , p_y . The utility function of the individual, twice differentiable and quasi-concave is:

$$U(z, x, y) \tag{1}$$

The government's evaluation function is given by:

$$U^g(z, x, y) \tag{2}$$

The government needs to maximize its welfare function (2) in relation to individual behaviour and in so doing we determine the subsidy rules.

However, we assume that if the government is dissatisfied with the level of consumption of the transport accessibility good, it intervenes through subsidy. According to the Schroyen model (2005), let us assume that the government total marginal willingness to pay for the transport accessibility, expressed in terms of the *numeraire*, is:

$$F^g(x, y, u) = \frac{\partial F(x, y, u)}{\partial y} - \int_{y^{g^*}}^{y^{g^{**}}} \mu(\chi) d\chi \tag{3}$$

The term $\mu(y)$ is positive, as in the case of transport, when the good is a merit good and negative when it is a demerit good. The term y^{g^*} is the initial point of divergence between the government's marginal evaluation of the transport accessibility and that of the consumer. We introduce in the evaluation of $\mu(y)$ the term $y^{g^{**}}$, the target government wants to reach in the consumption of the merit good.

Moreover, we need to account for different levels of merit good values of transport accessibility. For instance, do we give the same values to the accessibility achieved by rail service and by car? We assume that the accessibility achieved by rail has a higher merit good value than accessibility by car in relation to the merit value expressed by the government, $\mu(\chi)$, and that expressed by the consumer, $\mu(y)$. Additionally, we postulate that the social planner knows best in relation to the provision of the merit good and thus evaluates the merit good with higher value than the private consumer. Based on these hypotheses we have the following relations:

$$|\mu(y)| \geq 0 \quad \nabla \chi \geq 0 \tag{4}$$

$$\begin{aligned} \mu(y_{rail}) &\geq \mu(y_{road}) \\ \mu(\chi_{rail}) &\geq \mu(\chi_{road}) \end{aligned} \tag{5}$$

$$\mu(\chi_{rail}) \geq \mu(y_{rail}) \tag{6}$$

$$\mu(\chi_{road}) \geq \mu(y_{road}) \tag{7}$$

$$\mu(\chi_{rail}) - \mu(y_{rail}) \geq \mu(\chi_{road}) - \mu(y_{road}) \tag{8}$$

Within the Schroyen procedure adjusted for transport accessibility, we can now observe how different transport accessibilities have different levels of subsidy. Let us next consider the government choice between two possible interventions: road and rail accessibility. We have assumed that both interventions are merit goods, but considering the previous relations, the levels of subsidy are as follows:

$$t_{road} \cong - \left(\frac{\partial \frac{u_2}{u_1}(z, x, y)}{\partial z} \right) \int_{y^{g'}}^{y^{g''}} \mu(\chi_{road}) d\chi - \mu(y_{road}) \tag{9}$$

$$t_{rail} \cong - \left(\frac{\partial \frac{u_3}{u_1}(z, x, y)}{\partial z} \right) \int_{y^{g'}}^{y^{g''}} \mu(\chi_{rail}) d\chi - \mu(y_{rail})$$

where $u_1 = \frac{\partial u}{\partial z}$ and $u_3 = \frac{\partial u}{\partial y}$. The two transport interventions, by being merit goods,

should be subsidised based on how government willingness to pay exceeds consumer willingness to pay. Moreover, given our assumption on the merit value of the two accessibility transport interventions, rail should be subsidised with a rate higher than

road. This result captures not only the nature of the good, i.e. transport accessibility as merit good, but also the different levels of accessibility that we can achieve through transport. The idea here is that the social planner when assessing transport investments needs to account for the types of accessibility that the transport intervention will achieve, and then rank projects also in relation to the accessibility parameter.

Conclusion

Equal access to education or health never refers to school provision without teachers, or hospitals without doctors, so why do we apply to transport a simplified and exclusive accessibility concept?

In transport in general, accessibility is seen as an operational factor linked with the idea of connectivity between origin and destination. In this paper I have argued that transport accessibility should be considered as a merit good, and that various transport interventions achieve different merit good values. By accepting this notion, I have shown how transport interventions, such as rail and road, should receive different levels of subsidy. The analysis has illustrated how, in comparing transport investments, the social planner (who we assume knows best in the notion of the merit good) should, in the choice of the transport investments, also discriminate on the basis of the accessibility achieved.

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