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Congestion Pricing With Heterogeneous Travellers

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Heterogeneity in preferences of users affects both the aggregate efficiency effects as the distributional effects of congestion pricing. This thesis considers two dimensions of heterogeneity. Proportional heterogeneity scales the values of time and schedule delay proportionally. More proportional heterogeneity raises the welfare gain of road pricing, because the efficiency gain from the reordering of the arrival times increases. More heterogeneity in the ratio between the value of time and value of schedule delay lowers the gain from tolling, because congestion externalities decrease.

This thesis finds that, in the bottleneck model of congestion, the distributional effects of congestion pricing are non-monotonic in the value of time and value of schedule delay. It is not users with the lowest values who lose most—or gain the least—from tolling, but an intermediate type of user. This differs from the traditional view that is based on the static flow model of congestion, and states that the higher the value of time is, the less harmful tolling is.

Preference heterogeneity also affects empirical estimates. If two heterogeneous marginal utilities are correlated, it can even bias the willingness-to-pay estimates obtained by logit estimation. The empirical chapters find that travel-cost compensation lowers price elasticities and increases the value of time and the values of restricting the timings of the travel moments.