

# Efficiency in Decentralized Transport Markets

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In this paper we explore both theoretically and empirically the efficiency properties of equilibria in decentralized transportation markets. Such markets include the bulk shipping industry, the trucking industry and the taxicab industry among others. We focus on the role of search frictions, which are common in transportation markets, much like in labor markets. In particular we discuss how frictions within each location, and interactions among them through the transportation network, affect the overall efficiency.

Search frictions in transportation create two types of externalities. As in labor markets, search frictions generate thin/thick market externalities: when choosing whether to enter, agents do not internalize the effect that their entry has on the matching opportunities faced by other agents. The spatial nature of transportation markets also generates “pooling externalities”, which are not present in standard search models: customers (e.g. passengers or exporters) are heterogeneous in their desired destination, however transportation agents cannot direct their search toward a specific type of customer. As agents on one side of the market are pooled together, often prices fail to internalize the social value of sending carriers to different destinations.

We provide a model for decentralized transport markets that nests many modes for transportation, going from taxicabs to dry bulk ships. We provide two conditions such that the two externalities described above are internalized. These two efficiency conditions combined characterize the efficient pricing rules. We apply these results to study empirically the dry bulk shipping industry. For this market, we first test whether the observed equilibrium is efficient. Then, we quantify empirically the social loss due to search frictions and disentangle the loss due to the standard search thin/thick market externalities, vs. the loss

from the pooling externalities.