

Pool Demands

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The objective of this study was to use aggregate water transportation data to develop a model that makes sense of the elasticity of demand for transportation on the Upper Mississippi – pool level demand. The study used LPMS data to trace barge movements up and down the river to determine the general origin-destination trends of barges. Compared to other modes of transportation, the Corps' waterway transportation data is very unique and robust.

Among the criteria for a good model is that it should be based on plausible decision settings and modifiable spatially. Classic problems associated with freight transportation demand estimation is that some data are confidential, rates are quoted at much higher levels of aggregation than quantity, and that the choice set can be complex.

The choice setting for grain shipments was considered to be reasonable in terms of variables:

- How many acres
- Level of effort to devote to crop
- How much of crop to harvest
- When to release the harvest
- Whether to deliver harvest to the river port or different location
- Which pool
- When to load harvest on barge to ship to the gulf.

Based on this choice setting, the study outlined three sources of “choice flexibility” of shippers if prices of river services got too high:

- Delay shipment
- Economize on use of river transportation
- Cut all upper river use and use alternative shipping modes

The initial modeling attempts have produced interesting results but have not yet established consistent results. Several issues still need to be reviewed. For example the impact of system leakages to local use, grain shipments to the Pacific Northwest, and intermodal transportation substitutions in shipment decisions.

Questions and Issues:

- Participants asked whether price is treated as exogenous. The presenter responded in the affirmative stating that the analysis will be evaluated at a pool level so price will be exogenous.

- With price being treated as exogenous to the model, one participant wondered whether the argument is that those demands will not have an impact on price. The presenter agreed with assumption explicitly clarifying that those demands would not have an impact on price through congestion.
- A participant pointed out that there two rate components. The mill rate has not changed much since 1984 because they have either increased efficiency or there is an oversupply of towboats. The participant suggested that demand for particular styles of equipment varies. For the Illinois Waterway, because of draft restrictions, rates are on the high side and there is a discount for using deep draft equipment. The participant also noted that the rates used in the study were realistic.
- One individual suggested using the differences between the Chicago Board of Trade price, Gulf price or Minneapolis price of grain as an alternative approach other using the rates currently used in the study.
- It was suggested that to the extent that the market is competitive, the bid price of grain from pool to pool should reflect transportation costs.
- One participant reasoned that there is likely to be bias in each pool and suggested that the direction of the bias be determined.
- One symposium attendee asked whether one would economize by delivering to the lower pool when prices are high. The presenter responded in the affirmative.
- On the question of whether seasonality was captured in the analysis, the presenter responded stating that seasonality was difficult to show. One seasonal pattern suggests that if shipping charges rise then the parameter describing how harvest relates to shipments is going to decrease.
- Participants recommended that 2000 LPMS data not be used for analysis because it represents the first year of a new data system and might have problems.
- One participant warned about the accuracy of reported data on design draft. The design draft is based on industry reporting a 50% error rate. The draft is either based on the vessel's first trip or what the industry supplied. The participant cited examples of cases (Ingram and ACBL) where half of the barge design drafts are incorrect. The participant commented that this problem is less prevalent in tank barge data especially if the vessel has been inspected by the Coast Guard.
- Questions were also raised on the impact of grain being diverted to Pacific Northwest in response to lower freight rates there. And if so, whether there is a need to divide the growing region: one part that is dedicated to the river, and the other to the Pacific Northwest. Furthermore, participants wondered whether there would be any movements over time in the boundary between what goes to the river and what goes to the Pacific Northwest.
- One participant's concern was how the study team would determine the spatial boundaries of the areas shipping by barge, without digging into the relevant transportation cost specific to the individual shippers across space. The boundaries should represent shippers with zero rent.