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**Box-Cox Double Hurdle Models and the Estimation of Gravity Models
of Agricultural Trade**

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International trade data often contain a high proportion of zero trade flows, and the statistical model used to handle these zero observations can significantly impact empirical results. To address the issue of zero observations, this study utilizes the Box-Cox Double Hurdle model in the estimation of a gravity trade equation for US seed corn. Virtually all gravity models estimate the determinants of trade flows using a log-linear specification of variables. The Box-Cox Double Hurdle is a flexible parametric model that can account for non-normal errors and double censoring of the dependent variable. This model also nests various alternative limited dependent variable models, including the log-linear sample selection model commonly used to estimate gravity equations. Empirical results suggest that the independent version of the Box-Cox Double Hurdle outperforms all other restricted models including the log-linear specification commonly undertaken in the literature. Similar to other trade studies, statistically significant correlation between the selection and trade flow equations was found for the log-linear sample selection model. In contrast, results for the Box-Cox Double Hurdle do not show significant correlation between these two equations. Conditional and unconditional elasticity estimates indicate that the log-linear sample selection model overstates the effect of all explanatory variables. For the sample selection model the unconditional distance and tariff rate elasticities are -1.90 and -1.95, while the elasticities estimated using the Box-Cox Double Hurdle for these variables are -1.37 and -1.49, respectively. Overall, results from this study suggest that the log-linear sample selection model does not properly handle zero trade flows for US seed corn.

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