

UNITED STATES OF AMERICA
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268

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POSTAL RATE COMMISSION
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Before Commissioners:

Edward J. Gleiman, Chairman;
George A. Omas, Vice Chairman;
Dana B. Covington; Ruth Y. Goldway;
and W.H. "Trey" LeBlanc III

Postal Rate and Fee Changes

Docket No. R2000-1

NOTICE OF INQUIRY NO. 4
CONCERNING MAIL PROCESSING VARIABILITY MODELS

(Issued August 2, 2000)

In Docket No. R97-1, witness Bradley conducted a specification search for a model of mail processing variability. He tested a family of models that lack time-indexed coefficients, and rejected the more restrictive models in favor of the facility-specific fixed-effects model. In response to Notice of Inquiry No. 4 in R97-1, the facility-specific fixed-effect model was tested and rejected against the general model, which had both time-indexed and facility-indexed coefficients. In Docket No. R97-1, witness Neels commented that this specification search had produced "too fragile and incomplete a set of results." One respect in which Mr. Neels regarded Dr. Bradley's specification search as incomplete was its failure to evaluate a parallel family of models that lacks facility-specific coefficients. See Docket No. R97-1 at Tr. 28/15775-84, 15805. This family of models was described in Docket No. R97-1 at Tr. 15776.

The record in this docket appears to be incomplete in the same respect as the record in Docket No. R97-1. To help provide a more complete record in this docket, interested parties are invited to test the compatibility of witness Bozzo's data with the family of models that lack facility-indexed coefficients. They are also invited to discuss, in testimony or comments, whether these specification test results, or those already

performed by witness Bozzo, establish the validity of any particular model or family of models. Responses are due within 14 days of the date of this Notice.

Specifically, interested parties are invited to consider the model tested by witness Bozzo that lacks time-indexed coefficients. It will be labeled Model A and it takes the general form

$$y_{it} = \alpha_i + x_{it} \beta + \varepsilon_{it}$$

Here α_i denotes a facility-specific fixed-effect, y_{it} is the logarithm of hours in that operation, and x_{it} is the vector of variables including the logarithm of total piece-handling. Interested parties are also invited to consider an alternative model labeled, Model B, which lacks facility-indexed coefficients. It takes the form

$$y_{it} = \alpha_t + x_{it} \beta + \varepsilon_{it}$$

where α_t denotes a quarter-specific fixed effect, and all other variables are as defined above. In both of these models, the subscript i denotes facilities, and the subscript t denotes quarters.

- a) Witness Bozzo performs a statistical test of the null hypothesis that $\alpha_i = \alpha$ for all i and rejects this null hypothesis. In addition, he tests and rejects the null hypothesis that the α_i are independently, identically distributed random variables with mean zero and variance. He uses both of these hypothesis tests to demonstrate that the facility-specific fixed effect model is statistically superior to the models nested within it, such as the "pooled" and "random effects" models. For the five largest MODS pools modeled by witness Bozzo (in terms of accrued costs), parties are asked to use his data to perform the following two hypothesis tests with respect to Model B: 1) the null hypothesis that $\alpha_t = \alpha$ for all t , and the null hypothesis that the α_t are independently, identically distributed random variables with mean zero and variance σ^2 . Any terms used by witness Bozzo that are not needed because of the presence of α_t , such as lagged dependent variables and regressors may be omitted.

- b) Parties are asked to indicate whether rejection of the hypotheses described in a) establish that Model A is statistically superior to the models nested within it, such as the "pooled" and the "random effects" models. Similarly, parties are asked to indicate whether rejection of the hypotheses described in a) establish that Model B is statistically superior to the models nested within it, such as the "pooled" and the "random effects" models.
- c) Parties asked to discuss whether Models A and B are nested within one another, and whether rejection of the hypotheses described in a) provide statistical grounds for preferring either of these models over the other.
- d) Parties are asked to discuss whether witness Bozzo's rejection of the hypotheses applicable to Model A is sufficient to establish that Model (A) yields a valid estimate of β , which determines the magnitude of volume variability.
- e) Parties are asked to discuss whether rejection of the hypotheses applicable to Model (B) is sufficient to establish that Model B yields a valid estimate of β , which determines the magnitude of volume variability.
- f) Parties are asked to discuss whether, even with the rejection of the hypotheses described in a), there may be theoretical grounds for concluding that a rejected model could provide a better estimate of variability than either model A or B.

By the Commission
(S E A L)


Margaret Crenshaw
Secretary