

BEFORE THE
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

POSTAL RATE AND FEE CHANGES, 2006

Docket No. R2006-1

RESPONSES OF UNITED STATES POSTAL SERVICE WITNESS
BRADLEY (USPS-T-17) TO INTERROGATORIES OF
OFFICE OF CONSUMER ADVOCATE [OCA/USPS-T17-3-11]
(July 5, 2006)

The United States Postal Service hereby provides the responses of Postal Service witness Michael D. Bradley to the above-listed interrogatories of Office of the Consumer Advocate, filed on June 21, 2006.

Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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**RESPONSE OF POSTAL SERVICE WITNESS MICHAEL D. BRADLEY
TO INTERROGATORIES POSED BY OCA**

OCA/USPS-T17-3. The purpose of this interrogatory is to ascertain your choice of estimating equation, given that you have used flexible functional forms in other testimony but are now relying on the linear form. You state in your testimony at 19, lines 11-14, that the established econometric model is linear in form. You appear to have continued to use the linear form in your analysis. In other testimony which you have filed before this commission in presenting estimating equations, you have presented flexible functional forms including the Quadratic form, the Restricted Quadratic form, and Translog form.

- (a) Did you consider the use of these or other forms? If you performed any studies using any of these or other forms, please provide the results of such studies or estimates of window service transactions.
- (b) Please explain your decision not to use equation forms which you have previously used, with references to the econometric and/or theoretical literature as appropriate.

Response:

- a. No.
- b. As I stated in my "Purpose and Scope" section, the purpose of my testimony is to update the transaction supply side variabilities for window service costs. These variabilities are just one part of the established method for calculating volume variable window service costs. The linear model was first introduced by the Postal Service in Docket No. R97-1. In so far as I could determine, no party to that proceeding criticized or took issue with the approach or the results. The Commission accepted it without criticism, or suggestion for improvement, or revision. The linear model was used by both the Postal Service and the Commission in Docket No. R2000-1, Docket No. R2001-1, and Docket No. R2005-1. In none of those dockets did any party criticize or object to any part of the analysis. Given this history, and given the limited scope of my testimony, it seemed appropriate to once again adopt a linear specification.

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OCA/USPS-T17-4. The purpose of this interrogatory is to compare the linear form with other flexible functional forms previously used by you in terms of underlying assumptions, recognizing that the assumptions about the choice of estimating equation will impact the conclusions. It is our understanding that flexible functional forms do not impose underlying assumptions on the equation being estimated. This question seeks to ascertain whether such is the case for the linear form.

- (a) Does the linear form involve the imposition of assumptions in terms of the signs of first or second derivatives and/or other assumptions?
- (b) If your answer is affirmative, please explain with references to the econometric and/or theoretical microeconomic literature, as appropriate.

Response:

a.& b. Consider the following linear function:

$$z = \alpha + \beta x_1 + \gamma x_2.$$

The first partial derivative of the function with respect to x_1 is given by:

$$\frac{\partial z}{\partial x_1} = \beta.$$

Note that there are no restrictions on the sign of β . The second partial derivative with respect to x_1 is given by:

$$\frac{\partial^2 z}{\partial x_1^2} = 0.$$

This shows that the second derivative of a linear function takes the value of zero.

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OCA/USPS-T17-5. Please refer to Table 1, page 22 in your testimony. It is clear that for each type of transaction in the table you have taken the total for the column and divided by 7,915. What is the purpose of this table and the use for these results?

Response:

As the title suggests, the purpose of the table is to provide the sample means. The use of the results is to consider a measure of central tendency for the listed variables.

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OCA/USPS-T17-6. The purpose of this interrogatory is to clarify for the record the naming of a key variable. Turning to table "wscleanpos.11.3.05.xls" in your Library Reference USPS-LR-KI-80, please verify that the variable "length" measures time. If you do not verify, please explain fully.

Response:

Yes. Please see my response to POIR #3, Question 12.

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OCA/USPS-T17-7. Table 2 at page 26 is one of a number of tables in your testimony presenting an estimate of transaction time as a function of variables. In some cases, the underlying equation would have a single intercept variable, and in other cases there would be a number of site-specific intercepts.

- (a) Is there an economic interpretation of the intercept variable for the case with one intercept variable? Please explain your answer.
- (b) Is there an economic interpretation of the intercept variable for the case with multiple intercept variables? Please explain your answer.

Response:

- a. Yes. As I explain on page 11 of my testimony:

The cost generating process underlying the established method can be captured in an equation for an individual transaction time (y_i) that has two parts, the time for processing the items in the transaction (captured by the β_j) and the time associated with the existence of the transaction itself (captured by β_0):

$$y_i = \beta_0 + \sum_{j=1}^m \beta_j x_{ji}$$

- b. Yes. The data set contains data from a number of different Post Offices. In the instance of multiple intercepts (one for each site), the estimated coefficients reflect an estimate of the time associated with existence of a transaction at the individual sites. An overall average time is calculated by taking a weighted average of those individual coefficients. For a discussion of its calculation please see USPS-LR-80 and my response to POIR #3, Question 7.

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OCA/USPS-T17-8. The purpose of this interrogatory is to document some of the properties of your regression equations. The regressions underlying your study have R squared values in the neighborhood of 0.5.

- (a) Why are the R-squared values not higher?
- (b) What could have caused the R-squared values to be higher?
- (c) If the R-squared values had been higher, would the elasticities ultimately computed have been different?
- (d) Does the value of the Durbin-Watson statistic raise a question as to the accuracy, precision, or reliability of your conclusions?

Response:

- a. It is difficult to speculate on the counterfactual. However, I would note that the R-squared values from the estimated equations in my testimony are quite a bit higher than those for the established model. Moreover, the R-squared are reasonable for a model that is estimated on what is essentially a cross-sectional data base.
- b. It is well known, for example, that R-squared is non-decreasing in the number of variables in the equation. Thus, if one's sole goal is increasing the R-squared measure, one could add additional variables, whether or not they make operational sense, to the equation.
- c. There is no functional relationship between the R-squared measure and the calculated variabilities so it is impossible to be definitive. In general, the R-squared measure could be higher in one of two regression equations and the

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computed variabilities from that equation could be either higher or lower than the computed variabilities from the regression equation with the lower R-squared.

- d. No. It is not an applicable statistic for these regressions. It is a measure of serial correlation which does not exist in cross-sectional data.

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OCA/USPS-T17-9. The purpose of this interrogatory is to confirm and highlight the linear nature of your estimating procedure. Please turn to page 13, lines 16 and 20, of your testimony. It appears that the equation on line 16 presents the amount of time for a single item transaction, consisting of a fixed amount of time plus a variable amount of time depending on quantity, which in this case is “one”.

- (a) Please confirm that if 20 items are transacted, then the total amount of time will be the same fixed amount of time plus 20 times the amount of time for the single transaction. If you do not confirm, please explain.
- (b) Please confirm that β_0 could be different for each type of transaction. If you do not confirm, please explain.

Response:

- a. Confirmed given the phrase, “the amount of time for the single transaction” refers to the β_k coefficient in the cited equation.
- b. Confirmed.

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OCA/USPS-T17-10. Please turn to page 41 of your testimony, where you provide an “addendum to USPS-T-17.” You indicate that some calculated variabilities in the associated spreadsheet were corrected for “minor cell errors.” Please provide the revised spreadsheet and the original spreadsheet.

Response:

Please see my response to POIR #3, Question 7.

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OCA/USPS-T17-11. On page 3 of your Library Reference USPS-LR-L-81 you reference the worksheet "Average Product Times.R2006.xls." A review of the Library Reference has not located the worksheet. Please indicate where the worksheet is located in the Postal Service filing or, alternatively, please provide the worksheet and appropriate documentation.

Response:

Please see my response to POIR #3, Question 8.