

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

POSTAL RATE AND FEE CHANGES, 2006

Docket No. R2006-1

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS BRADLEY
TO INTERROGATORIES OF THE OCA (OCA/USPS-T14-9 - 12)
(June 29, 2006)

The United States Postal Service hereby provides the response of witness Bradley to the following interrogatories of the OCA, filed on June 15, 2006: OCA/USPS-T14-9 – 12.

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

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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June 29, 2006

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by the OCA

OCA/USPS-T14-9. In USPS-T-14, Docket No. R2006-1 you have referenced your work in USPS-T-14, Docket No. R2005-1. The purpose of this interrogatory is to understand your treatment of heteroscedasticity in USPS-T-14, filed in R2005-1. You state at 33, lines 15-17, "Because of the large cross sectional variation in the data, it is likely that the econometric estimates for the delivery equations suffer from heteroscedasticity."

- (a) Did you test for the existence of heteroscedasticity? If so, please indicate where you have presented the test and/or please present the test. If your answer is negative, please explain why you did not test for heteroscedasticity.
- (b) You present the HC standard error and HC t-statistic in various tables in your testimony, e.g. Table 3 at 35. Please state where the SAS or other program presenting the computations may be found in your testimony. Alternatively, please provide the program and/or the detailed computations if available or, alternatively, explain the unavailability of the program.

OCA/USPS-T14-9 Response:

- a. Please see my response to ADVO/USPS-T14-3b, Docket No. R2005-1.
- b. Please see my response to OCA/USPS-T14-17, Docket No. R2005-1.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by the OCA

OCA/USPS-T14-10. The purpose of this interrogatory is to obtain additional understanding of marginal cost and volume variability in the unrestricted and restricted quadratic equations supporting your testimony in USPS-T-14, filed in R2005-1. You have generated the equations based on a dataset of 1545 Zip code days. Suppose that the number of letters were different than is the case in the database. For example, suppose the total number of letters was 50 percent greater for each Zip code day, with all other data unchanged. Alternatively, suppose the number of letters was 50 percent less for each Zip code day, with all other data unchanged.

- (a) Would the volume variability change for letters? Please explain your answer.
- (b) Would the marginal cost for letters change? Please explain your answer.
- (c) Suppose that in general the numbers of letters, flats, sequenced mail, collection volume, and parcels changed simultaneously. Would this affect volume variabilities and/or marginal costs? Please explain your answer

OCA/USPS-T14-10 Response:

- a. Yes. In the scenario described in the question, the volume variability would become zero. If the total number of letters was increased by 50 percent but all other variables (including regular delivery time) were held constant, the percentage change in time in response to the volume change would necessarily be zero.
- b. Yes. If there is no change in delivery time in response to 50 percent increase in letters, then the marginal cost (time) would be zero. Similarly if there was a 50 percent decrease in letters and no change in delivery time then the marginal cost of those letters would, presumably, be zero.
- c. Whether or not there would be a change in volume variabilities and/or marginal costs (times) would depend upon the change, if any, in delivery time that occurred in response to the volume change.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by the OCA

OCA/USPS-T14-11. The purpose of this interrogatory is to obtain a better understanding of the full quadratic and restricted quadratic functions used in your testimony in USPS-T-14, filed in R2005-1.

- (a) Please explain what economic type of function is being estimated—e.g., cost function, production function, factor demand function, or other type of function. .
- (b) Please provide literature citation(s) that define the type of function you reference in (a).

OCA/USPS-T14-11 Response:

- a. The type of economic function being estimated is known as a “first order condition.”¹ This condition provides a model of the process the Postal Service goes through to minimize the delivery time within a ZIP CODE given the volume to be delivered, the number of delivery points in the ZIP CODE, the physical geography of the ZIP CODE and the work rules (e.g. the “eight hour day rule”) governing the labor conditions of city carriers.
- b. For an example of the definition and estimation of this type of function please see Bernard, Stephane, Cohen, Robert, Robinson, Matthew, Roy, Bernard, Toledano, Joelle, Waller, John and Xenakis, Spyros, “Delivery Cost Heterogeneity and Vulnerability to Entry,” in Postal and Delivery Services: Delivering on Competition, Michael Crew and Paul Kleindorfer (eds.), Kluwer, 2002.

¹ This type of equation might also be derived from solving a set of first order conditions, depending upon the structure of the underlying optimization problem.

Response of Postal Service Witness Michael D. Bradley
To Interrogatories Posed by the OCA

OCA/USPS-T14-12. The purpose of this interrogatory is to obtain additional information on your estimation procedure in reference to the full quadratic and restricted quadratic functions in the analysis of City Carrier Costs. On page 37 of your testimony in USPS-T-14 in Docket R2005-1 you indicate "The usual procedure is to drop unnecessary variables in an attempt to maintain the integrity of the regression while reducing the impact of the multicollinearity." The results for the Full Quadratic dropping only small parcel cross products are presented in Table I-4 of Appendix I of the *Opinion and Recommended Decision, Docket R2005-1*. The concept of deleting variables in the presence of multicollinearity is well known. For example, you dropped all of the cross products in the full quadratic, arriving at a reduced quadratic. One could, however, have dropped fewer variables based on the VIF factors. For example, five of the cross product variables have VIF values less than 10. Only 6 of the cross product variables had VIF values greater than 43.3, the VIF value for the variable letters, which you retained.

- (a) Is there any basis for dropping and/or retaining variables based on the VIF values? Please explain.
- (b) Why would an equation retaining some of the low VIF value cross product variables be worse than an equation in which all of the cross product variables had been dropped? Please provide citations to the literature as appropriate.

OCA/USPS-T14-12 Response:

- a. Not that I am aware of. The VIF is a diagnostic tool that detects the presence of multicollinearity but does not provide an explicit guideline on how to correct for that condition.
- b. It is difficult to answer the question without a more concrete definition of "worse." There are no standard procedures for dealing with multicollinearity and some judgment is necessarily involved. For the results of an estimation process which retains some of the cross product terms and has lower Variance Inflation Factors than the full quadratic, please see my response to POIR 9, Question 11, Docket No. R2005-1.

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document in accordance with Section 12 of the Rules of Practice and Procedure.

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