

UNITED STATES OF AMERICA
Before The
POSTAL RATE COMMISSION
WASHINGTON, D.C. 20268-0001

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Postal Rate and Fee Changes, 2000)

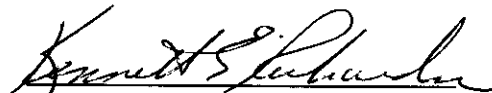
Docket No. R2000-1

ANSWERS OF THE OFFICE OF THE CONSUMER ADVOCATE
TO INTERROGATORIES OF UNITED STATES POSTAL SERVICE
WITNESS: J. EDWARD SMITH (USPS/OCA-T4-1-7)
(June 8, 2000)

The Office of the Consumer Advocate hereby submits the answers of J. Edward Smith to interrogatories of United States Postal Service, dated May 25, 2000. Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

OFFICE OF THE CONSUMER ADVOCATE



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ANSWER OF OCA WITNESS J. EDWARD SMITH
TO INTERROGATORIES USPS/OCA-T4-1-7

USPS/OCA-T4-1. Please refer to your testimony at page I, line 9. Please specify each regulatory proceeding, other than Docket No. R97-1, in which you gave testimony pertaining to an econometric analysis of panel data, and provide a copy of the written testimony. If there are no such instances, please so indicate.

RESPONSE TO USPS/OCA-T4-1. With the exception of Docket No. R97-1, I have not provided testimony on the econometric analysis of panel data.

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USPS/OCA-T4-2. Please refer to your testimony at page 13, lines 34 and footnote 14.

- (a) Please define the term "equilibrium point" as you use it in the footnote.
- (b) Please define the term "facility size" as you use it in the footnote.

RESPONSE TO USPS/OCA-T4-2. (a) The Commission has implicitly referenced the equilibrium point in Appendix F of the Opinion in Docket No. 97-1. (Appendices to Opinion and Recommended Decision, Volume 2, Appendix F, Docket No. R97-1 at 43). For a more detailed exposition see *Econometric Models, Techniques, and Applications* by Intriligator, Bodkin and Hsiao, at page 278 (Michael D. Intriligator, Ronald G. Bodkin, and Chen Hsiao, *Econometric Models, Techniques, and Applications*, Second Edition, Upper Saddle River, New Jersey, Prentice Hall, 1996):

The equilibrium of the firm in the long run, when both inputs can be freely varied, is at the tangency of an isocost to an isoquant. Only at such a point is output maximized for a given cost or, equivalently, is cost minimized for a given output. The former follows by moving along any one isocost: if at any one point it crosses an isoquant it is possible to increase output with no additional cost--by moving toward the tangency point. Similarly, moving along any one isoquant, if at any one point it crosses an isocost, it is possible to decrease cost while holding output constant--by moving toward the tangency point. The locus of tangency points is the set of possible equilibrium points for the firm; it is called the expansion path and is characterized by the equality of slopes of isocost and isoquant. From the above results on these slopes, the geometric tangency is in fact equivalent to the algebraic conditions (8.2.7), stating that, for profit maximization, the marginal rate of technical substitution must equal the ratio of wages.

The possible equilibrium points along the expansion path of Figure 8.1 indicate at each such point an output, y , from the isoquant, and a level of cost, C , from the isocost. The set of all possible pairs of output and cost along the expansion path defines the cost curve: $C = C(Y)$ (8.2.14), in this case the long-run total cost curve, since it represents total cost: $C = w_1x_1 + w_2x_2$ (8.2.15) in the long-run situation in which all factor inputs can be varied freely. A *short-run cost curve* is defined using an alternative

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expansion path that reflects whatever factors are fixed in any particular short run. An example would be the expansion path defined by the horizontal line at \bar{x}_2 , where the second input is fixed at this level and the first input is free to vary.

(b) Facility size is defined in terms of the specific isoquant currently producing product.

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USPS/OCA-T4-3. Please refer to your testimony at page 15, lines 15-18, where you discuss the "random effects" estimator. Do you mean to say in line 18 that the random-effects model assumes that the facility specific characteristics are stochastic (i.e., random)? If not, please explain.

RESPONSE TO USPS/OCA-T4-3. Yes. My paraphrasing of Dr. Bradley's testimony is based on his statement "Alternatively, one could model the facility-specific effects as random events." (USPS-T-14, Docket No. 97-1, lines 24-25 at 43.)

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USPS/OCA-T4-4. Please refer to your testimony at page 28, lines 1-2. Did you perform any quantitative analysis of Dr. Bozzo's data, models, or results to determine whether the "underlying investment series" is actually "unrepresentative of current operations"? If so, please describe the methods and results of your analysis in detail.

RESPONSE TO USPS/OCA-T4-4. An analysis of the models or results would not be indicative of whether the data are unrepresentative of current operations. Instead, I base my comments on a review of USPS investment and investment policies rather than on any particular quantitative analysis of Dr. Bozzo's data, models, or results. It is clear that in recent years there has been significantly increased investment in mail processing equipment, and the Postal Service discusses ongoing investment efforts in this case. It appears that the Postal Service has a variety of activities at mail processing plants in various stages of technological sophistication. One obtains the impression that major savings are being obtained, or are about to be obtained, from new technologies and facilities. Accordingly, an analysis that includes data for obsolete facilities may not be representative of costs to be incurred in the future.

This is an example of an issue whose analysis would benefit from input from USPS experts as well as a review of site specific data on a facility-by-facility basis for the MODS operations. A working group cooperatively focused on the resolution of this issue would be appropriate.

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USPS/OCA-T4-5. Please refer to your testimony at page 28, lines 5-7. Also please refer to Dr. Bozzo's testimony, USPS-T-15 at pages 78. line 11 to page 79 and Appendix D, page 152.

- (a) Please confirm that the referenced sections of Dr. Bozzo's testimony discusses "the appropriate way, if any, to use data from previous years to evaluate the elasticities [volume-variability factors] for the 1998 Base Year" and present the results of evaluating the elasticities using only the FY 1998 observations. If you do not confirm, please state your understanding of the referenced sections.
- (b) Did you perform any quantitative analysis of Dr. Bozzo's data, models, or results to determine whether any relevant discontinuities actually exist and/or to quantify their effects? If so, please describe the methods and results of your analysis in detail.

RESPONSE TO USPS/OCA-T4-5. (a) The statement is confirmed, subject to noting that there are a substantial number of problems in the testimony as well as an incorrect model. An interesting issue for the proposed working group to explore would be the impact of 1999 data on the results of a correctly specified model. This would be an appropriate topic for consideration by a working group.

(b) As stated, I found significant problems with Dr. Bozzo's models, and data are not available to correct the problems. Accordingly, any reestimation would be irrelevant at this time. This also would be an appropriate topic for consideration by a working group.

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USPS/OCA-T4-6. Please refer to your testimony at page 38, lines 6-7. Please also refer to Docket No. R97-1, USPS-T-14 at page 12, and the Commission's Docket No. R97-1 Opinion and Recommended Decision, Vol. 1, at page 81 (paragraph 3039) and page 83 (paragraph 3043).

- (a) Please confirm that Dr. Bradley characterized his models as "cost equations" which he (and the Commission) specifically distinguished from "cost functions" as the latter term is normally used in treatments of economic production theory. If you do not confirm, please explain.
- (b) Please indicate your understanding of the Commission's reference, at page 83 (cited above), to Dr. Bradley's need to provide a data set sufficient to "specify cost functions or, more precisely, functions describing the Postal Service's derived demand for mail processing labor time."

RESPONSE TO USPS/OCA-T4-6. (a) Confirmed.

(b) Paragraph 3039 concludes that the Bradley approach lacks a firm basis in economic theory. Deficiencies include the use of a cost equation rather than a cost function, the use of accounting period data that are inconsistent with the operating plan, and, implicitly, a criticism of the short run nature of the study.

Paragraph 3043 of the Commission's Opinion criticizes the data set. The Commission indicated that Dr. Bradley did not "include a sufficient set of explanatory variables to properly specify cost functions." The data requirements associated with a translog cost function, a production function, and a labor demand function are well known; a reference source is Chapter 12 of *Chung's Utility and Production Functions*. (Jae Wan Chung, *Utility and Production Functions*, Blackwell, 1994).

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USPS/OCA-T4-7. Please refer to your testimony at page 38, lines 12-18 and footnote 47.

- (a) Do you contend that formal (mathematical) derivation of the labor demand function cannot be performed? Please explain any answer other than an unqualified no.
- (b) Is it your understanding that sources in the economic literature provide and/or discuss the derivation, including (but not limited to) the material cited in Dr. Bozzo's response to OCA/USPS-T-15-56(c), to which you refer in footnote 47? Please explain any answer other than an unqualified yes,

RESPONSE TO USPS/OCA-T4-7. (a) No. The testimony would have been enhanced by providing the derivation of the function, along with sufficient discussion of the appropriate variables, a discussion of the properties of the function, a discussion of the implications of various results under various market conditions, and a discussion of the relevant literature.

(b) Yes, and it would have been appropriate to include the information in Dr. Bozzo's testimony. To be specific, by presenting a derivation of the labor demand function as related to a production function or a cost function, the analyst would set the basis for the consideration of appropriate variables, estimating procedures, and functional type (Dr. Bradley presents the information in terms of a cost function; Dr. Bozzo presents the information in terms of a labor demand function). There is substantial confusion.

A relatively succinct presentation of the translog production, cost, and factor demand function may be found in Chapter 12 of *Utility and Production Functions*, (Jae Wan Chung, *Utility and Production Functions*, Blackwell, 1994). The book also presents an overview of selected studies, including country and industry data (pooled,

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cross sectional, time series: the associated footnote mentions that a cross-section analysis yields long-run effects, whereas a time-series analysis yields short-run effects), assumptions (linear homogeneity, separability, homotheticity), estimation technique, and results.

DECLARATION

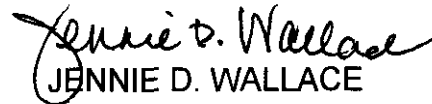
I, J. Edward Smith, declare under penalty of perjury that the answers to interrogatories USPS/OCA-T4-1-7 of the United States Postal Service are true and correct, to the best of my knowledge, information and belief.

Executed June 7, 2000

J. Edward Smith

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the rules of practice.


JENNIE D. WALLACE

Washington, D.C. 20268-0001
June 8, 2000