

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

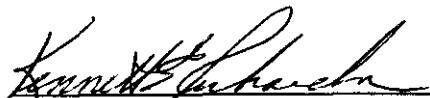
ANSWERS OF THE OFFICE OF THE CONSUMER ADVOCATE  
TO INTERROGATORIES OF UNITED STATES POSTAL SERVICE  
WITNESS: J. EDWARD SMITH (USPS/OCA-T4-20-25)  
(June 16, 2000)

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The Office of the Consumer Advocate hereby submits the answers of J. Edward Smith to interrogatories of United States Postal Service, dated June 2, 2000. Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

OFFICE OF THE CONSUMER ADVOCATE



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ANSWERS OF OCA WITNESS J. EDWARD SMITH  
TO INTERROGATORIES USPS/OCA-T4-20-25

USPS/OCA-T4-20. Please refer to your testimony, OCA-T-4, at page 18, lines 14-16. You state that "[t]he expansion path is the hyperplane that should be measured, not the short-run hours/TPF relationship." Consider an economic (variable) cost function  $c = f(y, w, x^*, z)$  and the associated derived labor demand function  $l = h(y, w, x^*, z)$ . In this notation,  $c$  denotes real cost,  $l$  real labor input,  $y$  real output ("volume"),  $w$  the price(s) of variable factor(s) over the desired length of run,  $x^*$  the quantities of factors that are quasi-fixed (if any), and  $z$  denotes other variables determining cost and hence labor demand, and  $f$  and  $h$  are functions with appropriate mathematical properties. Please indicate how you believe the "expansion path" to which you refer relates to the cost and/or labor demand functions as defined above. Please relate your answer to the standard treatment of economic cost theory as presented in, e.g., Robert G. Chambers' *Applied Production Analysis*. If you cannot specify the relationship between the "expansion path" and the cost and/or labor demand functions defined above, please so indicate.

RESPONSE TO USPS/OCA-T4-20. As indicated by C.E. Ferguson, *Microeconomic Theory*, Irwin, 1969, Revised Edition, page 174, "...the expansion path is crucial in determining the long-run cost of production." In *Econometric Models, Techniques, and Applications* (by Michael D. Intriligator, Ronald G. Bodkin, and Cheng Hsiao, Second Edition, Prentice Hall, 1996) the authors show the expansion path of the firm on page 277. They show that the set of all possible pairs of output and cost along the expansion path define the cost curve, page 278. They then show that given the profit-maximizing output, the choice of inputs is given at that point where the corresponding isoquant intersects the relevant expansion path. In general, one can obtain a system of factor demand functions, as presented on page 280.

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USPS/OCA-T4-21. Please refer to your testimony, OCA-T-4, at page 19. lines 3-4, where you state that "it is not clear whether capital is an exogenous or an endogenous variable and whether some type of reduced form simultaneous equations system is needed." On the same page, at lines 7-8, you state that "capital is treated as exogenous when it may in fact be endogenous."

a. Please confirm that, in response to oral examination by counsel for OCA, Dr. Bozzo stated he considered capital to be "predetermined" for the purposes of his analysis (see Tr. 15/6414, line 23; Tr. 15/6415, lines 3-7).

b. Please confirm that in econometrics, "predetermined" variables are variables that are "not exogenous, but, as regards the current values of the endogenous variables, may be regarded as having already been determined" (see William H. Greene, *Econometric Analysis*, Second Edition, page 581). If you do not confirm, please state your understanding of the econometric content of the term "predetermined" and provide references to appropriate sources in the econometrics literature to support your position.

c. Please confirm that the "relevant distinction" that determines whether a simultaneous equations statistical model is needed is "between jointly dependent [endogenous] variables and predetermined variables," including exogenous variables (see George G. Judge, et. al., *The Theory and Practice of Econometrics*, Second Edition, Wiley, 1985, at page 565). If you do not confirm, please state fully your understanding, and provide references to appropriate sources in the econometrics literature to support your position.

d. Is it your understanding that there is a time lag between the Postal Service's investment decisions and the availability of the related equipment for Postal Service operations? Please explain fully any answer other than an unqualified yes, and provide all document(s) and studies that support your position.

RESPONSE TO USPS/OCA-T4-21. (a) Confirmed

(b) Assuming that the quote is repeated in the third edition of Dr. Greene's book on page 711, I will confirm. Lagged endogenous variables are often called "predetermined" variables.

(c) I find no such reference in the aforementioned book on page 565. Furthermore, I do not believe that capital should be modeled as predetermined in the long run.

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(d) Whether or not there is a time lag between investment decisions and the availability of the equipment is irrelevant; the relevant question would be whether the capital used in a time period is related to the activity level. For example, one might forecast correctly two years in advance that a certain level of capital is needed for a certain level of mail processing, but with concurrent acquisition of capital for current increased mail processing load. Based on information furnished by the Postal Service, it appears that the current level of capital is related to the current level of activity, though not necessarily on a 100 percent basis. I have no documents, studies, or analyses not in the public domain; my statements are based on the information available before the Commission.

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USPS/OCA-T4-22. Please refer to your testimony, OCA-T-4, at page 19, lines 6-7. You reference the inclusion of "variables assumed non-volume variable that are actually volume-variable" in Dr. Bozzo's analysis, specifically the manual ratio and capital, as an indication that his analysis is "fatally flawed."

- a. Is it your testimony that, if the manual ratio and/or capital are volume-variable (to any degree), the effects of those variables on mail processing labor costs cannot in principle be incorporated into calculations of the corresponding volume-variability factors, and instead the entire econometric analysis must be discarded as "fatally flawed"?
- b. Please confirm that Dr. Bozzo presents estimates of the elasticities of workhours with respect to capital and the manual ratio for the cost pools covered by his study in USPS-T-15 at pages 119-120. If you do not confirm, please explain.
- c. Please confirm that Dr. Bozzo presents a derivation of the "manual ratio effect," i.e., the appropriate calculations for treating the manual ratio as volume-variable, in Appendix C of USPS-T-15. If you do not confirm, please explain.

RESPONSE TO USPS/OCA-T4-22. (a) The Commission concluded that Dr. Bradley's manual ratio variable was volume variable; see Docket No. R97-1, "Appendices to Opinion and Recommended Decision Volume 2," Appendix F, at 38. Capital is required for the processing of mail and, accordingly, is in my opinion also volume variable. This could be addressed by treating capital as an endogenous variable, not predetermined.

(b) Confirmed.

(c) Confirmed.

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USPS/OCA-T4-23. Please refer to your testimony, OCA-T-4, at page 20, lines 9-12.

- a. In the section of your testimony cited above, you state, "The current estimators appear to be tentative." What do you mean by the term "tentative" in reference to econometric estimators? Please provide appropriate references to the econometric literature to support your answer.
- b. Please explain your use of the term "appear" in the statement quoted in part (a)--i.e., does your usage of the term "appear" signify that you have not conducted an analysis that would determine whether the current estimators actually are "tentative"?
- c. In the section of your testimony cited above, you state that "the proposed variabilities have actually changed over the short course of several years, apparently due to changes in data scrubbing and methodological changes." If the original data "scrubs" and methodology were flawed, and those flaws were remedied, would you expect the variabilities to change as a result of the remedy? Please explain why or why not.

RESPONSE TO USPS/OCA-T4-23. (a) The word "tentative" is more appropriately defined in the dictionary, not the econometric literature; the meaning is "offered, undertaken, or arrived at as a first step; provisional." For example, I have testified to the deficiencies of the study; the study is at best a "first step." In addition, the Postal Service studies have revised variabilities with each offering. The variabilities computed by Dr. Bozzo statistically differ from those computed by Dr. Bradley in some cases; and the confidence intervals for some variables vary by over 15 percent which could have, in some cases, an impact of over \$50 million per activity on attributable costs.

(b) Appear means "to be taken as." I have presented testimony on the analysis and have also estimated confidence intervals for the variabilities presented.

(c) Any answer is speculative. However, I would expect very minimal change in the variabilities on a longer-run basis, and possibly greater change in the variabilities on a short-run basis, assuming that the study were correctly performed.

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USPS/OCA-T4-24. Please refer to your testimony, OCA-T-4, at page 20, lines 2-3. You state, "Possibly another five person years of effort would be required to complete the work." Please indicate the scope of "the work" as you use the term in the quoted statement.

RESPONSE TO USPS/OCA-T4-24. "The work" would consist of a study presenting at least the variabilities developed by Dr. Bradley, with appropriate consideration of variables, econometric estimation, and economic theory. Dr. Bozzo in OCA/USPS-T15-20 and OCA/USPS-T15-62 presents time estimates for the various study efforts. One would expect that the required time estimates would be person year levels of effort, not calendar time.

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USPS/OCA-T4-25. Please refer to your testimony, OCA-T-4, at page 64, lines 10-11. You state that “based on Mr. Degen’s testimony, [the cross sectional approach] appears to be superior to either the fixed effects or pooled models.”

- a. Please confirm that Mr. Degen does not claim that the cross sectional approach is superior to the fixed effects or pooled models. If you do not confirm, please provide citations to statements in USPS-T-16 that support your response.
- b. If you confirm in response to part (a), please confirm that the conclusion that the cross sectional approach is superior is your testimony, not Mr. Degen’s. If you do not confirm, please explain.

RESPONSE TO USPS/OCA-T4-25. (a) Confirmed. However, although Mr. Degen does not specifically make that claim, that conclusion is reached based on a reading of his testimony. Please see my testimony in this docket (OCA-T-4) page 58, lines 2 through 5 and footnote 85.

(b) It is my testimony that in this case the cross sectional approach is superior; this conclusion is based not only on information contained in Mr. Degen’s testimony but on various sources in the literature. For example, one can find that “cross-section estimates relate to the long-run version of many parameters” in *A Guide to Econometrics*, Fourth Edition, Peter Kennedy, MIT Press, 1998. Another statement focusing on the econometric estimation of segment 3 costs indicates that I am not alone in my conclusion that the cross sectional approach is superior. See Appendix F, “Appendices to Opinion and Recommended Decision,” Volume 2, Docket No. R97-1 at 13, “Both witness Neels and witness Smith have observed that, because of this relatively long production period, the cross sectional dimension of the empirical relationship between costs and volume is more important for determining the true relationship between costs and volumes.” Moreover, the Commission concluded,



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“Consequently, an estimation procedure which primarily relies on the cross-sectional dimension of the panel dataset is preferred to one that relies on differences over time within the same facility, such as the fixed-effect estimator.” Id. at 14.

DECLARATION

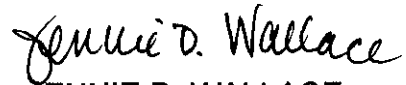
I, J. Edward Smith, declare under penalty of perjury that the answers to interrogatories USPS/OCA-T4-20-25 of the United States Postal Service are true and correct, to the best of my knowledge, information and belief.

Executed June 16, 2000

J Edward Smith, Jr

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 16, 2000