

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

POSTAL RATE AND FEE CHANGES, 2006

Docket No. R2006-1

INTERROGATORIES OF THE UNITED STATES POSTAL SERVICE TO
GCA WITNESS CLIFTON
(USPS/GCA-T1-56-80)

Pursuant to Rules 25 and 26 of the Commission's Rules of Practice and Procedure, the United States Postal Service directs the following interrogatories to GCA witness Clifton: USPS/GCA-T1-56-80.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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USPS/GCA-T1-56. You have stated in several places in your testimony and in your responses to USPS/GCA-T1-9, USPS/GCA-T1-33, and USPS/GCA-T1-42 that the non-linear transformation which witness Thress applies to consumption expenditures on Internet Service Providers in his testimony “is not a Box-Cox transformation.”

- a. Please confirm that witness Thress’s model can be expressed as follows:

$$\text{Ln}(V) = a + b(X^\lambda) + \dots$$

- b. Please confirm that a Box-Cox model can be expressed as follows:

$$\text{Ln}(V) = a' + b'[(X^\lambda - 1) / \lambda] + \dots$$

- c. Please confirm that the Box-Cox model equation in b. could be re-written as follows:

$$\text{Ln}(V) = a' + (b'/\lambda)(X^\lambda) - (b'/\lambda) + \dots$$

- d. Please confirm that the Box-Cox model equation in c. could be re-written as follows:

$$\text{Ln}(V) = [a' - (b'/\lambda)] + (b'/\lambda)(X^\lambda) + \dots$$

- e. Please confirm that the Box-Cox model equation in d. could be re-written as follows:

$$\text{Ln}(V) = a + b(X^\lambda) + \dots$$

$$\text{Where } a = a' - (b'/\lambda) \text{ and } b = (b'/\lambda)$$

- f. Please confirm that witness Thress's model equation in a. is identical to the Box-Cox model equation in e.
- g. Please confirm that your statements that witness Thress's transformation "is not a Box-Cox transformation" (e.g., page 31, line 3 of your testimony) are not correct.
- h. Would the fact that witness Thress does, in fact, use a correct Box-Cox transformation in his work change your answer to USPS/GCA-T1-33?
- i. Would the fact that witness Thress does, in fact, use a correct Box-Cox transformation in his work change your answer to USPS/GCA-T1-42?

USPS/GCA-T1-57. In your response to USPS/GCA-T1-42, you indicate that you believe that "[i]ncluding a variable as non-linear without some reasonable justification is nothing but an arbitrary choice."

At line 3 of page 18 of your testimony you present the following hypothetical equation for modeling the demand for First-Class single-piece letters.

$$(2) \log(Q) = a - b \log(P) + b_2 \log(P_2)$$

where P is the price of First-Class single-piece letters and P₂ is the price of competing electronic alternatives. You go on to state that "price data for competing substitutes ... is not readily available."

- a. Would it be appropriate in this case to attempt to find some variable, call it z, to serve as a proxy for log(P₂) within equation (2)? If not, why not?
- b. Suppose that there was some variable, X, and some constant, y, such that X^y appeared to be very highly correlated with log(P₂). Would it be appropriate in this case to substitute X^y into equation (2) as a proxy for log(P₂)? If not, why not?
- c. If X^y as described in part b. were used instead of log(P₂) in equation (2), would the estimated value of b be biased? If so, please provide the

- precise mathematical formulation for the expected value of b expressed as a function of the true value of b ?
- d. If X (not raised to the power y) as described in part b. were used instead of $\log(P_2)$ in equation (2), would the estimated value of b be biased? If so, please provide the precise mathematical formulation for the expected value of b expressed as a function of the true value of b ?

USPS/GCA-T1-58. In your response to USPS/GCA-T1-1(c), you say that witness Thress's own-price elasticity estimate is "biased" because "the Box-Cox specification ... dampens the true estimates."

- a. Please confirm that it is possible for two unbiased estimates to have different values. Further, please confirm that if two estimates are different, this does not necessarily mean that either of the two estimates is "biased" as you define that term in your response to USPS/GCA-T1-1(a).
- b. Why was the "Box-Cox specification of the ISP variable" used by witness Thress "incorrect and unnecessary"?
- c. What is the specific bias which is introduced through witness Thress's use of the "Box-Cox specification of the ISP variable"? In your answer, please provide a precise mathematical formula for the expected value of the own-price elasticity from witness Thress's equation. If you are unable to provide such a formula, please explain how you can state with certainty that witness Thress's own-price elasticity is "biased" as you define that term in your answer to USPS/GCA-T1-1(a).
- d. What is the basis for your assertion in your answer to USPS/GCA-T1-1(c) that "even if Box-Cox is correctly specified, its coefficients should be estimated along with the other coefficients using an appropriate econometric technique such as the maximum-likelihood estimation rather than least square technique. Otherwise, this could also be another source of bias."

USPS/GCA-T1-59. In your response to USPS/GCA-T1-2, you state that “the definition of the U.S. payments market I adopt is based on that of the 2004 Federal Reserve Bank of Atlanta study.”

- a. Please confirm that the “U.S. payments market” as defined in the 2004 Federal Reserve Bank of Atlanta study includes non-cash transactions made at the point of sale. For example, point-of-sale transactions are cited specifically on pages 4, 5, and 6 of this report.
- b. Please confirm that point-of-sale transactions would not have ever been sent through the mail. If you cannot confirm, please give an example of a point-of-sale transaction which would involve payment being sent through the mail.
- c. Please confirm that the greatest increases in non-cash payments identified in the Federal Reserve’s report were for credit cards and debit cards.
- d. Please confirm that the vast majority of credit card and debit card payments represent point-of-sale transactions. If you cannot confirm, please provide the basis for your position.
- e. Since credit cards and debit cards are used primarily for point-of-sale transactions, and point-of-sale transactions would never have been sent through the mail, what would you expect the increase in the use of credit cards and debit cards to make point-of-sale transactions to be on the volume of First-Class Mail? Please explain fully.

USPS/GCA-T1-60. In your response to USPS/GCA-T1-3, you define “pricing power” as “an economic term referring to the effect that a change in a firm’s production price has on the quantity demanded of that product.”

On page 4, line 1, of your testimony you make the following assertion. “The facts are the Postal Service has no remaining ‘pricing power’ in [the U.S. payments] market[], where its correctly measured market share is well under 50%.”

- a. Do you believe that the Postal Service had a “correctly measured market share” greater than 50% in the U.S. payments market at one time?
Please provide the basis for your answer.
- b. You state in your answer to USPS/GCA-T1-3 that “[p]ricing power relates to the “Price Elasticity of Demand.” Do you believe that the “Price Elasticity of Demand” has changed for First-Class Mail within the U.S. payments market? Please provide all of the evidence upon which you base your answer.

USPS/GCA-T1-61. In your response to USPS/GCA-T1-44, you confirm that your First-Class single-piece letters equation includes the volume of First-Class single-piece letters lagged two quarters as an explanatory variable.

- a. In your answer to USPS/GCA-T1-44(b), you say that witness Thress’s “econometric program is incapable of dealing with the autocorrelation problems.” What do you mean by this statement? Please provide all statistical evidence to suggest that witness Thress’s econometric program has failed to adequately deal with autocorrelation in his equations.
- b. In your response to USPS/GCA-T1-44(b), you say that “Autocorrelation and partial autocorrelation that Mr. Thress has provided ... reveals that his econometric program is incapable of dealing with the autocorrelation problems.” In his testimony on page 321, at line 3, Mr. Thress says that “a 95 percent confidence level is used to test for the presence of autocorrelation.” Please confirm that the partial autocorrelation values associated with First-Class single-piece letters presented by witness Thress in his output file, `demandequations.txt`, in LR-L-64, are not significant at a 95 percent confidence level. If not confirmed, please explain fully.
- c. In your answer to USPS/GCA-T1-44(b), you state that with respect to witness Thress’s demand equations “in most cases the calculated Durbin

Watson values are in the indeterminate range of critical values.” Please confirm that a Durbin Watson value “in the indeterminate range” is not evidence of autocorrelation. If not confirmed, please explain fully.

- d. In the third edition of Econometric Analysis by William H. Greene (1997), on page 586, the author says, “If the regression contains any lagged values of the dependent variable, least squares will no longer be unbiased or consistent.” In your response to USPS/GCA-T1-47(a) you confirm that your demand equation for First-Class single-piece letters presented in Table A-8 of your testimony includes a lagged value of the dependent variable. Please confirm that your elasticity estimates from this equation are therefore biased and inconsistent. If not confirmed, please explain fully.

USPS/GCA-T1-62. USPS/GCA-T1-15(c), asked the following: “If the percentage of checks which are mailed, as opposed to being used at the point of sale, has been increasing over time, could the number of checks which are mailed have increased even as the total number of checks has decreased?”

- a. If a variable, A, increases over time, and a variable, B, decreases over time, please confirm that the product of these two variables, $A*B$, could increase or decrease over time, depending on the specific values of A and B. If not confirmed, please explain fully.
- b. Let A = the percentage of checks which are mailed, as opposed to being used at the point of sale. Let B = the total number of checks. Please confirm that the number of checks which are mailed would be equal to $A*B$. If not confirmed, please explain fully.
- c. Please confirm that, if A has been increasing over time and B has decreased, that the value of $A*B$ could have increased over time. If you cannot confirm, please reconcile your answer to your answer to part a.

- d. Please confirm that the answer to USPS/GCA-T1-15(c) is “Yes.” If you cannot confirm, please reconcile your answer to your answer to parts a – c. above.

USPS/GCA-T1-63. In your response to USPS/GCA-T1-16, you quote Dennis Carlton and Jeffrey Perloff, “All else the same, the larger a cross-elasticity of demand, the larger in absolute value is the direct elasticity of demand.”

- a. Please confirm that Carlton and Perloff are talking about true (i.e., not estimated) price elasticities under long-run equilibrium conditions in the quoted text. If not confirmed, please explain fully.
- b. Question USPS/GCA-T1-16 asked about your quote that “[a] direct estimate of that cross price elasticity, b_2 , would greatly sharpen the estimate for b , the own-price elasticity of demand for single piece payments mail.” Please confirm that the relationship between the estimated values b and b_2 is a mathematical relationship, not an economic relationship. If not confirmed, please explain fully.
- c. Consider the following two equations:

$$(1) \quad V = a + bX_1 + u$$

$$(2) \quad V = a + b_1X_1 + b_2X_2 + u$$

Please express the OLS estimator of b in equation (1) as a function of the OLS estimator of b_1 in equation (2).

- d. Please confirm that the OLS estimator of b in equation (1) and the OLS estimator of b_1 in equation (2) in part c. of this question will be identical if sample correlation between X_1 and X_2 is zero. If not confirmed, please explain fully.
- e. On page 17, at line 20 through page 18, line 2, you claim that “[o]ther things being equal, a further property of the demand specification in equation (2) is that when the cross price elasticity b_2 is high, the absolute

- value of the own price elasticity, b , will also tend to be high.” Please confirm that this statement is only true mathematically if the prices P and P_2 are correlated. If not confirmed, please explain fully.
- f. Please define the mathematical term “correlation” as it is commonly used in the fields of statistics and econometrics.
 - g. Please answer USPS/GCA-T1-17(d) using the definition of “correlation” in part f. above.

USPS/GCA-T1-64. Please refer to your response to USPS/GCA-T1-12. Part b. of the question asked what percentage of First-Class Mail single piece letters consist of payments sent by households. Please indicate where in your response that percentage is identified, or please provide it now.

USPS/GCA-T1-65. In your response to USPS/GCA-T1-22(a), you say that the BEA deflator in the GDP accounts for computers and peripheral prices “performed appreciably better” as a “proxy for electronic substitutes” because “[t]he GDP deflator has a higher correlation with the single-piece volume compared to the BLS series.” Why would you expect the correlation of a variable with respect to mail volume to measure the appropriateness of using such a variable as a proxy for the price of non-mail payment methods? Wouldn’t a more appropriate test be to consider how well such a variable correlated with the volume of electronic substitutes? Please explain fully.

USPS/GCA-T1-66. USPS/GCA-T1-24 asked about your equation which models commercial check volume as a function of the First-Class additional ounce rate. In your response, you described this work as “descriptive” and said that “no other explanatory variable was included.”

- (a) Is it possible for two variables to exhibit a high mathematical correlation over a 10-year period while having no true causal relationship with one another? Please explain any answer other than “Yes.”

(b) You state in your response to USPS/GCA-T1-24, “Clearly, other factors have been impacting check volumes, but data was not readily available to investigate their relative importance.” Could these other factors account for all of the change observed in check volumes over the time period which you investigated? If your answer is No, please explain how you could make such a determination, given that you did not “investigate their relative importance”?

(c) In your response to USPS/GCA-T1-24, you state, “In periods of low inflation such as the limited period examined here, business and consumer decision making may reflect nominal rates as much or more than it reflects real rates.”

(i) Please confirm that the implicit price deflator for personal consumption expenditures, as presented by witness Thress in LR-L-63 in this case, increased by 18.9% from 1995Q1 to 2004Q4. If not confirmed, please explain fully.

(ii) Do you believe that consumers will respond to an 18.9% price change?

(iii) If your answer to (ii) is yes, please explain why you did not consider the effect of inflation on check volumes.

(iv) If your answer to (iii) is no, please reconcile this with your results here in which you assert that check volumes were affected by changes in First-Class additional ounce rates of less than 10%.

USPS/GCA-T1-67. In your response to USPS/GCA-T1-25, you say that you “have descriptive statistics for the payments market, which indicate own price elasticities for the payments market could be well above -1.0.” Please provide all such statistics or provide an exact citation to where such statistics might be found in your testimony in this case.

USPS/GCA-T1-68. Interrogatory USPS/GCA-T1-40(a) asked, “What are the factors which you believe determine the real price of stamps?” You do not appear to have answered this question. Please do so now.

USPS/GCA-T1-69. Interrogatory USPS/GCA-T1-40(b) asked, “If the Postal Service does not go to the Postal Rate Commission and seek an increase in the real price of stamps, is there any mechanism by which stamp prices will increase? Please explain.” You do not appear to have answered this question. Please do so now.

USPS/GCA-T1-70. Interrogatory USPS/GCA-T1-40(c) asked, “If mail volume declines as a result of an increasing ‘presence of competing substitutes due to Internet diversion and electronic payments substitutes for the mail’ when nominal stamp prices remain unchanged, what do you believe this indicates about the own-price elasticity for First- Class Mail? Please explain why you believe this.” You do not appear to have answered this question. Please do so now.

USPS/GCA-T1-71. In your response to USPS/GCA-T1-27 you indicate the “firm” to whom you refer in your testimony on page 28 at line 23 is “[a]n oligopolist as defined in the theory of the firm in microeconomics.” The full context here in your testimony is the following paragraph, which begins on page 28 at line 22 of your testimony:

“It has long been recognized in the literature of pricing under oligopolistic conditions that the response to a market price increase by a firm is not necessarily the same as the response to a market price decrease, and that therefore the price elasticities may not be the same for the two situations.”

- a. Please confirm that the “response to a market price” which is discussed “in the literature of pricing under oligopolistic conditions” refers to the pricing strategy of firms which are in competition with the “oligopolist as defined in

- the theory of the firm in microeconomics". If not confirmed, please explain fully.
- b. Please confirm that the own-price elasticity of demand for a product is determined by the behavior of consumers of a product in response to changes in prices. If not confirmed, please explain fully.
 - c. Please confirm that the "consumers of a product" in part b. of this question are not the "firms which are in competition with the oligopolist" as defined in part a. of this question. If not confirmed, please explain fully.
 - d. Please confirm that the textbook definition of "own price elasticity", which measures the degree of demand changes as a response to changes in own price, assumes that all other market conditions be constant. If not confirmed, please explain fully.
 - e. Do you agree that "under oligopolistic conditions" a market price decrease by a firm would be followed by a market price decrease by its competitors while a market price increase by a firm would not be followed by a market price increase by its competitors? If not, why not?
 - f. If the quantity demanded of a good decreases due to decreases in the competitor's price, which in turn is triggered by the decrease in own price, should this effect be measured by "own price elasticity"? If it is to be measured by own price elasticity, would the result of a positive own price elasticity be self-contradicting? Please explain fully.
 - g. "Under oligopolistic conditions" should there be any difference in own price elasticity when a firm increases price and when a firm decreases price if the effect of its competitor's price changes is properly controlled for? If there is any difference, what is the source of this difference? Please explain fully.

USPS/GCA-T1-72. In your response to USPS/GCA-T1-28(c), you say that witness Thress's First-Class single-piece letters demand equation does not represent "statistical data that would allow one to calculate an own-price elasticity

for single piece mail when letters prices are cut” because you are “talking about a cut in the nominal price of stamps.”

- a. Do you believe that consumers respond to real prices or nominal prices?
- b. If you believe that consumers respond to real prices, please confirm that witness Thress’s First-Class single-piece letters demand equation represents “statistical data that would allow one to calculate an own-price elasticity for single piece mail when letters prices are cut”. If not confirmed, please explain fully.
- c. If you believe that consumers respond to nominal prices, please explain why you did not include the nominal price of First-Class single-piece letters in your estimated demand equations for First-Class single-piece mail which you present in Appendix A of your testimony.
- d. If you believe that consumers respond to nominal prices, please provide citations in the economics literature which support your position.

USPS/GCA-T1-73. In your response to USPS/GCA-T1-29(c), you say that “Mr. Thress’ R2006-1 internet variable does not reflect or even capture the price of competing substitutes to First-Class single-piece mail.”

In your testimony on page 21, beginning at line 7, you state the following:

“While direct price data are hard to come by for each of these electronic substitutes, I tested both the BLS series for computer prices and the BEA deflator in the GDP accounts for computer and peripherals prices. The latter series performed appreciably better, and I adopt it as a proxy for the prices of electronic substitutes.”

- a. Do you believe that “the BEA deflator in the GDP accounts for computer and peripherals prices” reflects or even captures the price of competing substitutes to First-Class single-piece mail? If your answer is yes, please explain why you believe this GDP deflator better “reflects or ... captures

the price of competing substitutes” as compared to “Mr. Thress’ R2006-1 internet variable.”

- b. Why do you believe that “Mr. Thress’ R2006-1 internet variable” is an inappropriate “proxy for the prices of electronic substitutes”?

USPS/GCA-T1-74. In your response to USPS/GCA-T1-34(a), you confirm “that the Internet variable(s) used by witness Thress were different in R2001-1, R2005-1, and R2006-1.”

On page 33 of your testimony, starting at line 5, you make the following statement:

“In R2001-1, the estimated coefficient, lambda, for witness Thress’ non-linear transformation of the Internet variable was 0.560; in R2005-1, it was 0.326; and in R2006-1, the value has fallen to 0.122. His non-linear transformation of the Internet variable is tending to a lambda of zero. In terms of mathematics, any variable to the power of zero equals one. This is the same as saying the Internet has no impact on the demand for single piece letters. This is an a priori absurd result which further points to the weakness of Mr. Thress’ approach to the demand for single piece mail in the presence of strong competing substitutes.”

In your response to USPS/GCA-T1-34(b), you confirmed that “a coherent discussion of an alleged “trend” in the coefficient estimates of a variable requires the definition of the variable to be consistent for each coefficient estimate under discussion.”

- a. Please confirm that, because the Internet variables used by witness Thress were different in R2001-1, R2005-1, and R2006-1, it is not possible to have a coherent discussion of an alleged “trend” in the lambda coefficients associated with these variables. If not confirmed, please explain fully.
- b. Please confirm that your statement that witness Thress’s “non-linear transformation of the Internet variable is tending to a lambda of

zero”suffers from the same lack of coherence you acknowledged in response to USPS/GCA-T1-34. If not confirmed, please explain fully.

USPS/GCA-T1-75. Interrogatory USPS/GCA-T1-35(a) asked for evidence “that Mr. Thress’s choice criterion did, in fact, lead to an incorrect model” (emphasis added). Your response to this question identified several issues that “can affect the MSE value” (emphasis added). Please confirm that your answer to USPS/GCA-T1-35(a) confirms that you have no evidence that Mr. Thress’s choice criterion did, in fact, lead to an incorrect model. If not confirmed, please explain fully.

USPS/GCA-T1-76. Interrogatory USPS/GCA-T1-36 asked you to what you referred when you claimed in your testimony that “Mr. Thress’ model ... includes prolonged periods in the 1970s.” Please confirm that Mr. Thress’s First-Class Mail models do not rely upon any data earlier than 1983, so that, in fact, Mr. Thress’s model does not rely upon any data from the 1970s at all. If not confirmed, please explain fully.

USPS/GCA-T1-77. Please confirm that the “experimental own-price elasticities” which you describe in your response to USPS/GCA-T1-41 are calculated assuming that all factors remain unchanged during the period surrounding Postal rate changes except for the price of First-Class single-piece letters. If not confirmed, please explain fully.

USPS/GCA-T1-78. In your response to USPS/GCA-T1-41, you indicate that “the experimental own-price elasticities which you found necessary to “bring the forecasted volume curve to the actual volume curve” had values which were greater than zero.”

- a. Please provide the values for these “experimental own-price elasticities” for each of the rate cases for which you calculated such elasticities.
- b. Would an “experimental own-price elasticity” greater than zero indicate that the negative impact of the change in First-Class postage rates was less than the impact estimated by witness Thress for a particular rate case?
- c. If your answer to b. is affirmative, would an “experimental own-price elasticity” greater than zero therefore suggest that witness Thress’s own-price elasticity estimates for First-Class Mail in recent cases are not too low? If not, why not?
- d. On page 40 of your testimony, beginning at line 13, you say the following:

“Figures 4 and 5 indicate the general bias that appears to exist with respect to USPS–sponsored volume forecasts in rate cases that are based on, among other things, their own price demand elasticity parameters that are estimated in order to do the forecast.”

- (i) What is the direction of this “general bias”?
- (ii) What is the source of this “general bias”?

USPS/GCA-T1-79. In your response to USPS/GCA-T1-46(c)-(d), you state that you “did not investigate, and had no reason to investigate, the period between 1983 and 1990.”

- a. Please confirm that the period between 1983 and 1990 was included within the sample period over which your own-price elasticity of -0.456 was estimated.
- b. Wouldn’t the presence of this time period within your sample period provide a “reason to investigate the period between 1983 and 1990”?
- c. You state, in your response to USPS/GCA-T1-46(c)-(d) that your “focus was on the post-1995 period.” Did you attempt to estimate a demand equation for First-Class single-piece letters relying only on data since

1995? If so, please report the results of all such experiments. If not, why not?

USPS/GCA-T1-80. In your response to USPS/GCA-T1-47, you indicate that your source for “commercial checks” was the 2004 Federal Reserve Payments Study.

- a. Please confirm that the number of Commercial Checks presented in Table 2 on page 20 of your testimony is equal to 16,993 million in 2000 and 15,805 million in 2003. If not confirmed, please explain fully.
- b. Please confirm that the number of Commercial Checks shown in Appendix A (page 11) of the 2004 Federal Reserve Payments Study were 41.4 billion in 2000 and 36.2 billion in 2003. If not confirmed, please explain fully.
- c. Please reconcile the difference between these numbers.

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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