BEFORE THE
POSTAL RATE COMMISSION

POSTAL RATE AND FEE CHANGES, 2000	:	DOCKET NO. R2000-1

ANSWERS OF UNITED PARCEL SERVICE
WITNESS KEVIN NEELS TO UNITED STATES
POSTAL SERVICE INTERROGATORIES
(USPS/UPS-T1-51 and 52)
(July 12, 2000)

Pursuant to the Commission's Rules of Practice, United Parcel Service hereby files and serves the answers of UPS witness Kevin Neels to the following interrogatories of the United States Postal Service: USPS/UPS-T1-51 and 52.

Respectfully submitted,

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ANSWER OF UNITED PARCEL SERVICE WITNESS NEELS
TO INTERROGATORY OF THE UNITED STATES POSTAL SERVICE

USPS/UPS-T1-51. Please refer to your response to USPS/UPS-T1-30. In your response, you do not confirm that the between estimator will be inconsistent "in the case of IID (i.e., identically and independently distributed) measurement error." You further state, "the averaging across time periods that the between model is based upon would tend to reduce the variance of the measurement error, with a resulting loss in bias."

a. Please confirm that, in the case of IID measurement error (with positive error variance), the averaged measurement error has positive variance. If you do not confirm, please explain.

b. Please confirm that, since the averaged measurement error has positive variance in the case of IID measurement error, the between estimator is inconsistent in the case of IID measurement error. If you do not confirm, please explain.

c. Please confirm that it would be incorrect to interpret your usage of the term "loss in bias" to mean that the between estimator completely eliminates inconsistency due to measurement error. If you do not confirm, please explain.

Response to USPS/UPS-T1-51.

(a) Confirmed.

(b) Confirmed.

(c) Confirmed.

USPS/UPS-T1-52. Please refer to your response to USPS/UPS-T1-33(d). Please provide equations for the "correct 'non-reverse' regressions... implicitly defined by the regression models on page 35, lines 3 and 7" of UPS-T-1. Please also describe your derivation of the equations you provide.

Response to USPS/UPS-T1-52.

The regression models from page 35, lines 3 and 5 of UPS-T-1, shown below, present FHP as a function of TPH and parameters α and β:

(line 3)

$$\ln(FHP_{it}) = \alpha_i + \beta_1 \ln(TPH / F_{it}) + \beta_2 \ln(TPH / F_{it})^2 + \beta_3 \ln(DPT_{it}) + \beta_4 TimeDummies_{it} + u_{it}$$

(line 5) $\ln(FHP_{it}) = \alpha_i + \beta_1 \ln(TPH / F_{it}) + \beta_2 \ln(TPH / F_{it})^2 + u_{it}$.

USPS-UPS-T1-33 and USPS-UPS-T1-52 both ask for an explicit expression of TPH as a function of FHP. However, because of the use of the log transformation and the polynomial functional form, it is generally mathematically impossible to write TPH as an explicit function of FHP.[1]

As I explained in my response to USPS-UPS-T1-33, the models used here *implicitly* define the reverse regression models of TPH as a function of FHP. The existence of the implicit function is guaranteed under the regularity conditions of the

1. There is only one condition on the model under which a singular root exists. However, there is no reason to expect that this condition holds, and thus the quadratic form that implicitly defines TPH as a function of FHP has multiple solutions.

implicit function theorem (see Alpha C. Chiang, Fundamental Methods of Mathematical Economics (New York: McGraw-Hill Book Company, 1984, pp. 205-206).

Furthermore, we can totally differentiate the implicit function relating lnTPH to lnFHP in order to obtain $\frac{d \ln TPH}{d \ln FHP}$. Consider for example the implicit function *F* for model (3):

$$F(FHP, TPH, X) \equiv \ln(FHP_{it}) - (\alpha_i + \beta_1 \ln(THP / F_{it}) + \beta_2 \ln(TPH / F_{it})^2 + X) = 0$$

where $X = -(\beta_3 \ln(DPT_{it}) + \beta_4 TimeDummies_{it} + u_{it})$. Allowing FHP and TPH to vary, holding all else equal, we can write: $dF_{\ln TPH} d \ln TPH + dF_{\ln FHP} d \ln FHP = 0$. Solving for $\frac{d \ln TPH}{d \ln FHP}$, gives $\frac{d \ln TPH}{d \ln FHP} = \frac{1}{\beta_1 + 2\beta_2 \ln TPH}$ - which is exactly the inverse of the marginal effect of TPH on FHP from the regression of FHP on TPH calculated and presented in UPS-T-1.

DECLARATION

I, Kevin Neels, hereby declare under penalty of perjury that the foregoing answers are true and correct to the best of my knowledge, information, and belief.

Kevin Neels

Kevin Neels

Dated: 7/15/00

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document by first class mail, postage prepaid, in accordance with Section 12 of the Commission's Rules of Practice.

John E. McKeever
Attorney for United Parcel Service

Dated: July 12, 2000
Philadelphia, Pa.

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