DOCKET SECTION

BEFORE THE
POSTAL RATE COMMISSION

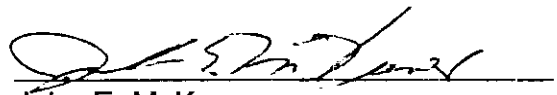
POSTAL RATE AND FEE CHANGES, 1997	DOCKET NO. R97-1

ANSWERS OF UNITED PARCEL SERVICE WITNESS KEVIN NEELS TO INTERROGATORIES OF THE UNITED STATES POSTAL SERVICE (USPS/UPS-ST1-1 THROUGH 3)

(February 26, 1998)

Pursuant to the Commission's Rules of Practice, United Parcel Service ("UPS") hereby serves and files the responses of UPS witness Kevin Neels to interrogatories USPS/UPS-ST1-1 through 3 of the United States Postal Service.

Respectfully submitted,



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USPS/UPS-ST1-1. Please refer to page 3, lines 6 and 7 of your supplemental testimony.

a. Please confirm that the specification of the equation that you estimated for your supplemental testimony in response to NOI No. 4 is given by:

$$\begin{aligned}\ln HRS = {} & [\delta_1 + \delta_2 L]\ln TPH + [\delta_3 + \delta_4 L](\ln TPH)^2 \\ & + \delta_5 \ln MANR + \delta_6 (\ln MANR)^2 + \delta_7 t_1 + \delta_8 t_1^{\,2} \\ & + \delta_9 t_2 + \delta_{10} t_2^{\,2} + \delta_{11}[\ln TPH * \ln MANR] \\ & + \delta_{12}[\ln TPH * t_1] + \delta_{13}[\ln TPH * t_2] \\ & + \delta_{14}[\ln MANR * t_1] + \delta_{15}[\ln MANR * t_2] \\ & + \sum_{l=t}^{12} \lambda_l D_l + \varepsilon\end{aligned}$$

Where the variables are defined as in USPS-T-14, the D*j* are seasonal dummies, and the δ and λ are parameters to be estimated.

If you do not confirm, please provide the exact functional form of the equation that you estimated for that supplemental testimony.

b. Please confirm that the "volume variability" or "elasticity" associated with this specification would be found by calculating the derivative of ln HRS with respect to lnTPH and lagged lnTPH. If you do not confirm, please explain in full.

c. Please confirm that this derivative is given by:

$$\frac{\partial \ln HRS}{\partial \ln TPH} = \delta_1 + \delta_2 + 2 * [\delta_3 + \delta_4](\ln TPH)$$
$$+ \delta_{11}[\ln MANR]$$
$$+ \delta_{12}[t_1] + \delta_{13}[t_2]$$

If you do not confirm, please provide what you think to be the correct derivative.

d. Please confirm that when the data are "mean centered" that the above derivative reduces to:

$$\frac{\partial \ln HRS}{\partial \ln TPH} = \delta_1 + \delta_2$$

If you do not confirm, please explain why you have used this formula to calculate volume variabilities in both your initial and supplemental testimonies.

e. Please confirm that this mean centered form implicitly assumes evaluation of the regression equation at the global mean. That is, please confirm that the complete form of the derivative of ln HRS with respect to log TPH and lagged log TPH, when the data are mean centered, is given by:

$$\frac{\partial \ln HRS}{\partial \ln TPH} = \delta_1 + \delta_2 + 2 * [\delta_3 + \delta_4](\ln \text{TPH} - \ln \overline{\text{TPH}})$$
$$+ \delta_{11}[\ln \text{MANR} - \ln \overline{\text{MANR}}]$$
$$+ \delta_{12}[t_1 - \overline{t_1}] + \delta_{13}[t_2 - \overline{t_2}].$$

where the "bar" notation signifies the global or overall mean from the data set on which the regression was estimated. If you do not confirm, please provide what you think is the correct complete derivative in this case.

f. Please confirm that one obtains the simplified derivative (that is presented in part d.) by evaluating the complete form of the derivative (that is presented in part e) at the global mean values from the data set on which the regression was estimated:

$$\frac{\partial \ln HRS}{\partial \ln TPH} = \delta_1 + \delta_2 + 2*[\delta_3 + \delta_4]\left(\ln \mathrm{TPH} - \ln \overline{\mathrm{TPH}}\right) + \delta_{11}\left[\ln \mathrm{MANR} - \ln \overline{\mathrm{MANR}}\right] + \delta_{12}\left[\bar{t}_1 - \overline{t_1}\right] + \delta_{13}\left[\bar{t}_2 - \overline{t_2}\right].$$

If you do not confirm, please provide the mathematics of how the simplified derivative presented in part d is derived from the complete derivative presented in part e.

g. Please confirm that if the complete derivative is evaluated at any point other than the global mean of the data on which the regression equation was estimated, then the simplified form of the derivative (as given in part d.) is not applicable. If you do not confirm please explain how the simplified form of the derivative (as given in part d.) is applicable when evaluating the derivative at points other than the global mean of the data on which the regression equation was estimated.

Response to USPS/UPS-ST1-1.

a. Confirmed.

b. Confirmed.

c. Confirmed.

d. The derivative reduces to that value when it is evaluated at the set of means on which the data are centered.

e. The formula that is shown is correct, regardless of whether the "bar" notation signifies a global sample mean, a subsample mean, or some other mean, as long as one is attempting to evaluate the derivative at the set of means on which the data are centered.

f. One obtains the simplified form of the derivative by evaluating the complete form of the derivative at the set of means on which the data have been centered. There is no requirement that this set of means be derived from the data set on which the regressions have been estimated.

g. Not confirmed. Because of the nonlinearity of the model, the value one obtains for a derivative will depend upon the point at which the derivative is evaluated. The simplified formula evaluates the derivative at the point around which the data have been centered, and provides a correct value for the derivative at that point. If the data had been centered around an arbitrary point in the space spanned by the data, the simplified formula would provide a correct value for the derivative at that arbitrary point.

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USPS/UPS-ST1-2. Please refer to page 3, line 6 of your testimony. Please confirm that each of the site-specific regressions estimated for your supplemental testimony were estimated on only the data for that site. If you do not confirm, please explain how the regressions could be site-specific.

Response to USPS/UPS-ST1-2. Confirmed.

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USPS/UPS-ST1-3. Please refer to page 2, line 18 of your supplemental testimony.

a. Please confirm that the "mean centering" you performed in estimating the equations for your supplemental testimony was around the global means for the entire data set for each activity, across all sites, and not on a site-specific basis. If you do not confirm, please identify where in your workpapers the site-specific mean centering is performed.

b. Please confirm that the complete form of the derivative of ln HRS with respect to log TPH and lagged log TPH when site specific equations are run on site-specific data that are globally mean centered is given by:

$$\frac{\partial \ln HRS_i}{\partial \ln TPH_i} = \delta_1 + \delta_2 + 2*[\delta_3 + \delta_4](\ln TPH_i - \ln \bar{TPH}) + \delta_{11}[\ln MANR_i - \ln \bar{MANR}] + \delta_{12}[t_{1i} - \bar{t}_1] + \delta_{13}[t_{2i} - \bar{t}_2],$$

where the "bar" notation signifies the global mean from all of the data for an activity (across all sites) and the "i" subscript refers only to the data from site i (the data on which the regression was estimated). If you do not confirm, please provide what you think is the correct complete derivative in this case.

c. Please confirm that the complete derivative, in this case, reduces to the simplified derivative given by $\delta_1 + \delta_2$ only if the site-specific mean just happens to equal the global mean. If you do not confirm, please provide the mathematics of how

the complete derivative reduces to the simplified derivative when the site-specific mean does not equal the global mean.

d. Please confirm that the site-specific means for the sites included in your estimated equation do not equal the global or overall mean. If you do not confirm, please provide a listing of all sites for which the site-specific means equal the global means for the variables in the regression equations.

Response to USPS/UPS-T1-3.

a. Confirmed.

b. Confirmed.

c. Not confirmed. The complete derivative reduces to the simplified form at the point defined by the global sample mean. Note that at that point the expressions in parentheses on the first line of the equation and in square brackets on subsequent lines reduce to zero.

d. Confirmed generally, although I have not checked to determine that the unlikely case of having the site specific means exactly equal to the global means never arose within the data.

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

Dated: February 26, 1998

CERTIFICATE OF SERVICE

I hereby certify that I have this date served the foregoing document in accordance with section 12 of the Commission's Rules of Practice.

John E. McKeever

Dated: February 26, 1998
Philadelphia, PA