DOCKET SECTION

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

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POSTAL RATE AND FEE CHANGES, 1997

Docket No. R97–1

RESPONSE OF UNITED STATES POSTAL SERVICE WITNESS BRADLEY (USPS-T-14) TO INTERROGATORIES OF UNITED PARCEL SERVICE (UPS/USPS-T14-48-56)

The United States Postal Service hereby provides responses of witness Bradley (USPS-T-14) to the following interrogatories of United Parcel Service: UPS/USPS-T14-48-56, filed on September 17, 1997. Interrogatories UPS/USPS-T14-57-60 were redirected.

Each interrogatory is stated verbatim and is followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorneys:

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October 1, 1997

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-48. Consider the case of a one-variable linear regression model with independently and identically distributed error terms. For a given sample size, what would be the effect of the standard errors of its estimated coefficient of an increase in the range of values taken by the independent variable?

UPS/USPS-T14-48 Response:

It depends upon the manner in which the increase in the range of the independent variable occurs. The standard error of the estimated coefficient is the square root of the ratio of two terms, the variance of the regression and the variance of the independent variable, X:

$$\sigma_{\beta} = [\sigma^2 / S_{XX}]^{1/2}$$

The key question then is what happens to the values for the dependent variable when the variance (range) of the independent variable increases. If the values of the dependent variable also increase in range along the regression line with the increase in range for the independent variable, then the variance of the regression should not increase and the standard error for the β coefficient will fall. If, on the other hand, the values for the dependent variable do not move in relationship with increased range of the indepedent variable, the size of the residuals from the regression line will increase, the variance of the regression will increase, and the standard error of β could increase even though the variance of the independent variable increases.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-49. From an econometric point of view, do you believe that it is ever appropriate to eliminate from an analysis observations containing numerical values that have been transcribed or keypunched incorrectly? Please explain your answer.

UPS/USPS-T14-49 Response:

Yes. For example, if it is known with certainty that an observation contains transcription or keypunching errors that cannot be corrected, it may be appropriately removed from the analysis.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-50. From an econometric point of view, do you believe that it is always appropriate to eliminate from an analysis observations containing numerical values that have been transcribed or keypunched incorrectly? Please explain your answer. If your answer is not an unqualified "yes" or "no," please describe the circumstances under which it would be appropriate to exclude such data, and the circumstances under which it would be inappropriate to exclude such data.

UPS/USPS-T14-50 Response:

No. For example, suppose that the researcher is aware of the possibility of a small amount of keypunch or transcription errors in a large data set, but does not know which observations contain the keypunch or transcription errors. If a review of the data revealed no anomalous or outlying data points, then the researcher could use all of the data while reporting the possibility of such errors in the data.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-51. From an econometric point of view, do you believe that it is ever appropriate to eliminate from an analysis observations that have numerical values which have been transcribed or keypunched correctly? Please explain your answer. Please describe the circumstances under which it would be appropriate to exclude such observations.

UPS/USPS-T14-51 Response:

Yes. For example, suppose the observation is correctly transcribed or keypunched but is generated from a different data generating process than the regression is trying to estimate. Then it would be appropriate to exclude it from the observation.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-52. From an econometric point of view, do you believe that it is appropriate to eliminate from an analysis observations that have numerical values which have been transcribed or keypunched correctly simply because one of those values falls in the tails of the distribution of such values across all observations? Please explain your answer.

UPS/USPS-T14-52 Response:

It can be appropriate. The data for an observation may be correctly keypuched and transcribed and still be considered erroneous. For example, data from a survey on annual household income may be correctly keypunched and transcribed, but reflect erroneous reporting of income by the household. Identification of the extreme values in the tails of the distribution may be a way of identifying such errors. Alternatively, there may be uncertainty about which observations contain keypunch errors. Again, identification of extreme values is a reasonable tool for investigating such possible errors.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-53. Do you believe the observations you eliminated from your analysis using the productivity (one percent tails) scrub contain transcription or key punching errors? If you do not believe these observations contain such errors, why were they dropped from your analysis? If you believe that the observations in the tails of the distribution eliminated by your productivity scrub may contain transcription or key punching errors, how can you be certain that the observations in the center of the distribution are correct and not subject to transcription or key punching errors?

UPS/USPS-T14-53 Response:

I believe that they probably contain some form of data reporting errors, although I do not know the exact source. Please note, however, that data were not eliminated because they were in the extreme value of their own distribution, as the question seems to suggest. A very large value for piece handlings was not dropped if it was accompanied by a appropriately large value for hours. Similarly, a very small value for hours was not dropped if it was accompanied by an appropriately small value for piece handlings.

Extreme values were identified by examining the distribution of productivity. Observations in which there was a severe mismatch between hours and piece handlings would fall in the extreme ranges of productivity and thus were identified as reflecting possible data errors. There is no way of being certain that none of the observations near the center of the productivity distribution contain keypunch errors. However, given that the data set typically contains tens of thousands of observations, there are sufficient data to establish an

Response of United States Postal Service Witness Bradley
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appropriate base line. By using the productivity distribution, I can be confident that any remaining transcription or keypunch errors are not creating observations that would inappropriately influence the regression analysis because of their apparent great disparity between piece handlings and hours.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-54. In a postal facility, is it possible for productivity to surge to a level that is unsustainable over the long term in response to a sudden increase in volume? Please discuss the difference between the short and long run responses of productivity to a change in volume. Include in your answer a discussion of an increase in volume that is sudden and temporary, as well as a discussion of a permanent increase in volume.

UPS/USPS-T14-54 Response:

I believe so. In the short run, it is possible that an increase in volume could be handled by a temporary but unsustainable increase in productivity. For example, it is my understanding that during the UPS strike, the Postal Service experienced a temporary surge in volume of certain classes of mail.[1] It is quite possible that, in the short run, the Postal Service could have handled this additional volume simply by asking its workers to provide an unsustainably high level of effort over the week or ten day period. Because such levels of effort are not sustainable, productivity would return to its regular value, and a sustained increase in volume would require the Postal Service to add more labor.

[1] I'm am not suggesting that I am an expert on what happened within the Postal Service during the UPS strike or that I have any data for that period of time. My comments are based upon what I read in newspaper accounts.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-55. Please refer to your discussion of technological progress on pages 13 through 15 of your testimony.

a. Is it your belief that technological change increases productivity monotonically over time? Please explain your answer.
b. If you do not believe that technological change increases productivity monotonically over time, please provide an example, relevant to the types of operations carried out in postal facilities, of a situation in which technological change would lead to decreases in productivity.
c. Do you expect there to be a discontinuity at the break point in technological trends of FYAP 9301 that you assume in the estimation? Please explain your answer.
d. To what extent did the "fundamental restructuring of Postal Service operations in FY 1993," which you refer to on page 15 of your testimony, result in a restructuring or rearrangement of mail flows at MODS and BMC facilities?
e. What were the specific changes in processing that occurred as of FYAP 9301? Was there a slow change-over to newer/different equipment? Was the change sudden or did it occur over several days or months? What were the changes in mail flows? Was mail processed more quickly after the change?

UPS/USPS-T14-55 Response:

a. If the question relates to an economy-wide notion of technological change that reflects the aggregate stock of knowledge, I generally think of improved technology as being only productivity-enhancing. In contrast, for an individual firm, technological change will not necessarily encourage productivity and could possibly reduce it.

b. Suppose the technological change is the development of automated letter sorting machines. If that technological change diverts clean mail to automated operations

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

leaving only difficult-to-sort mail in manual operations, the productivity in those operations could fall.

c. I expected the time trends to be segmented. That is to say, I would expect the time trends to have one slope before 1993 and to have another slope after 1992.

d. The existence of the restructuring in 1993 lead me to construct a more flexible time trend specification to allow for the possibility that the time trend changed. Apart from that, I have not studied the restructuring and have no basis for answering the question. For a discussion of the operational changes that took place at that time, please see witness Moden's response to Presiding Officers Information Request No. 3, Question 30.

e. Please see my answer to part d. above.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-56. What factors do you believe affect the "manual ratio" you refer to on page 16, line 15, of your testimony? Is it affected by volume? Does it change over time? Does it differ across facilities? Could the manual ratio be affected by different forces in a small facility as compared to a large facility, or a facility with newer equipment as compared to a facility with older equipment? Please explain your answer.

UPS/USPS-T14-56 Response:

The manual ratio is affected by changes in the degree of mail sorted on automated and mechanized equipment. For example, as a site sorts more mail on automated equipment, the percentage of its total mail which is sorted manually will decline. Consequently, the manual ratio will decline.

Because the manual ratio is the percentage of volume sorted manually, it is not affected by volume, but by the way that the volume is sorted. The manual ratio has changed over time and it is different across facilties. I think that the forces that affect the manual ratio would be the same at small and large facilities. The key issue is the relative size of manual and automated activities within the facility. This is not to say that the historical values for the manual ratio will necessarily be the same for small and large facilities. If, for example, larger facilities got automated equipment before smaller facilities, then I would expect the manual ratio to be lower for larger facilities during that time period.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

In response to the final part of the question, if the newer equipment at a facility means that more mail can be sorted on automated machinery in place of manual sorting, than the manual ratio would be lower at those places with newer equipment.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-57. Please discuss the way in which the Postal Service staffs peak volume periods. Include in your discussion answers to the following:

a. Is the Postal Service more likely to schedule overtime work during peak volume periods than during normal volume periods? Please explain your answer.
b. Is the Postal Service more likely to schedule part-time or casual workers during peak volume periods than during normal volume periods? Please explain your answer.
c. What is the mix of the use of overtime pay for workers as compared to the use of part-time or casual workers during peak volume periods? What is the mix during normal volume periods?
d. Do supervisors work on sorting machines during peak volume periods? Please explain your answer.
e. Are employees moved from one activity to another based on volume and need? Please explain your answer.
f. What is the change in the mix of employees performing an activity when volume increases or decreases, and do these changes differ by facility? Please explain your answer.

UPS/USPS-T14-57 Response:

This interrogatory has been redirected.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-58. You have used "total pieces handled" as the basic measure of volume in your cost analysis.

a. With respect to First Class letters, Priority Mail, and Parcel Post, what is the minimum number of "handlings" as counted in your analyses that a particular item might experience between its initial drop-off at a postal facility and its delivery to its final destination? What is the maximum number of handlings?

b. Has the number of times a piece is handled increased or decreased over time? Why? If the number of times a piece is handled has increased over time, what is the impact of this change on the relationship between pieces delivered and costs? If the number of times a piece is handled has decreased over time, what is the impact of this change on the relationship between pieces delivered and costs?

c. Does the number of times a piece is handled increase or decrease with volume?

UPS/USPS-T14-58 Response:

This interrogatory has been redirected.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

UPS/USPS-T14-59. What data over time are available on the total number of items, by class, delivered by the Postal Service to their ultimate destinations? Please provide such data.

UPS/USPS-T14-59 Response:

This interrogatory has been redirected.

Response of United States Postal Service Witness Bradley
to
Interrogatories of UPS

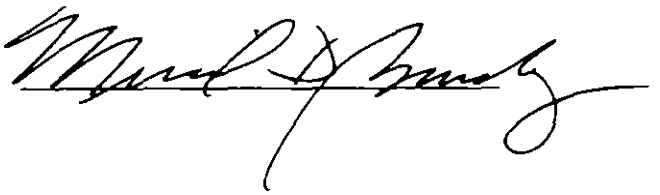
UPS/USPS-T14-60. What data are available on the number of pieces, by class, that arrive into a site and the number of pieces that leave a site? Please provide any data available on total inflow and outflow by site and FYAP for the MODS and PIRS sites used in the data in your testimony and analysis.

UPS/USPS-T14-60 Response:

This interrogatory has been redirected.

**DECLARATION**

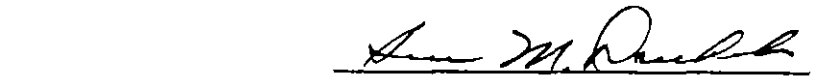
I, Michael D. Bradley, declare under penalty of perjury that the foregoing answers are true and correct, to the best of my knowledge, information, and belief.



Dated: Sept. 30, 1997

## CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon all participants of record in this proceeding in accordance with section 12 of the Rules of Practice.



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