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

POSTAL RATE AND FEE CHANGES PURSUANT TO PUBLIC LAW 108-18	Docket No. R2005–1

RESPONSE OF POSTAL SERVICE WITNESS BRADLEY TO ORAL QUESTION FROM THE BENCH (July 15, 2005)

The United States Postal Service hereby provides the response of witness Bradley to an oral request from the bench posed July 8 during the hearing on the testimony of witness Kelley. At that time, the Postal Service indicated (Tr. 7/3030) that, due to the nature of the question, the response was unlikely to be provided by witness Kelley.

Each question is paraphrased and is followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

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July 15, 2005

Response of Postal Service Witness Michael D. Bradley
To Oral Question of Commissioner Tisdale.

Q. Tr. 7/3029 (Commissioner Tisdale). Why was a two week-period selected for constructing the CCSTS data set? Why was a two week period in the end of May and beginning of June selected?

Two essential factors to be considered in designing a data collection effort are the purposes for which the data will be used and the cost of collecting the data. The determination that a two-week period, across over 150 Zip Codes, encompassing more than 3,500 individual routes, was appropriate for the task of measuring city carrier street time costs was based upon consideration of both the purposes for which the data would be used and the cost of collecting it. Both of these factors are discussed in this answer.

There are two main purposes for the data collected in the City Carrier Street Time Study:

1. Identify the time taken by carriers to perform their actual activities on the street.

2. Estimate volume variabilities for the major time pools.

The first effort, identifying the time associated with carrier activities, requires a large amount of detailed data to reach the level of precision associated with Commission standards. The City Carrier Street Time Study (CCSTS) asked carriers to scan their street activities throughout the day and, for the first time, provides the Commission with complete coverage of carrier street time activities. To meet Commission standards for reliability, a large number of scans were required. The CCSTS thus took scans on over 3,500 routes for a two week period, producing over a million scans.

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The second effort requires the estimation of the response in carrier time (and thus cost) to a sustained increase in volume. In general, and in past Commission practice, estimation of volume variabilities requires the use of cross sectional data (or panel data that encompasses a substantial cross-sectional element). Below are some examples of accepted Commission variabilities studies and the type of data each used:

Accepted Commission Variability Studies	Type of Data
Purchased Highway Transportation	Cross Section over contracts
Load Time Variability	Cross Section over stops
CAT/FAT	Cross Section over carrier "runs"
Vehicle Service Drivers	Cross Section over drivers.

The Commission has relied upon cross-sectional data because its costing exercises required measuring the cost reaction to sustained increases or decreases in volume. The Commission has made clear that it is not measuring temporary or very short-term cost responses associated with temporary or very short-term changes in volume. This means that the collected data must be consistent with the measurement goal. In making this decision, one should note that there are two main dimensions to data sets. They can be either time-series data or cross-sectional data:[1]

> Another important distinction to be drawn with reference to the data is that between time-series and cross-section data. Most data utilized in econometric model estimation are one of these types.

[1] Michael D. Intrilligator, "Econometric Models, Techniques, & Applications," Prentice Hall, Englewood Cliffs, New Jersey, 1978 at 62.

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> Time-series data measure a particular variable during successive time periods or at different dates. The time period is often a year (i.e., annual data) but it can be a quarter, month, or week (i.e., quarterly, monthly, or weekly data).
>
> Cross-section data measure a particular variable at a given time for different entities. Just as the "time period" can assume different values in time-series data, the "entity" can assume different identities in cross-section data.
>
> Sometimes cross-section and time-series data are merged or "pooled". The result could be interpreted as a cross section of time series or a time series of cross sections.

Because cross sectional data looks across units, each of which has adjusted to its current level of output, it provides more complete responses of hours or cost to volumes. Cross sectional data thus provides longer-run responses to output changes than time series data: [2]

> In general, time series data usually reflect short-run behavior while cross-section data reflect long run behavior, in particular a greater adjustment to long-run equilibrium.

In evaluating a data set, it is important to keep clear the distinction between the unit of observation and the sample length. In a time series data set, the unit of observation may be a month or a quarter, but the sample length might be several years. Thus, the sample can cover a long period of calendar time despite the unit of observation being only one month. Similarly, in the CCSTS, the unit of observation is the Zip Code day,

[2] Id. at 64.

but the length of the sample is two weeks.[3] Because of its inherently cross-sectional nature, the CCSTS contains a very wide range of variations in volumes and carrier street times, and these variations include all of the responses of the Postal Service to sustained volume changes, including factors like route adjustments. This is one of the well-known strengths of cross sectional data.

Another advantage of cross-sectional data is that the estimation of volume variabilities is not confounded by seasonal variations or changes in technologies. When time series data are used, the researcher must be concerned that the estimated variabilities reflect temporary seasonal fluctuations or temporary adjustments to technical change, not the true structural variability. These other influences can cause erroneous estimation of variabilities, causing the calculated variability to be either too high or too low, and must be controlled. This is why time series econometric models, like the demand models, may have to add synthetic variables, such as dummy variables for certain time periods, in an effort to control for possible spurious effects. To be clear, the introduction of

[3] An example of the confusion between the unit of observation and the length of the sample occurred during cross-examination of witness Stevens, by the OCA (at Tr. 6/2019-20). The posed questions referred to a portion of the Commission's Opinion from Docket No. R97-1 which referred to periods of weeks (four and eight). The OCA was attempting to show a correspondence between those periods and the two week period of data collection for the CCSTS. However, this attempt was mistaken because of confusion between unit of observation and the length of the data set. The four and eight week periods referred to by the OCA were the unit of observation in the mail processing study, not the length of the data set, which covered a number of years. Those comments by the Commission, therefore, related to the unit of observation. The unit of observation in the CCSTS is the Zip Code day, and the Commission's comments are thus not applicable to the two-week sample length of the CCSTS. In fact, the cross-sectional nature of the CCSTS was chosen specifically to respond to and avoid the concerns raised by the Commission in its Docket No. R97-1 comments.

seasonal factors does NOT assist in estimating variabilities, it makes it more difficult.[4] This type of difficulty associated with time series data has been recognized by the Commission:[5]

> [T]ime series analysis by its very nature is subject to "unwanted side effects," i.e., non-volume exogenous variables which vary over time, such as national economic activity levels, postal budgeting and management policies, postal productivity, and changes in physical mail characteristics. Tr. 13/8959. It is very difficult to include variables in the analysis to adequately represent all significant side effects, and in some cases to even identify them all. The failure to resolve this problem makes time series analysis results extremely sensitive to the choice of time period.

A potential disadvantage of a cross-sectional database is the difficulty in producing sufficient observations for reliable estimation. Often there are a limited number of cross-sectional units for observation and this limits the amount of available data. Similarly, it may be very expensive to obtain the data from each cross-sectional unit and this too can limit the amount of available data. In the CCSTS, the unit of observation is the Zip Code. Because there are many Zip Codes, one possibility in collecting the CCSTS would have been to select data from over a thousand Zip Codes on a single day and construct a pure cross-sectional data base. This would have required obtaining cooperation from over a thousand Zip Codes, training over a thousand study coordinators and compiling the scans from nearly twenty thousand carriers. Obviously this would be prohibitively expensive and a logistical nightmare. An alternative

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[4] This is why government agencies typically “seasonally adjust” their data before making it available to researchers for econometric analysis.

[5] See, PRC Op., Docket No. R87-1, Vol. 1. at 214.

approach was to select as smaller number of Zip Codes (just over 160) and obtaining two weeks of data, at approximately the same time, from all the participating Zip Codes. By obtaining repeated cross sections from a widely dispersed (both geographically and volumetrically) set of Zip Codes, the Postal Service obtained a robust, highly useful and highly informative data base that could support both detailed cost pool formation and variability estimation.

Two weeks of data were selected for several reasons. First, only one day of activity data and one week of volume data are used in the route evaluation process. Thus, by taking two weeks of data, the CCSTS was able to capture more data than the amount used to reconfigure routes. Second, a period of two weeks was judged to be the maximum period for which to get continuing compliance by carriers. In fact, based upon attrition rates, two weeks may have been pushing the limit of cooperation, but in general carriers cooperated for the full period. Third, the collection of two weeks of data approximately exhausted the budget for data collection activities. Fourth, two weeks of data ensure the incorporation of high volume days and low volume days in the data set. Finally, two contiguous weeks is a short enough period of calendar time to avoid the estimation difficulties associated with time series data.

Once a two-week period was selected, the final choice was to determine which two-week period over which to collect data. In the ideal, one would like to select a two week period that was not visited with any substantial variations from normal operations. Review of the various factors that temporarily distort operations identified three major

disruptions: the seasonal volume build up in the fall and early winter, the volume slowdown in the summer and the taking of annual leave by regular carriers in the summer months. It was determined that any two week period from late April through early June would avoid these difficulties and reflect a normal period of operations.

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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