

here. Dr. Smith's responses to POIR No. 25 raise numerous disputed issues of material fact, and thus trigger the fully panoply of due process rights afforded to litigants in an adversarial proceeding. Indeed, the violation of due process threatened here is even starker than in Order No. 1482, for the passage of 40 days since the issuance of that order has eliminated even the theoretical possibility that affected parties might submit evidence rebutting the POIR responses now at issue. Hence, as in Order No. 1482, the Commission should hold that Dr. Smith's responses to POIR No. 25 may not be admitted into evidence "for purposes of establishing the truth of the matters asserted," and may not "serve as substantial evidence supporting any specific estimate of attributable carrier costs." *Id.* at 4-5.¹

BACKGROUND

POIR No. 25, like the POIRs at issue in Order No. 1482, concerns the econometric modeling of city carrier street time. The Commission issued POIR No. 25 on November 17, just three days before rebuttal testimony was due. The request solicited further material from OCA on the proper use of the City Carrier Street Time Survey ("CCSTS") data and models—and, in particular, on whether Commission-specified street time models are useful in dealing with the problems associated with multicollinearity in the CCSTS data. The information request singled

¹ Presiding Officer's Ruling No. R2006-1/115 (issued Nov. 29, 2006) dictates the same outcome. The ruling held that due process entitles participants to an opportunity to rebut disputed material facts asserted in POIR responses designated as evidence by the Commission. There is no time left in the procedural schedule for any such rebuttal to Dr. Smith's responses to POIR No. 25.

out one of several possible treatments for analysis by OCA: the option of dropping certain independent variables selected by the Commission from the full quadratic regression equations.

Question 1 of POIR No. 25 asked the OCA to perform new regression runs to determine whether “the regressors dropped from the full quadratic models in CC2A and CC3A,” two of the models, “are correlated with the regressors remaining in” the models.” The Commission also asked the OCA to provide its opinion on “the relative merits of omitting or retaining the interaction terms referenced above, in terms of their effects on multicollinearity and bias.”

Question 2 of POIR No. 25 asked the OCA to rerun the “full quadratic models reported in CC2A and CC3A,” but without the “interaction terms that interact with the small parcels variable”—i.e., without the Small Parcel and Roll volume cross-product variables—and to report the “t-values and standard deviations of the marginal time estimates” thereby obtained. Question 2 also asked the OCA to provide its opinion on “the relative merits of these models” vs. the CC6B model proposed by OCA and the model adopted by the Commission in R2005-1 and proposed by the Postal Service for adoption again in this case.

OCA witness Smith answered POIR No. 25 on November 27, 2006—two days before the commencement of the rebuttal round of hearings. Dr. Smith’s response included the new regression runs contained in Library Reference OCA-LR-10. In response to Question 1(a), Dr. Smith provided a correlation matrix showing

the Commission-requested correlations for the CC2A and B and CC3A and B models.² In response to Question 1(b), Dr. Smith stated that correlation exists between the various pairs of independent variables. He suggested, however, that the multicollinearity related to the “SPR” variable and the SPR cross-product terms is the major source of collinearity in the model. Response of OCA witness Smith to POIR 25 at 2-9.

In response to Questions 2(c) and (d), Dr. Smith stated that the Commission’s requested CC3C model

assuming that one chooses not to use the three bundle approach. . . appears to be superior to witness Bradley’s model, being more of a full quadratic, having more reasonable marginal cost relationships, and not being burdened with an incorrectly specified density variable.

Response of OCA witness Smith to POIR 25 at 10-13.

POIR No. 25 was directed to the OCA alone. Neither the Postal Service nor any intervenor was invited to answer the questions. Moreover, the Commission did not invite any other participant to file a written rejoinder to Dr. Smith’s responses, and did not ask either of the witnesses who filed rebuttal testimony on city carrier costs three days later—MPA *et al.* witness Crowder and USPS witness Bradley—to respond orally to Dr. Smith while on the witness stand.

² There is no difference in the correlations between the CC2 and CC3 models with the exception of the density-based variables. The density variables in the CC2 and CC3 models differ, but density was not used in the CC3 model.

On December 13, 2006—more than three weeks after the deadline for filing rebuttal testimony, six days after the close of hearings on that testimony, and only eight days before the due date for post-trial briefs—the Presiding Officer designated Dr. Smith’s responses for inclusion in the evidentiary record. Presiding Officer’s Ruling No. R2006-1/124, Attachment A at 2.

ARGUMENT

The hearing requirements of 39 U.S.C. § 3624(a), and the provisions of the Administrative Procedure Act incorporated by that section, entitle participants in Commission rate cases to discovery, cross-examination and rebuttal of cost data that raise material disputed issues of fact. As the Commission recognized only last month, the attribution of city carrier costs is one of the most important, complex, controversial and fact-laden tasks that the Commission faces. Order No. 1482 at 4 (“attributable carrier street time cost estimates are central to any general rate case, and . . . ample time is needed to examine the complexities of any new study of these costs”). Accordingly, due process forbids the Commission from adopting city carrier cost estimates based on data or analyses not subject to full adversarial testing. Order No. 1482 at 4-5; *Mail Order Ass’n of America v. USPS*, 2 F.3d 408, 428-430 (D.C. Cir. 1993) (“MOAA”); *accord*, Objection of MPA *et al.* To Receipt Into Evidence Of The Response Of The USPS To POIR No. 4, Questions 4-12, And POIR No. 16, Items 13-21 (October 17, 2006) at 9-13 (citing legal authority).

These authorities control here. Dr. Smith's responses to POIR No. 25 raise numerous disputed issues of material fact. Admitting those responses into evidence would therefore entitle other interested parties to the "full panoply of procedural due process rights" that are triggered by the submission of evidence on a contested point in an adversarial proceeding. Order No. 1482 at 4. Too little time remains in this case, however, to afford the procedures that would be due. Accordingly, Dr. Smith's responses to POIR No. 25 may not be admitted into evidence "for purposes of establishing the truth of the matters asserted," and may not "serve as substantial evidence supporting any specific estimate of attributable carrier costs." *Id.* at 4-5.

I. DR. SMITH'S RESPONSES TO POIR NO. 25 RAISE NUMEROUS DISPUTED ISSUES OF MATERIAL FACT.

The disputed issues of fact raised by Dr. Smith's responses begin with a key premise of both POIR No. 25 and Dr. Smith's responses: that the SPR and SPR cross-product variables are the main cause of the multicollinearity problems in the CCSTS model. Another disputable assumption underlying Dr. Smith's responses is that dropping the Commission-selected independent variables is an appropriate solution to multicollinearity in the CCSTS model. As noted by Dr. Bradley, MPA *et al.* witness Crowder—and elsewhere by Dr. Smith himself—dropping independent variables leads to biased results, and therefore should be undertaken only after thorough analysis and careful deliberation.³ Moreover, as noted by Dr. Bradley,

³ See Smith response to POIR No. 25, Item 1; Crowder Reb. (MPA et al.-RT-1) at 7, lines 8-17 (34 Tr. 11646). See *also* Bradley Reb. (USPS-RT-4) at 13 n. 26 (34 Tr. (footnote continued on next page)

even if the estimated coefficients from a restricted model “appear” reasonable, multicollinearity still will affect the results.⁴ Further, a better remedy for multicollinearity often is simply to add more information to the model, a step that may or may not entail the use of more observations.⁵ For ratemaking, this alternative is superior to simply dropping model variables since it can (1) significantly reduce variances in coefficient estimates and (2) preserve non-bias or limit the amount of introduced bias in the estimates. Such an approach should be seriously investigated.

Equally debatable is the assumption, clearly shared by POIR No. 25 and Dr. Smith, that multicollinearity related to the SPR cross-product terms is the major source of multicollinearity problems in the model. See Response of OCA to POIR No. 25 at 8-9. The reported data certainly suggest otherwise:

- The SPR variables are not the most highly correlated with all other variables. Rather, the correlation coefficients reported by Dr. Smith suggest that the correlation of sequenced volume with the cross-product terms is the most widespread, followed by that for letters and small parcels, and then flats and collection volume. In the

11566); and Docket No. R2005-1, Response of USPS Witness Bradley to POIR No. 9, Question 9 (filed July 6, 2005).

⁴ Bradley Reb. (USPS-RT-4) at 13 n. 26 (34 Tr. 11566).

⁵ William H. Greene, *Econometric Analysis* (5th ed. 2003) at 58-59. One way to add information would be the three-bundle approach, which witness Smith, Bradley and Crowder all agree should be considered. See, e.g., 19 Tr. 6745 (Bradley). Other approaches would be using a data set that extends over a longer period of time, introducing more information in the form of coefficient restrictions and normalizing the model with respect to one of the variables. These are all acceptable approaches that avoid causing bias.

Equation 2 matrix, five of the correlation coefficients involving sequenced volume and the other terms are over 80 percent, followed by three each for letters and SPRs, and two each for flats and collection volume.⁶

- Correlation coefficients for volume variables and own volume-PD cross-product terms are over 80 percent in all cases (the five volume variables). This indicates that the possible deliveries (PD) variable by itself is also highly collinear with each of the volume variables. If so, distinguishing between the effects on modeled street time from each volume shape and PD variable may be difficult.⁷ This is an example of a system problem, not something isolated to the SPR variable.
- In CC3A (the full quadratic with no density variable), the variance inflation factors (“VIFs”) for letter and flat volumes are higher than that for small parcels. Letter, flat, small parcel and sequenced volume VIFs are all over 10 percent, indicating harmful collinearity between the indicated variable and all other independent variables as a group.⁸ The comparable model requested by the Commission (a restricted quadratic without SPR cross-product terms or density variable) shows a lower VIF for the small parcel variable. However, based on the VIFs from the CC3A model and correlation coefficient results, there is an equal rationale to drop the cross-product terms for the other volume variables individually as well in order to test a range of results. This demonstrates that the SPR variables were singled out inappropriately.

⁶ Kennedy suggests in his text that correlation coefficients over 80 percent indicate serious multi-collinearity between any two independent variables. Peter Kennedy, *A Guide to Econometrics* 209 (5th ed. 2003).

⁷ Dr. Bradley noted this particular point in his response to POIR No. 4, Question 11. There, he explored the possibility of dropping the PD cross-product terms. See 19 Tr. 6748 (Bradley).

⁸ Kennedy, *supra*, at 213.

These questions about the soundness of the alternative models suggested by the Commission in POIR No. 25 are underscored by the equivocal tenor of Dr. Smith's comments on those models. In response to Question 1(b), which solicited Dr. Smith's views on the "relative merits of omitting or retaining" certain cross-product variables, Dr. Smith stated that

the interaction terms are drivers of carrier time and should be retained if one is modeling delivery time as a function of the shapes. However, there has been some consideration of modeling the delivery process in terms of three major bundles – (1) DPS, (2) Cased Mail, and (3) Sequenced Mail.

OCA Responses to POIR No. 25 at 7. In other words, to avoid biasing the results, alternatives to simply dropping relevant variables should also be considered as treatment for the multicollinearity issue.

Although Dr. Smith ultimately opined that "from an estimation viewpoint a strong case can be made for the dropping of the 'spr' based cross-product terms," he acknowledged that "one might not then have a flexible functional form"; "the record contains no discussion of the dropping of cross products as related to the estimation of flexible functional forms"; "from an empirical viewpoint, the dropping of the 'spr' variable appears to be inappropriate"; "collinearity and its resulting problems could be reduced through the use of a data set extending over a longer period of time"; and "from a theoretical viewpoint all cross products should be retained in the current model." *Id.* at 8-9.

Similarly, while he asserted in response to Question 2(c) that the Commission's requested CC3 model without SPR cross-product terms "appears to be superior to witness Bradley's model, being more of a full quadratic, having more reasonable marginal cost relationships, and not being burdened with an incorrectly specified density variable," *id.* at 12, he acknowledged that whether "the modified CC3A model would apply in today's environment, given the increased use of DPS mail . . . is not clear." *Id.* at 12-13.

Dr. Smith's previous testimony in this case raises further questions about his judgment regarding (1) the merits of deleting only the SPR cross-product terms as a remedy for multicollinearity and (2) the reasonableness of the "marginal cost relationships." Throughout his direct testimony, Dr. Smith severely criticized Dr. Bradley's CCSTS regular delivery model. He questioned both the reliability of the dataset and the adequacy of the model. *See, e.g.,* Smith Direct (OCA-T-3) at 3-8 and 15. He also admitted, however, that he had not performed any independent review of the data or developed an appropriate conceptual structure in which to determine the most important cost causal variables and how these variables should be combined to explain city carrier street costs. In his responses to ADVO/OCA-T3-15(e) and 24 (22 Tr. 8147), for example, he acknowledged that he had not developed either an appropriate economic specification for a city delivery cost model or even a suggested approach to the development of such a specification. Without

those basic analytical steps, one has no basis for knowing what are the reasonable marginal cost relationships or which model is “superior.”⁹

Further, as noted above, Dr. Smith is mistaken in assuming that the multicollinearity problem is due mainly to the SPR cross-product variables, and that eliminating only the SPR cross-product variables makes the model coefficients superior. As Dr. Bradley explained in his rebuttal testimony (USPS-RT-4) at 13 n. 26,

Dr. Smith appears to think that if a version of the full quadratic model does not produce any negative variabilities, then he can ignore the fact that multicollinearity is a problem. (See, the discussion of models on pages 12-14 of OCA-T-3.) This is erroneous. A negative variability is an extreme symptom of multicollinearity, but it is not a necessary condition for its existence. The existence of substantial multicollinearity renders the estimated coefficients unreliable even if they are not negative. Thus, it is not appropriate to deal with multicollinearity by picking and choosing among the full quadratic results based upon whether or not one produces a negative coefficient.

The same criticism also applies to using *assumed* reasonable marginal cost relationships to choose among restricted quadratic models. The multicollinearity problem with the CCSTS data is a system problem (as clearly demonstrated in the correlation matrices requested by the Commission). Without serious analysis of the

⁹Notably, he did not recommend a restricted quadratic, or independently develop any restricted quadratic models of his own, but simply presented in his direct testimony some models that were based on Dr. Bradley’s own restrictions. Smith Direct (OCA-T-3) at 9-14. Further, as noted by MPA *et al.* witness Crowder, his model recommendation was based on obtaining results that avoid “sign” problems and satisfy his *a priori* expectations. These are inappropriate criteria. Lacking the appropriate conceptual analysis, he cannot determine whether a model’s results comport with reality. Crowder Direct (MPA *et al.*-RT-1) at 6, lines 3-13; Bradley Reb. (USPS-RT-4) at n. 26.

sources of the multi-collinearity and or consideration of alternative specifications that add more information, isolating one variable (SPR) for special treatment is a make-shift and inappropriate remedy for the problem.¹⁰

Finally, Dr. Smith's position that a density variable should be omitted from the model (Response of OCA witness Smith to POIR No. 25 at 10-12) has been vigorously challenged by the other two witnesses in the case who have testified on city carrier costs. See Bradley Reb. (USPS-RT-4) at 1-9 (34 Tr. 11554-62) and Crowder Reb. (MPA *et al.*-RT-1) at 8-10 (34 Tr. 11647-49). Under the circumstances, it would be grossly unfair to enter into the record what amounts to additional testimony by Dr. Smith on this issue, at a point when no opportunity remains for meaningful rebuttal by the parties sponsoring Bradley or Crowder.

II. IT IS TOO LATE TO CURE THE VIOLATION OF DUE PROCESS THAT WOULD RESULT FROM ADMITTING DR. SMITH'S RESPONSES TO POIR NO. 25 INTO EVIDENCE.

No opportunity remains in this case for the adversarial testing of Dr. Smith's responses required by 39 U.S.C. § 3624(a). The third and final round of hearings

¹⁰ In Docket No. R2005-1, the Commission asked Dr. Bradley whether dropping only the SPR cross-product terms would be an improvement over dropping all cross-product terms, as he chose to do. He responded that he believed that "dropping all of the cross product terms"—the equivalent of his "restricted quadratic model"—would produce better results than the Commission's alternative of dropping only selected independent variables. Response of USPS Witness Bradley to POIR No. 9, Question 11(d) (filed July 6, 2005). Bradley thus clearly understood that the multicollinearity was a system problem, not one principally caused by the SPR variable.

ended on December 7. Initial briefs are due on December 21. If this proceeding was too advanced in early November to allow admission into evidence of the POIR responses at issue in Order No. 1482, it is surely too late to admit similar POIR responses into evidence now, 40 days later.

CONCLUSION

If the record in this case establishes anything about the city carrier street time model, it is that more work is required. Three competent witnesses have submitted testimony to the Commission on this issue. All three witnesses have acknowledged that more work needs to be done on both the CCSTS data and the models derived from those data. Alternative approaches to treating the multicollinearity problem have been brought to light. The hesitant and equivocal endorsement of the Commission's alternative model specifications by Dr. Smith in response to POIR No. 25 merely underscores the unresolved state of the record on these issues. Under the circumstances, admitting Dr. Smith's responses into evidence, without a full and adequate opportunity for rebuttal by other interested parties, would be a clear violation of due process.

For the foregoing reasons, the undersigned parties respectfully request that the Commission hold that the Responses of OCA witness Smith to Presiding Officer's Information Request No. 25 may not be admitted into evidence "for purposes of establishing the truth of the matters asserted," and may not "serve as substantial evidence supporting any specific estimate of attributable carrier costs." Order No.

1482 at 4-5. Instead, the Commission should defer consideration of Dr. Smith's responses until the "informal rulemaking" that the Commission plans to institute "after the conclusion of this docket." *Id.* at 6.

Respectfully submitted,

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