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Is the Bias - Efficiency Estimation Tradeoffs in Double Bounded Dichotomous Choice CVM Less Pronounced Using Visitor Survey Data?

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Introduction and Background

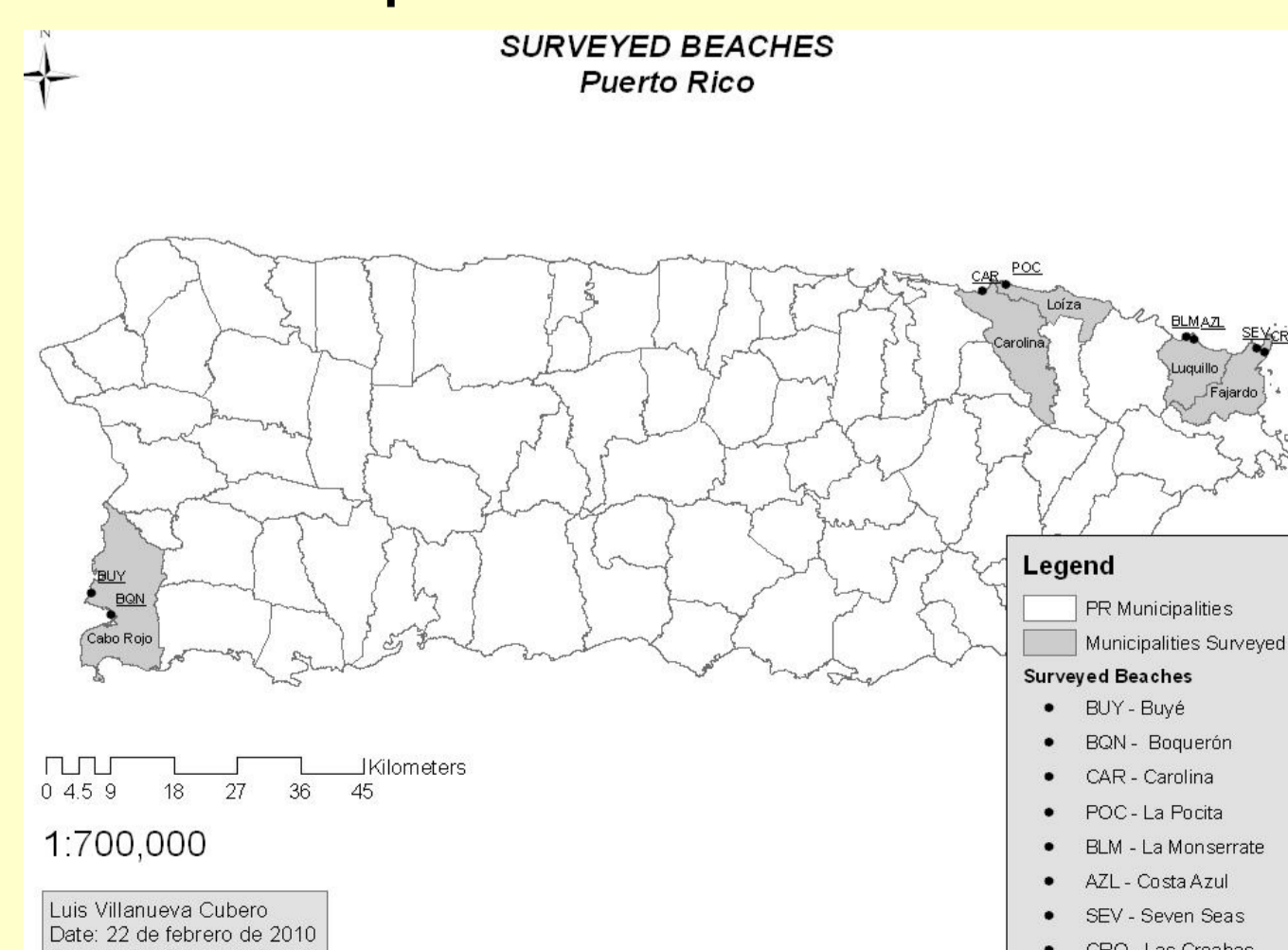
- Environmental Economists utilize a wide range of econometric tools to model WTP. All methods have tradeoffs between bias and efficiency.
- The double bounded models have greater efficiency over single payment dichotomous choice models.
- The previous work exhibits a potential starting point bias in double bounded interval estimate.
- Most of the past findings involve household passive use values rather than experienced on-site users.

Objectives

- Investigate whether with experienced on-site users the response for the 2nd bid amount in the double bounded Dichotomous Choice CVM Question also suffer from anchoring/starting point.
- Provide insight into the trade-offs that researchers face as they narrow the confidence intervals for policy makers.
- Compare the sensitivity of WTP to three econometric modeling methods.

Data

- A 2009 in-person survey on the beaches of Puerto Rico.
- 660 total respondents, with 657 total useable responses.



Survey Design:

- The respondents on the beach provide values for their current beach location. The assumption that the respondents are familiar with the good they are valuing since most are repeat visitors.
- Each respondent has two questions: an initial random bid amount and a follow up bid amount.
- If the response to initial bid is "Yes," a follow up bid = (2*initial bid amount). Conversely, a "No" response leads to a follow up bid = (initial bid amount/2).
- The bid amount is in addition to the amount paid in travel costs to arrive at the beach.
- The initial bid amounts range from \$5 - \$150

Hypothesis Tests:

- Null Hypothesis: The median WTP values for Single Bounded Logit = Double Bounded Logit = Bivariate Probit (Eq 1 = Eq 2).
- Null Hypothesis: Correlation of Bivariate Probit equations 1 and 2 = 1.
- Alternative Hypothesis: They are not equal.



Econometric Modeling and Tests

- A single bounded logit model of the first response to the first bid price.
- A bivariate probit (BVP) model with one equation apiece for the first response and the second response.
- A double bounded interval logit model utilizing the both first and second responses and bid amounts.
- Krinsky-Robb 95% Confidence Intervals of WTP

Figure 1 Median WTP & 95% Confidence Intervals

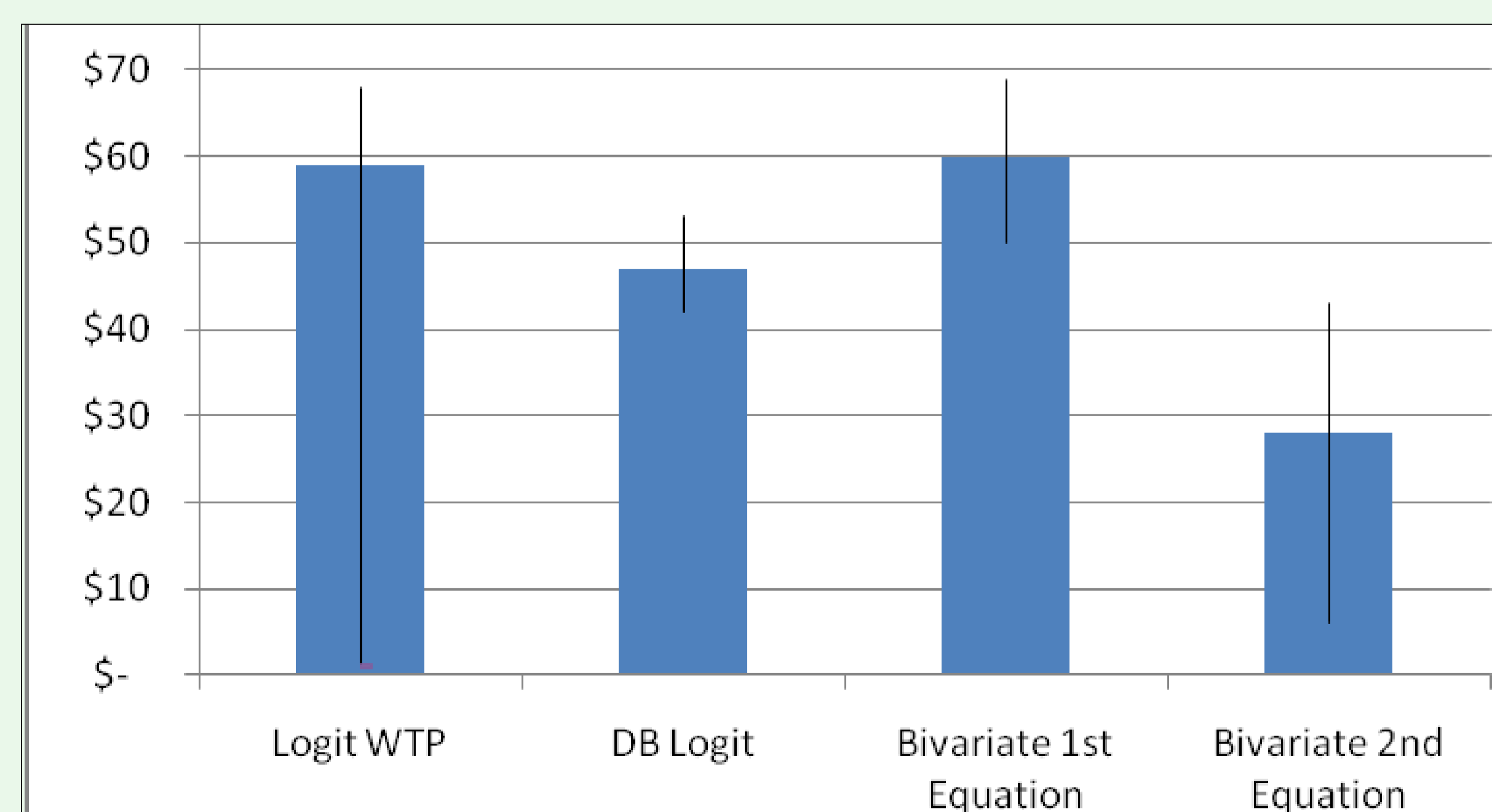
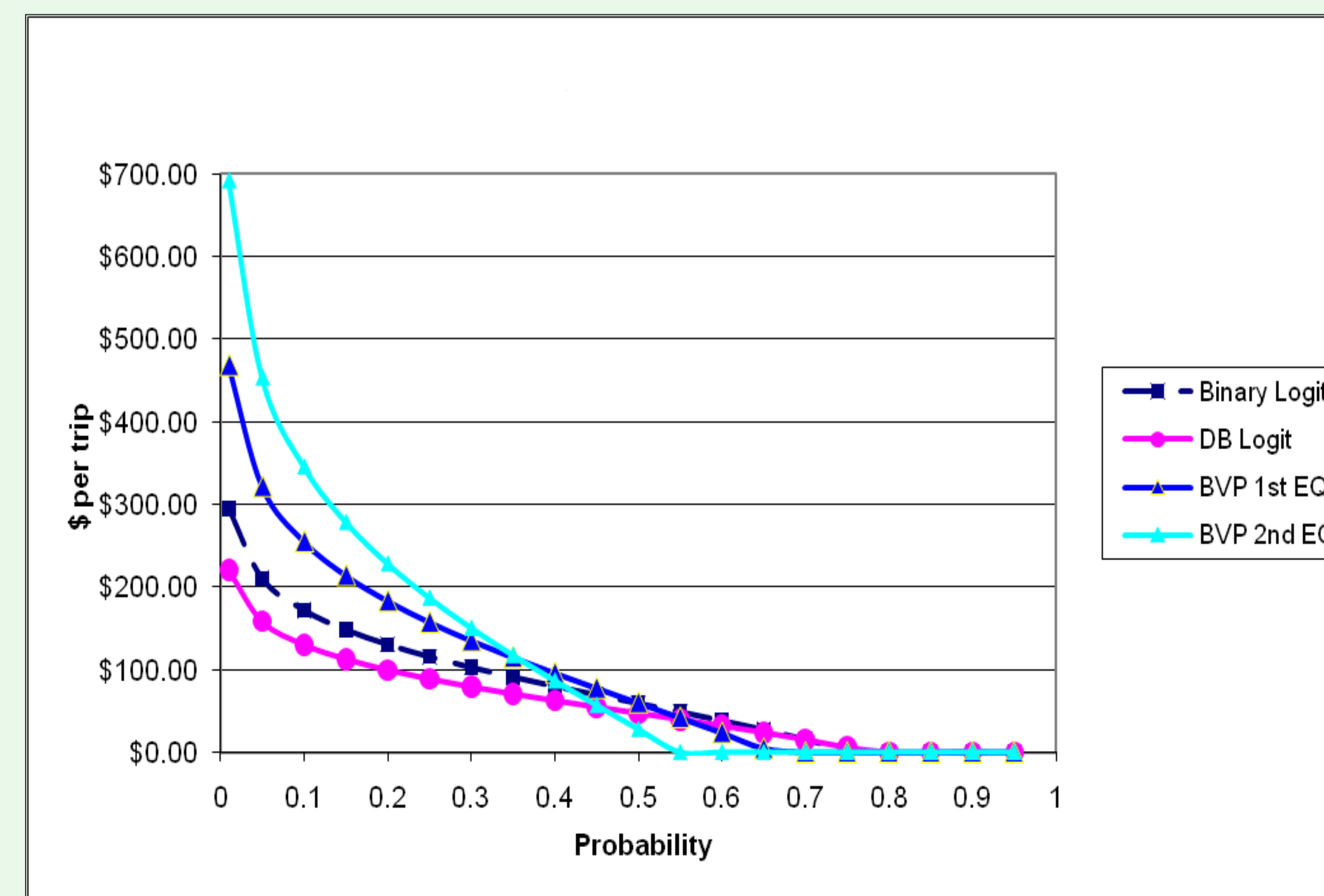


Figure 2 Comparison of WTP Curves



Results

- Reject Null Hypothesis that Correlations between 1st & 2nd Equation in BVP=1.
- Accept Null Hypothesis of WTP SB=BVP(1st Eq)=DB (Figure 1)
- Reject Null Hypothesis of WTP BVP(2nd Eq)=DB
- There is a difference between response to the first and second bid, even for those who visit the sites.
- The median WTP for the double bounded logit does not fall halfway between the bivariate probit.
- There is a marked difference in the upper end of the WTP curves of the Bivariate Probit models & the DB, suggesting that differences in Mean WTP could be substantial (Fig. 2)

Implications

- This implies a difference in the first and second bid responses. This could indicate the response shift is intrinsic to the double bounded model.
- Research into why said shift occurs and how it could be mitigated might prove worthwhile if the statistical efficiency gains in estimating WTP are desired from DB DC CVM.

