

A Meta-Analysis on the Value of a Statistical Life in Road Safety

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Research question and Methodology

Traffic safety is an important and significant benefit in many traffic project and policies. In this study we focus on the value of a statistical life (VSL) which is the monetary equivalent of preventing one statistical death in society (Andersson and Treich, 2011). The objective of the study is to conduct a meta-analysis (see, e.g., Nelson and Kennedy, 2009) on VSL in road safety.

Meta-analyses on VSL for traffic have been conducted in the past (e.g., de Blaeij et al, 2003; Lindhjem et al., 2011), but are either relatively old (considering the significant development of non-market valuation techniques and increase in usage) or did not cover the full literature (e.g. only focusing on stated-preference studies). Hence, we believe a new meta-analysis is of importance and we use VSL estimates from 64 studies consisting of 401 estimates. The full data set is labelled “All-Set”, but we also consider a sub-sample “Best-Set” (111 observations), consisting of the best or the two bests estimates of each study (Viscusi, 2017). These estimates are the ones recommended by the author(s) of each study, and two best estimates are provided when the good/policy varies. For instance, one estimate may reflect VSL for a public safety measure whereas a second one for a private safety measure. We further run a third analysis on a “Trimmed-Set” (105 observations) in which the data set has been trimmed at the 95 percentiles, resulting in the exclusion of a few outliers.

Expected results

A funnel plot for the All-Set reveals that the estimates include negative values of VSL. As expected, these negative values disappear in the Best-Set since there is reluctance to report theoretically improbable negative estimates. In addition, there is a clustering of the small positive values combined with an upper right tail of the distribution that extends farther than does the left tail. This overall distribution is consistent with the presence of publication selection bias reported in the literature. To clarify, one might expect two opposite effects through the “Best Estimate Selection Bias”. The first effect is supposed to be positive since no negative values are reported anymore. The second effect is assumed to be negative since the most extreme positive values are deleted, reducing the range of the statistical series.

From the regression analysis we retrieve some common results from the literature; the VSL is directly impacted by the value assessment approach (revealed vs. stated preferences), by the elicitation format

(willingness-to-pay vs. willingness-to-accept) and by the dimension of the safety policy (public vs. private). However, we also find strong effects from publication outlet, i.e. in which peer-reviewed journal the article has been published. That is, the results suggest, controlling for large group of explanatory variables, that estimates are significantly different if published in specific journals. This could be interpreted as a second definition of publication bias.

References

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