SUPPLEMENT A

Data example

The dataset originates from an APC validation procedure in Germany which needed to be approved under a former version of the VDV 457 as it was pre-specified in the tendering documents. The dataset dates from the year 2012 and was provided by Interautomation Deutschland GmbH. The sample size is $n = 1907$ and can in retrospect be considered too low since sample size calculation was not yet considering risks properly as version 2.1 of the VDV 457 now does. The average number of (manually) counted boarding passengers was 1.89 per stop door event. For the average expectation in the relative differences μ of the APC the data gives an estimate of about minus one half percent ($\overline{D}$ = -0,00499) and for the variability ν an estimate $\widehat{\nu} = 0.173$. The APC was correct in 94% of the cases and the distribution of boarding passenger counts and APC errors is visualized in the following histograms:

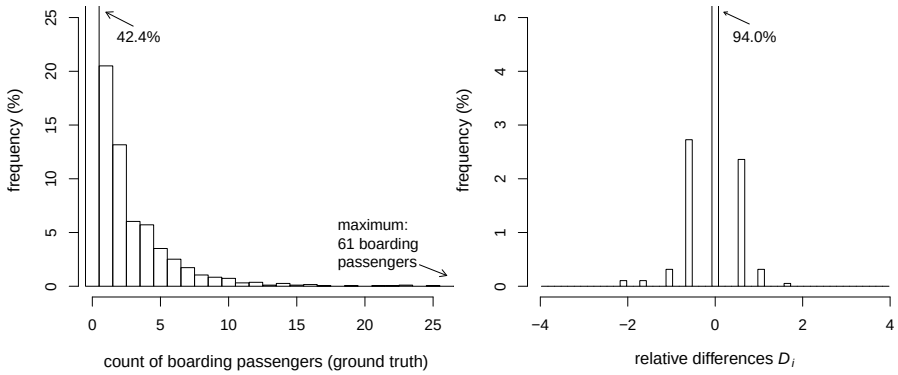

Figure: Histograms of the observed counts of boarding passengers (left) and counts of the relative differences D_i (right) in percent. Values outside of the displayed area are marked with separate text fields.

The resulting confidence interval for μ is [-1.2%,0.2%] and the APC would therefore not have passed the equivalence test for $\Delta = 1\%$ most likely because the sample size estimation was not carried out properly and thus too small.