

# Readme: A/B Contracts Matlab Code

To reproduce the figures and tables in the manuscript titled “A/B Contracts”, you need:

- Stata 14.0 or later
- Matlab 2019 or later
- The CVX add-on for Matlab (available for download at <http://cvxr.com/cvx/>).
- The data file “MTurkCleanedData.dta” from DellaVigna and Pope (REStud, 2018). Including or can be accessed via <https://doi.org/10.1093/restud/rdx033>. (For the latter, Oxford Academic access is required.)
- The data file “Mturk-2015-2018.dta” from DellaVigna and Pope (AEJ-Micro, forthcoming). This can be accessed via <https://doi.org/10.3886/E135221V1>. (Publicly accessible.)

**Step 1.** Export the .dta files from the DellaVigna and Pope papers and import them into Matlab

- Load the file named “MTurkCleanedData.dta” and run the “Export\_ABdata\_Excel.do” file. Alternatively, type “*export excel buttonpresses treatment using DP\_ab\_task.xlsx*” into the Stata command window
- Load the file named “Mturk-2015-2018.dta” and run the “Export\_EWdata\_excel.do” file. Alternatively, type “*export excel treatment arm effort using DP\_extrawork\_task.xlsx*” into the Stata command window

**Step 2.** Generate the figures and tables by executing the file named “ABcontracts\_master.m”

- The command “ImportDPData” in line 9 will import the data into Matlab and save it in .mat format (in addition to generating Table 1 in the paper)
- You can generate any particular figure or table by running the relevant part of the code inside the master file

*Estimated time (using a 2.4 GHz 8-Core Intel i9 CPU): 60 hours.*

Note: If the optimization procedures take too long, switch the CVX solver to “SeDuMi” (from the default “SDPT3”) by typing “*cvx\_solver sedumi*” in the Matlab command window before Step 2.

Note: The tables and figures in the paper were generated using the “SDPT3” solver for CVX and the default options for the “fsolve” function. Using a different CVX solver or different options for “fsolve” can lead to small discrepancies in the output.

## List of Tables and Figures

### Section 5.1

- Table 1: Summary statistics of treatments in DellaVigna and Pope (2018)
- Figure 1: Predicted effort vs. actual effort for homogeneous A/B tests
- Table 2: Summary statistics for effort predictions for different coefficients of RRA

### Section 5.2

- Table 3: Fitted parameters for the benchmark model
- Figure 2: Average realized gains vs. maximum available gains
- Figure 3: Benchmark-optimal effort change vs. test-optimal effort change
- Table 4: Performance of optimal adjustments & sensitivity analysis

### Section 6.2

- Figure 4: Prediction error when elasticity is misspecified
- Figure 5: Prediction effort when coefficient of RRA is misspecified

### Appendix A.1. Additional Results

- Figure 6: Disaggregated data for the performance of optimal adjustments
- Figure 7: Benchmark-optimal and test-optimal contracts when  $C=3$  and  $C=7$
- Figure 8: Predicted CDFs for piece-rate treatments using homogeneous A/B tests
- Figure 9: Predicted CDFs for bonus treatments using homogeneous A/B tests
- Table 5: Performance of optimal adjustments & sensitivity analysis for hybrid A/B tests
- Figure 10: Disaggregated data for the performance of optimal adjustments with magnified payoffs 100x
- Table 6: Performance of optimal adjustments & sensitivity analysis with magnified payoffs 100x

### Appendix A.2. External Incentives

- Table 7: Summary statistics for effort predictions with one vs. two test contracts

### Appendix A.3. Multitasking / Gaming

- Figure 11: Predicted vs. actual CDF for bonus treatments (multidimensional model)

### Appendix B. DellaVigna and Pope (Forthcoming) WWII Card Extra-work Coding Task

- Table 8: Summary statistics of treatments
- Figure 12: Predicted effort vs. actual effort
- Table 9: Summary statistics for effort predictions for different coefficients of RRA
- Table 10: Performance of optimal adjustments & sensitivity analysis
- Figure 13: Disaggregated data for the performance of optimal adjustments