Readme.pdf
Jesse Rothstein
July 2014

This file accompanies the replication archive for the following paper:

Rothstein, Jesse. "Teacher Quality Policy When Supply Matters." Forthcoming,
American Economic Review.

The archive contains two main directories. The "results" directory contains Stata
.gph files for each of the figures in the paper and appendix, along with .txt files with
the contents of the tables. These are produced by Stata using the "esttab" command,
which can be installed from the SSC archive. The "toreproduce" directory contains
all programs needed to reproduce these results and a large number of intermediate
data files. They are described in turn. The archive root directory also contains this
readme.pdf file and a Stata program, "pdfify.do," that makes the .gph files into PDFs.

RESULTS DIRECTORY
```
./mainmodels subdirectory:
models_table2_table.txt                 Results for Table 2
models_table3_table.txt                 Results for Table 3
models_table4_table.txt                 Results for Table 4


./figures:
gph_equivalentvariation.gph             Figure 2
gph_totalnumber.gph                     Figure 4
varygraphs_budget.gph                   Figure A2
gph_info.gph                            Figure 1
optimalpolicies_table.txt               Results for Table 5
varygraphs_fire.gph                     Figure 7
gph_recruitretain.gph                   Figure 3
varygraphs_bonuses.gph                  Figure 5
varygraphs_tenure.gph                   Figure 6

./appendix:
appendix_altfiringfig_cumulative.gph  Figure A4
appendix_exithazard.gph               Figure A1
appendix_altfiringfig_everfire.gph    Figure A3
```

TOREPRODUCE DIRECTORY
The file "aer_20140710_102517.smcl" contains a listing of the files in this directory,
along with checksums for each.

The key program which runs all others is the "ppay.do" program in the
"aer_20140710_102517" directory. This program uses the "project.ado" Stata add-

on, available from SSC, to manage all subroutines and resulting files. To run it, you need to do the following:

- Place all programs from the "aer_20140710_102517" directory of the replication archive in a project root directory (with whatever name you like), preserving the subdirectory structure.
- Create a "scratch" subdirectory or symbolic link in the project root directory. This will hold several gigabytes of files; make sure that it has enough space.
- Install the "estout" and "project" add-on Stata programs. These can be obtained from SSC by typing "ssc install estout" and "ssc install project" at the Stata prompt. The replication archive also contains zipped versions of each that can be used if you do not have an internet connection.
- Type "project, setup" at the Stata prompt. Note that a graphical version of Stata is required for this. Select the "ppay.do" file as the main project file.
- Type "project ppay, build."
- Wait while the programs execute. This may take several days (it takes about a week on my computer, using 4-processor Stata MP). If it is interrupted, it is not necessary to start from scratch. The project.ado command will keep track of which portions have been completed. If you type "project ppay, build" again, it will start where it left off.
- Results should match the ones distributed with this archive. Note that the checksums for many of the files (.smcl, .gph, .dta, and .dta.gz extensions) will differ from those listed in "aer_20140710_102517.smcl," due to Stata's inclusion of date stamps in these files. But the results should match.

An annotated listing of the specific files included in the archive follows. Feel free to contact me at rothstein@berkeley.edu if you have any questions.

ANNOTATED LISTING OF CONTENTS OF AER_20140710_102517 DIRECTORY (SUBDIRECTORIES LISTED IN LOGICAL RATHER THAN ALPHABETICAL ORDER)

```
./
readme_project.txt          Information about project.ado
estout.zip                  Files needed to install estout.ado
ppay.do                     The master program for the project.
project.zip                 Files needed to install project.ado

./learningmodels:
learningmodel_bonus.do      Main model used for bonus simulations
learningmodel_fire.do       Main model used for firing simulations
learningmodel_tenure.do     Main model used for tenure simulations

./subroutines:
drawsamp.do                 Creates initial sample, used for all
                            simulations.
sub_findthresholds.do       Computes performance thresholds associated
                            with chosen bonus/firing rates.
sub_search.do               Search routine to find w0 that clears
                            market.¹
project_includesubroutines.do  Used to include all subroutines in main
                               programs.
sub_makebetas.do            Converts results of simulation into usable
                            output.
sub_summarize.do            Summarizes results of simulations.
runmodel.do                 Master program used to run simulations.
sub_makeinitialgrid.do      Sets up discrete grid used to approximate
                            continuous mu–tau–y distributions.
sub_valfn.do                Evaluates the teacher value function
                            recursively.
sub_baselineparms.do        Uncovers the outside offer distribution
                            parameters needed to produce specified
                            elasticities
sub_makesamp.do             Makes the basic simulation samples

./mainmodels:
models_table2.do            Creates Table 2
models_table3.do            Creates Table 3
models_table4.do            Creates Table 4
```

---

[1] Note: All of the simulations included in this archive (in the mainmodels and varycontracts directories) are specified with starting values for w0 that clear the market. The starting values were obtained on preliminary runs using the routine in sub_search.do, then encoded into the calling programs to avoid repeating computationally intensive Newton-Raphson searches each time the programs are re-executed. With these w0, sub_search.do should exit after a single iteration, having confirmed that the specified w0 indeed clears the market. This w0 is unique up to the precision of the process; if the programs are changed to use different starting values, the results will be the same (again, up to precision limits), but the execution will be several times slower.

```
./figures:
gph_careerlength.do        Creates an extra figure, not in paper.
gph_newentrants.do         Creates an extra figure, not in paper.
optimalpolicies.do         Creates Table 5
gph_equivalentvariation.do Creates Figure 2
gph_recruitretain.do       Creates Figure 3
varygraphs.do              Creates Figures 5–7 and A2
gph_info.do                Creates Figure 1
gph_totalnumber.do         Creates Figure 4

./varycontracts:
optimalfirethresholds.do   Computes thresholds for alternative
                           firing rules in Figure 7
vary_budget2.do            Estimates optimal budgets (not used)
vary_frtenured.do          Simulates varying tenure rules for Fig. 6
vary_bonusshare.do         Simulates varying bonus award rates for
                           Fig. 5
vary_frfired.do            Simulates varying firing rates (posterior
                           mean rule) for Fig 7.
vary_rescale.do            Computes x–axes for Figures 5–7.
vary_bonussize.do          Simulates varying bonus sizes for Fig. 5
vary_frfiredavgva.do       Simulates varying firing rates (average VA
                           to date rule) for Fig. 7
vary_budget.do             Simulates varying budgets for Fig. A2
vary_frfiredoptimal.do     Simulates varying firing rates ("optimal"
                           rule) for Fig. 7

./rawdata/sasstfs:         Files from SASS/TFS 1999/2000 to create
                           Appendix Figure A1
SASS_99_00_S1A_v1_0_Codebook.txt.gz
SASS_99_00_S4a_v1_0.dta.gz
SASS_99_00_S1A_v1_0_S4A_Layout.txt.gz
SASS_99_00_T2_v1_0.dta.gz
SASS_99_00_S1A_v1_0_T2_Layout.txt.gz
SASS_99_00_T3_v1_0.dta.gz
SASS_99_00_S1A_v1_0_T3_Layout.txt.gz
readme_sasstfs.txt         Describes how SASS/TFS files were obtained.

./appendix:
appendix_altfiringfig.do   Creates Appendix Figures A3 and A4
appendix_altfiringruns.do  Prepares data for appendix_altfiringfig.do
appendix_exithazard.do     Creates Appendix Figure A1
```