

README File for the Replication of Empirical Results in: "Identification of Average Marginal Effects in Fixed Effects Dynamic Discrete Choice Models"

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1 Introduction

This README file outlines the steps to replicate the results presented in: Aguirregabiria, Victor, and Jesús Carro (Forthcoming). "Identification of Average Marginal Effects in Fixed Effects Dynamic Discrete Choice Models," *Review of Economics and Statistics*. All the code and data, including this README file, are in the folder:

`/replication_package`

The paper provides three sets of empirical results:

1. Results from the Monte Carlo experiments in Section 4, as shown in Table 1 and Figure 1 in the paper.
2. Descriptive statistics from the empirical application in Section 5.1, reported in Table 2 in the paper.

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3. Model estimation results from the empirical application in Section 5.2, detailed in Tables 3 and 4 in the paper.

Below, we describe the code and data required for each of these three sets of results.

2 Monte Carlo Experiments in Section 4

The `.do` and `.ado` files for replicating the Monte Carlo experiments and generating the results for Table 1 and Figure 1 in the paper are located in the following folder:

```
/replication_package/monte_carlo_experiments
```

It is written in `Stata` and was run using `Stata version 14MP`. It consists of the following three `.ado` files and four `.do` files:

`allToest_bCMLE.ado` – This `Stata` `ado` file contains a program for the Conditional Maximum Likelihood estimation of slope parameters in Fixed Effects model. This `ado` file is called by the `do` files.

`Toest_REMix.ado` – This `Stata` `ado` file contains a program for the Maximum Likelihood estimation of slope parameters in Random Effects model. This `ado` file is called by the `do` files.

`Toest_AMEfeT4.ado` – This `Stata` `ado` file contains a program for the estimation of Average Marginal Effects. This `ado` file is called by the `do` files.

`Simul_TrueNoUH_vsRE.do` – This `Stata` `do` file:

1. Simulates data from the DGP without permanent unobserved heterogeneity: DGPs $NoUH(-1)$ and $NoUH(+1)$.
2. Estimates slope parameter of the Fixed Effect model by CMLE calling program `allToest_bCMLE.ado`.
3. Estimates slope parameter of the model without unobserved heterogeneity.

4. Estimates slope parameter of the Random Effect model by MLE calling program `Toest_REMix.ado`.
5. Estimates AME for the three different models calling program `Toest_AMEfet4.ado`.
6. Using the estimates from all simulated samples, it calculates the means and standard deviations of the estimators, which are presented in rows *NoUH(-1)* and *NoUH(+1)* in Table 1 of the paper.

`Simul_TrueRE_vsRE.do` – This Stata do file:

1. Simulates data from the DGP with Finite Mixture unobserved heterogeneity: DGPs *FinMix(-1)* and *FinMix(+1)*.
2. Estimates slope parameter of the Fixed Effect model by CMLE calling program `allToest_bCMLE.ado`.
3. Estimates slope parameter of the model without unobserved heterogeneity.
4. Estimates slope parameter of the Random Effect model by MLE calling program `Toest_REMix.ado`.
5. Estimates AME for the three different models calling program `Toest_AMEfet4.ado`.
6. Using the estimates from all simulated samples, it calculates the means and standard deviations of the estimators, which are presented in rows *FinMix(-1)* and *FinMix(+1)* in Table 1 of the paper.

`Simul_TrueFE_vsRE.do` – This Stata do file:

1. Simulates data from the DGP with Mixture of Normals unobserved heterogeneity: DGPs *MixNor(-1)* and *MixNor(+1)*.
2. Estimates slope parameter of the Fixed Effect model by CMLE calling program `allToest_bCMLE.ado`.

3. Estimates slope parameter of the model without unobserved heterogeneity.
4. Estimates slope parameter of the Random Effect model by MLE calling program `Toest_REMix.ado`.
5. Estimates AME for the three different models calling program `Toest_AMefeT4.ado`.
6. Using the estimates from all simulated samples, it calculates the means and standard deviations of the estimators, which are presented in rows *MixNor(-1)* and *MixNor(+1)* in Table 1 of the paper.

`HausmanTests_se_from_Simuls.do` – This Stata do file reads the vectors of Monte Carlo estimates and standard errors generated by the do files `Simul_TrueNoUH_vsRE.do`, `Simul_TrueRE_vsRE.do`, and `Simul_TrueFE_vsRE.do`. It then calculates the Hausman statistics along with the corresponding p-values and generates the graphs shown in Figure 1 of the paper. Naturally, this do file should be executed after running the aforementioned do files.

Instructions for replicating results:

- The provided versions of the do files implement the Monte Carlo experiments for a value of the slope parameter $\beta = 1$. To implement the corresponding Monte Carlo experiment for a value of the slope parameter $\beta = -1$, the user only needs to change code line 35 in these do files. Specifically, replace code line:

```
scalar beta=1
```

with

```
scalar beta=-1
```

- Do file `HausmanTests_se_from_Simuls.do` generating Figure 1 should be executed after running the do files `Simul_TrueNoUH_vsRE.do`, `Simul_TrueRE_vsRE.do`, and `Simul_TrueFE_vsRE.do`.

3 Descriptive Statistics from Empirical Application: Section 5.1, Table 2

The Stata datafile and the .do file for generating the transition probability matrix in Table 2 in the paper are located in the following folder:

```
/replication_package/descriptive_statistics
```

The folder contains two files:

`consumer_withprices.dta` – Stata datafile with Nielsen consumer scanner panel data provided by Susumu Imai.

`application_trans_matrix.do` – Stata .do file that reads the datafile `consumer_withprices.dta` and generates descriptive statistics including the transition probability matrix in Table 2 in the paper.

Instructions for replicating results:

- Line 25 in the code loads the data file using the following command:

```
use consumer_withprices.dta
```

Make sure to specify the full folder path where this data file is stored on your computer.

4 Estimation of Parameters and AMEs in Empirical Application: Section 5.2, Tables 3 and 4

The datafiles and code for generating the statistics in Tables 3 and 4 in the paper are located in the following folder:

```
/replication_package/application_estimates_beta_ame
```

The folder contains three files:

`generate_xls_datafile.do` – Stata `.do` files that reads that Stata datafile `consumer_withprices.dta` and generates the `.xls` file `consumer_feestimation.xls`. This Excel file is the input of the GAUSS program for the Fixed Effects estimation of slope parameters and AMEs.

`consumer_feestimation.xls` – Datafile Excel format created by `generate_xls_datafile.do`.

`fe_dyn_logit_EIKdata.gss` – GAUSS program for the Fixed Effects estimation of slope parameters and AMEs in Tables 3 and 4 in the paper. This code is self-contained as it includes all the procedures and functions called by the main program.

Instructions for replicating results:

- The program `fe_dyn_logit_EIKdata.gss` has been executed using GAUSS version 23.0. However, it should also work well in earlier versions at least up to GAUSS version 12.0.