Replication files and instructions for

"Financial Fair Play in European Football"

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To generate most of the tables and results reported in the paper we use Stata programs, supplemented by basic calculations in Excel. We use Matlab to evaluate the properties of the simulated equilibria, which are reported in the technical appendix, and to generate the randomized league outcomes for the null model reported in table 5. Below we give an overview of the files we make available and the programs to replicate our results.

Stata data files

Each country "x" folder contains three data files:

1. "x"master.dta contains game-level data for all relevant variables
2. "x"financial.dta contains the season-level data to estimate the revenue equations
3. "x"model.dta contains the results of the CSF estimation and is generated in the respective do-file.

Variables on the game level are denoted by the prefixes home_ and away_ for the home and away team respectively. The prefix "lag-" indicates the variable refers to previous season. Variables are denominated the country's respective currency. Not all countries have information on all variables. Definitions are given as:

- day: day game is played
- month: month game is played
- realyear: year game is played
- division: division of both teams
- match_id: unique identifier for each game
- res: result of game, 0 = home loss, 1= draw, 2 = home win
- year: year season t ends
- _team: name of club
- _id: unique identifier for club
- _sc: score in game
- _manten: tenure of manager in games at time of game
- _played: total number of games played in season t
- _wins: total number of games won in season t
- _draws: total number of games drawn in season t
- _losses: total number of games lost in season t
- _points: total number of points won in season t
- _pointsadj: total number of points adjusted for point penalties in season t (Italy)
- _prom: promoted at end of season t (1=yes, 0=no)
- _releg: relegated at end of season t (1=yes, 0=no)
- _notseasaccyear: accounting year corresponds to season (1=no, 0=yes)

- _notultpar: club owned by larger parent company in season t (1=yes, 0=no)
- _accmis: club accounts are missing in season t (1=yes, 0=no)
- _abb: club filed abbreviated accounts in season t (1=yes, 0=no)
- _rev: club total revenues in season t
- _revffp: club revenues excluding “non-football” income
- _wage: club total wage bill in season t
- _emp: total number of employees in season t
- _profit: accounting profit in season t
- _profffp: profit based on football activities in season t
- _profffp1: profit based on football activities in season t-1
- _profffp2: profit based on football activities in season t-2
- _cash: cash on balance sheet in season t
- _tanfixass: book value of tangible fixed assets in season t
- _totass: book value of total assets in season t
- exrate: echange rate pound to euro in season t
- rpi: retail price index in season t
- rpimulti: multiplier based on rpi to convert to 2010/11 prices

Stata do-files

To run each Stata do-file, first open Stata’s do-file editor, then adjust the current directory (cd) to your local directory, then press do-button. Each country “x” folder has 6 do-files:

1. “x” estimate CSF.do estimates the results for the CSF (table 2 in the paper). This file contains the estimation of the CSF parameters, as well as the bootstrap procedure to obtain standard errors. Note that bootstrapping may cause standard errors in replication to deviate slightly from those reported in the paper. After the estimation we calculate the productivity measures reported in table 3. This file finally provides the robustness checks on the instrument choice and effort provision described in appendix section 2.1.
2. “x” FFP OP profit.do first provides the estimation results for the revenue function in table 4 and 13. It then simulates the results for the FFP scenario using the polynomial result for equation 1 and the “profit” hypothesis, i.e. each first column in table 6 and first column in table 7. The scenarios are labeled by the year (2010 or 2011) and a number which refers to a scenario:
    a. “00”= no FFP
    b. “01” = €15m
    c. “02” = €10m
    d. “03” = €5m
    e. “04” = final

    The standard errors are obtained by bootstrapping the procedure 200 times. After the bootstrap procedure, we present full league tables for selected variables, among others the points results, which are reported in table 9, 10, 11 and 12 for the “OP win” scenario. Then we report the results from table 6 where the league average is denoted by the prefix “av-” and the standard errors by the prefix “sd-”.

3. "x" FFP FE profit.do simulates the results for the FFP scenario using the fixed effects result for equation 1 and the "win" hypothesis, i.e. each third column in table 6. The file structure is the same as above.
4. "x" FFP OP win.do simulates the results for the FFP scenario using the polynomial result for equation 1 and the "win" hypothesis, i.e. each third column in table 6 and second column in table 7. The file structure is the same as above.
5. "x" FFP FE win.do simulates the results for the FFP scenario using the fixed effects result for equation 1 and the "win" hypothesis, i.e. each fourth column in table 6. The file structure is the same as above.
6. "x" no controls result.do simulates points tables for the "no FFP" scenario with the "no controls" estimation for equation 1 to be used as a comparison in table 5.
7. "x" cap OP win.do simulates the results for the comparison with a US-style salary cap in table 8.

Matlab files

Each folder for country "x" has 6 Matlab programs:

1. "x"nullmodelsimulator.m calculates a points table for randomized game results based on the null model probabilities. These results are reported in table 5.
2. "x"equilibriumcalculator.m calculates the equilibrium from random starting values and reports the maximum deviation in points total from the reported equilibrium in the paper. For all leagues we present 1000 draws for the unrestricted case, for England we also implement cases with FFP.
3. "x"winprofitmix15m.m calculates the equilibrium values of average wage, wtto, revenues and standard deviation of points for leagues where teams are randomly assigned to the win or profit hypothesis for the "€15m" regime. Produces the graphs depicted in appendix figure 2.
4. "x"winprofitmix10m.m see above, but for "€10m" regime.
5. "x"winprofitmix5m.m see above, but for "€5m" regime.
6. "x"winprofitmixfinal.m see above, but for "final" regime.

The data input for these programs is generated in the Stata files. Two data files are required for each country "x", entitled "x".out and "x"2.out.