Replication files for: "Capital Obsolescence and Agricultural Productivity"

Empirics

The main Stata do file is "Main_Paper_Tables.do". This code calls the subroutines that produce the tables in the main paper.

- MP_Table-4 computes summary stats for the benchmark sample.
- MP_Table-5_Column_1 computes the estimates of the slope of the profile with raw data.
- MP_Table-5_Column_2 computes the estimates of the slope of the profile with data where missing hours have been imputed. It also stores the intercepts of the profile relative to the US which will be used for Tables 6 and Table 8.
- MP_Table-6 stores the estimates of the intercept.
- MP_Table-7_Column_1 is identical to MP_Table-1_Column_2.
- MP_Table-7_Column_2-5 reports the estimates of the slope and intercepts of the profile for different specifications of the sample that has been matched to crops via geolocation.
- MP_Table-7_Column_6 reports the estimates of the slope of the profile allowing for a Box-Cox transform in prices.
- MP_Table-7_Final compiles all estimates of Table 7 into a single file.
- MP_Table-8_Final compiles all estimates of Table 8 into a single file.
- MP_Table-10 generates the estimates of the elasticity of prices to labor productivity including gravity controls.

Output files: Tables 4 to 8 and Table 10 in the paper.

Accounting

The files in folder Quantitative compute the path of quality in each country, run the accounting exercises and produce corresponding statistics and figures reported in the paper. All files are coded for Matlab.

The main file is *AA_Main.m*; this program calls the following programs:

step 1: *data.m* – loads the data needed in the exercise.

step 2: *accounting.m* – computes the path of capital-embodied technology, runs the accounting exercises, and outputs the data for the tables in Sections 4, 5 and 6. Note that by setting the parameter *ptm_corr_shift=1* the script corrects for pricing to market as per Section 6.2. Also, the parameter *m_ss* allows to choose the number of years used to generate the data for the income accounting exercise.
The program calls two programs:

- *ga.m* – selects the data for all the accounting exercises and runs the growth accounting exercise. The output is saved in the file *accounting.xlsx*, sheet *growth*.
- *ia.m* – runs the income accounting exercise. The output is save in the file *accounting.xlsx*, sheet *income*.

  This program calls two sub-routines: *compute_LHS.m* and *help_ia.m*. The script *compute_LHS.m* computes the variable LHS in each country i:

$$\underbrace{\frac{\tilde{\kappa}_{it}}{N_i\Phi_{it}}\left(\frac{1}{u_i}\frac{1-\zeta(\sigma_m+\sigma_u)}{1-\zeta\sigma_u}\right)^{\frac{1}{1-\alpha_k}}}_{LHS_i}=\left[\frac{\alpha_k N_i^{\alpha_k+\alpha_n+\alpha_l-1}\left(\frac{L_i}{N_i}\right)^{\alpha_l}}{(1+g_{qi})^{1-\alpha_k}R_i-u_i e^{-\zeta}}\right]^{\frac{1}{1-\alpha_k}}.$$

  The script *help_ia.m* computes the level of embodied technology:

$$q_{\hat{j}_{i,t}}=\left(\frac{p_{\hat{j}_{i,t},i,t}(0,0)}{p_{i,t}^C}(1-\psi_i)\frac{1}{\alpha_k}\frac{(LHS_i)^{1-\alpha_k}}{\left(\frac{L_i}{N_i}\right)^{\alpha_l}N_i^{\alpha_n+\alpha_k+\alpha_l-1}}\right)^{\frac{1}{\alpha_k}},$$

  for $\psi_i \equiv \frac{(1-u_i e^{-\zeta})}{R_i(1+g_{i,q})^{1-\alpha_k}}$, detrended efficiency units per worker,

$$\underbrace{\frac{\tilde{\kappa}_{i,t}}{N_i\Phi_{it}}}_{k_starin_t}=LHS_i\left(\frac{1}{u_i}\frac{1-\zeta(\sigma_m+\sigma_u)}{1-\zeta\sigma_u}\right)^{\frac{1}{\alpha_k-1}},$$

  TFP,

$$\Phi_{it}=\frac{Y_{it}^d}{N_i}\left((q_{\hat{j}_{i,t}}k_starin_t)^{\alpha_k}N_i^{\alpha_k+\alpha_n+\alpha_l-1}\left(\frac{L_i}{N_i}\right)^{\alpha_l}\right)^{-1},$$

  and the normalized efficiency units per worker,

$$\frac{\tilde{\kappa}_{i,t}}{N_i}=k_starin_t\Phi_{it}.$$

step 3: *plots.m* – generates all the figures in the paper but figure VI.

The remaining Matlab files in the folder are sub-routines. Details are included in each of the files.