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This is the replication package for MSMS 20220547: Dynamic Gains from Trade Agreements with Intellectual Property Provisions
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Software: MATLAB R2022b
          Stata MP15
          Dynare v5.4
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Raw Data
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The raw data are in Motivation=>Data. These are the data needed to run the programs:

=> CEPII_gravity.dta
=> Development.csv
=> fdi.dta
=> Industries_trade.dta
=> INPACIT_IN_Quality_New
=> Master_Analysis.dta
=> RTA_technology.dta
=> trips.dta
=> TRIPS_Plus_formerge.dta

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Section 2: Royalty Payments and Deep Trade Agreements
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Figure 1 in Section 2 and Tables A.1. and A.2. and Figures B.1. and G.1 in the Online Appendix are constructed using the files in the folder Motivation:

=> Royalties_deeptradeagreements.do is used for the regression analysis in the Online Appendix.

   => Raw data is in folder "Data"
   => Figures are stored in "Figures"
   => Master.do creates Figure 1 in Section 2 and Tables A.1. and A.2. and Figures B.1. and G.1 in the Online Appendix

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Sections 5.1 and 5.2: Calibration and Model Validation
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In the folder "Calibration", we have all the files needed to reproducer Table 1 and Figures 2 and 3:

=> The dofile Diffusion.do creates Figure 3 and estimates the structural gravity equation for royalty payments to calibrate the diffusion parameters
   => It uses data on royalties from Santacreu (2023, RESTAT) stored in Reduced_form.dta.
=> In the folder "Gravity" I estimate the gravity equation to calibrate productivity and trade costs and reproduce Figure 2
=> The parameters that are estimated within the model using the iterative algorithm developed by Cai, Li, and Santacreu (2022, AEJ: Macroeconomics) are obtained running the codes in the folder "Codes". These parameters are betar, lambda, and epsbar to match a 1.85% growth rate, the estimated diffusion parameters epsilon, and R&D data.
    => The folder "Calibration" creates a mat file called Parameters_calibration.mat that will be used for the subsequent analysis on the design of the trade agreement and all the counterfactual exercises. There is a readme file in that folder that explains how to run the programs.

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Section 5.3: Design of Trade Agreement
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The design of the trade agreement on Table 2 is obtained by running the code Run_code.m in the folder "DesignTradeAgreement". This code calls several files:

=> To compute the initial BGP it uses:
   => Parameters.m
   => BGP_allocations
   => BGP_growth
=> To compute the final BGP it uses:
   => Parameters_counterf
   => BGP_allocations
   => BGP_growth_counterf
=> To compute the transitional dynamics between the initial and final BGP is uses Dynamic_GFT_exponents.mod

=> Need to install Dynare to be able to run the codes. I am using Dynare v5.4

=> The code generates dynamic gains from trade for the US and China for a grid over the policy parameters (tariffs and IP enforcement) and stores the results in Results_NN.mat

=> I then use findNashBargainingEquilibrium.m to load those results and find the solution of the Nash bargaining agreement using a bargaining power of 0.5
   => The code gives the position in the grid where the optimal values are
   => It also computes the welfare gains for the US and China under the optimal

agreement

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Sections 5.4 and 5.5: Counterfactuals
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=> To compute the optimal policy instruments that result from the agreement under different assumptions (i.e., Gradual, Anticipated, Nash-equilibrium, ...), I follow the same steps as previously described for Section 5.3. The codes will be in the folders:

Table 3 (bottom panel)

   => Gradual
   => Anticipated
   => Nash_equilbrium

Table I.1 in the Online Appendix
   => HigherTariffs
   => LowerTariffs
   => Low IPR
   => Lowinnoveff
   => Optimaltariff
   => PerfectIPR

=> In the folder "Counterfactuals", you can find all the programs used to produce:

   => Figure 4: Run_codes.m in the folder Counterfactuals
   => Figure 5: Run_codes.m in the folder Counterfactuals
   => Table 3: Here use the optimal policy instruments found in the different scenarios and run:

      Table 3 (upper and middle panel)

      => Baseline: Run_code.m
      => Only tariffs: Run_code_onlytrade
      => Only IPR: Run_code_onlyIPR
      => Unilateral IP reform: Run_code_domesticIPR

     Table 3 (bottom panel)

      => Nash equilibrium: Run_code_uncooperative
      => Shortsighted government: Run_code_myopic
      => China deviates: Run_code_Chinadeviates5periods
      => China deviates (retal): Run_code_Chinadeviates5periodsretal
      => Anticipated: Run_code_anticipated
      => Gradual: Run_code_gradual

   => All the figures for welfare gains under different assumptions of the agreement will be produced after running Master_run.m

=> Figure I.1. in the Online Appendix is in Run_code_mechanism.m
=> Figures J.1. and J.2. are in Figures_dynamcis.m