**Programs to Create Model Simulations**

- All the files used to make the tables and figures containing model simulations in the text are contained in the Model Simulations folder of the replication package. The files that create each of the figures and tables are marked at the beginning of the file title – F1, F2, F3, F4, F5. The tables containing simulations are T4, T5, T7, T9, T11, and T12 – each of which corresponds to a Matlab script in the folder that is clearly marked.
- The remainder of the files are necessary for the programs that create the figures and tables to be run. A brief description of each is as follows.
- The programs that begin with steady_state_simulation contain the main model simulation, which finds an equilibrium of the economy in each period and simulates the innovation process between periods. There are a number of versions of this file that correspond to different moment calculations, tables, and figures that we produce from the simulation. Each version of the file is called in a different one of the files that creates the tables and figures.
    - There are also versions for alternative specifications of the model. The files marked targeted_disembodied are for the version of the model in which idea flows are not embodied in trade, which is described in Section 2.5 (and has corresponding results shown in Figure 3 and Table 12).
- The files set_parameters, initialize_vectors, find_equilibrium, find_equilibrium_innerloop, find_equilibrium_trade_elasticity_real, and innovation_and_assignment contain the steps carried out in the main steady_state_simulation.m files. Some of these also have alternative versions – most notably innovation_and_assignment_targeted_disembodied in which knowledge flows are not embodied in trade.
- The files track_moments_within_loop and calculate_moments_after_loop calculate a variety of moments about trade, growth, and firm dynamics in the model economy. Note that many of these moments we calculated for our own understanding in the research process, but are not shown in the paper. We left the code for these in the simulation in case it is of interest to other researchers.
- The files run_annealing_para.m and sim_annealing_para.m conduct the grid searches for parameters that most closely match the moments. Note that these "homemade" algorithms can easily be replaced by a variety of pre-packaged tools available in the Matlab Global Optimization Toolbox (e.g. patternsearch, particleswarm, etc.)
- There are a few extraneous .mat files that contain matrices of different results. These matrices can be reproduced in the simulation code, but the saved versions are left in the folder for making graphs without running the most time-intensive of the simulations.
- Please note the note in set_parameters.m about how the innovation rates are defined in the code relative to the paper. In the paper, we describe unconditional probabilities of innovation. In the code, for path dependence reasons dating back to previous drafts, innovation probabilities are defined based on conditional probabilities from a sequence of innovation draws going from US incumbents to US entrants to OECD incumbents to OECD entrants. Thus, the arrival probabilities in the code have slightly different numbers than the ones in the paper, which correspond to the unconditional probabilities that map to the conditional probabilities in the program.

- The folder marked Sigma 3 robustness contains a subset of the same files in the main folder, but edited to represent the alternative version of the model which does not have Cobb-Douglas consumer preferences over all varieties. That program T4_T5 produces the target moments shown in Table 5 using the parameters from Table 4. Other moments in this version of the model can also be calculated using these scripts for any interested readers.
- The code is set up to be run in parallel, so it will work best if you run it on a server with access to multiple (ideally up to 16) parallel processors.

**Programs to Calculate Empirical Moments**

- The folder Empirical_Moments contains the datasets and code necessary to calculate the empirical moments contained in the tables, in particular in Section 4. The code to calculate these moments is contained in trademoments.do.