README: Replication Package for "Are Inflationary Shocks Regressive? A Feasible Set Approach"

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Overview

The code in this replication package provides all the necessary data cleaning and results for the paper, using MATLAB, Python, R and Stata. One configuration file and 12 scripts run all of the code in the required order (more details in the "Descriptions of programs/code" section). Figures and some Tables are exported automatically (more details in the "List of tables and programs" section). The replicator should expect the code to run for about 9.5 hours excluding the HANK model, which should take between one and two days, depending on the hardware used.

Data

This project uses multiple publicly available datasets. These are included in this package in the folder `data/raw` (and subfolders therein). Table 1 contains a summary of all the datasets included. Below are provided additional details on each one.

1. **ACM Term Premium**: This file was obtained from the Federal Reserve Bank of New York. The data is available at https://www.newyorkfed.org/research/data_indicators/term_premium.html. Last accessed: October 20, 2022.
2. **Case-Shiller Home Price Index**: This file was obtained from the Federal Reserve Bank of St. Louis FRED database. The data is available at https://fred.stlouisfed.org/series/CSUSHPISA.
3. **Excess Bond Premium**: This file is based on the methodology of Gilchrist and Zakrajšek (2012) and updated by the Federal Reserve Board. See https://www.federalreserve.gov/econres/notes/feds-

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Table 1: Raw Data Summary

Data.Name	**Data.Files**	**Location**
ACM Term Premium	ACMTermPremium.xls	`Asset Prices/`
Case-Shiller Home Price Index	CSUSHPISA.xls	`Asset Prices/`
Excess Bond Premium	ebp.csv	`Asset Prices/`
House Price Index (Quarterly)	HPI_quarterly.xls	`Asset Prices/`
Moody's Corporate Bond Yield	Moodys_Corporate_BondYield.xls	`Asset Prices/`
S&P 500 Dividend Yield	MULTPL_SP500_DIV_YIELD_MONTH.csv	`Asset Prices/`
Oil Prices	oil.xls	`Asset Prices/`
S&P 500 Index Value (CRSP)	sp500_index_value_CRSP.xlsx	`Asset Prices/`
Treasury Rates	Treasury_Rates.xlsx	`Asset Prices/`
CEX Reduced CPI Categories	CEX_CPI_reduced_categories.xlsx	`CEX/`
CPI Code Dictionary	cpi_code_dict.csv	`CEX/`
SSA Death Probabilities	death_probabilities.xlsx	`CEX/`
CPI Code Dictionary	cpi_code_dict.csv[a]	`CPI/`
CPI EC Crosswalk	cpi_EC_crosswalk.xlsx	`CPI/`
CPI Full Dataset	cpi_full.csv	`CPI/`
CPI Prices (Wide Format)	cpi_prices_wide.dta	`CPI/`
CPI Basic Item Aggregation	cpi-basic-item-aggregation.xlsx	`CPI/`
CPI Index (CPIAUCSL)	CPIAUCSL_index.xls	`CPI/`
CPS Extract	cps_raw.dta[b]	`CPS/`
Consumer Expenditure Survey (Interview)	Multiple files[c]	`CEX/interview`
Behavioral Elasticities	behavioral_elasticities.xlsx	`Elasticities/`
NHTS 2017 (person file)	perpub.csv	`NHTS/`
NHTS 2017 (vehicle file)	vehpub.csv	`NHTS/`
SCF 2010 (summary extract)	rscfp2010.dta	`SCF/`
SCF 2013 (summary extract)	rscfp2013.dta	`SCF/`
SCF 2016 (summary extract)	rscfp2016.dta	`SCF/`
SCF 2019 (summary extract)	rscfp2019.dta	`SCF/`
SCF 2010 (main survey)	scf2010.dta	`SCF/`
SCF 2013 (main survey)	scf2013.dta	`SCF/`
SCF 2016 (main survey)	scf2016.dta	`SCF/`
SCF 2019 (main survey)	scf2019.dta	`SCF/`
SIPP 2018	pu2018.dta	`SIPP/`
SIPP 2019	pu2019.dta	`SIPP/`
SIPP 2020	pu2020.dta	`SIPP/`
SIPP 2021	pu2021.dta	`SIPP/`
Kaenzig (2020) raw data	dataBaseM.csv	`TimeSeries/`
GK Updated Series	GK_FRED_updated.xlsx	`TimeSeries/`
GSS Raw Data	GSSrawdata.xlsx	`TimeSeries/`
Mortgage Debt Outstanding	Mortgage_Debt_Outstanding_Effective_Interest_Rate.xlsx	`TimeSeries/`
Quarterly TFP	quarterly_tfp.xlsx	`TimeSeries/`

a: This file appears in both the CEX and CPI folders.
b: See full variable description in the text for details on CPS extract contents.
c: Multiple interview files included; see documentation section for details.

notes/updating-the-recession-risk-and-the-excess-bond-premium-20161006.html. Last accessed: October 14, 2022.

4. **House Price Index (Quarterly)**: This file was obtained from the Federal Reserve Bank of St. Louis FRED database. See the file header for the corresponding mnemonics.

5. **Moody's Corporate Bond Yield**: This file was obtained from the Federal Reserve Bank of St. Louis FRED database. See the file header for the corresponding mnemonics.

6. **S&P 500 Dividend Yield**: Historical S&P 500 Dividend Yields by month. Provided by MULTPL.com at https://www.multpl.com/s-p-500-dividend-yield. Last accessed: October 19, 2022

7. **Oil Prices**: This file was obtained from the Federal Reserve Bank of St. Louis FRED database. See the first sheet of the Excel document for details.

8. **S&P 500 Index Value (CRSP)**: Data obtained from the Center for Research in Security Prices (CRSP). Access requires subscription.

9. **Treasury Rates**: This file was obtained from the Federal Reserve Bank of St. Louis FRED database. See the file header for details.

10. **CEX Reduced CPI Categories**: This file is based on category mappings described in Orchard (2022), provided after request.

11. **CPI Code Dictionary**: A crosswalk of CPI item codes used throughout the replication package. This file was created by the authors.

12. **SSA Death Probabilities**: Derived from U.S. Social Security Administration actuarial life tables. See https://www.ssa.gov/oact/STATS/table4c6.html. Rates correspond to those in 2019. Last accessed: March 3, 2023.

13. **CPI EC Crosswalk**: Crosswalk that maps paper's baseline CPI aggregation to finer CPI categories. Created by coauthors from the publicly available CPI documentation.

14. **CPI Full Dataset**: Raw CPI data compiled from BLS files (see https://download.bls.gov/pub/time.series/cu/). Preprocessed into tidy format.

15. **CPI Prices (Wide Format)**: A reshaped version of the CPI data for convenient analysis. Constructed using BLS files.

16. **CPI Basic Item Aggregation**: Excel file containing nesting for the CPI Major Group, Expenditure Class, Item Stratum, Entry Level Item, and Item Title. Taken from BLS public files.

17. **CPI Index (CPIAUCSL)**: All-Items Consumer Price Index for All Urban Consumers (seasonally adjusted). Retrieved from https://fred.stlouisfed.org/series/CPIAUCSL.

18. **CPS Extract**: Microdata from the Current Population Survey obtained through IPUMS. This extract contains all "basic monthly" CPS samples from January 1976 to May 2022. Variables include `YEAR` (survey year), `MONTH`, household identifiers like `SERIAL` and `HRHHID`, household weights (`HWTFINL`), and geographic indicators such as `STATEFIP` and `METFIPS`. Person-level variables include demographics (`AGE`, `SEX`, `RACE`), employment (`EMPSTAT`, `OCC`, `IND`), education (`EDUC`), and earnings information such as `HOURWAGE`, `EARNWEEK`, and usual hours worked (`UHRSWORKORG`, `WKSWORKORG`). Longitudinal linking variables like `CPSID`, `CPSIDP`, and `CPSIDV` are also included.

19. **Consumer Expenditure Survey (Interview)**: The subfolder `CEX/interview` contains multiple files from the Public Use Micro Data files (PUMD) of the Consumer Expenditure Survey (CEX), interview section. This data is freely available from the Bureau of Labor Statistics (BLS) at https:

//www.bls.gov/cex/pumd.htm. The included files are identical to the ones available on the BLS website and cover the years 1990-2021.

20. **Behavioral Elasticities**: Excel file containing behavioral elasticities used for computing welfare effects using the second order approximation. The file indicates the values of these elasticities, as well as the reference from which the value is chosen.
21. **NHTS 2017 (person and vehicle files)**: Data from the National Household Travel Survey 2017, accessed via https://nhts.ornl.gov/.
22. **SCF (2010–2019 summary and full)**: Survey of Consumer Finances files, downloaded from the Federal Reserve Board. See https://www.federalreserve.gov/econres/scf-previous-surveys.htm.
23. **SIPP (2018–2021)**: Survey of Income and Program Participation panel files, accessed from the U.S. Census Bureau. See https://www.census.gov/programs-surveys/sipp/data/datasets.html.
24. **Kaenzig (2020)**: Monthly macro data taken from the replication files of Kaenzig (2020).
25. **GK Updated Series**: Updated Gertler & Karadi (2015) data retrieved from FRED. See the header for the mnemonics.
26. **GSS Raw Data**: Updated surprises data of Gürkaynak, Sack, and Swanson (2005). Taken from the replication files of Gürkaynak, Karasoy-Can, & Lee (2022) (See URLhttp://www.bilkent.edu.tr/~refet/GKL_replication.zip).
27. **Mortgage Debt Outstanding**: Downloaded from CEIC data (may require a subscription). See the URL https://www.ceicdata.com/en/united-states/mortgage-interest-paid/mortgage-debt-outstanding-effective-interest-rate.
28. **Quarterly TFP**: Updated quarterly total factor productivity using the methodologies of Basu, Fernald, and Kimball (2006) maintained by the Federal Reserve Bank of San Francisco (See https://www.frbsf.org/research-and-insights/data-and-indicators/total-factor-productivity-tfp/).

Computational requirements

Software Requirements

The code in this replication package was written in multiple languages, including MATLAB, Python, R and Stata. A brief description is below.

- MATLAB: Run on MATLAB R2024a.
  - Requires the Econometrics, Parallel Computing, and the Statistics and Machine Learning toolboxes.
- Python
  - Two options: can either run `2A_HANK_Notebook.ipynb` using a Jupyter Notebook running Python 3.7 (ipykernel), or submit `2A_HANK_batch.py` to a compute node using an amended version of `submit_two_asset_hank.slurm`. The former option will permit seeing the output as it is produced in a clean way, while the latter will be faster. We recommend installing the Anaconda python distribution.
  - Several packages are required, as listed below and called at the beginning of the program:
    - `os`, `numpy`, `numba`, `time`, `matplotlib`, `scipy`, `xlrd`. These packages are all included in the standard Anaconda distribution.

    * `sequence-jacobian`. This is the only non-standard package. It can be downloaded from https://github.com/shade-econ/sequence-jacobian and installed following the instruction listed there. Credit to Auclert et al. (2021).

- R: Run on R 4.3.2. Requires the following packages:
  - `seasonal, foreign, zoo, tidyverse, readxl,` and `rstudioapi`.
- Stata (code was last run with StataNow, version 18.5). Requires the following commands:
  - `ereplace` (Available from SSC).
  - `texdoc` (available from SSC).
  - `labmask` (run `net install gr0034.pkg`).
  - `colorpalette` (run `net install gr0075.pkg`)
  - `filelist` (available from SSC).
  - `distinct` (run `net install dm0042_5.pkg`)

Memory, Runtime, Storage Requirements

Excluding the HANK model, the full time needed to reproduce all the results is approximately 9.5 hours. The HANK model takes approximately 1-2 days to run from a Jupyter Notebook, depending on the computer's resources, and somewhat less time if run via the batch script submitted to a server. After the code finishes and all figures and intermediate datasets are created, the total size of the package is approximately 50 GB. The code was last run on multiple computers:

- Code in `0_DataCleaning` and `3_WelfareEffects` were run on a 2020 M1 MacBook Pro with 16 GB of RAM and 512 GB of storage.
- Code in `1_ImpulseResponses` was run on a 2023 M3 MacBook Pro with 36 GB of RAM and 1 TB of storage.
- Code in `4_HANK_Model` was run on a Dell OptiPlex7090 x64-based PC, featuring an Intel Core i7-10700K CPU with 8 Cores and 64GB of RAM.

Description of programs/code

- Programs in `Programs/0_DataCleaning` process the data from each survey to construct the final dataset for computing welfare effects, as well as some of the output related to the cross-sectional data and some inputs for estimating the impulse-response functions. The file `0_master_DataCleaning.do` in this folder runs the programs in each subfolder. These subfolders contain individual programs for each survey, which are ran by the previously mentioned file.
- Programs in `Programs/1_ImpulseResponses` seasonally adjusts and estimates time series impulse responses. The file `1_SeasonalAdjustment/0_masterSA.R` runs the R seasonal adjustment routines in sequence. The IRF estimation files are to be run in sequence (1a, 1b, 1c, 2, 3, and 4). If desired, file 5 produces Figure C1 and is to be run *after* the programs in `Programs/3_WelfareEffects`.
- Programs in `Programs/3_WelfareEffects` use the cross-sectional data, together with the IRFs to compute welfare effects and produce the figures and tables related to them. The file `0a_master_WelfareEffects.do` in this folder runs all the files.
- Programs in `Programs/4_HANK_Model` produce the results from Section 9 and Appendix E.

Instructions to Replicators

The following steps must be followed in order so the programs work properly. All locations are relative to the `Programs` folder.

1. Edit the `REPLICATION_PACKET_DIR` global in `__config.do` so it matches the path to the `Replication_Packet` folder. Then run the file.
2. Run `0_DataCleaning.do` once.
3. Run `1_ImpulseResponses/1_SeasonalAdjustment/0_masterSA.R` once. Set the current working directory to `1_ImpulseResponses/1_SeasonalAdjustment/`.
4. Run files 1a, 1b, 1c, 2, 3, and 4 in directory `1_ImpulseResponses/2_Estimate IRFs/` once in sequence. For each file, set the current working directory to `1_ImpulseResponses/2_Estimate IRFs/`.
5. Run `3_WelfareEffects/0a_master_WelfareEffects.do` once.
6. Run file 5 in directory `1_ImpulseResponses/2_Estimate IRFs/`, setting the current working directory to `1_ImpulseResponses/2_Estimate IRFs/`.
7. Run `4_HANK_Model/2A_HANK_NoteBook.ipynb` (or submit `2A_HANK_batch.py` to a server via `submit_2A_HANK.slurm`) once. Note one must change the first line defining the variable `replication_dir` to be the location where the replication packet is stored on your machine.
8. Run `4_HANK_Model/create_results_dataset.do` once. Note you will need to change line 6 defining the global macro `replication_dir` to be the location where the replication packet is stored on your machine.

List of tables and programs

The provided code reproduces all tables and figures in the paper, as well as the numbers in the text. Regarding the latter, these are obtained from some of the excel files outputted by the programs. Some tables and figures are produced by the same program, using different datasets. Table 2 below summarizes the relationship between the tables and figures and the programs that produce them, for the main text. Table 3 repeats the same exercise for the tables in the appendix. Finally, Tables 5, 6 and 7 summarize the same information for the figures in appendices E, F and G, respectively

As mentioned in the summary tables, some of the tables in the paper are manually constructed from different scripts and output files. Below is a detailed explanation for these particular tables.

- Table 1: All numbers in this table, with the exception of the "Project No-Shock Choices" are obtained from a file named `educ_groups_welfare_loss_byAgeEduc.xlsx`. For the first three columns, this file is located under `Results/Tables/Welfare Change/irfs_excel_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)/baseline`.
  For the last three columns the file is located under `Results/Tables/Welfare Change/irfs_excel_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)/baseline`.
  The specific numbers in each row are obtained as follows:
  - "Baseline": Percentage of consumption value is obtained from the column `total_welfare_loss_c`. Dollar values are obtained from the column `total_welfare_loss`. Both numbers are rounded to the corresponding number of decimals.
  - "Second order": Percentage of consumption values are obtained as the sum of columns `total_welfare_loss_c` and `total_welfare_loss_secondOrder_c`. The dollar values are

the sum of the columns `total_welfare_loss` and `total_welfare_loss_secondOrder`. Both numbers are rounded to the corresponding number of decimals.

  - "Asset Values in Utility Function": Percentage of consumptions values are obtained from the column `total_welfare_loss_asset_value_c`. Dollar values are obtained from the column `total_welfare_loss_asset_value`. Both numbers are rounded to the corresponding number of decimals.
  - "Long-Run Welfare Effects": Percentage of consumption values are obtained from the column `total_welfare_loss_long_run_c`. Dollar values are obtained from the column `total_welfare_loss_long_run`. Both numbers are rounded to the corresponding number of decimals.

  Numbers in the row "Project No-Shock Choices" are obtained from an indetically named file located under the `project no shock choices` subfolder, instead of `baseline`. Percentage of consumption values are obtained from the column `total_welfare_loss_c` and the dollar values are obtained from the column `total_welfare_loss`. Both numbers are rounded to the corresponding number of decimals. All these files are generated by the program `3_WelfareEffects/4_produce_output`.

- Table 2: Numbers are produced by `4_HANK_Model/2A_HANK_NoteBook.ipynb`. The numbers are contained in Results/HANK_ModelOutput/2A_HANK_Comparison_Stats_monetary.csv (Panel A) and Results/HANK_ModelOutput/2A_HANK_Comparison_Stats_TFP.csv (Panel B).
- Table 3: Numbers in both "Data" columns (2 and 4) are produced by the program `3_WelfareEffects/4d_HANK_model_comparisons`. Rows "Mean Value Change", "SD Total Value Change", "Mean Labor Income Effect", "Mean Portfolio Effect", and "Mean Conumption + Transfer Channel" are obtained from the files `oil_welfare_change_summary_statistics_byAgeEduc.xlsx` (for the Oil Shock column) and `monetary_welfare_change_summary_statistics_byAgeEduc.xlsx` (for the Monetary Shock column). Regressivity coefficients in the last three rows of the table are obtained from the files `oil_regression_coefficients_byAgeEduc.xlsx` (for the Oil Shock column) and `monetary_regression_coefficients_byAgeEduc.xlsx` (for the Monetary Shock column). All numbers correspond to the "weighted" rows. All these files are located under `Results/Tables/Welfare Change`.

  All numbers from the "Model" columns (1 and 3) are produced by `4_HANK_Model/create_results_dataset.do` after running `4_HANK_Model/2A_HANK_NoteBook.ipynb`. The numbers will be contained in the log file entitled `Model_Results_Production.log` in the `Results/HANK_ModelOutput/` directory.
- Tables B1 and B2: These tables are constructed manually using blocks produced by the code. Panels are produced in order from the files `CEX_summary_statistics.tex`, `CPS_summary_statistics.tex`, `SCF_summary_statistics.tex`, and `SIPP_summary_statistics.tex`, respectively. These files are produced by the following programs:
  - `CEX_summary_statistics.tex`: `0_DataCleaning/1_CEX/2b_create_summary_table.do`
  - `CPS_summary_statistics.tex`: `0_DataCleaning/2_CPS/2b_create_summary_table.do`
  - `SCF_summary_statistics.tex`: `0_DataCleaning/3_SCF/3b_create_summary_table.do`
  - `SIPP_summary_statistics.tex`: `0_DataCleaning/4_SIPP/2b_create_summary_table.do`
- Table B3: Manually constructed by coauthors using publicly available tables from the BLS.
- Table B4: Manually constructed by coauthors using publicly available from the CPS.
- Table B5: Manually constructed by coauthors using publicly available data from the sources listed in the Source column.

- Table F1: This table is constructed manually using blocks produced by the code. "Oil Supply Shock" columns are obtained from the file `oil_table.tex`, while the "Monetary Policy Shock" columns are obtained from the file `monetary_table.tex`. Both files are produced by the program `3_WelfareEffects/4a_paper_tables.do` and are located under `Results/Tables`.

References

Auclert, A., Bardóczy, B., Rognlie, M., & Straub, L. (2021). Using the Sequence-Space Jacobian to Solve and Estimate Heterogeneous-Agent Models. Econometrica, 89(5), 2375-2408. https://doi.org/10.3982/ECTA17434

Orchard, Jacob. (2022) Cyclical Demand Shifts and Cost of Living Inequality. https://github.com/JakeOrchard/CDS-Public

Table 2: List of Tables and Figures in the main text, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	Program File	Output File
Table 1	Multiple files[a]	Manually constructed
Table 2	Multiple files[a]	Manually constructed from `4_HANK_Model/2A_HANK_NoteBook.ipynb` output
Table 3	Multiple files[a]	Manually constructed from `4_HANK_Model/2A_HANK_NoteBook.ipynb` output
Figure 1-A	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/log_real_WTI.pdf`
Figure 1-B	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/log_cpiCUUR0000SA0.pdf`
Figure 1-C	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/DGS1.pdf`
Figure 1-D	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_customboundslog_cpiCUUR0000SA0.pdf`
Figure 2-A	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/coefplot/coefplot_shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12/group=2/h=24.pdf`
Figure 2-B	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/coefplot/coefplot_shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12/group=2/h=24.pdf`
Figure 3-A	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/lnearnweek1_mean.pdf`
Figure 3-B	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/lnearnweek1_mean.pdf`
Figure 3-C	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/lnearnweek2_mean.pdf`
Figure 3-D	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/lnearnweek2_mean.pdf`
Figure 3-E	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/lnearnweek3_mean.pdf`
Figure 3-F	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/lnearnweek3_mean.pdf`
Figure 4-A	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/coefplot/coefplot_shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12/group=1/h=24.pdf`
Figure 4-B	`1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m`	`Results/Figures/IRF/coefplot/coefplot_shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12/group=1/h=24.pdf`
Figure 5-A	`0_DataCleaning/1_CEX/6c_base_expenditure_lifecycle.do`	`Results/Figures/base_consumption.pdf`
Figure 5-B	`0_DataCleaning/1_CEX/5a_expenditure_shares_output.do`	`Results/Figures/oilShockShares_main.pdf`
Figure 6-A	`0_DataCleaning/4_SCF/3c_portfolio_composition_output.do`	`Results/Figures/asset_shares_by_age_group.pdf`
Figure 6-B	`0_DataCleaning/4_SCF/3d_accumulation_patterns.do`	`Results/Figures/lifecycle_accumulation_equity.pdf`
Figure 6-C	`0_DataCleaning/4_SCF/3d_accumulation_patterns.do`	`Results/Figures/lifecycle_accumulation_housing.pdf`
Figure 6-D	`0_DataCleaning/4_SCF/3d_accumulation_patterns.do`	`Results/Figures/lifecycle_accumulation_non_corporate_bonds.pdf`
Figure 7-A	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/oil_welfare_change_ConsumptionChannel_c_byAgeEduc.pdf`
Figure 7-B	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/oil_welfare_change_LaborIncomeChannel_c_byAgeEduc.pdf`
Figure 7-C	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/oil_welfare_change_PortfolioChannel_c_byAgeEduc.pdf`
Figure 7-D	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/oil_welfare_change_c_byAgeEduc.pdf`
Figure 8-A	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/monetary_welfare_change_ConsumptionChannel_c_byAgeEduc.pdf`
Figure 8-B	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/monetary_welfare_change_LaborIncomeChannel_c_byAgeEduc.pdf`
Figure 8-C	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/monetary_welfare_change_PortfolioChannel_c_byAgeEduc.pdf`
Figure 8-D	`3_WelfareEffects/4b_welfare_output.do`[b]	`Results/Figures/Welfare Change/monetary_welfare_change_c_byAgeEduc.pdf`
Figure 9-A	`3_WelfareEffects/4f_idiosyncratic_risk_output.do`	`Results/Figures/Welfare Change/oil_baseline_v_fullIdRisk_byAgeEduc.pdf`
Figure 9-B	`3_WelfareEffects/4f_idiosyncratic_risk_output.do`	`Results/Figures/Welfare Change/monetary_baseline_v_fullIdRisk_byAgeEduc.pdf`
Figure 9-C	`3_WelfareEffects/4e_borrowing_constraints_output.do`	`Results/Figures/Welfare Change/oil_baseline_v_fullBC_c_byAgeEduc.pdf`
Figure 9-D	`3_WelfareEffects/4e_borrowing_constraints_output.do`	`Results/Figures/Welfare Change/monetary_baseline_v_fullBC_c_byAgeEduc.pdf`
Figure 10-A	`4_HANK_Model/create_results_dataset.do`	`Results/HANK_ModelOutput/Figures/Model_dV_Validation_Monetary.pdf`
Figure 10-B	`4_HANK_Model/create_results_dataset.do`	`Results/HANK_ModelOutput/Figures/Model_dV_Validation_TFP.pdf`

a: See the text for details.

b: This program produces multiple output depending on the input data.

Table 3: List of Tables in the appendix, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	**Program File**	**Output File**
Table B1	Multiple files[a]	Multiple files[a]
Table B2	Multiple files[a]	Multiple files[a]
Table B3	Multiple files[a]	Manually constructed
Table B4	Multiple files[a]	Manually constructed
Table B5	Multiple files[a]	Manually constructed
Table F1	`3_WelfareEffects/4a_paper_tables.do`	Multiple files[a]

a: See the text for details.

Table 4: List of Figures in Appendix C, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	Program File	Output File
Figure C1-A	1_ImpulseResponses/2_Estimate IRFs/file_5_appendix_compareblockuncorr.m	Results/Figures/IRF/CILengthComparison/shock=oil_tran=none_control=oilVAR_window=1999M1-2017M12_estType=internalVAR_p=12.pdf
Figure C1-B	1_ImpulseResponses/2_Estimate IRFs/file_5_appendix_compareblockuncorr.m	Results/Figures/IRF/CILengthComparison/shock=GK_tran=none_control=MPVAR_window=1999M1-2017M12_estType=internalVAR_p=12.pdf

Table 5: List of Figures in Appendix E, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	**Program File**	**Output File**
Figure E1-A	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_shocks.pdf
Figure E1-B	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_dws.pdf
Figure E1-C	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_drb.pdf
Figure E1-D	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_dra.pdf
Figure E1-E	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_dn.pdf
Figure E1-F	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_IRF_dtax.pdf
Figure E2	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_Theta_dist.pdf
Figure E3-A	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/Monetary/3Dplot_BackwardInduct_MM_percC_enum0_baseline.pdf
Figure E3-B	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/TFP/3Dplot_BackwardInduct_MM_percC_enum0_baseline.pdf
Figure E3-C	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/Monetary/3Dplot_BackwardInduct_MM_percC_enum1_baseline.pdf
Figure E3-D	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/TFP/3Dplot_BackwardInduct_MM_percC_enum1_baseline.pdf
Figure E3-E	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/Monetary/3Dplot_BackwardInduct_MM_percC_enum2_baseline.pdf
Figure E3-F	4_HANK_Model/2A_HANK_NoteBook.py	Results/HANK_ModelOutput/Figures/Baseline/TFP/3Dplot_BackwardInduct_MM_percC_enum2_baseline.pdf
Figure E4-A	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_dV_vs_lnc_Calibrated_TFP.pdf
Figure E4-B	3_WelfareEffects/4d_HANK_model_comparisons.do	Results/Figures/Welfare Change/oil_regressivity_plot_byAgeEduc.pdf
Figure E4-C	4_HANK_Model/create_results_dataset.do	Results/HANK_ModelOutput/Figures/Model_dV_vs_lnc_Calibrated_Monetary.pdf
Figure E4-D	3_WelfareEffects/4d_HANK_model_comparisons.do	Results/Figures/Welfare Change/monetary_regressivity_plot_byAgeEduc.pdf

a: See the text for details.
b: This program produces multiple output depending on the input data.

Table 6: List of Figures in Appendix F, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	Program File	Output File
Figure F1-A	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/log_cpiCUUR0000SETB.pdf
Figure F1-B	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/log_cpiCUUR0000SAH2.pdf
Figure F2-A	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/returns_capital.pdf
Figure F2-B	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/log_dividends.pdf
Figure F2-C	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/CSUSHPISA.pdf
Figure F2-D	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=oil_tran=none_control=oilVAR_window=NaT_estType=internalVAR_p=12)_custombounds/DAAA.pdf
Figure F3-A	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/returns_capital.pdf
Figure F3-B	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/log_dividends.pdf
Figure F3-C	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/CSUSHPISA.pdf
Figure F3-D	1_ImpulseResponses/2_Estimate IRFs/file_3_plot_IRFs.m	Results/Figures/IRF/irfs/irfs_all (shock=GK_tran=none_control=MPVAR_window=shockSample_estType=internalVAR_p=12)_custombounds/DAAA.pdf
Figure F4-A	0_DataCleaning/4_SCF/3d_accumulation_patterns.do	Results/Figures/total_accumulation_all_assets.pdf
Figure F4-B	0_DataCleaning/4_SCF/3d_accumulation_patterns.do	Results/Figures/total_accumulation_equity_bonds_housing.pdf
Figure F5-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_TransfersChannel_c_byAgeEduc.pdf
Figure F5-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_TransfersChannel_c_byAgeEduc.pdf
Figure 6-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_ConsumptionChannel_byAgeEduc.pdf
Figure 6-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_LaborIncomeChannel_byAgeEduc.pdf
Figure 6-C	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_PortfolioChannel_byAgeEduc.pdf
Figure 6-D	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_byAgeEduc.pdf
Figure 7-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_ConsumptionChannel_byAgeEduc.pdf
Figure 7-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_LaborIncomeChannel_byAgeEduc.pdf
Figure 7-C	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_PortfolioChannel_byAgeEduc.pdf
Figure 7-D	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_byAgeEduc.pdf
Figure F8-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_difference_p_value_byAgeEduc.pdf
Figure F8-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_difference_p_value_byAgeEduc.pdf
Figure F9-A	Programs/0_DataCleaning/1_CEX/7b_idiosyncratic_risk_output.do	Results/Figures/theta_W_lowess.pdf
Figure F9-B	Programs/0_DataCleaning/1_CEX/7b_idiosyncratic_risk_output.do	Results/Figures/theta_Port_lowess.pdf
Figure F9-C	Programs/0_DataCleaning/1_CEX/7b_idiosyncratic_risk_output.do	Results/Figures/theta_T_lowess.pdf
Figure F10-A	Programs/0_DataCleaning/1_CEX/4e_output_wedges	Results/Figures/lifecycle tau.pdf
Figure F10-B	Programs/0_DataCleaning/4_SCF/3e_borrowing_constraint_output.do	Results/Figures/constrained share by group.pdf
Figure F11-A	3_WelfareEffects/4c_long_run_welfare_output.do[b]	Results/Figures/Welfare Change/oil_long_run_welfare_change_c_byAgeEduc.pdf
Figure F11-B	3_WelfareEffects/4c_long_run_welfare_output.do[b]	Results/Figures/Welfare Change/oil_long_run_welfare_change_c_byChannel_byAgeEduc.pdf
Figure F11-C	3_WelfareEffects/4c_long_run_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_long_run_welfare_change_c_byAgeEduc.pdf
Figure F11-D	3_WelfareEffects/4c_long_run_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_long_run_welfare_change_c_byChannel_byAgeEduc.pdf
Figure F12-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_byAgeIncome5.pdf
Figure F12-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_byChannel_byAgeIncome5.pdf
Figure F12-C	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_byAgeIncome5.pdf
Figure F12-D	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_byChannel_byAgeIncome5.pdf
Figure F13-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_byAgeEduc.pdf
Figure F13-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_SCF_2016_byAgeEduc.pdf
Figure F13-C	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_SCF_2013_byAgeEduc.pdf
Figure F13-D	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/oil_welfare_change_c_SCF_2010_byAgeEduc.pdf
Figure F14-A	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_byAgeEduc.pdf
Figure F14-B	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_SCF_2016_byAgeEduc.pdf
Figure F14-C	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_SCF_2013_byAgeEduc.pdf
Figure F14-D	3_WelfareEffects/4b_welfare_output.do[b]	Results/Figures/Welfare Change/monetary_welfare_change_c_SCF_2010_byAgeEduc.pdf

a: See the text for details.

b: This program produces multiple output depending on the input data.

Table 7: List of Figures in Appendix G, with associated programs and output files. Program files are relative to the `Programs` folder.

Output	**Program File**	**Output File**
Figure G1-A	`0_DataCleaning/1_CEX/7b_idiosyncratic_risk_output.do`	`Results/Figures/theta_W_lowess.pdf`
Figure G1-B	`0_DataCleaning/1_CEX/7b_idiosyncratic_risk_output.do`	`Results/Figures/theta_W_nu2_lowess.pdf`