

# Structural Change in Investment and Consumption – A Unified Analysis

## Replication and data files

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### 1 Introduction

This file first describes how to construct the file `Data-MainDatabase.dta`, which is used to obtain the empirical results and to generate the graphs in the paper. Secondly, it describes the files that generate the results and the graphs.

The folder `rawdata` contains the raw data sources which are needed for the construction of the file `Data-MainDatabase.dta`. Although these data are all publicly available, they provided for convenience. The folder `data` contains various Stata `do` files which use the raw data files, and download additional publicly available data to generate `Data-MainDatabase.dta`. Finally, the folder `paper` contains the Stata `do` files which use `Data-MainDatabase.dta` to estimate the preference parameters, calculate TFPs, generate graphs, and check the assumptions.

### 2 Construction of `Data-MainDatabase.dta`

#### 2.1 Publicly available data provided with the paper

The folder `rawdata` contains the data files provided with the paper for convenience although they are publicly available. These data are:

- The “Use–Make Tables” from the Bureau of Economic Analysis (BEA) for the construction of consumption and investment value added in Stata format.

<code>IOMakeBeforeRedefinitions1947-1962.dta</code>	(46 industries)
<code>IOMakeBeforeRedefinitions1963-1996.dta</code>	(65 industries)
<code>IOMakeBeforeRedefinitions1997-2017.dta</code>	(71 industries)
<code>IOUseBeforeRedefinitions1947-1962.dta</code>	(46 industries)
<code>IOUseBeforeRedefinitions1963-1996.dta</code>	(65 industries)
<code>IOUseBeforeRedefinitions1997-2017.dta</code>	(71 industries)

- Industry codes and names from the BEA used for labelling industries in the various data files.

naics.xlsx

- KLEMS data for the USA 1947–2014 from the WORLD KLEMS web site, March 2017 release provided in Stata format.

usa\_wk\_mar\_2017.dta

This data set has 65 industries. They can be aggregated to 46 industries to be consistent with the input–output tables for the period 1947–1962. The data set is consistent with the input–output tables for the period 1963–1996. Finally, it is consistent with the input–output tables for the period 1997–2017 once one aggregates the 71 industries into 65.

In addition to the original data on WORLD KLEMS website, this file includes value added in current prices and in 2009 prices. The current-price value added data are obtained by subtracting current-price intermediate inputs from current-price gross outputs. The value-added quantities result by using the growth rates (in log differences) of the value added quantities. We obtain them by applying the Törnqvist index to the growth rates of the quantities of output and of intermediate inputs.

- The integrated industry-level production account of the BEA (BEA-BLS KLEMS) provided in Stata format.

BEA-BLS-industry-level-production-account-1998-2017.dta

In addition to the original BEA data, the Stata file also includes capital and labour services for each industry which were obtained by aggregating of the different types of capital and labour services with the Törnqvist index.

This data set has 63 industries. The difference between the 63 industries of this data set and 65 industries in the WORLD KLEMS is government industries. The BEA-BLS KLEMS dataset includes two government industries, “federal government” and “state and local government”. In contrast, the WORLD KLEMS disaggregates each of these two industries further into general government and government enterprises.

## 2.2 Stata files generating Data-MainDatabase.dta

The folder data contains several Stata do files that use data from the folder rawdata and download some additional data from the Bureau of Economic Analysis web site. The Stata do files can be run in any order except Data-MainDatabase.do which has to be run last.

- Data-NIPA.do downloads the full NIPA data set from the BEA web site and selects the NIPA variables including population needed for the construction of the main database. In particular, using the Fisher-index it constructs the quantity indexes for:
  - goods consumption as the aggregate of personal consumption expenditures on goods, goods exports and netting out goods imports;
  - services consumption as the aggregate of personal consumption expenditures on services, government consumption expenditure, service exports and netting out service imports;

- aggregate consumption as aggregate of GDP netting out gross fixed domestic investment.
- `Data-I0-Tables.do` splits federal and local “government gross investment, except structures” into equipment and IPP investment by assigning government investment expenditures excluding structures on the commodity “Professional, scientific, and technical services” to government IPP investment and the rest of “government investment expenditures, except structures” to government equipment investment for the period 1947–1962 and 1962–1996 to make final expenditures consistent across the three use tables.
- `Data-I0-FEValueAdded.do` calculates the value added in final consumption and investment expenditures using the input-output tables generated by `Data-I0-Tables.do`.
- `Data-WORLDKLEMS.do` performs two tasks. First, it combines information from the Integrated Industry-Level Production Account of the BEA and value added data from BEA industry data to extend WORLD KLEMS data from 1947-2014 to 1947-2017. Secondly, it aggregates the quantities of value added, capital and labour inputs of 65 industries into the total economy, goods and services. In particular:
  - First, the file extends the BEA-BLS KLEMS data from 63 to 65 industries to be consistent with WORLD KLEMS 65 industry structure. The BEA-BLS KLEMS dataset includes two government industries, “federal government”, and “state and local government”. The WORLD KLEMS dataset includes four government industries, “federal general government”, “federal government enterprises”, “state and local general government”, “state and local government enterprises”. We use shares and growth rates of nominal value added of “federal government”, and “state and local government” from the BEA industry data to construct nominal and real value added for “general government” and “government enterprises” for the “federal” and “state and local” industries for 2015-2017. Absent alternatives, we assumed the growth rates of capital and labour services are the same across “general government” and “government enterprises” to obtain capital and labour inputs for all four government industries for 2015-2017.
  - Secondly, the file aggregates real value added, capital and labour inputs from the 65 industry level to goods, services, and the total economy. The aggregation is carried out using the Törnqvist index. The current price values for goods, services, and the total economy are obtained by adding up the industry values.
- `Data-MainDatabase.do` generates the main data file for the paper using the data files created by the previous Stata files.

## 2.3 Stata files generating the results and graphs in the paper

The Stata do files in this folder *must be run in the listed order* because the first three files save some results in a stata data file which is then used by the next file.

- `Estimation.do` estimates the parameters of the investment aggregator and the preferences, and saves them as variables in the Stata data file together with the fitted values. It also calculates the goodness-of-fit measures quoted in the paper.

- `TFP.do` calculates the various TFP measures we use to produce the graphs.
- `Graphs.do` produces the figures which are saved in the folder `MS25621manuscript` in eps format. All but two figures have the extension `ps`. Figure #13 and #14 have extension `eps`. This is because to produce the figure in the paper the corresponding tex files, the files `InvestmentGraph13.tex` and `InvestmentGraph14.tex` need to be run through `LATEX` and `Dvips` to produce the eps file in the paper. The two tex files use the figures #13 and #14 as inputs.
- `Assumptions.do` checks whether the conditions in Assumption 2 and 6 hold.