READ ME

1 Overview

This replication package reproduces all the results in the paper **"The Economic Dynamics of City Structure: Evidence from Hiroshima's Recovery"** (Kohei Takeda and Atsushi Yamagishi) for the *Journal of Political Economy*. The package compiles data, code, and documentation required to replicate the empirical analysis and quantitative exercises in the paper. This version of the replication package was compiled in February 2026.

Section 2 of this document describes the datasets used in the paper, including their sources, formats, and availability. Section 3 summarizes the Stata, MATLAB and R programs used to generate the results. Section 4 provides instructions for the replicator on how to run the full replication in the correct order. All references for the underlying data sources are listed at the end of this document.

2 Data Availability and Provenance Statements

2.1 Statement about Rights

We certify that the authors of the manuscript have legitimate access to and permission to use the data used in this manuscript.

2.2 License for Data

See License.txt for details.

2.3 Summary of Availability

Some datasets used in the paper cannot be made publicly available due to privacy or copyright restrictions. For these cases, we provide processed versions of the data, described in Section 2.4, which can be shared and are sufficient to fully replicate the results. Specifically:

- We cannot redistribute the original data compiled by Takezaki and Soda (2001) as we are not allowed to redistribute it.

- We are not allowed to redistribute the microdata from the Hiroshima Person-Trip Survey, provided by the Chūgoku Region Development Bureau and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). See Section 2.4.6 below for the data we provide.

However, all derived datasets used in the empirical analysis or quantitative exercise – after processing the restricted sources – are provided whenever possible. These processed datasets correspond to the files listed and described in Section 2.4.

In accordance with the *JPE* data policy, we affirm that we will preserve the restricted microdata and all associated code for at least five years following publication, and we will provide reasonable assistance to researchers seeking clarification or attempting to replicate the results to the extent permitted by the data providers. Researchers who wish to access the restricted microdata must apply directly to the original data custodians.

We provide a codebook (Codebook.csv) in the replication package.

2.4 Details on Each Data Source

The provenance, directory and availability of the datasets included in this replication package are summarized in the table below. Detailed explanations of each dataset follow the summary table. All data files are located in

```
…/data/raw data/
```

in the replication package.

Data description	Data file	Sources	Provided
(1) Main Data	popemp_33_75_cleaned6.dbf	See Section 2.4.1 in this document	YES
(2) Destruction by Atomic Bombing in Hiroshima	popemp_33_75_cleaned6.dbf 広島原爆デジタルアトラス /distance_epicenter_atlas.dta Hiroshima_Shisei_Yoran_Sengo/buildingbydistance_1946_changerate.xlsx;	See Section 2.4.2 in this document	YES
(3) Hiroshima Population, Employment, and Establishment	popemp_33_75_cleaned6.dbf; Hiroshima_Shisei_Yoran_Sengo/pop194546_schooldistrict.dta; shoko_ULURU/shoko_raw.dta	See Section 2.4.3 in this document	YES
(4) Nagasaki Population	Nagasaki/Nagasaki_poparea.xlsx	See Section 2.4.4 in this document	YES
(5) Floor Space and Land Values	1967 床面積と建築年数町別 /hiroshima67_floorspace_points2.dbf ; AR1prediction.dta landprice/Hiroshima75_landprice_blocks.dta	See Section 2.4.5 in this document	YES
(6) Trip Survey and Travel Time	commuting/bilateralflow_traveltime.dta commuting/modechoice.dta	See Section 2.4.6 in this document	NO (See Section 2.4.6)

(7) Location characteristics of Hiroshima	hiroshima_fundamental.dta	See Section 2.4.7 in this document	YES
(8) Miscellaneous Data	publichouse/pubhouse4650_bytown.dta; hiroshima67_area_h.dta others/hiroshima1950_agshare.dta ; others/addedcontrols_oct2024.dta ; newspaper/predicted_population.csv blockinfo.dta	See Section 2.4.8 in this document	YES

2.4.1 Main Data on Hiroshima

We use GIS block boundaries of Hiroshima city as of 1945, compiled by Takezaki and Soda (2001). We supplement this data with block boundary data for additional years (see Appendix A for details).

Our main dataset, `popemp_33_75_cleaned6.dbf`, merges the boundaries based on Takezaki and Soda (2001) with population, employment, and establishment data in Section 2.4.3 and the floor space and land price data in Section 2.4.5. Appendix A provides a full documentation of the data construction procedure.

2.4.2 Destruction by Atomic Bombing in Hiroshima

We use block-level measures of destruction, specifically the fraction of totally destroyed buildings, taken from *Hiroshima Genbaku Sensai-Shi* (Hiroshima City Government, 1971) and Takezaki and Soda (2001). These destruction measures are included directly in `popemp_33_75_cleaned6.dbf`. Additionally:

- Distance from the epicenter is obtained from …/広島原爆デジタルアトラス /distance_epicenter_atlas.dta.

- We also digitized the reconstruction status by building-use category from the 1946 Statistical Abstract of Hiroshima City (*Hiroshima shisei yōran*), where the number of postwar buildings is reported as of early August 1945. The building numbers are adjusted to correspond to early November 1945, when the initial population is observed. The final dataset is provided as: `buildingbydistance_1946_changerate.xlsx`.

2.4.3 Population, Establishment and Employment Data in Hiroshima

The population data are taken from the following sources:

- 1933-1936: The Statistical Handbook of Hiroshima City (*Hiroshima-shi tōkei-sho*)
- 1945-1953: The Statistical Abstract of Hiroshima City (*Hiroshima shisei yōran*)
- 1955-1975: Population Census

Note that the Statistical Abstract of Hiroshima City (1946) also reports population changes from the pre-war period to the post-bombing period in 1946, saved as: `pop194546_schooldistrict.dta`.

The establishment and employment data come from the following sources:

- 1938: The Survey of Commerce and Industry in Hiroshima City (*Hiroshima-shi shokōgyō keiei chōsa*)
- 1946: The Statistical Abstract of Hiroshima City (*Hiroshima shisei yōran*)
- 1952: The Business Directory of Hiroshima City (*Hiroshima-shi shoko nenkan*)
- 1953: The Survey on the Daytime Population of Hiroshima (*Hiroshima-shi chūkan jinkō chōsa*)
- 1957-1975: The Business Establishment Statistical Survey (*jigyōsho tōkei chōsa*)

The combined data are stored in `popemp_33_75_cleaned6.dbf`.

The Business Establishment Statistical Survey records both employment and establishment counts. The Survey on the Daytime Population of Hiroshima records employment only, while the remaining datasets report only the establishment counts. We infer employment counts following the procedure detailed in Online Appendix A.2.

Additionally, the Business Directory of Hiroshima City separately records establishment counts by sector (manufacturing and service). After anonymizing the data by eliminating the name and the exact address information that allows one to identify each establishment, the data are provided as: `shoko_raw.dta`.

2.4.4 Population Data in Nagasaki

We obtain population data for Nagasaki from The Nagasaki Atomic Bombing Damage Records: Volume 5. (1983), saved in `Nagasaki/Nagasaki_poparea.xlsx`.

2.4.5 Floor Space and Land Prices in Hiroshima

We digitized block-level floor space data from *Hiroshima toshi-iki kotsu chosa Shiryo*, which records the amount of floor space by construction year as of 1967. This allows us to observe the floor space in square meters built in six-periods: prior to 1940, 1940–1945, 1945–1950, 1950–1955, 1955–1960, and 1960–1965. Online Appendix A.2 (Floor Space) provides details on the data. These data, merged with 1966 GIS block boundaries, are provided as: `/1967` 床面

積と建築年数町別/hiroshima67_floorspace_points2.dbf.

Using these data, we back out the floor space prices for every five years from 1950 to 1965 and construct the predicted floor space prices for 1970 and 1975, stored in: /1967 床面積と建築年数町別/AR1prediction.dta. Please see Online Appendix A for more details.

The land price assessment data are taken from the 1975 Public Notice of Land Prices (kouji chika), which are provided as: /landprice/Hiroshima75_landprice_blocks.dta.

2.4.6 Trip Survey and Travel Time

We use trip-level microdata from the 1987 Hiroshima City Person-Trip Survey, administered by the Hiroshima City Government. We aggregate the microdata to the 66 "zone" bilateral trip data.

In order to calculate the travel costs between the zones, we digitize Hiroshima's road and public transportation networks in 1950 and 1987. The road data in 1950 and 1987 are taken from the Geospatial Information Authority of Japan Map. The public transportation network data in 1950 is taken from the Statistical Abstract of Hiroshima City. The 1987 public transportation map is taken from a town map published by *Shobunsha* in 1987 (Shoubunsha Area Map 1987).

We are not allowed to redistribute the microdata of the travel survey data provided by the Chūgoku Region Development Bureau and the Ministry of Land, Infrastructure, Transport and Tourism (MLIT). In our paper, we use the microdata to estimate the logit model for mode choices (See Section 5.1 in the main text and Online Appendix F.1 for details) and compute the average commuting costs between blocks. Therefore, we provide only the following estimated datasets used in the analysis:

- ../data/raw data/commuting/bilateralflow_traveltime.dta
- ../data/raw data/commuting/modechoice.dta

The first data file includes bilateral travel flows between blocks and average travel times; and the second data file contains the choice of different modes.

These files contain all the information required for replication.

2.4.7 Location Characteristics

We assemble block-level geographic and environmental characteristics from a variety of sources:

- Altitude and slope: the Digital National Land Information (*kokudo suuchi joho*) database
- Water areas: Takezaki and Soda (2001) for the pre-war period and the Basic Geospatial Information (*kokudo kihon zu*) for the post-war period
- Soil condition: the Land Classification Basic Investigation data
- Train stations in 1950: the Digital National Land Information data
- Location of Hiroshima port (*Ujina*): Google Maps
- List of cultural assets (*bunkazai*): the Hiroshima Metropolitan Area and Hiroshima Prefecture Open Data Portal Site
- Zoning regulations (1940): the 1940 Hiroshima Urban Planning Area Map (*Hiroshima toshi keikaku chiiki-zu*)
- Public housing units (1949-50): Statistical Abstract of Hiroshima City

All variables are compiled in: `hiroshima_fundamental.dta`.

2.4.8 Miscellaneous Data

Additional datasets include:

Public housing data: We digitized the block-level number of units of public housing reported in The Statistical Abstract of Hiroshima City (1949, 1950). This is saved as `/publichouse/pubhouse4650_bytown.dta`.

Agricultural employment: We digitized the share of agricultural households from The Statistical Abstract of Hiroshima City (1950). This is saved as `/others/hiroshima1950_agshare.dta`.

Habitable area: `/1967` 床面積と建築年数町別`/hiroshima67_area_h.dta` is the habitable land area as of 1967 for each city block, which is defined as the land area in our block boundary GIS data minus the green areas taken from the Digital National Land Information data.

Pre-war zoning: We digitize Hiroshima Urban Planning Area Map (1940) to define residential zones, manufacturing zones, commercial zones, and street commercial zones, which are provided in `/others/addedcontrols_oct2024.dta`.

Predicted population in the newspaper: We digitized the population predicted in the newspaper, which is recorded in *Hiroshima Shin-shi* (1983). This is used in Online Appendix H (also, see Section 3.3 in this document). Data is `/newspaper/predicted_population.csv`.

2.5 Dataset List

We now list all data files used for our analysis, describe them, provide notes, and indicate whether the data files are provided or not. To generate all data files, the replicator should run the do file:

- …/code/Stata/HIROSHIMA_DATA_MASTER.do

in Stata. All data are stored in: …/data/processed data/ within the replication package.

Data file	Description	Notes	Provided
../data/processed data/ 1933_75_popemp.dta	Population and Employment data		YES
../data/processed data/hiroshima_main_1933_75 .dta	Main data for analysis	The dataset is primarily used for running reduced-form analysis (see Section 3.1.1 of this document)	YES
../data/processed data/quant/Hiroshima_DATA.c sv	CSV format of the above data	Used in calibration (see Section 3.2 of this document)	YES
../data/processed data/quant/Hiroshima_DATA_3 km.csv	The above data for blocks within 3km from epicenter	Used in calibration	YES
../data/processed data /quant/ODtime_allmodes_bloc ks_MATLAB.csv	OD time matrix between blocks	Calculated in QGIS	YES
../data/processed data/quant/ODtime_allmodes_ blocks1950v2_MATLAB.csv	OD time matrix between blocks based on the 1950 transport network	Calculated in QGIS	YES

Other datasets in the processed data folder are auxiliary data, which are created in the section below (see Section 3.1 of this document).

2.6 Map List

We list all maps used in the main text and the Online Appendix.

Paper	Data file	Source
Figure 1 (b)	output/map/abomb_konjyaku.PNG	Subsection 2.4.1. See also the Figure footnote.
Figure A.1	output/map/1945blocks.JPG; output/map/1975blocks.JPG	Subsection 2.4.1. See also the Figure footnote.
Figure A.3	output/map/Shucchojo.jpg	Subsection 2.4.1. See also the Figure footnote.
Figure A.10	output/map/housingarea.jpg; output/map/manufacturingarea.jpg; output/map/commercialarea.jpg;	Subsection 2.4.7. See also the Figure footnote.

	output/map/rosencommercialarea.jpg	
Figure B.2 (a)	output/map/Nagasaki_map.jpg	The figure is permitted to be used by Nagasaki University. (URL: www.genken.nagasaki-u.ac.jp/abomb/pdamage_j.html)
Figure G.6	output/map/altCBD1.jpg; output/map/altCBD2.jpg; output/map/altCBD3.jpg; output/map/altCBD4.jpg	We highlight the candidate of the CBD locations in the city block boundary data (subsection 2.4.1). Train station data come from Subsection 2.4.7. See also the Figure footnote.

2.7 Software Requirements

All code in the replication package was executed using the software versions and packages listed below.

- STATA: All Stata code (see Section 3.1 of this document) was last run using Stata 17 (MP). The following user-written commands must be installed prior to running the scripts:
  - ereplace (version 1.0.3)
  - reghdfe (version 6.13.1)
  - ftools (version 2.50.0)
  - require (version 1.3.1)
  - ppmlhdfe (version 2.3.3)
  - estout (version 3.31)
  - ivreghdfe (version 1.1.4)
  - psacalc (version 2.1)
  - unique (version 1.2.4)
  - spgen (version 1.40)
  - geodist (version 1.1.0)

  All commands were last verified on 4 February 2026.

- MATLAB: MATLAB code (see Section 3.2 in this document) was last run using MATLAB 2025b.

- R: The R code (see Section 3.3 in this document) was last run using R version 4.5.2, with the following packages installed:
  - dplyr (version 1.1.4)
  - lubridate (version 1.9.4)
  - ggplot2 (version 4.0.1)
  - stringr (version 1.6.0)
  - scales (version 1.4.0)

2.8 Machine Specification

Authors use Dell Pro Max Tower T2, Intel(R) Core(TM) Ultra 7 265 (2.40GHz); 64 GB RAM

3 Descriptions of Programs/Code

This section documents the Stata, MATLAB and R programs included in the replication package. Section 3.1 summarizes the Stata code and explains the order in which files should be run to replicate all results in the paper and Online Appendix. In Section 3.2, we list the MATLAB files and explain the order in which they should be run to replicate all results in the paper and the Online Appendix. Section 3.3 describes the R code to replicate all results in Online Appendix H.

3.1 Summary of Stata code that generates results

3.1.1 Section 3 and Online Appendix A-B

The replicator should run

```
../code/Stata/HIROSHIMA_REDUCEDFORM.do
```

This master do-file produces most of the tables and figures in Section 3 and Online Appendices A and B. On a standard desktop running Stata17 (MP), the script requires approximately 1 minute.

Additional figures are produced by separate do-files listed at the end of the table. These scripts also generate auxiliary datasets used later in calibration.

Paper	Program	Output	Note
	`code/Stata/HIROSHIMA_REDUCEDFORM.do`		Master file to run and replicate the results
Table 1		output/table/ols_regtable_popdens.tex	p-values in the table are reported in Stata
Figure 2		figure/Hiroshima_pop_year.pdf; figure/Hiroshima_emp_year.pdf	
Figure 3		output/figure/LogPopdensityPREWARTREND_CBDdistance_diffyears_lpoly3.pdf	
Table A.2		output/table/summary_stat_basicdata.tex; output/table/summary_stat_basicdata_3km.tex;	
Table A.3		output/table/summary_stat_fundamentals.tex;	

		output/table/summary_stat_fundamentals_3km.tex	
Figure A.2		output/figure/Destroybuild_CBDdistance.pdf; output/figure/Destroypeople_CBDdistance.pdf	
Figure A.7		output/figure/LogEmploymentADJUSTED_CBDdistance_diffyears_lpolysmoother.pdf	
Figure A.8(a)		figure/est_emp_1966.pdf	
Figure B.1		output/figure/Popdensity_Change_DW_1stperiod.pdf; output/figure/Popdensity_Change_DW_2ndperiod.pdf	
Table B.1		output/table/ols_regtable_popdens_me.tex	
Table B.2		output/table/ols_regtable_empdens53.tex	p-values in the table are reported in Stata
Table B.3		output/table/speconom_dw.tex	p-values in the table are reported in Stata
Table B.4		output/table/pubhousing_dw.tex	p-values in the table are reported in Stata
The figures below are produced by different do files.			
Figure A.4(a)	`code/Stata/hiroshima_1933_75_popemp.do`	output/figure/Popchange_bomb_tdest.pdf	We create auxiliary data files: /processed data /1933_75_popemp.dta; /processed data /geocode_blockname.csv Note that 1933_75_popemp data is before rescaling employment data after WW2. Rescaling is done in the MATLAB file for calibration.
Figure A.4 (b)	`code/Stata/employmentchange_damage.do`	output/figure/Estchange_bomb_tdest.pdf	
Figure A.5	`code/Stata/hiroshima_1933_75_popemp.do`	output/figure/validation_pop1945.pdf	
Figure A.6	`code/Stata/1933_60_population_aggregationepicenter.do`	output/figure/3360_dwlike_epicenter.pdf	
Figure A.8 (b)	`code/Stata/preliminary_shoko.do`	output/figure/figure_twosector_estcount.pdf	The replicator creates an auxiliary data file: /processed data/ shoko.dta

Figure A.9	code/Stata/HousingPriceCalculation.do	output/figure/prediction_validation_CBD20grids.pdf	
Figure B.2 (b)	code/Stata/nagasaki_popDW.do	output/figure/Popdensity_Change_DW_Nagasaki54.pdf	

3.1.2 Sections 5 - 6 and Online Appendix F-G

To replicate the estimation of the gravity equation (Section 5.1), the replicator should run:

```
../code/Stata/GRAVITY.do
```

This script requires approximately 2 minutes in Stata 17 (MP) on a standard desktop and loads:

- `../data/raw data/commuting/bilateralflow_traveltime.dta`
- `../data/raw data/commuting/modechoice.dta`

The do-file requires the following user-written Stata commands (see the first lines in the do-file GRAVITY.do): `ftools`, `require`, `ppmlhdfe`, `reghdfe`, and `estout`.

Paper	Program	Output	Note
Table F.1	code/Stata/GRAVITY.do	output/table/tableF1_gravity_regression_logitcost.tex output/table/tableF1_gravity_regression_logitcost_iv.tex	Estimate the gravity equation. F-stats are reported in Stata.

After running the MATLAB code (Section 3.2.1 of this document), the replicator should run:

```
../code/Stata/MASTER_FIGURE.do
```

This script reproduces all figures in Sections 5 and 6 in the paper and in Online Appendices F and G. Runtime is approximately 1 minute. Two intermediate datasets are created during execution (`/code/Stata/temp.dta`; `/code/Stata/temp_main.dta`). We summarize all the do-files and figures below:

PAPER	Program	Output File
	code/Stata/MASTER_FIGURE.do	
Figure 5		output/figure/figure_density_pop_baseline_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_baseline_scatter_with_areasizeweight.pdf

Figure 6		output/figure/figure_density_pop_noagg_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_noagg_scatter_with_areasizeweight.pdf
Figure 7		output/figure/figure_density_pop_rationalcf_scatter_with_areasizeweights.pdf; output/figure/figure_density_emp_rationalcf_scatter_with_areasizeweight.pdf
Figure F.2		output/figure/figure_identification_amenity_change.pdf; output/figure/figure_identification_productivity_change.pdf
Figure F.3		output/figure/figure_identification_amenity_level.pdf; output/figure/figure_identification_productivity_level.pdf
Figure F.4		output/figure/figure_fundamental_log_productivity_netarea.pdf; output/figure/figure_fundamental_log_amenity_netarea.pdf
Figure F.5		output/figure/figure_fundamental_amenity_momentcondition.pdf
Figure F.6		output/figure/figure_fundamental_productivity_momentcondition.pdf
Figure F.7		output/figure/figure_fundamental_amenity_allperiods.pdf; output/figure/figure_fundamental_productivity_allperiods.pdf
Figure F.8		output/figure/figure_fundamental_amenity_1930s_cbddist.pdf; output/figure/figure_fundamental_productivity_1930s_cbddist.pdf
Figure G.1		output/figure/figure_density_pop_noise_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_noise_scatter_with_areasizeweight.pdf
Figure G.2		output/figure/figure_density_pop_1950_robustness.pdf
Figure G.3		output/figure/figure_density_emp_1950_robustness.pdf
Figure G.4		output/figure/figure_amenities_1950noagg_cbddist.pdf
Figure G.5		output/figure/figure_productivity_1950noagg_cbddist.pdf
Figure G.7		output/figure/figure_density_pop_noagg_landowners_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_noagg_landowners_scatter_with_areasizeweight.pdf
Figure G.8		output/figure/figure_density_pop_myopic_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_myopic_scatter_with_areasizeweight.pdf
Figure G.9		output/figure/figure_density_pop_memory_scatter_with_areasizeweight.pdf; output/figure/figure_density_emp_memory_scatter_with_areasizeweight.pdf

3.2 Summary of MATLAB code that generates results

3.2.1 Section 5-6 and Online Appendix F-G

The replicator should run the main MATLAB script:

```
../code/Matlab/MASTER.m
```

to replicate all quantitative results in Sections 5 and 6 in the paper and Online Appendix F and G. On an author's machine (Dell Pro Max Tower T2, Intel(R) Core(TM) Ultra 7 265 (2.40GHz); 64 GB RAM), total runtime is approximately 500 minutes.

We summarize them below with auxiliary MATLAB files created in the process.

Paper	Program	Output File	Note
	code/Matlab/MASTER.m		**Master file to replicate All results**
	code/Matlab/m_commutecost.m		
Figure F.1 **Table 2, Columns (1) and (2)**	code/Matlab/m_calibration_main.m	output/figure/figure_sum_of_squared_deviations_alpha.pdf; output/figure/figure_sum_of_squared_deviations_beta.pdf; output/quant/table_parameter_estimates.csv; output/quant/output_calib_fundamentals.csv	
Table 2, Columns (3) and (4)	code/Matlab/m_calibration_center.m	output/quant/table_parameter_estimates_center.csv	
	code/Matlab/m_identificationtest.m	output/quant/output_calib_identidicationtest_change.csv; output/quant/output_calib_identidicationtest_level.csv	
Table F.3 Columns (1) and (2)	code/Matlab/m_calibration_robust_10grids.m	output/quant/table_parameter_estimates_10grids.csv	
Figure F.9	code/Matlab/m_calibration_spillover.m	output/figure/figure_spillover_agglomeration.pdf	
Table F.3 Columns (3) and (4)	code/Matlab/m_calibration_robust_popdens36.m	output/quant/table_parameter_estimates_popdens36.csv	
Online Appendix F.10	code/Matlab/m_calibration_robust_highrho.m	output/quant/table_parameter_estimates_highrho.csv	
Online Appendix F.10	code/Matlab/m_calibration_robust_lowrho.m	output/quant/table_parameter_estimates_lowrho.csv	
Table F.4 Columns (1) and (2)	code/Matlab/m_calibration_AD.m	output/quant/table_parameter_estimates_AD.csv	
Table F.4 Columns (3) and (4)	code/Matlab/m_calibration_AD_center.m	output/quant/table_parameter_estimates_AD_center.csv	
	code/Matlab/m_calibration_1930s.m	output/quant/output_calib_fundamentals_1930s.csv	

Figure 4	code/Matlab/m_eval_1945_50.m	output/figure/figure_momentcondition_check.pdf; output/figure/figure_fundamental_momentcondition_50_55.pdf; output/quant/table_fundamentals_variance_1950.csv; output/quant/output_evaluations_1945_50.csv; output/quant/output_fundamentals_1945_50.csv; output/quant/output_avewelfare_1945_50.csv	
	code/Matlab/m_eval_1945_50_noise.m	output/quant/output_evaluations_1945_50_noise.csv	
	code/Matlab/m_eval_1945_50_robustness.m	output/quant/output_evaluations_1945_50_robustness.csv	
	code/Matlab/m_calibration_noaggfund_1950.m	output/quant/output_noaggfund_50.csv	
	code/Matlab/m_scale.m		
	code/Matlab/m_no_agglomeration.m	output/quant/output_no_agglomeration.csv	
	code/Matlab/m_counterfactualpath.m	output/quant/output_counterfactualpath.csv	
Discussion in Online Appendix G.6	code/Matlab/m_welfare.m	output/quant/output_welfare_counterfactualpath.csv	
	code/Matlab/m_landowner.m	output/quant/output_no_agglomeration_landowner.csv	
	code/Matlab/m_eval_1945_50_myopic.m	output/quant/output_evaluations_1945_50_myopic.csv	
	code/Matlab/m_eval_1945_50_memory.m	output/quant/output_evaluations_1945_50_memory.csv	
	code/Matlab/m_randomCBD.m		**Note that this code takes longer.**

In the following, we explain MATLAB code that generates auxiliary datasets for calibration.

Commuting costs: MATLAB code `m_commutecost.m` loads the basic data for calibration (../data/processed data/quant/Hiroshima_DATA.csv) and the travel time data for calibration (../data/processed data/quant/ODtime_allmodes_blocks1950v2_MATLAB.csv and ../data/processed data/quant/ODtime_allmodes_blocks_MATLAB.csv) and create an auxiliary MATLAB data set, which contains the commuting costs used in the calibration:

- `../code/Matlab/commuting_cost.mat`

Main calibration: `m_calibration_main.m` loads the basic data (Hiroshima_DATA.csv) and estimates key parameters of agglomeration forces, and also creates the following auxiliary files that contain the inverted values of location fundamentals and information used in the main calibration:

- `../code/Matlab/calib_productivity_amenity.mat`
- `../code/Matlab/calib_setup.mat`
- `../code/Matlab/calib_auxiliary.mat`
- `../code/Matlab/parameters.mat`

Main evaluation: `m_eval_1945_50.m` loads the set of MATLAB data above and evaluates the fit of the model, which is discussed in Section 5.5 in the paper. When the replicator runs the code, two auxiliary MATLAB data sets are created:

- `../code/Matlab/calib_1950_auxiliary.mat`
- `../code/Matlab/fundamentals_1950.mat`

Setting scale: `m_scale.m` adjust the scale of floor space supply as discussed in the final paragraph of Online Appendix F.2. When the replicator runs the code, two auxiliary MATLAB data sets are created:

- `../code/Matlab/calib_qadjusted.mat`
- `../code/Matlab/calib_hscale.mat`

No agglomeration counterfactual in Section 6.1: Running `m_no_agglomeration.m` creates an auxiliary MATLAB data set, which is used in the other counterfactual analysis. The data set is saved as:

- `../code/Matlab/noagglomeration.mat`

Other counterfactual in Section 6.2: When running `m_counterfactualpath.m`, the replicator should create an auxiliary MATLAB data set:

- `../code/Matlab/counterfactualpath.mat`

3.2.2 Online Appendix E

The replicator should run

```
../code/Matlab/MASTER_SIMULATION_E.m
```

to reproduce all results in Online Appendix E. The approximate time needed to run the code is 15 minutes. This section also lists the helper functions used in the simulation and the output files generated for population and employment dynamics figures in Online Appendix E.

Paper	Program	Output File	Note
	`code/Matlab/MASTER_SIMULATION_E.m`		**Master file to replicate all results**

			in Online Appendix E
	code/Matlab/m_equivsolve_level.m		Function used in the master file
Figure E.1 (a) **Figure E.3 (a)**	code/Matlab/m_popfigure.m	output/appendixE/population_dynamics_base.pdf; output/appendixE/population_dynamics_lowtheta.pdf	
Figure E.2(a) **Figure E.4(a)** **Figure E.4(c)**	code/Matlab/m_popfigure_2.m	output/appendixE/population_dynamics_multiple.pdf; output/appendixE/population_dynamics_fundadvantage_norecovery.pdf; output/appendixE/population_dynamics_fundadvantage_recovery.pdf	
Figure E.1(b) **Figure E.3 (b)**	code/Matlab/m_empfigure.m	output/appendixE/employment_dynamics_base.pdf; output/appendixE/employment_dynamics_lowtheta.pdf	
Figure E.2(b) **Figure E.4(b)** **Figure E.4(d)**	code/Matlab/m_empfigure_2.m	output/appendixE/employment_dynamics_multiple.pdf; output/appendixE/employment_dynamics_fundadvantage_norecovery.pdf; output/appendixE/employment_dynamics_fundadvantage_recovery.pdf	

3.3 R code for Online Appendix H

The R script:

```
../code/R/graph.R
```

produces **Figure H.1** in the Online Appendix. The output is saved as:

```
../output/figure/Predicted Population.png
```

4 Instructions to Replicators

This section describes the complete workflow for reproducing all results in the paper and Online Appendix. The replication proceeds in seven steps, and it is important that the steps are followed in the order listed below.

1. First, the replicator should run the following master do-file:

   ```
   /code/Stata/HIROSHIMA_DATA_MASTER.do
   ```

   This script reproduces all datasets summarized in Section 2.5 of this document. These

datasets serve as the inputs for both reduced-form and quantitative analysis.

2. Second, the replicator should run:

   `/code/Stata/HIROSHIMA_REDUCEDFORM.do`

   This master script generates most of the tables and figures in Section 3 of the paper and Online Appendices A and B. Additional figures listed in Section 3.1.1 of this document must be produced by running the corresponding individual do-files.

3. Third, the replicator should run:

   `/code/Stata/GRAVITY.do`

   This script estimates the gravity equation for commuting patterns, producing Online Appendix Table F.1. The resulting estimates serve as inputs for the calibration in MATLAB.

4. Fourth, the replicator should execute the main MATLAB script:

   `/code/Matlab/MASTER.m`

   This program generates all quantitative results in Section 5 and 6 of the paper and in Online Appendix F and G. Details on each component script are provided in Section 3.2.1 of this document.

5. Fifth, after completing the MATLAB step, the replicator should run:

   `/code/Stata/MASTER_FIGURE.do`

   The script generates all figures and numbers related to the quantitative exercises in Sections 5 and 6 and in Online Appendices F and G. Details of each output are described Section 3.1.2 of this document.

6. Sixth, the replicator should run:

   `/code/Matlab/MASTER_SIMULATION_E.m`

   This script reproduces all simulation results and figures reported in Online Appendix E. Further details are provided in Section 3.2.2 of this document.

7. Lastly, seventh, the replicator should run:

   `/code/R/graph.R`

This script generates Figure H.1 in Online Appendix H.

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