Replication Instructions for SCF Exhibits in
"Cross-Sectional Patterns of Mortgage Debt"
during the Housing Boom: Evidence and Implications"
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This document describes the replication files for SCF results in the FLW paper. Files that replicate FLW results using the New York Fed Consumer Credit Panel/Equifax data set are available to Federal Reserve economists on the Fed's RADAR website. If you need the replication files for results using confidential Home Mortgage Disclosure Act (HMDA) data, which appear in the appendix of the FLW paper, please contact the authors directly.

All of the programs that construct the SCF exhibits use the Stata software package.

1 Unpacking These Files

When these replication files are unzipped, there should be six directories:

- `data`

- `scf_barchart`

- `scf_binscatter`

- `scf_regs`

- `scf_sumstats`

- `scf_turnfear`

There are two files in the `data` directory that create the main data set (`scf_data.dta`) and the set of replicate weights (`scf_rw.dta`). These `.do` files are described in the next section. In the remaining five directories, the most important file in each is a Stata `.do` file that has the same name of the directory with `_final.do` appended at the end (for example, `scf_barchart_final.do` resides in the `scf_barchart` directory).

2 Getting the Data

All of the SCF results in the paper use the public-use version of the SCF (Board of Governors of the Federal Reserve System, various years). Further, the results use the SCF summary variables that are made available in the "Previous Surveys" section of the main

SCF web page (`https://www.federalreserve.gov/econres/scfindex.htm`). Fortunately, compressed (that is, zipped) Stata versions of these summary data sets can be downloaded directly from the Board's SCF website. The compressed data set for each triennial wave of the SCF must be downloaded independently. At the end of these instructions, the exact URL for each year's Stata dataset is provided.

Here are the names of the zipped files for each wave, as well as the names of the corresponding uncompressed Stata data sets. The uncompressed data sets should be placed in the `data/rawdata/board_summary_data` directory.

Survey Year	Name of Zipped File	Name of Unzipped Data Set
1989	scfp1989s.zip	rscfp1989s.dta
1992	scfp1992s.zip	rscfp1992s.dta
1995	scfp1995s.zip	rscfp1995s.dta
1998	scfp1998s.zip	rscfp1998s.dta
2001	scfp2001s.zip	rscfp2001s.dta
2004	scfp2004s.zip	rscfp2004s.dta
2007	scfp2007s.zip	rscfp2007s.dta
2010	scfp2010s.zip	rscfp2010s.dta
2013	scfp2013s.zip	rscfp2013s.dta

In addition to the Board summary data sets, we also use the Board's replicate weight files, which are used when calculating the standard errors for regressions. These replicate weight files are also available at `https://www.federalreserve.gov/econres/scfindex.htm` and URLs for each wave are provided at the end of these instructions. The uncompressed versions of these weights should be placed in the `data/rawdata/replicate_weights` directory. Here are the names of the compressed and uncompressed versions of the replicate weight files:

Survey Year	Name of Zipped File	Name of Unzipped Data Set
1989	scf89rw1s.zip	p89_rw1s.dta
1992	scf92rw1s.zip	p92_rw1s.dta
1995	scf95rw1s.zip	p95_rw1s.dta
1998	scf98rw1s.zip	p98_rw1s.dta
2001	scf2001rw1s.zip	scf2001rw1s.dta
2004	scf2004rw1s.zip	p04_rw1s.dta
2007	scf2007rw1s.zip	p07_rw1s.dta
2010	scf2010rw1s.zip	p10_rw1s.dta
2013	scf2013rw1s.zip	p13_rw1s.dta

To construct the main SCF data set, run the program `data/scf_data.do`. To construct the data set of replicate weights, run `data/rw_data.do`. These two programs will create `scf_data.dta` and `scf_rw.dta`, respectively. Both of these data sets will reside in the `data/dta` directory.

3   Running the Programs

Once the `data/dta` directory includes `scf_data.dta` and `scf_rw.dta`, you are ready to run the five programs that create the SCF figures, as well as the table of summary statistics:

- `scf_barchart/scf_barchart_final.do`

- `scf_binscatter/scf_binscatter_final.do`

- `scf_regs/scf_regs_final.do`

- `scf_sumstats/scf_sumstats_final.do`

- `scf_turnfear/scf_turnfear_final.do`

An easy way to do this is simply to run the `do_all.do` program, which resides in the top-level directory of these replication files. You can also run the five `.do` files individually, and in any order. Either way, the `.log` file from each of the five `.do` files will reside in the same directory as the `.do` file that created it. The programs place black and white versions of the figures in directories called `graphs_bw`. The occasional color versions are placed in `graphs_color`, although color versions were not used in the paper.

In fact, most of the .do files create some figures than were not included in the paper. At the end of these instructions, we have reproduced the figures that were used in FLW, along with the names of the corresponding .eps files.

Here are a few things to keep in mind as you run these programs:

- The household-level and household-implicate-level id variables in the Board's summary datasets are XX_ and X_ in some years and YY_ and Y_ in others, where the underscore corresponds to a number that identifies either the household or the household-implicate observation. Our data programs construct a consistent ZZ_ and Z_ system for all years instead.

- The Board's summary data sets also divide the weight variable (WGT) for each of the 5 implicates by 5, so that taking a sum of a variable across all households *and across all 5 implicates* in a given year will correspond to the overall population total. We undo this division in our `scf_data.do` program, so that taking the sum *within each of the 5 implicates* corresponds to an estimate of the population total.

- The `scf_sumstats_final.do` program reprints the table of summary statistics in the `.log` file. It also produces some output that was lightly edited and included in the TeX file that produced the FLW paper.

- The `scf_regs_final.do` program takes some time to run, because it bootstraps the standard errors using the replicate weights. This program is the only one that uses the replicate weights. A subdirectory of `scf_regs` includes some code that compares our use of the replicate weights with the user-written -scfcombo- program. Our main regression program `scf_regs_final.do` also compares some of our results with the user-written -micombine- program, which must be installed in your version of Stata before running `scf_regs_final.do`. Finally, the `scf_regs` directory also includes an old version of the regression program that does not bootstrap the standard errors, but instead uses Rubin's rules for multiply imputed data to calculate the standard errors (like -micombine- does).

- These replication files are supplied with each of the five `_final.do` programs already run, so .eps files of the figures are already included in either the `graphs_bw` or the `graphs_color` subdirectories. If you run the .do files again, these .eps files will be overwritten with identical copies.

- The `data` and `scf_sumstats` directories each contain a PDF copy of a "networth flowchart" that is supplied by the Board of Governors. This chart clarifies the relationships between the asset and debt variables in the Board's summary data sets. You

can download a copy of this chart at `https://www.federalreserve.gov/econres/files/Networth%20Flowchart.pdf`.

4 References

Board of Governors of the Federal Reserve System. 1989, 1992, 1995, 1998, 2001, 2004, 2007, 2010, and 2013. "Survey of Consumer Finances: Summary Extract Public Data."

Main website for SCF data:

`https://www.federalreserve.gov/econres/scfindex.htm`.

URLs for SCF datasets used in paper (all are in Stata format):

1989: `https://www.federalreserve.gov/econres/files/scfp1989s.zip`

1992: `https://www.federalreserve.gov/econres/files/scfp1992s.zip`

1995: `https://www.federalreserve.gov/econres/files/scfp1995s.zip`

1998: `https://www.federalreserve.gov/econres/files/scfp1998s.zip`

2001: `https://www.federalreserve.gov/econres/files/scfp2001s.zip`

2004: `https://www.federalreserve.gov/econres/files/scfp2004s.zip`

2007: `https://www.federalreserve.gov/econres/files/scfp2007s.zip`

2010: `https://www.federalreserve.gov/econres/files/scfp2010s.zip`

2013: `https://www.federalreserve.gov/econres/files/scfp2013s.zip`

URLs for SCF replicate weights used in paper (all are in Stata format):

1989: `https://www.federalreserve.gov/econres/files/scf89rw1s.zip`

1992: `https://www.federalreserve.gov/econres/files/scf92rw1s.zip`

1995: `https://www.federalreserve.gov/econres/files/scf95rw1s.zip`

1998: `https://www.federalreserve.gov/econres/files/scf98rw1s.zip`

2001: `https://www.federalreserve.gov/econres/files/scf2001rw1s.zip`

2004: `https://www.federalreserve.gov/econres/files/scf2004rw1s.zip`

2007: `https://www.federalreserve.gov/econres/files/scf2007rw1s.zip`

2010: `https://www.federalreserve.gov/econres/files/scf2010rw1s.zip`

2013: `https://www.federalreserve.gov/econres/files/scf2013rw1s.zip`

5   License

Figure 2a: Shares of Outstanding Mortgage Debt by Wage Income.
(scf_barchart/graphs_bw/scf_barchart_final_debtshare_WAGEINCnom_5.eps)
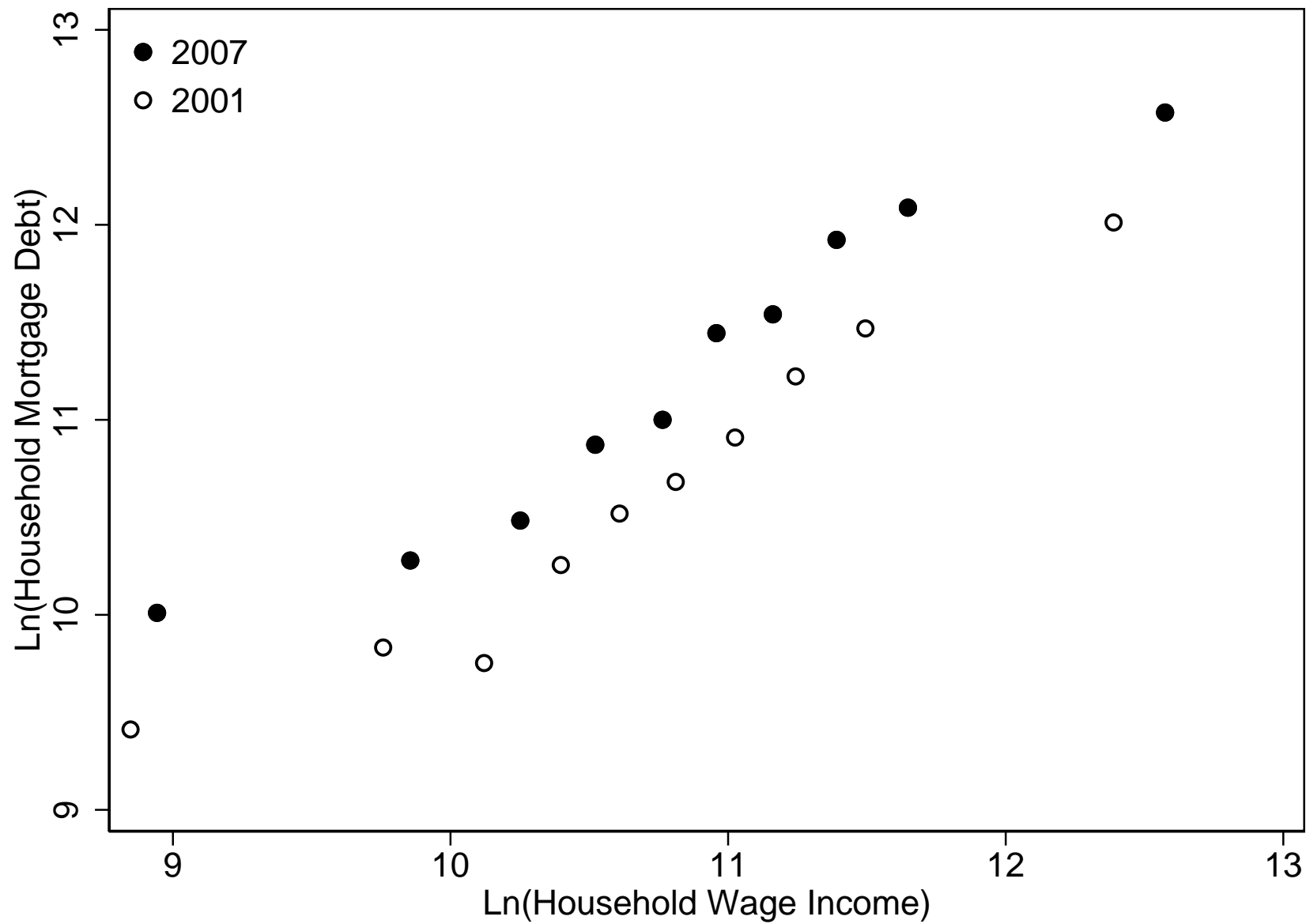
Figure 2c: Binned Scatter Plot of Mortgage Debt and Wage Income.
(scf_binscatter/graphs_bw/scf_binscatter_final_debt_WAGEINCnom.eps)
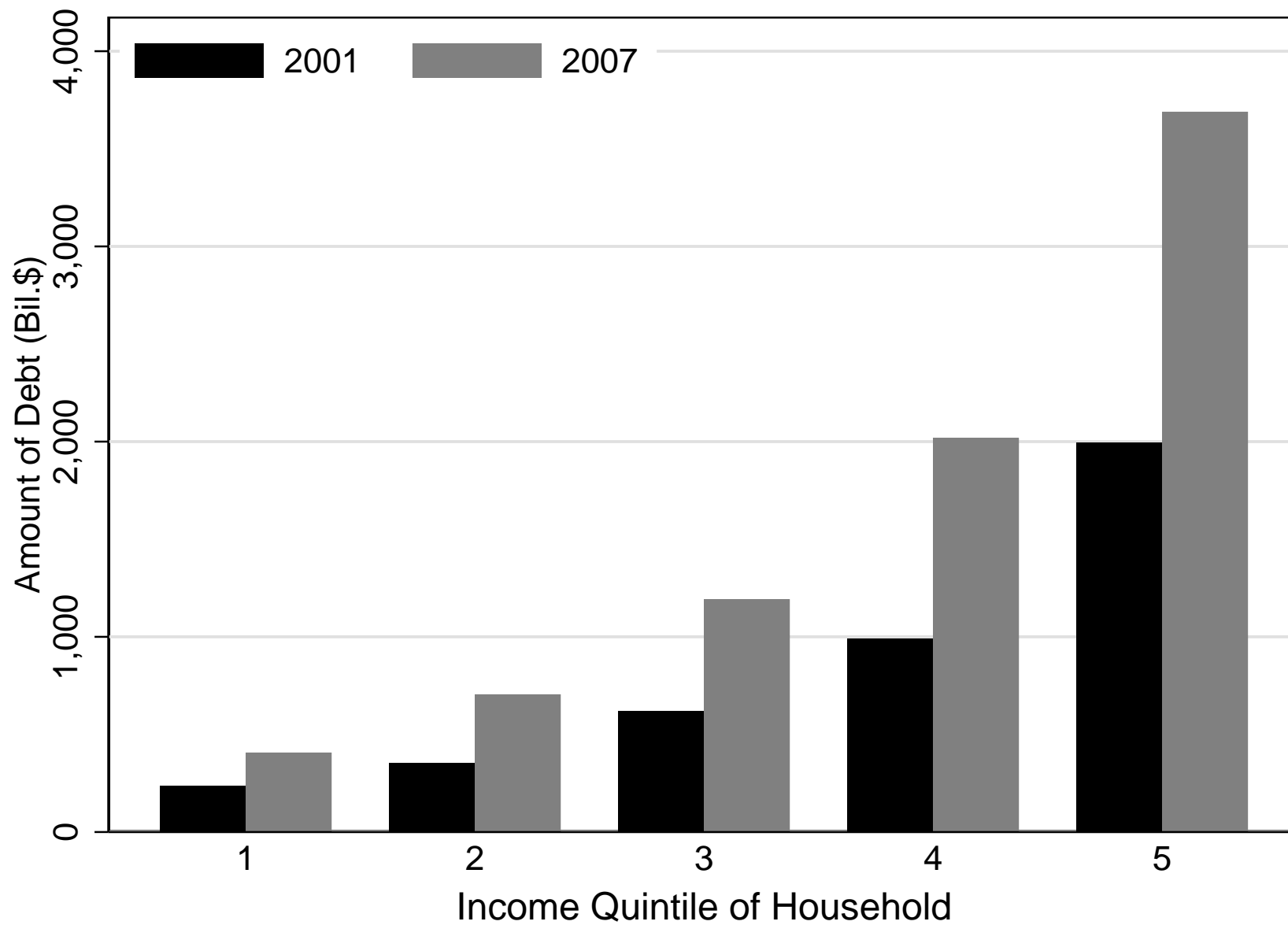
Figure 2e: Levels of Outstanding Mortgage Debt by Wage Income.
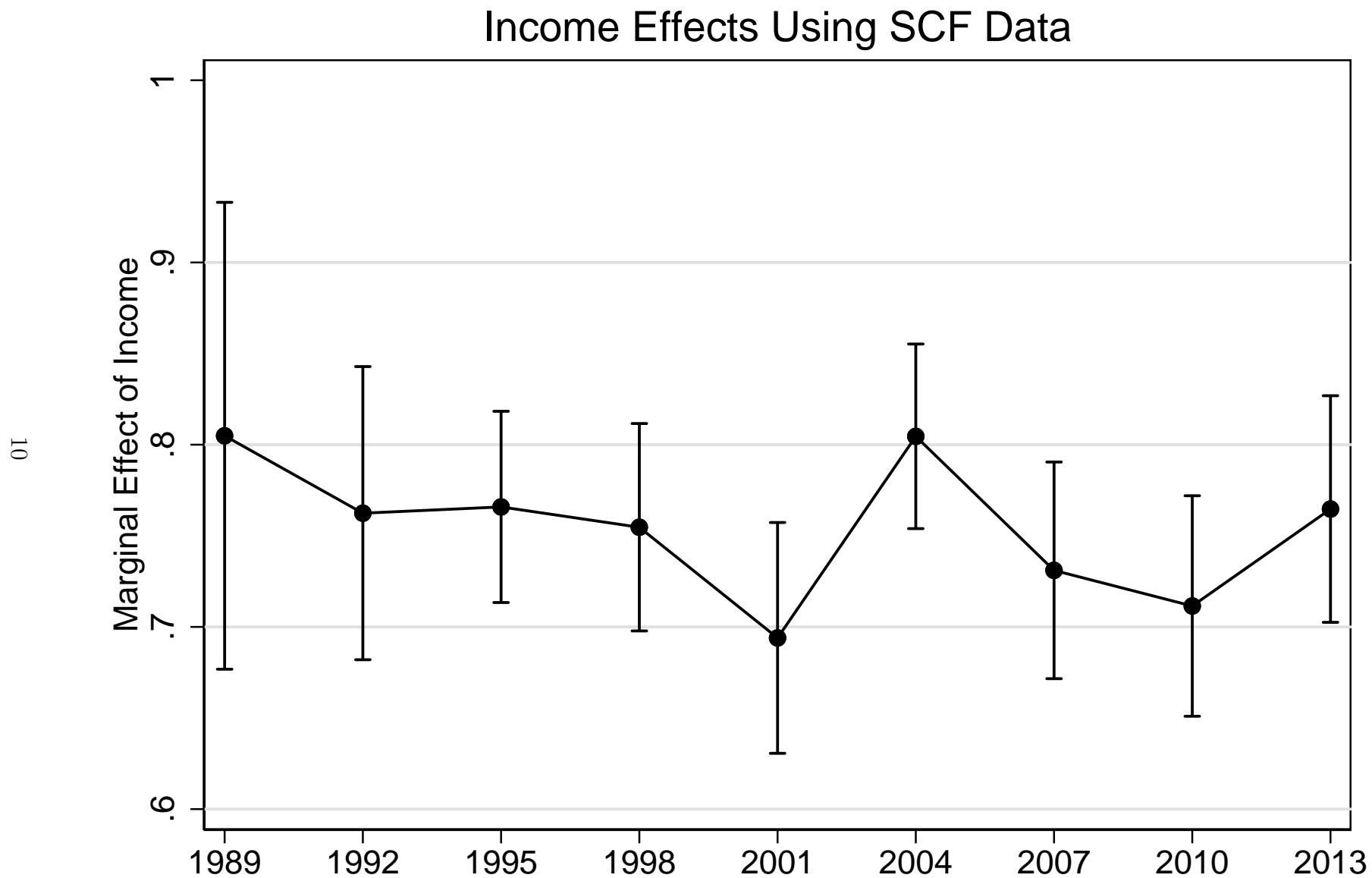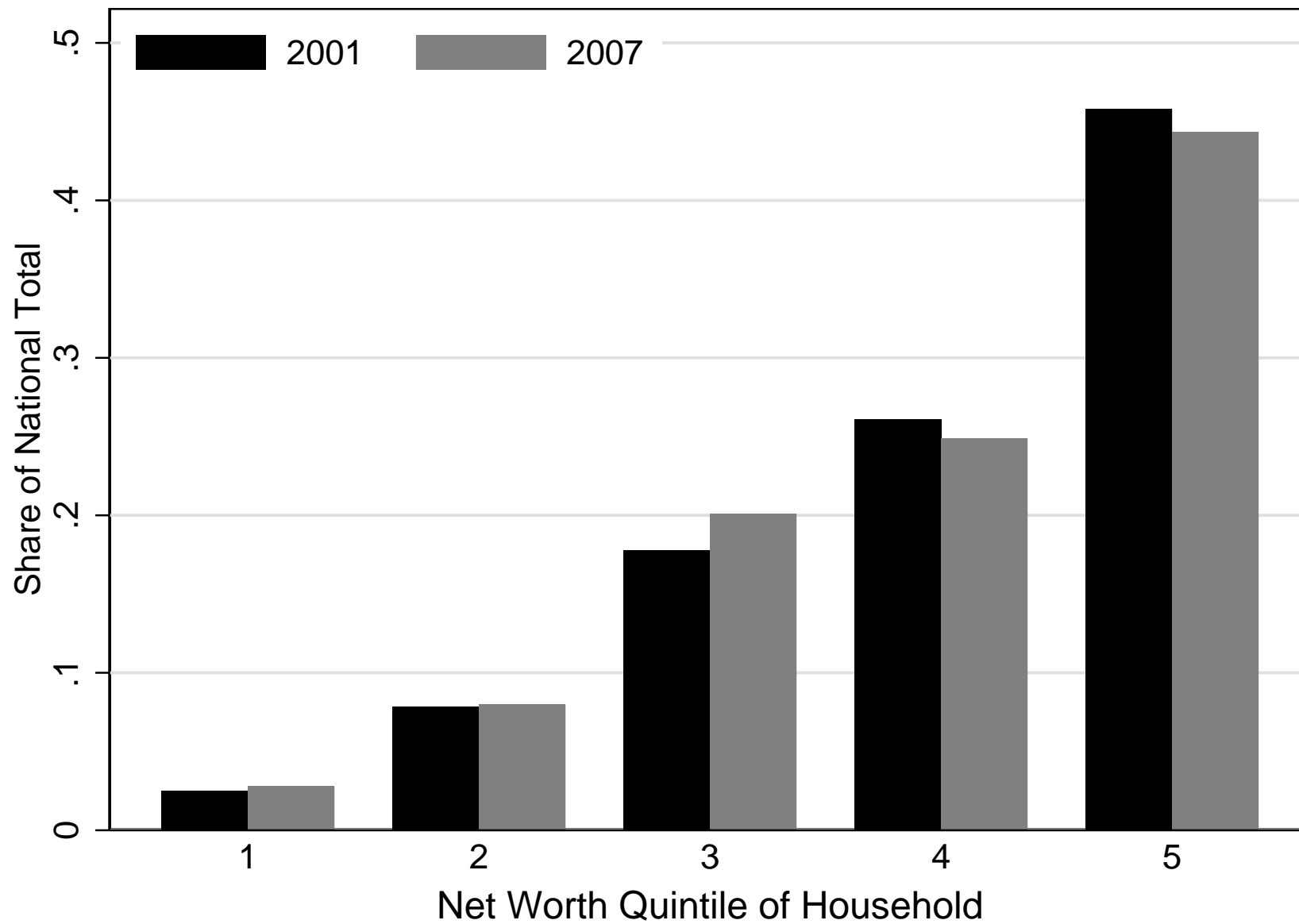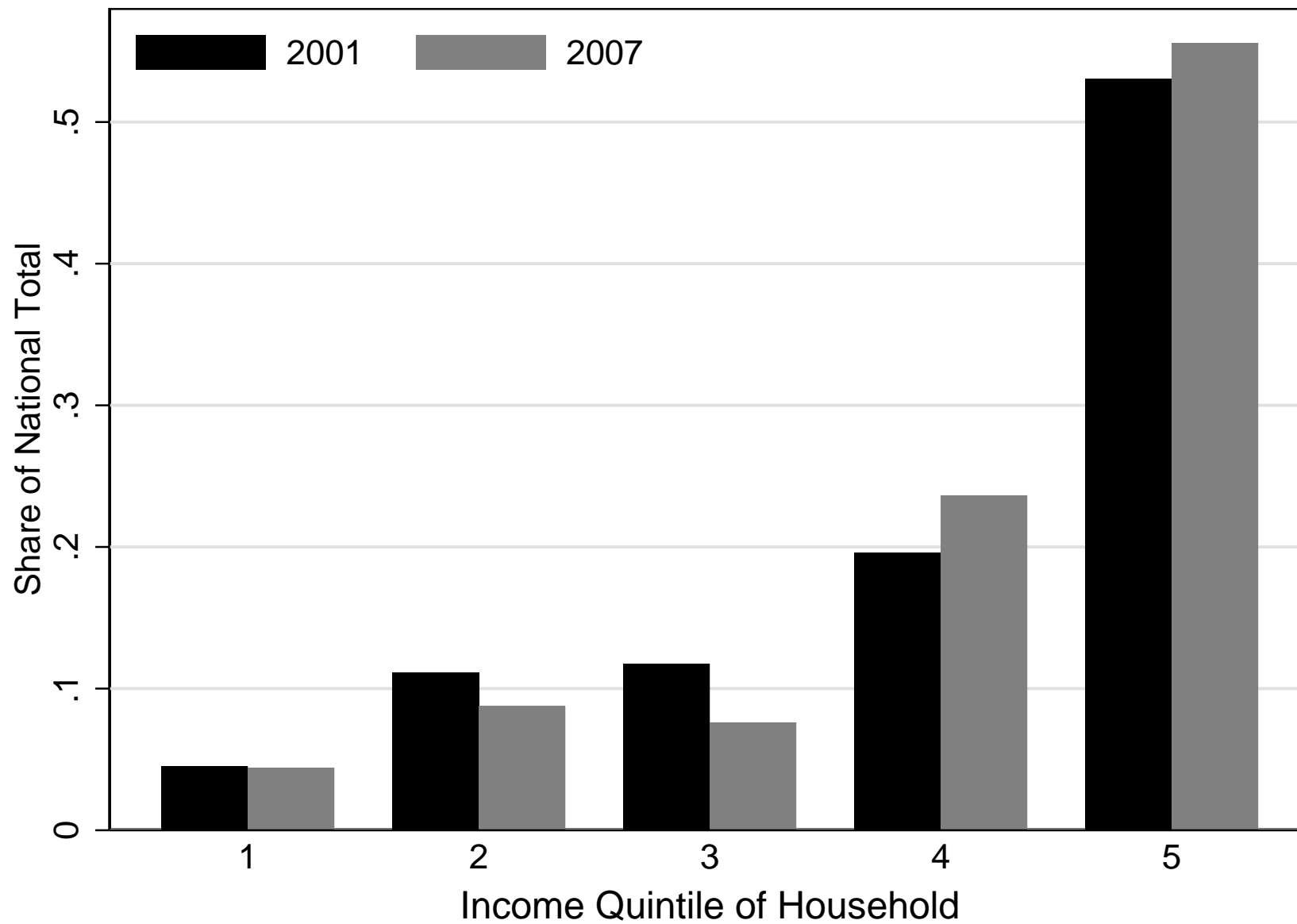(scf_barchart/graphs_bw/scf_barchart_final_debtlevel_WAGEINCnom_5.eps)

Income Effects Using SCF Data

Figure 3 (Lower panel): Income Effects Using SCF Data.
(scf_regs/graphs_bw/scf_regs_final_alldebtnom_lnWAGEINCnom.eps)

Figure 5a: Shares of Outstanding Mortgage Debt by Net Worth.
(scf_barchart/graphs_bw/scf_barchart_final_debtshare_NETWORTHnom_5.eps)
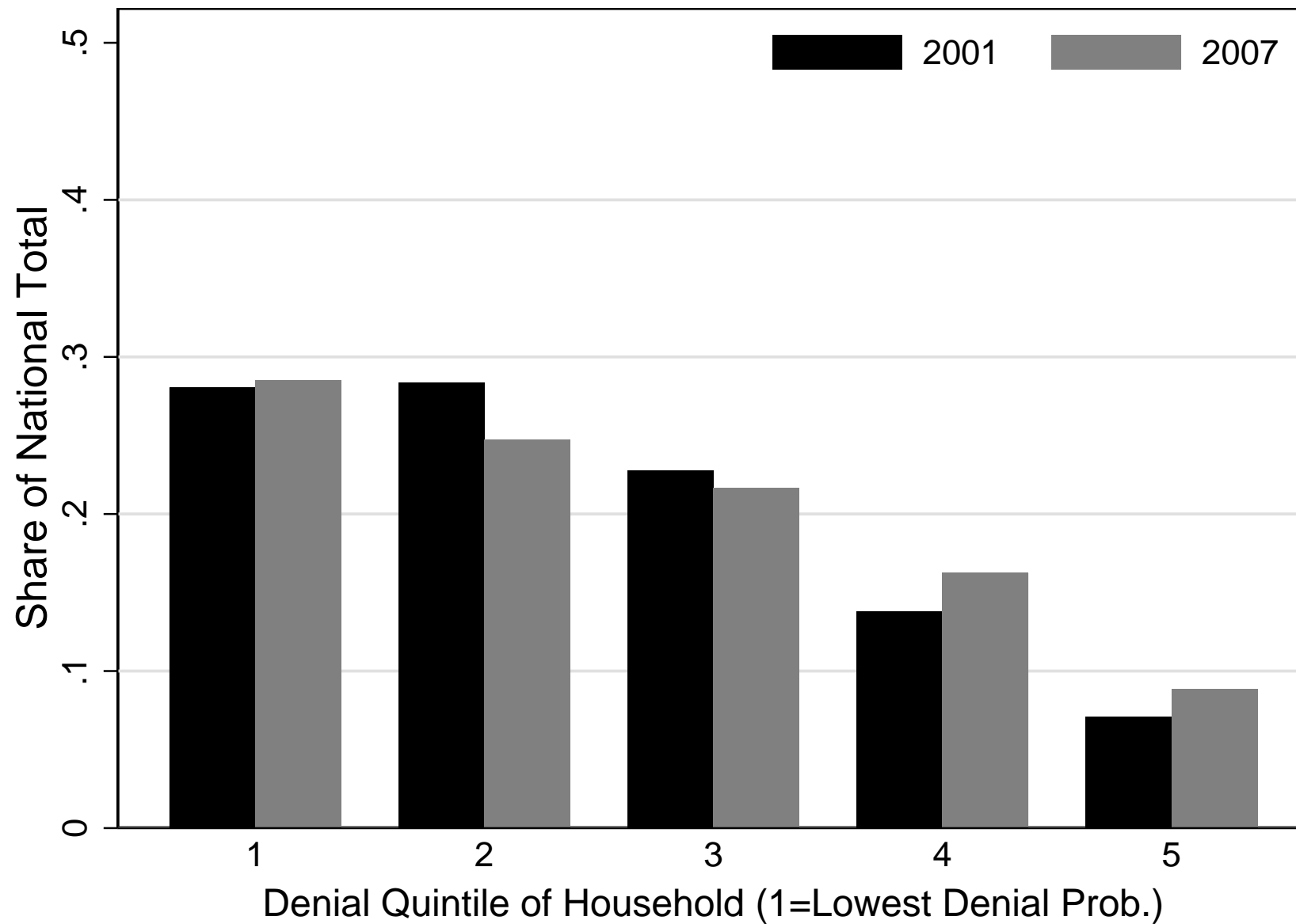
Figure 5b: Mortgage Debt Shares by Previous Loan Denial.
(scf_turnfear/graphs_bw/scf_turnfear_final_debtshare.eps)
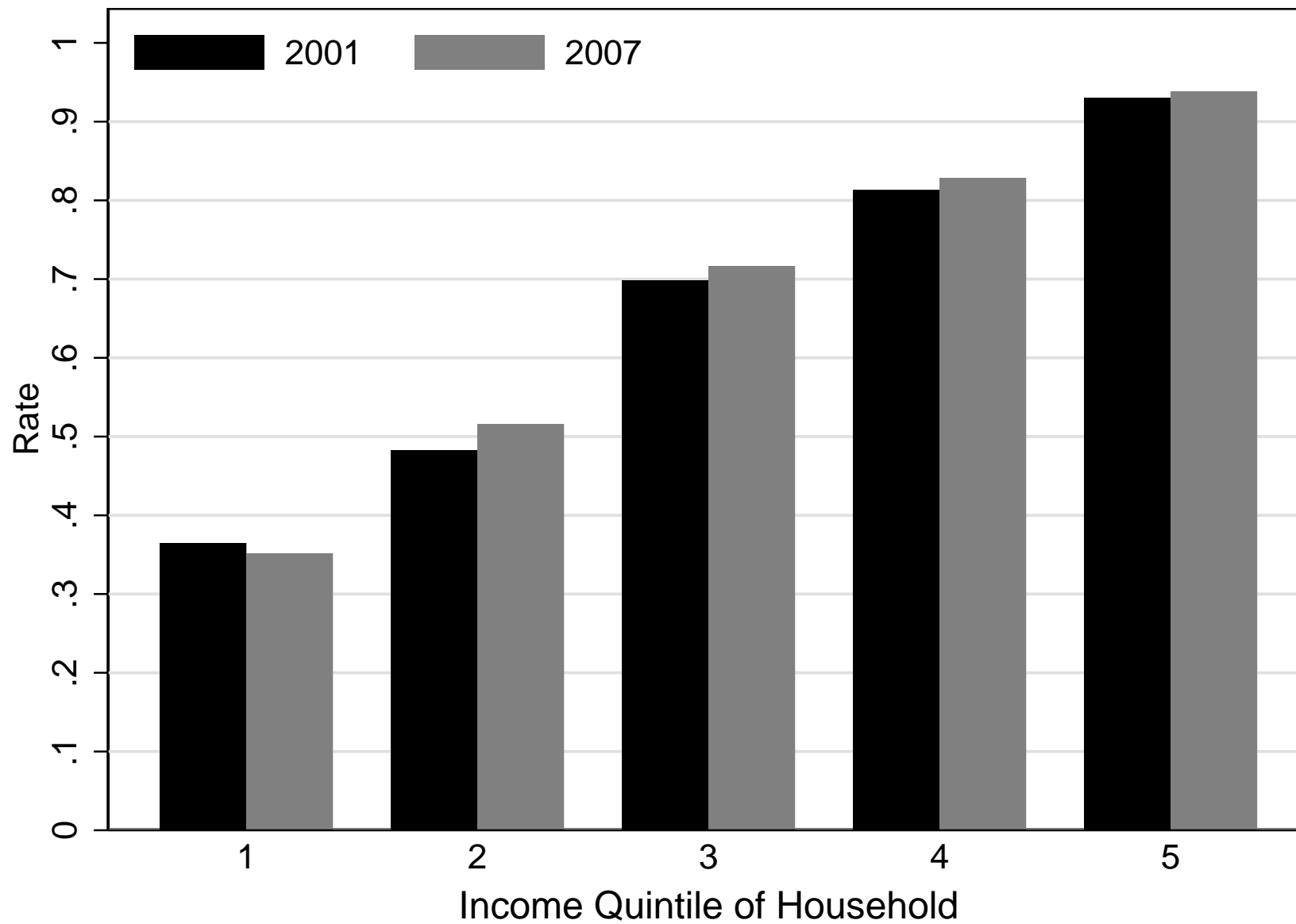
Figure 5c: Homeownership Rates by Wage Income.
(scf_barchart/graphs_bw/scf_barchart_final_homeowner_WAGEINCnom_5.eps)

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Figure 5d: Share of Nonprimary Residence Mortgage Debt by Wage Income.
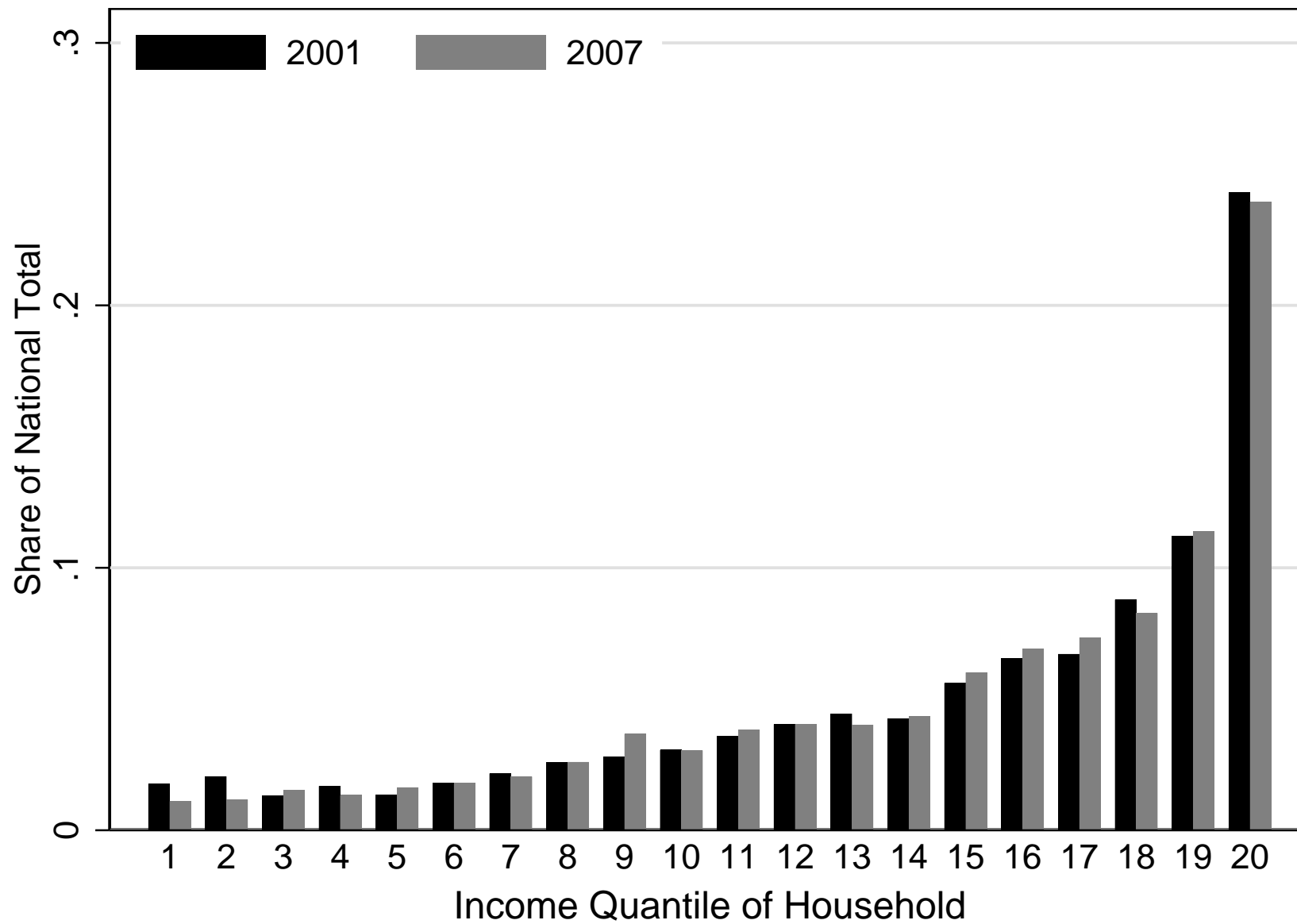(scf_barchart/graphs_bw/scf_barchart_final_debtothershare_WAGEINCnom_5.eps)

Figure 7 (Upper panel): Share of Real Estate Assets by Wage Income.
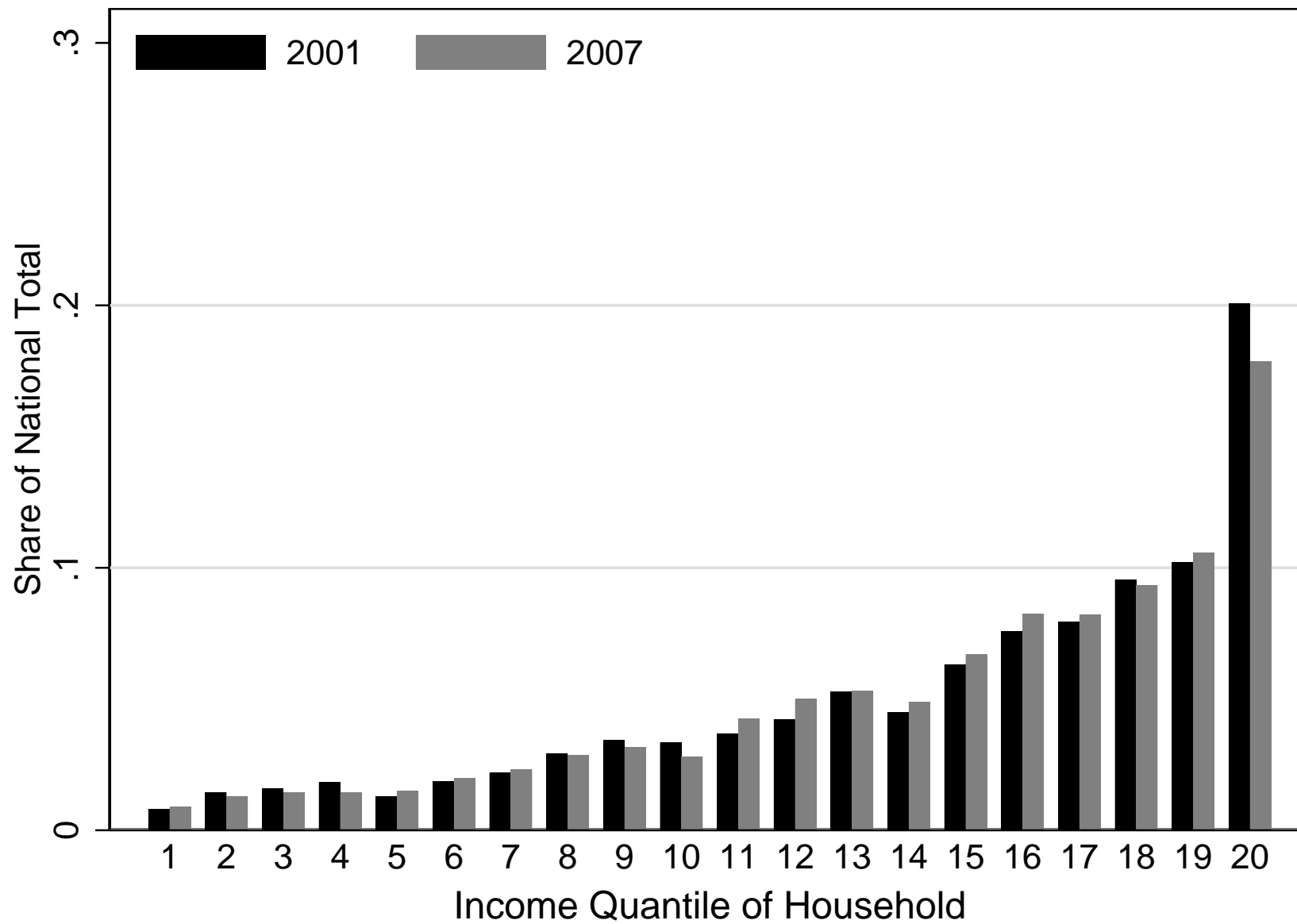(scf_barchart/graphs_bw/scf_barchart_final_reassetsshare_WAGEINCnom_20.eps)
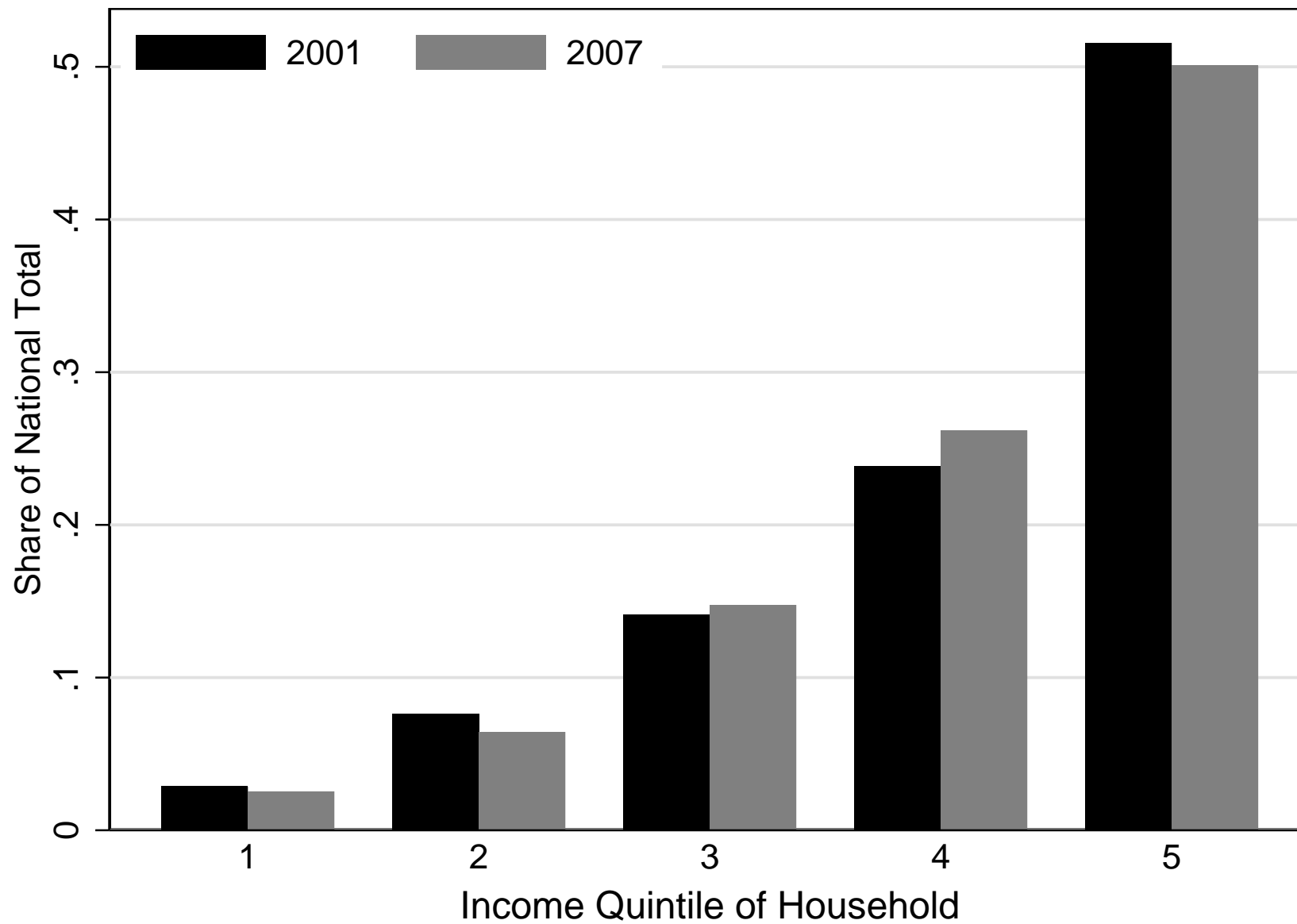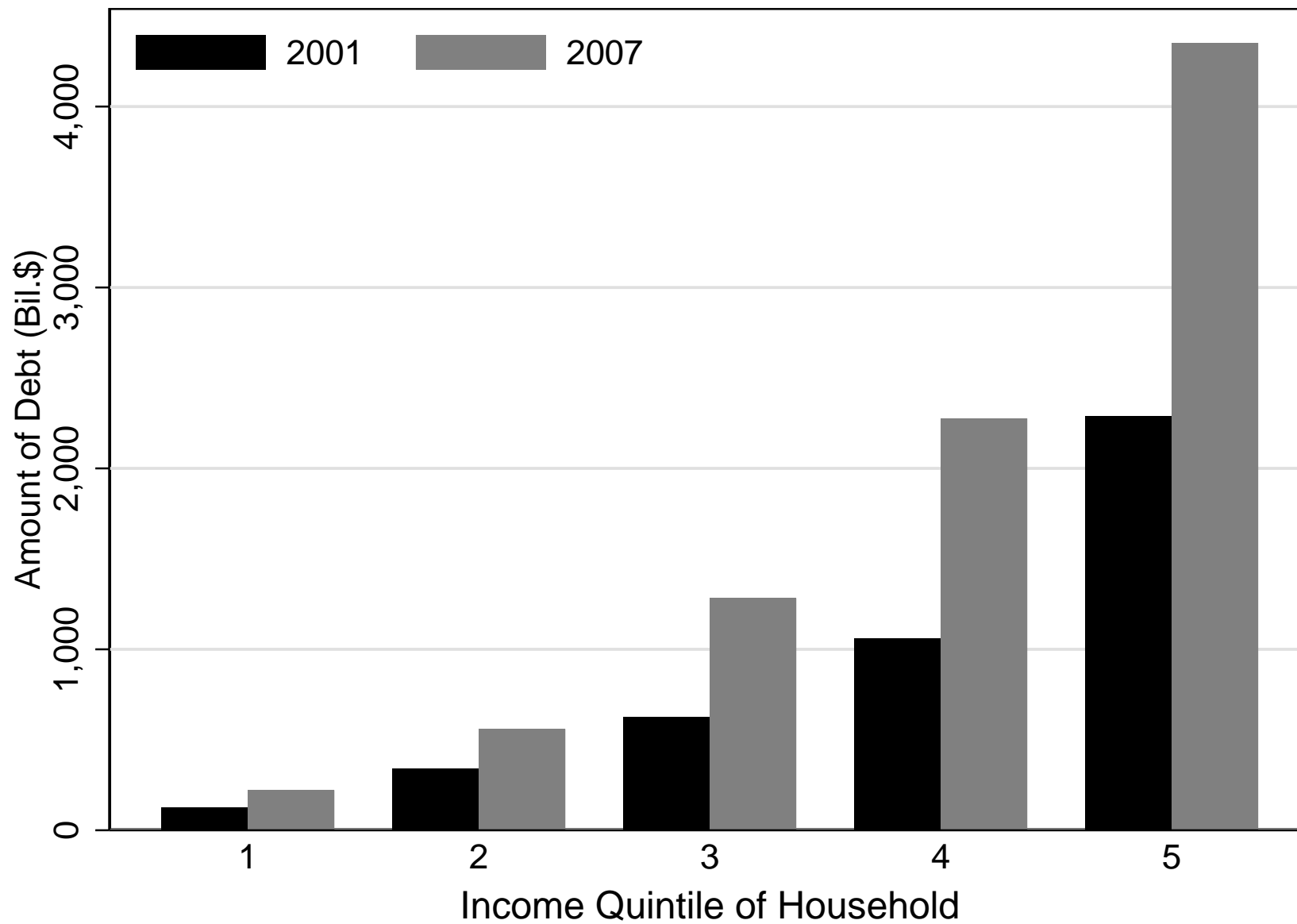
Figure 7 (Lower panel): Share of Mortgage Debt by Wage Income.
(scf_barchart/graphs_bw/scf_barchart_final_debtshare_WAGEINCnom_20.eps)

Appendix Figure B.2b: Shares of Outstanding Mortgage Debt by Total Income.
(scf_barchart/graphs_bw/scf_barchart_final_debtshare_INCOMEnom_5.eps)

Appendix Figure B.2d: Levels of Outstanding Mortgage Debt by Total Income.
(scf_barchart/graphs_bw/scf_barchart_final_debtlevel_INCOMEnom_5.eps)