

# Economic Security in Retirement: Does Borrowing from Home Equity Moderate the Impact of a Health Shock on Health Outcomes?

Stephanie Moulton, John Glenn College of Public Affairs, The Ohio State University

Joshua Joseph, Division of Endocrinology, Diabetes and Metabolism, The Ohio State University Wexner  
Medical Center

Cäzilia Loibl, Department of Human Sciences, The Ohio State University

Donald Haurin, Department of Economics, The Ohio State University

*\*With research assistance from Alec Rhodes and Bjorn Kluwe*

Virtual Annual RDRC Meeting

August 6, 2021

The research reported herein was performed pursuant to a grant from the U.S. Social Security Administration (SSA) funded as part of the Retirement and Disability Consortium. The opinions and conclusions expressed are solely those of the author(s) and do not represent the opinions or policy of SSA or any agency of the Federal Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of the contents of this report. Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply endorsement, recommendation or favoring by the United States Government or any agency thereof.

# Motivation

## Economic Security of Social Security Beneficiaries

- Housing debt as a resource
  - ✓ Housing wealth is a substantial portion of wealth for many older adults. For example, in 2016, nearly **one in five** homeowners age 62 and older had less than \$10,000 in financial assets but held at least \$40,000 in home equity.
- Health shocks, housing wealth, and economic security
  - ✓ Home equity may serve as precautionary savings to help buffer the negative financial consequences of a health shock (Davidoff, 2010; Nakajima & Telyukova, 2009; Poterba & Venti, 2017; Poterba et al., 2011; Venti & Wise, 2004)
- But, home equity must be converted to a more liquid form to be used directly to pay for the costs associated with a health shock.

# Motivation

- Significant **decline in housing wealth after a health shock**
  - Poterba and Venti (2017): Heart attack, lung disease, and stroke associated with **\$5k-\$7k** decline in home equity, wave after diagnosis
  - Dalton and LaFave (2018): Increase in health limitations associated with **\$12k** decline in home equity for married couples
- Relationship between **home equity and health outcomes**
  - Hamoudi and Dowd (2013): Increase in home value associated with fewer problems with ADLs, improved lung capacity, lower blood pressure
  - Angrisani and Lee (2016): Decrease in House Price Index (HPI) associated with increased probability of hypertension (self-report and biomarkers)

Home Equity Health Shock → Reduced Home Equity Health Outcomes



# Research Question & Aims

To what extent does home equity mitigate the economic burden created by a health shock, ultimately leading to better health outcomes?

1. Identify extent to which home equity held prior to the onset of a disease improves older adults' ability to manage a health shock, as indicated by the disease being adequately controlled.
2. Investigate the causal relationship between liquidating home equity through borrowing or home sale after a health shock on older adults' disease outcomes.

# Data and Sample

- Health and Retirement Study 1998-2016
- Sample restrictions:
  - ✓ Health shock between 2002-2014: Onset of a new disease, as measured by being newly diagnosed (since last wave) with diabetes, heart disease, cancer, or lung disease
  - ✓ Homeowner as of wave prior to health shock
  - ✓ Biomarker data available in at least one wave after the health shock
  - ✓ Trim outliers on key financial variables
- Of the 25,481 homeowners in the sample, 9,000 had a health shock between 2002-2016; of these, 4,077 have biomarker data after the shock and are in the primary analysis sample

First Shock:	< Age 65	>= Age 65
Cancer	18%	21%
Diabetes	39%	28%
Heart Disease	31%	41%
Lung Disease	17%	15%
N	1,414	2,663

# Outcome Measures

- Disease specific biomarkers
  - Every 4 years, beginning in 2006 or 2008
  - We include an indicator for “wave since diagnosis”

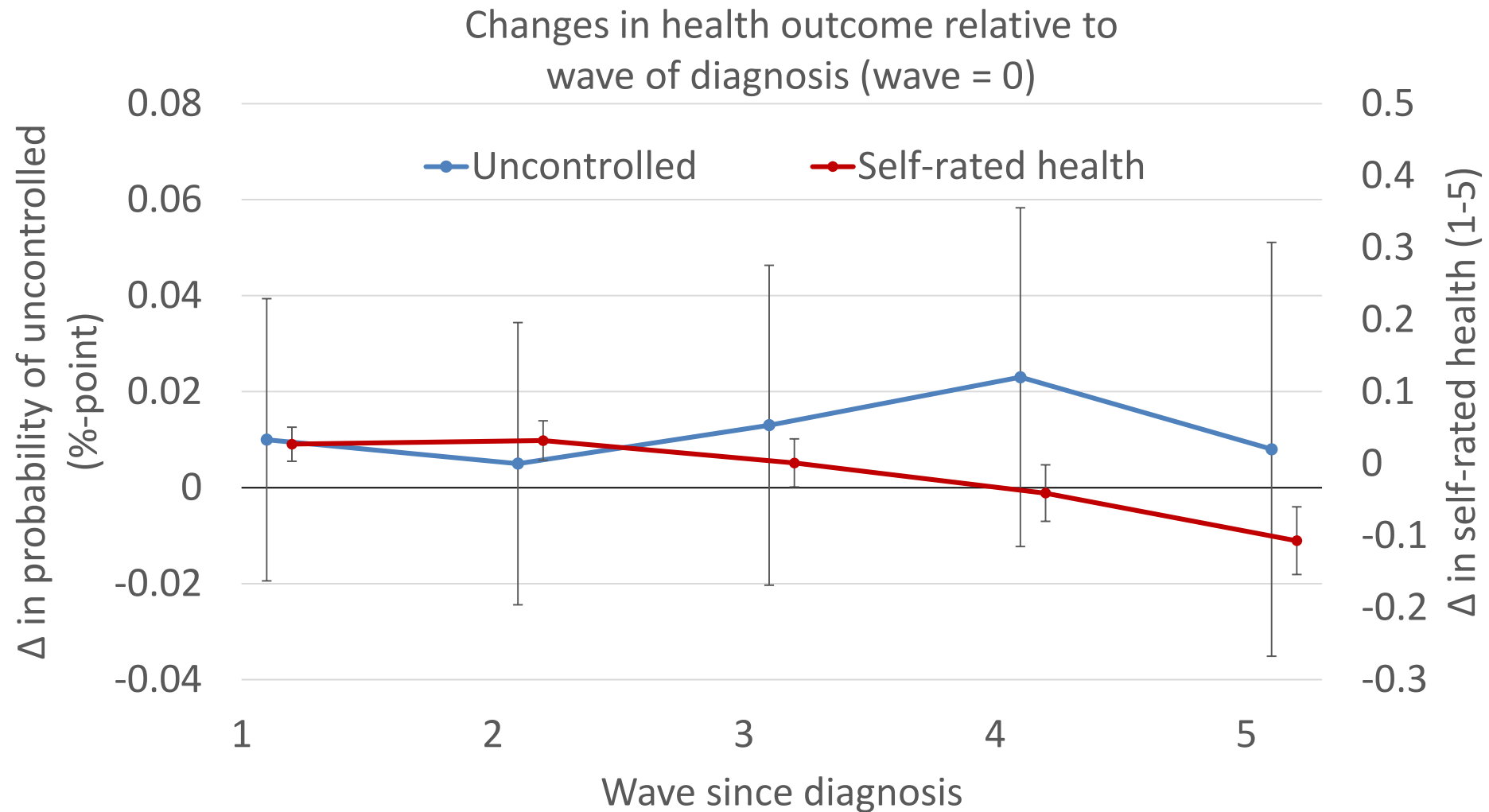
Wave 1		Wave 2		Wave 3	
2006	2008	2010	2012	2014	2016
Cohort A	Cohort B	Cohort A	Cohort B	Cohort A	Cohort B

- Medically defined threshold for “uncontrolled” = 1

Disease	Biomarker	Threshold	% Uncontrolled Diagnosed <65	% Uncontrolled Diagnosed ≥65
Cancer	C-Reactive Protein	≥5	24%	20%
Diabetes	Hemoglobin A1c	≥7	28%	22%
Heart Disease	Blood Pressure	140/90	27%	37%
Lung Disease	Peak Expiratory Flow Rate	≤50%	12.6%	33%

- Alternative Measure: Self-reported health (scale 1-5)

# Outcome Measures



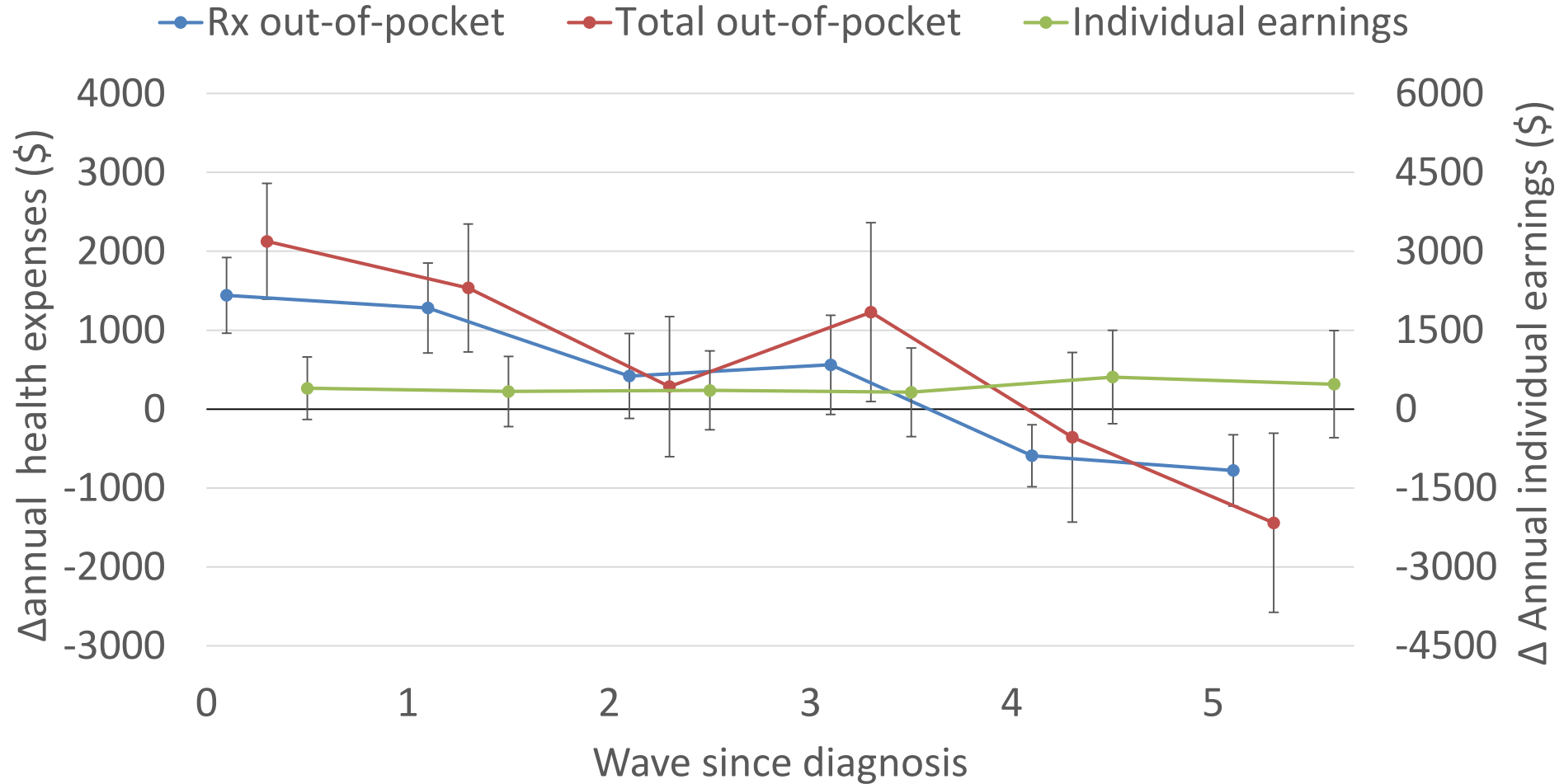
Mean uncontrolled in Wave 0 = 0.231

Mean self-rated health in Wave 0 = 2.797



# Financial Variables

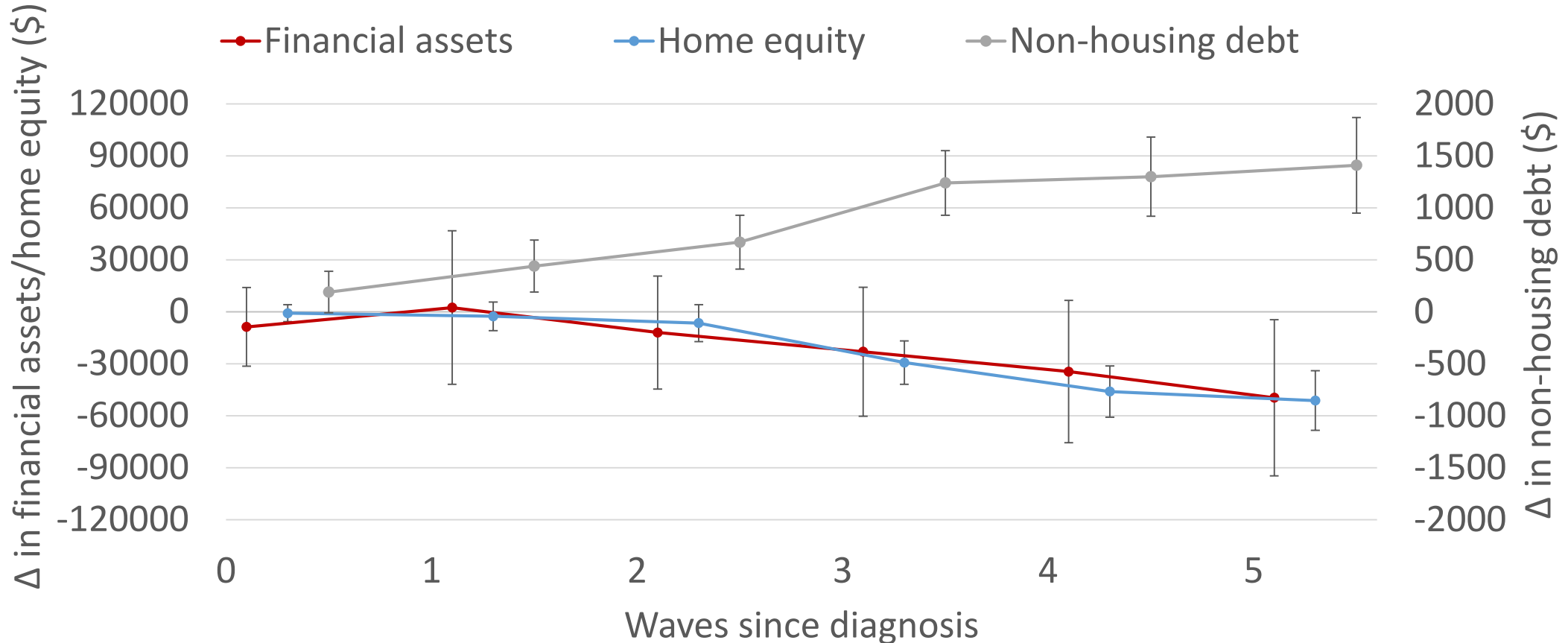
Respondents diagnosed on or after age 65



Mean Rx OOP Wave -1 = \$1,927 | Mean Total OOP Wave -1 = \$5,289 |  
Mean individual earnings Wave -1 = \$6,502

# Financial Variables

Respondents diagnosed on or after age 65



Mean fin. Assets Wave -1 = \$289,993 | Mean home equity Wave-1 = \$210,942 |  
Mean non-housing debt Wave -1 = \$2,634

# Measuring Home Equity Extraction

- **New borrowing through a mortgage**
  - Increase in total mortgage amount between waves (all homes and mortgages)
  - Does not move between waves; exclude observations with imputed mortgage amounts
- **Equity extracted through home sale**
  - Home sale between waves (primary or secondary residence)
  - Home equity extracted =  $\text{Home Equity}_{T_2} - \text{Home Equity}_{T_1}$

Post Shock Waves:	Shock Age <65	Shock Age >=65
Borrow (2 years)	18.4%	11%
Home Sale (2 years)	3.8%	3.3%
N (Observations)	2,539	4,126

- **Instruments for equity extraction**
  - Lagged change in House Price Index (Federal Housing Finance Agency) in the ZIP code
  - Lagged ZIP code level house price (Zillow)
  - Lagged indicator for being mortgage borrowing constrained ( $\text{LTV} \geq 80\%$ )

# Methods

## Aim 1: Home equity held prior to shock and disease outcomes

(OLS, individual random effects, errors clustered on HH)

- **Outcome:** Disease controlled (0,1) in waves post diagnosis
- **Explanatory variable (time invariant):** Home equity at baseline (wave prior to diagnosis)
- **Controls at baseline (time invariant):** income, assets, disease, health status, demographics
- **Controls (time varying):** wave since shock, age

## Aim 2: Borrowing from home equity after a shock and disease outcomes

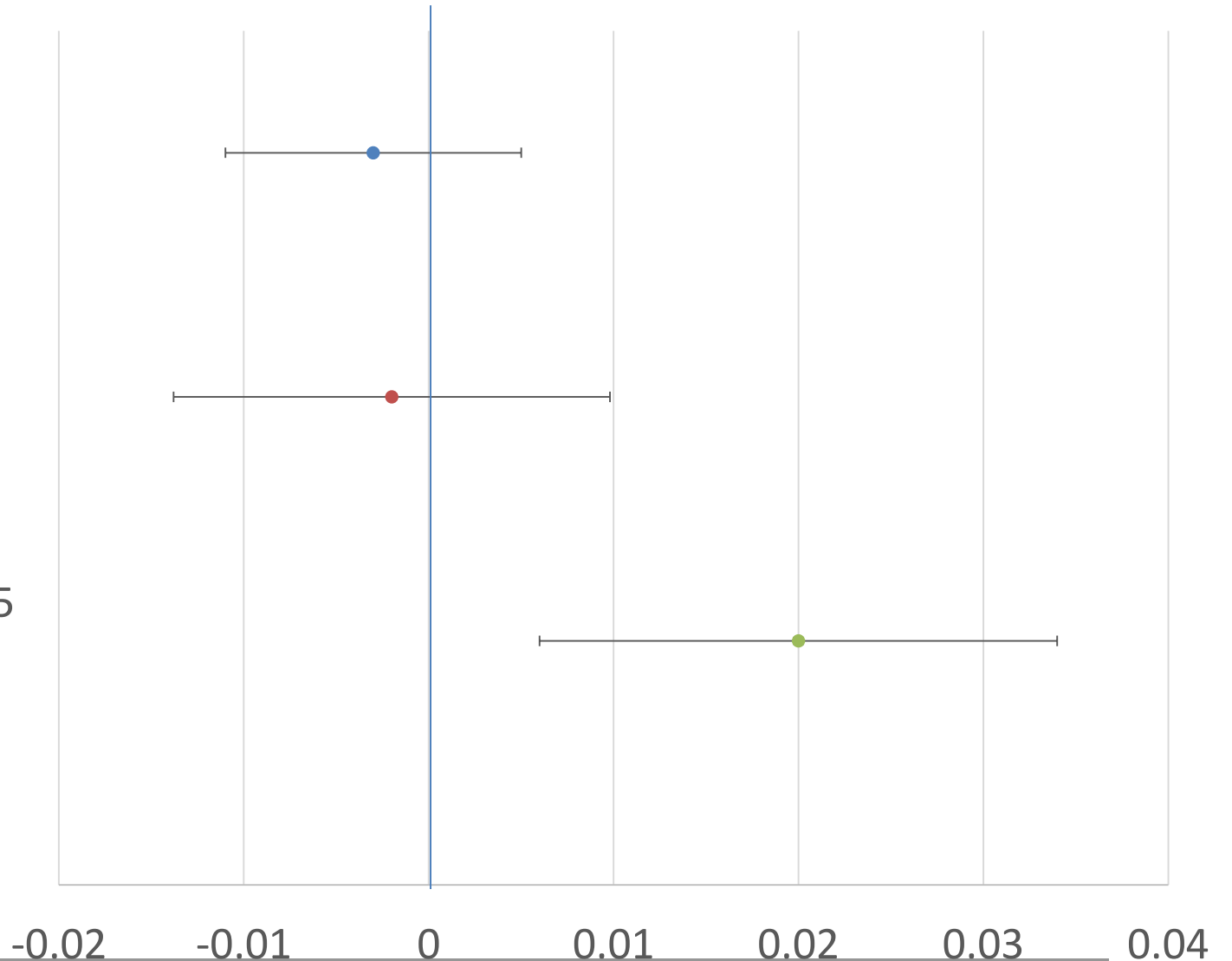
(2SLS, individual random effects, errors clustered on HH)

- **Outcome:** Disease controlled (0,1) in waves post diagnosis
- **Explanatory variable (time varying):** Lagged \$ amount of home equity borrowed (post diagnosis)
- **Instruments for Borrowing:** lagged HPI change, ZIP house price, LTV $\geq$ 80%
- **Controls at baseline:** disease, health status, demographics
- **Controls (time varying):** wave since shock, age
- **Controls (lagged two waves, time varying):** income, assets, insurance, spousal death

# Reduced Form Regression Results: Home Equity

Coefficients for \$100k Higher Home Equity in the Wave Prior to Shock

- Uncontrolled - age  $\geq$  65  
(N = 5,093)
- Uncontrolled - age  $<$  65  
(N = 2,957)
- Self-rated health - age  $\geq$  65  
(N = 12,826)



# 2SLS Regression Results: Equity Extraction

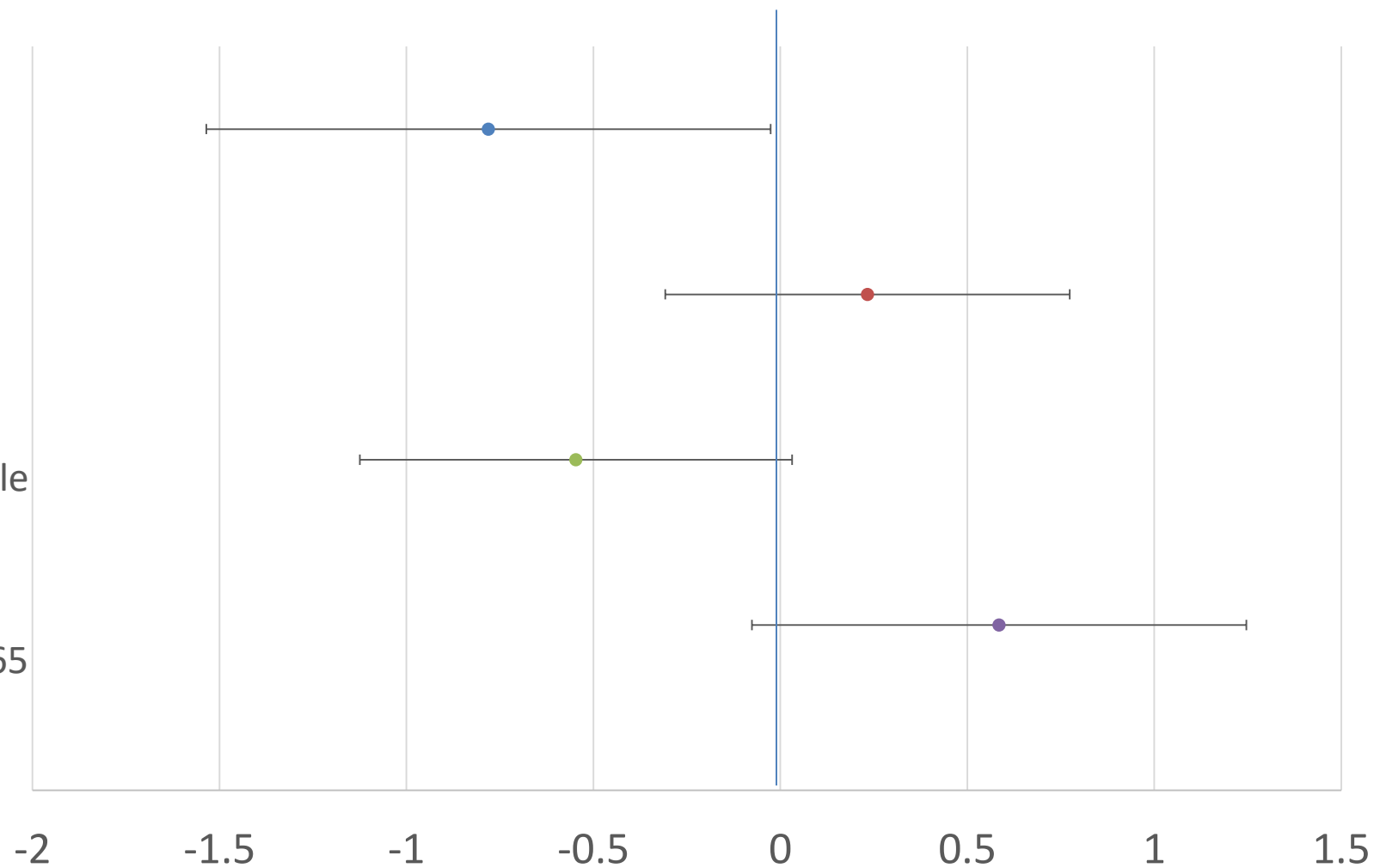
Coefficients for \$100k Equity Extraction (modeled as endogenous) After the Shock

- Uncontrolled - borrowing - age  $\geq$  65  
(N = 4,126)

- Uncontrolled - borrowing - age  $<$  65  
(N = 2,344)

- Uncontrolled - borrowing and home sale  
- age  $\geq$  65  
(N = 4,126)

- Self-rated health - borrowing - age  $\geq$  65  
(N = 10,373)



# Discussion & Policy Implications

- Health shocks in older age can be a significant source of financial insecurity
  - ✓ We document significant increases in out of pocket health expenditures in the waves immediately after being newly diagnosed with a disease
- Home equity is a large source of wealth for many older adults that may be used to help buffer the costs of a health shock; however, it must be converted to a more liquid form
  - ✓ After a health shock, we find that about 11% of adults age 65+ borrow from a mortgage in a two-year period, and about 3% engage in a home sale in a two-year period
- We do not find evidence of a relationship between the stock of home equity held prior to diagnosis and the ability to control a disease; however, liquidating home equity matters!
  - ✓ Each \$10,000 borrowed lowers the probability of uncontrolled disease by 7.8 ppts (23 percent)
- Policies that reduce borrowing constraints and increase access to home equity following a health shock may increase the financial security of social security beneficiaries, thereby improving individual health outcomes and reducing longer term health care costs

Thank you!