“Debt And The Macroeconomy”

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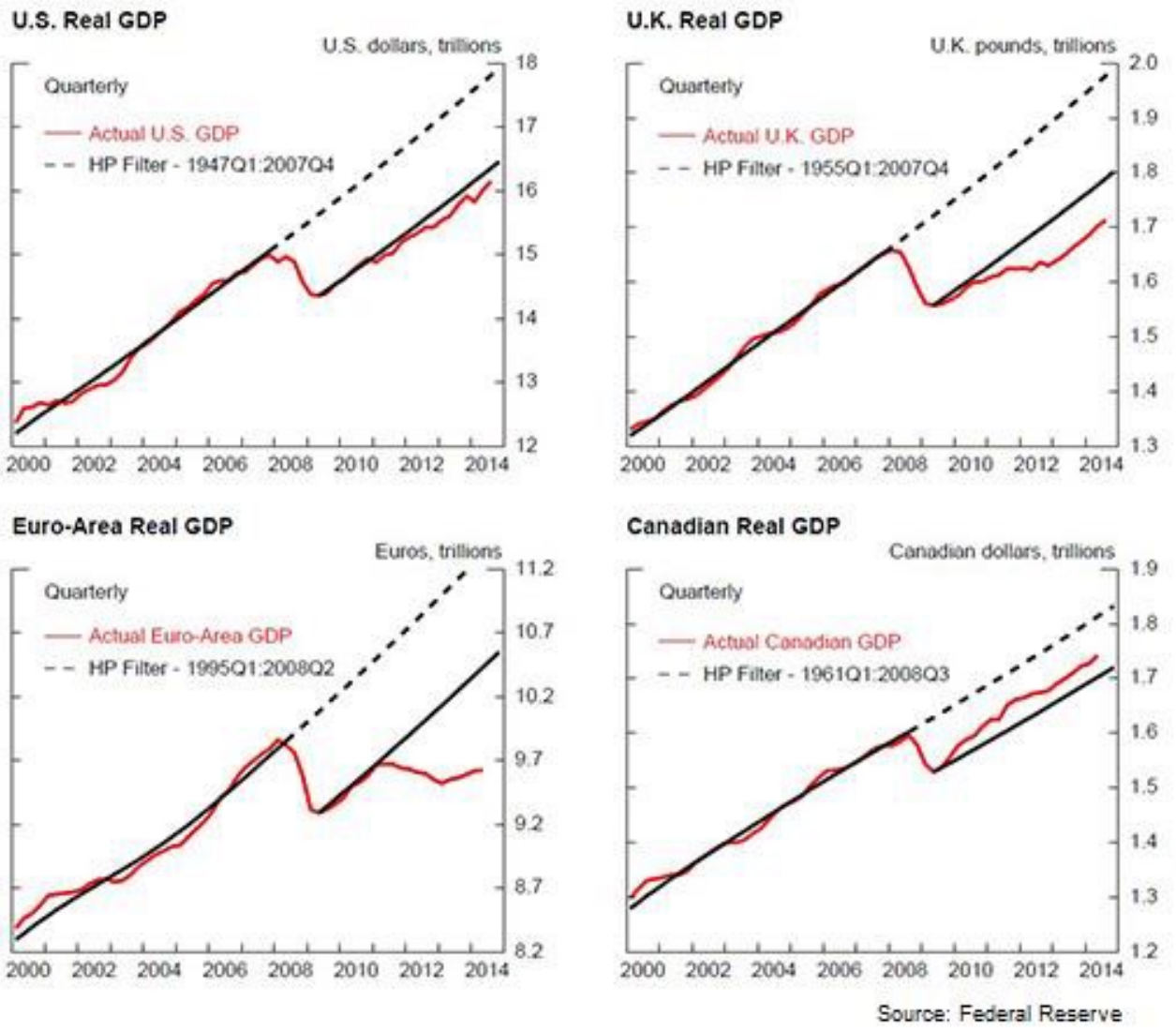
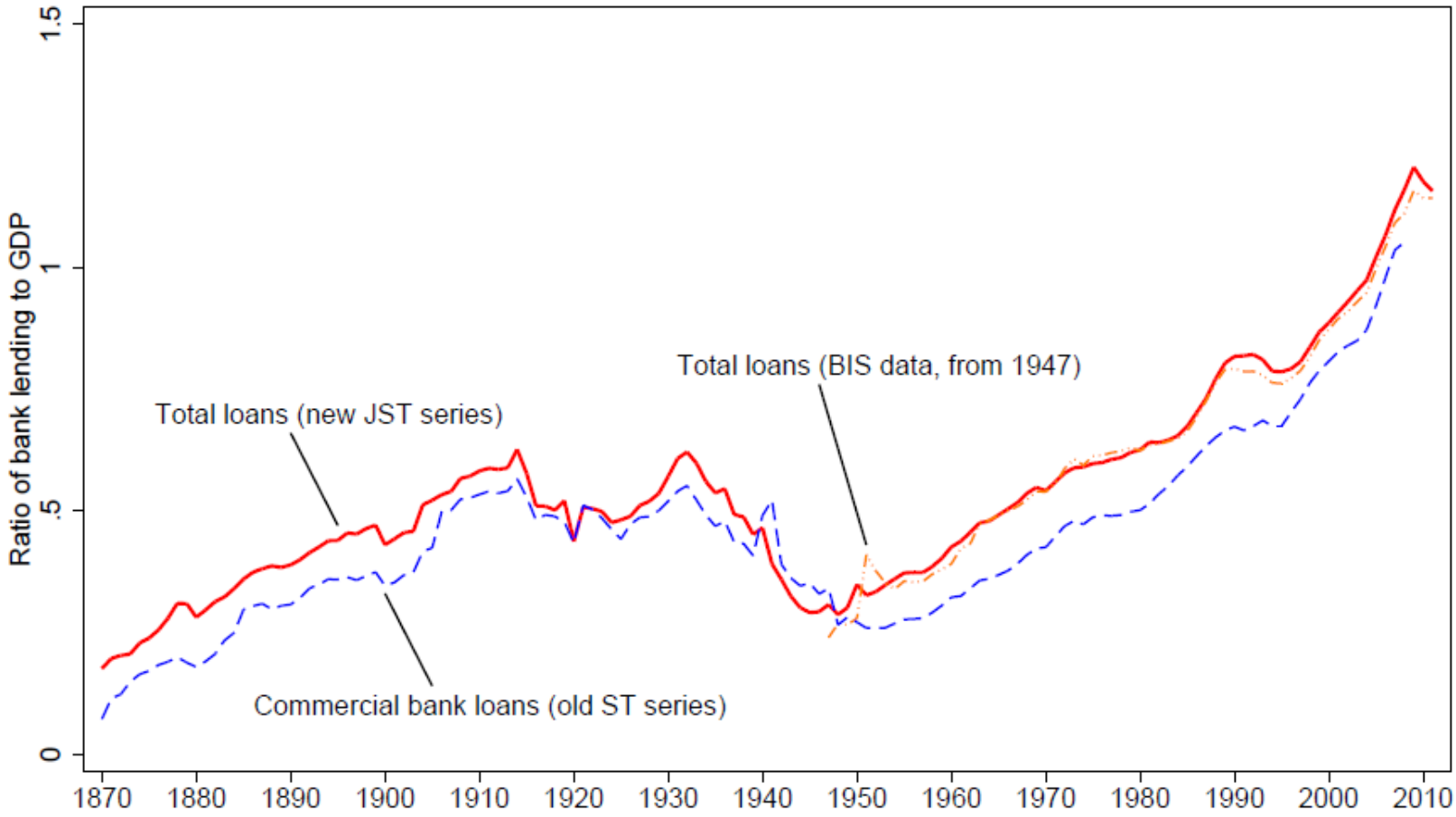
Debt and GDP Growth

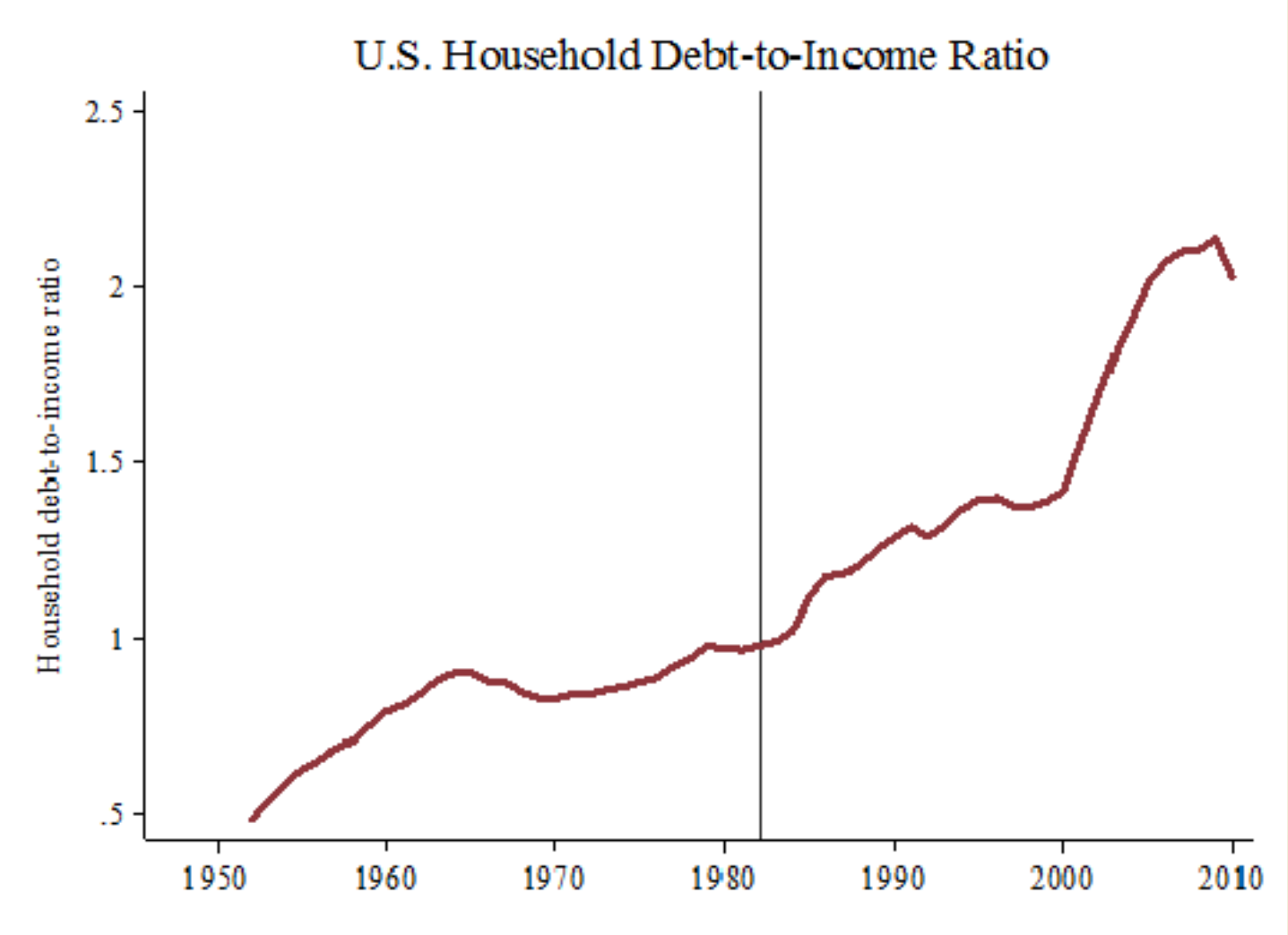


Global Rise In Finance

Figure 1: *Bank credit to the domestic economy, 1870–2011, with a comparison of data from three different sources: Average ratio to GDP by year for 17 countries*



Debt Growth


U.S. Household Debt-to-Income Ratio
Household debt-to-income ratio
2.5
2
1.5
1
.5
1950
1960
1970
1980
1990
2000
2010

Why Is Debt Harmful?

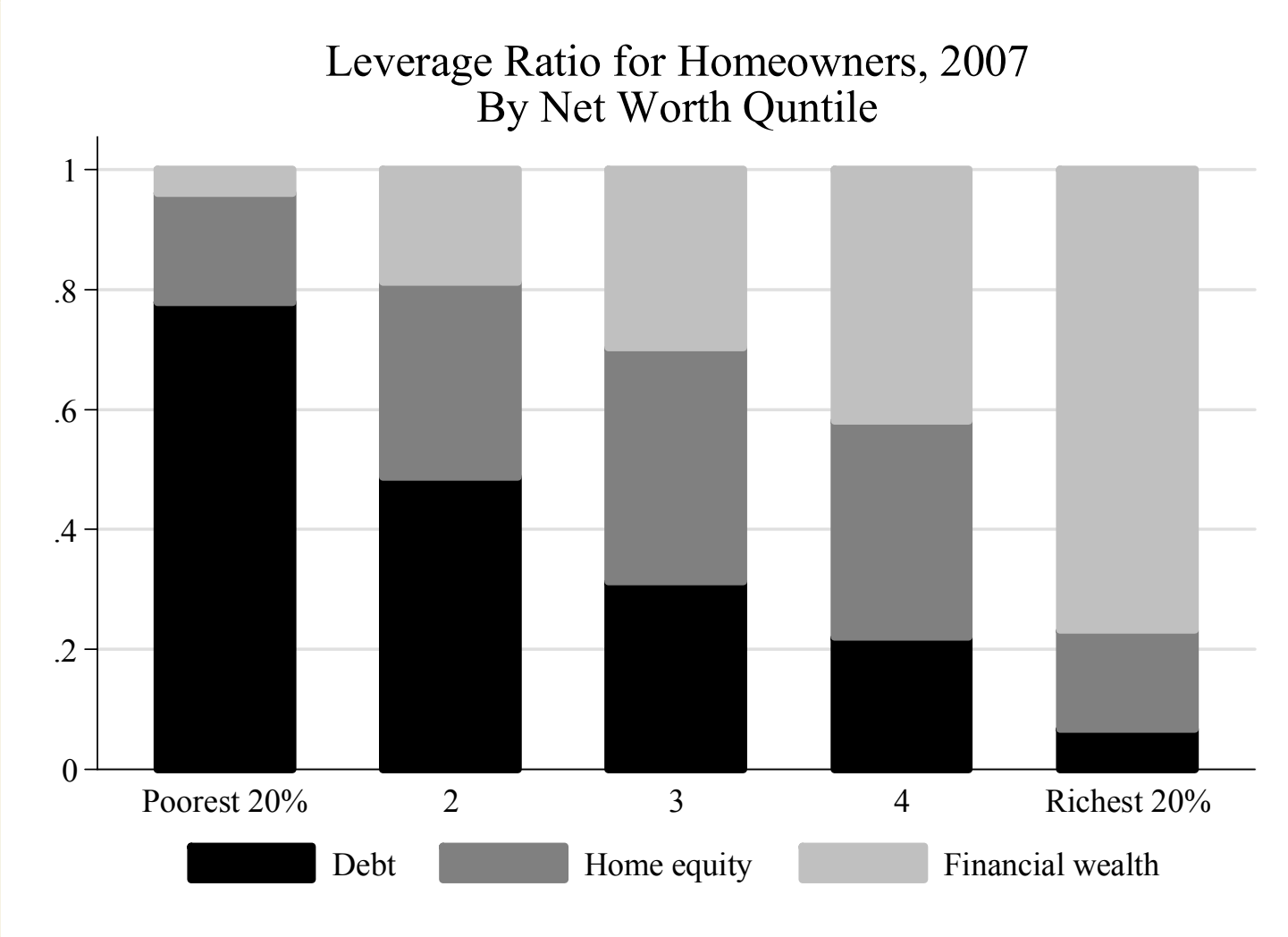
Should debt matter for GDP?

- Traditional approach
  - No. Output depends on fundamental factors such as capital, labor and productivity.
  - Typically generate positive correlation between debt growth and subsequent growth due to PIH.

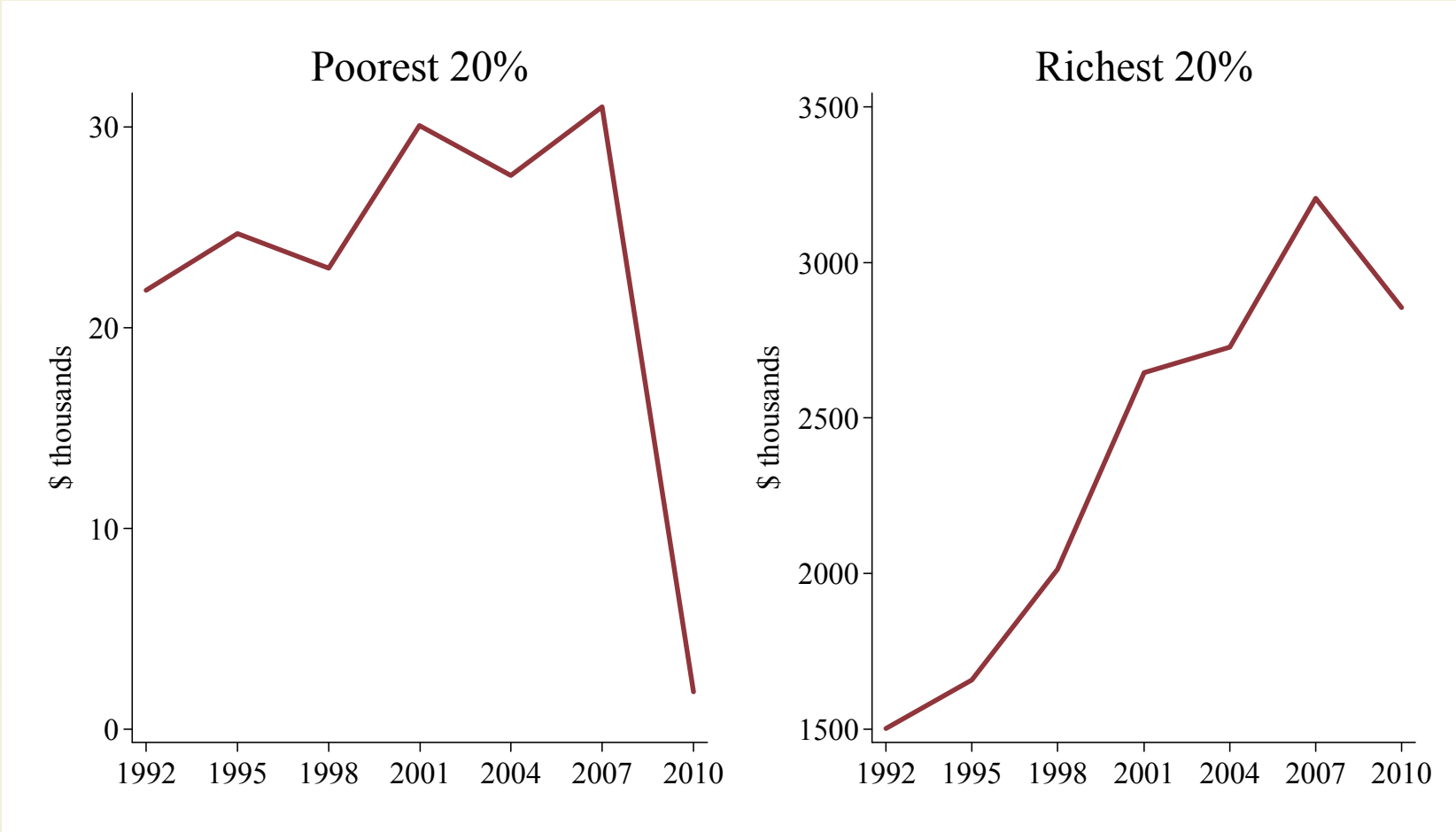
Alternative Models

- Behavioral
  - Myopic agents might borrow and “over consume” at the expense of capital accumulation
- Private debt has macro externalities
  - Aggregate demand externality with heterogeneous MPC
  - Fire-sale / pecuniary externalities
  - Frictions, such as constrained monetary policy, cannot undo the negative effects
  - Implies, ex-ante “excessive borrowing”

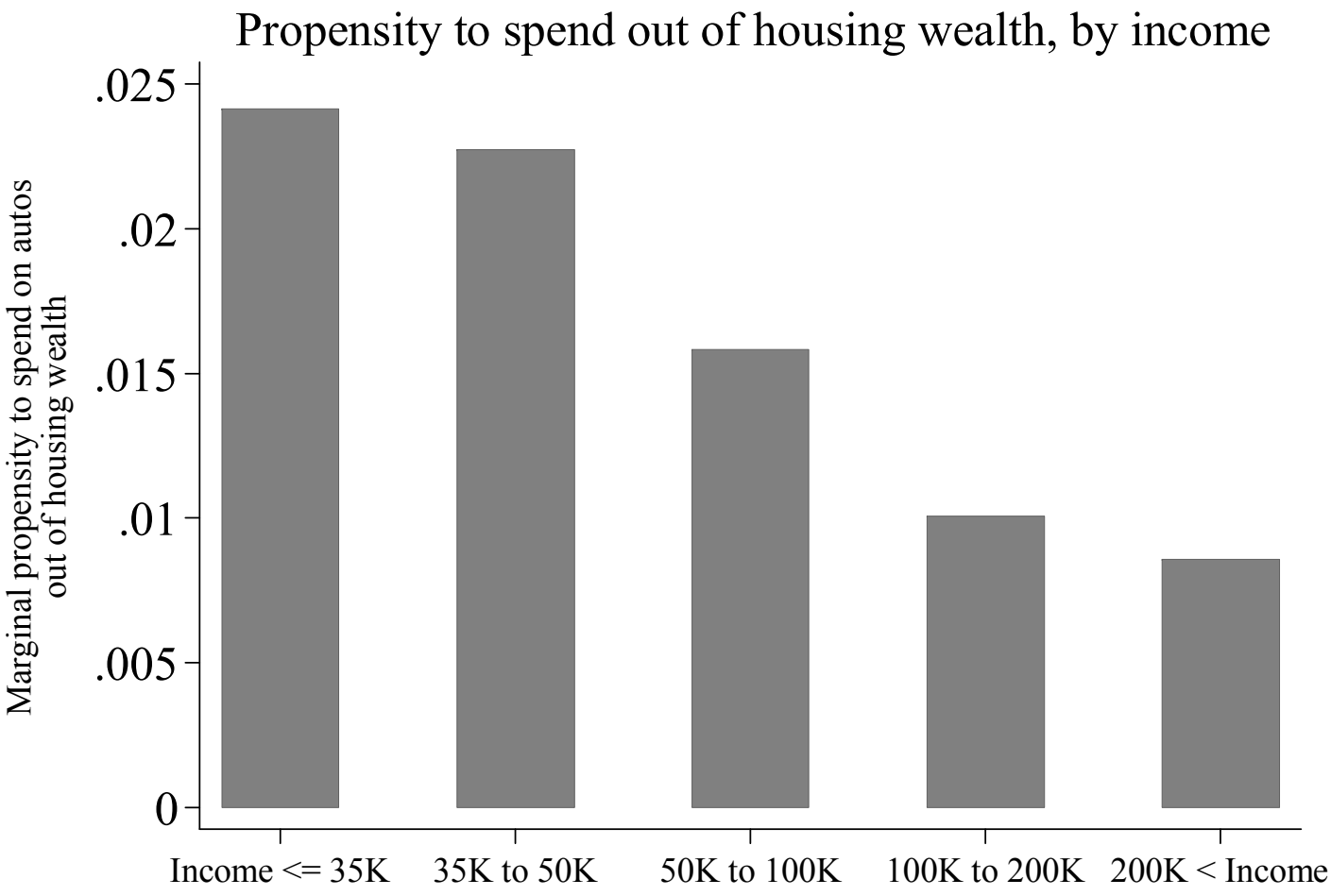
Example:
Creditor vs Debtor Balance Sheet



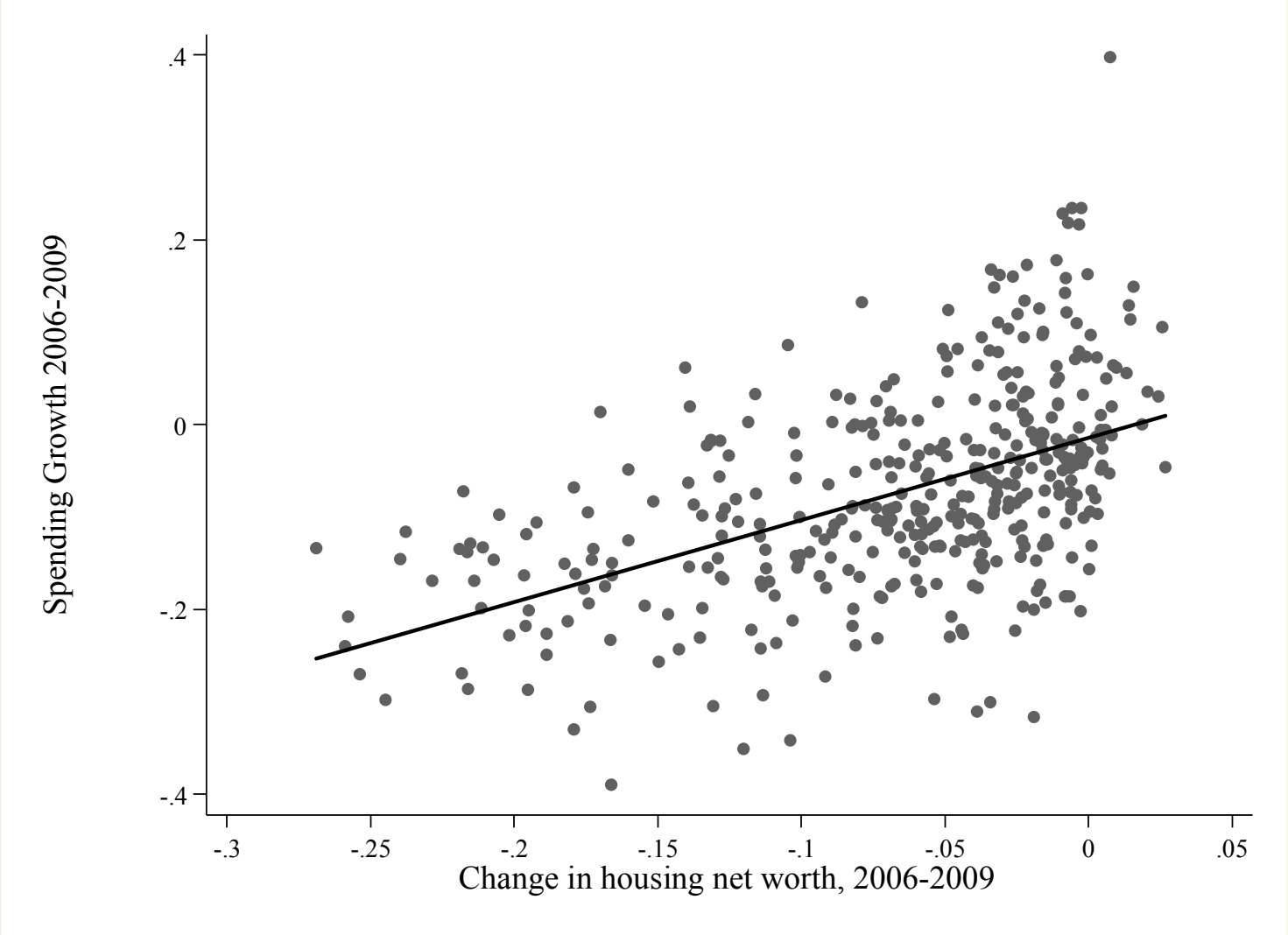
The Distribution of Losses Matters!



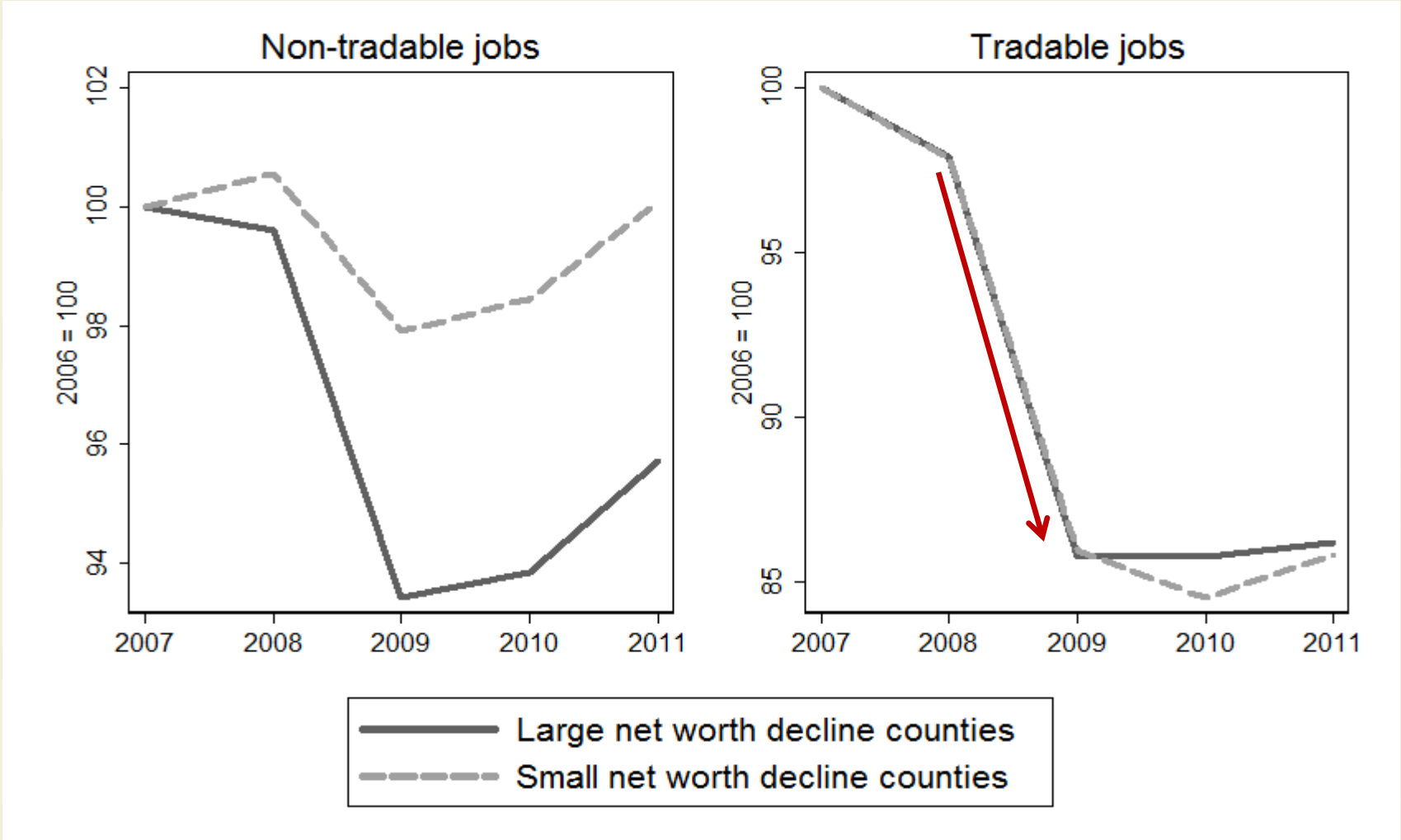
The aggregate demand feedback



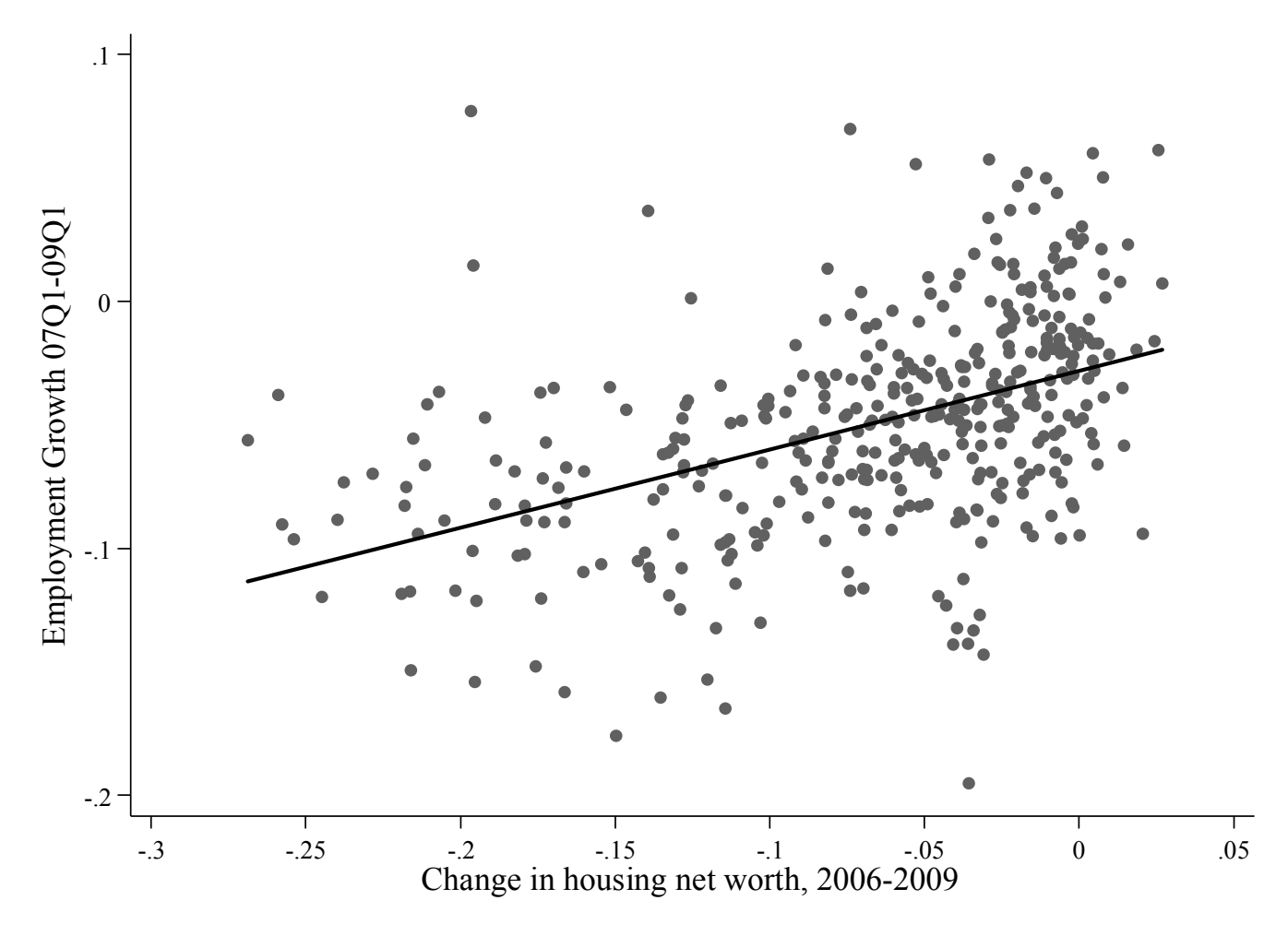
The Aggregate Demand Channel



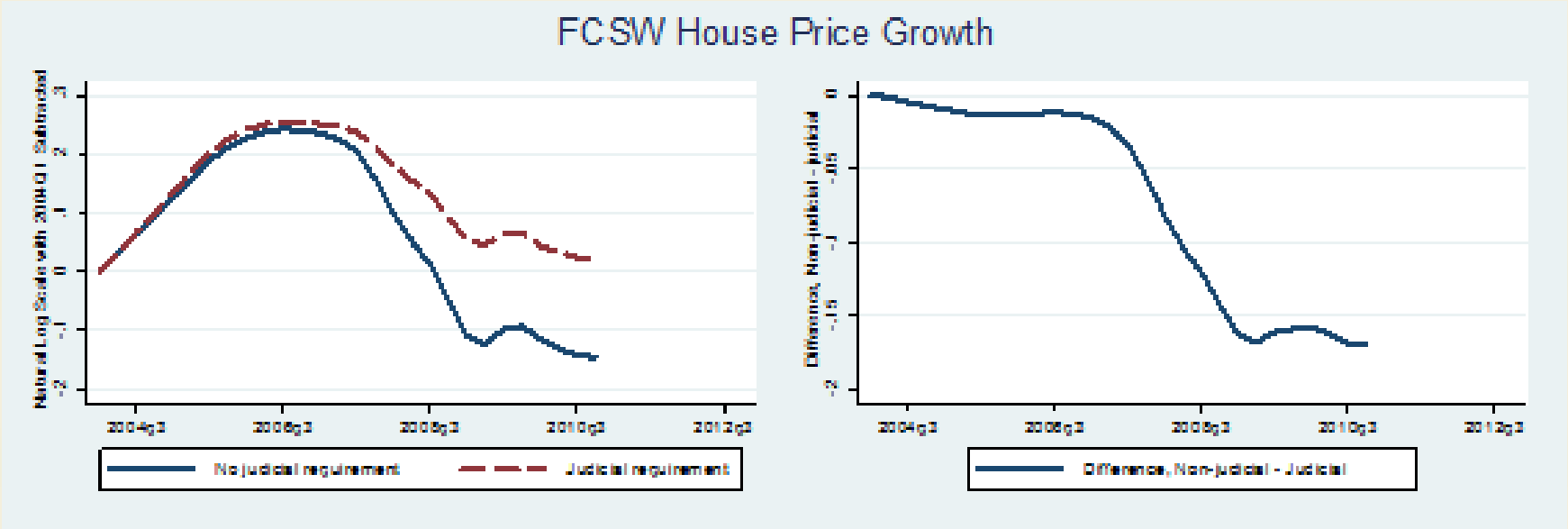
The employment feedback



Employment Consequences

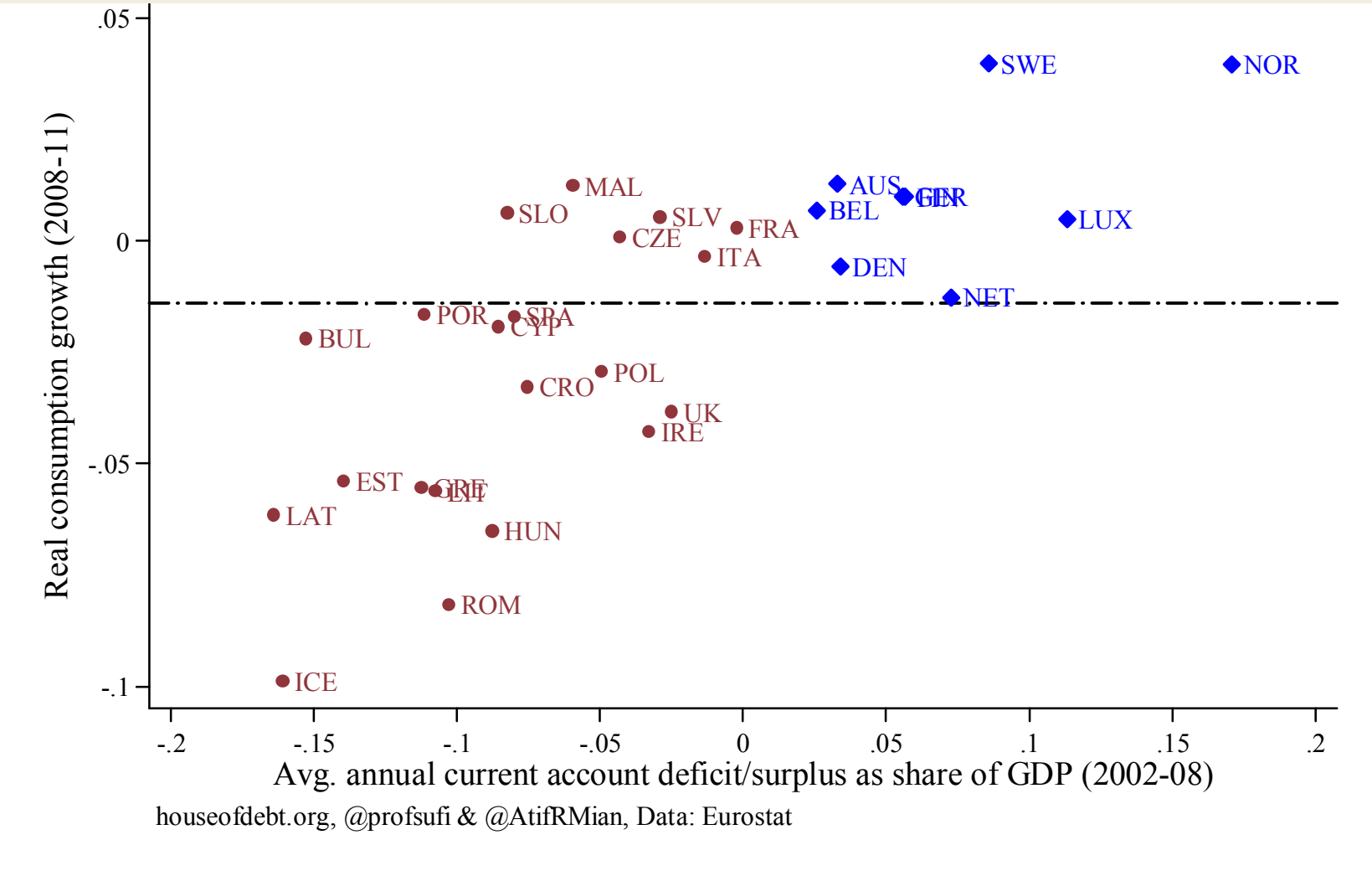


The fire-sale feedback

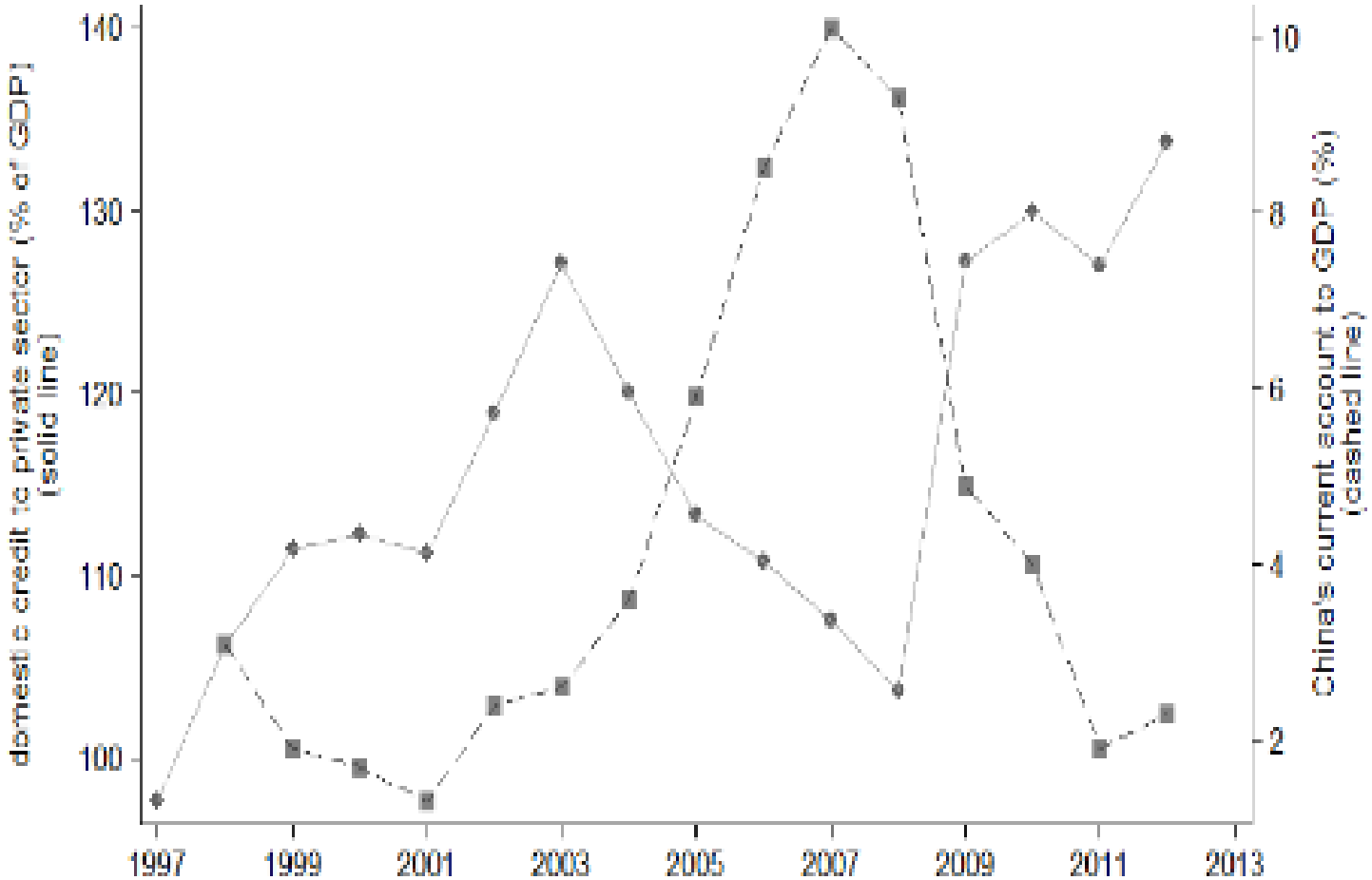


EU Parallel

The European Example

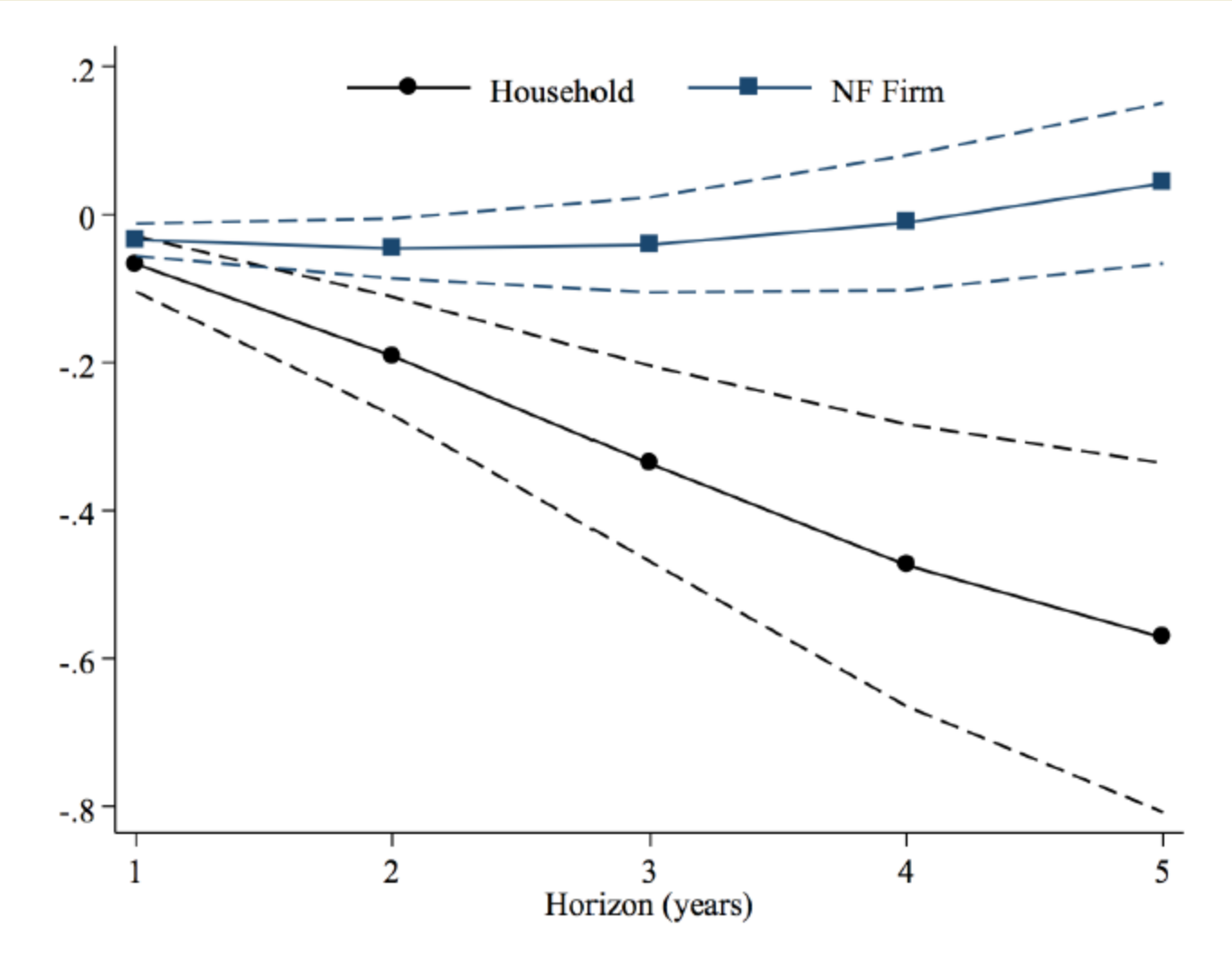


China Next?

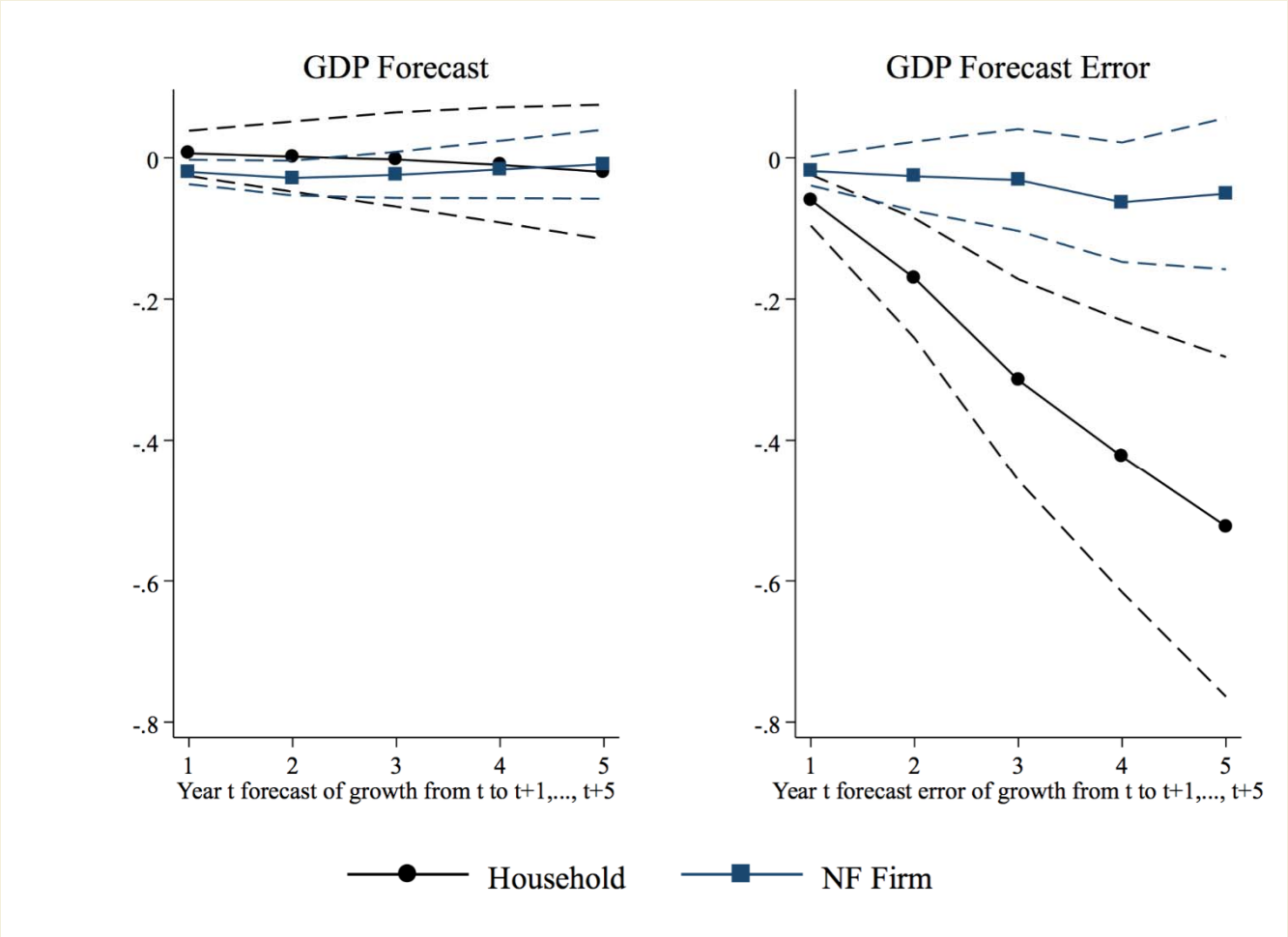

domestic credit to private sector (% of GDP)
(solid line)
China's current account to GDP (%)
(dashed line)
140
130
120
110
100
10
8
6
4
2
1997
1999
2001
2003
2005
2007
2009
2011
2013

Debt and Business Cycles Worldwide

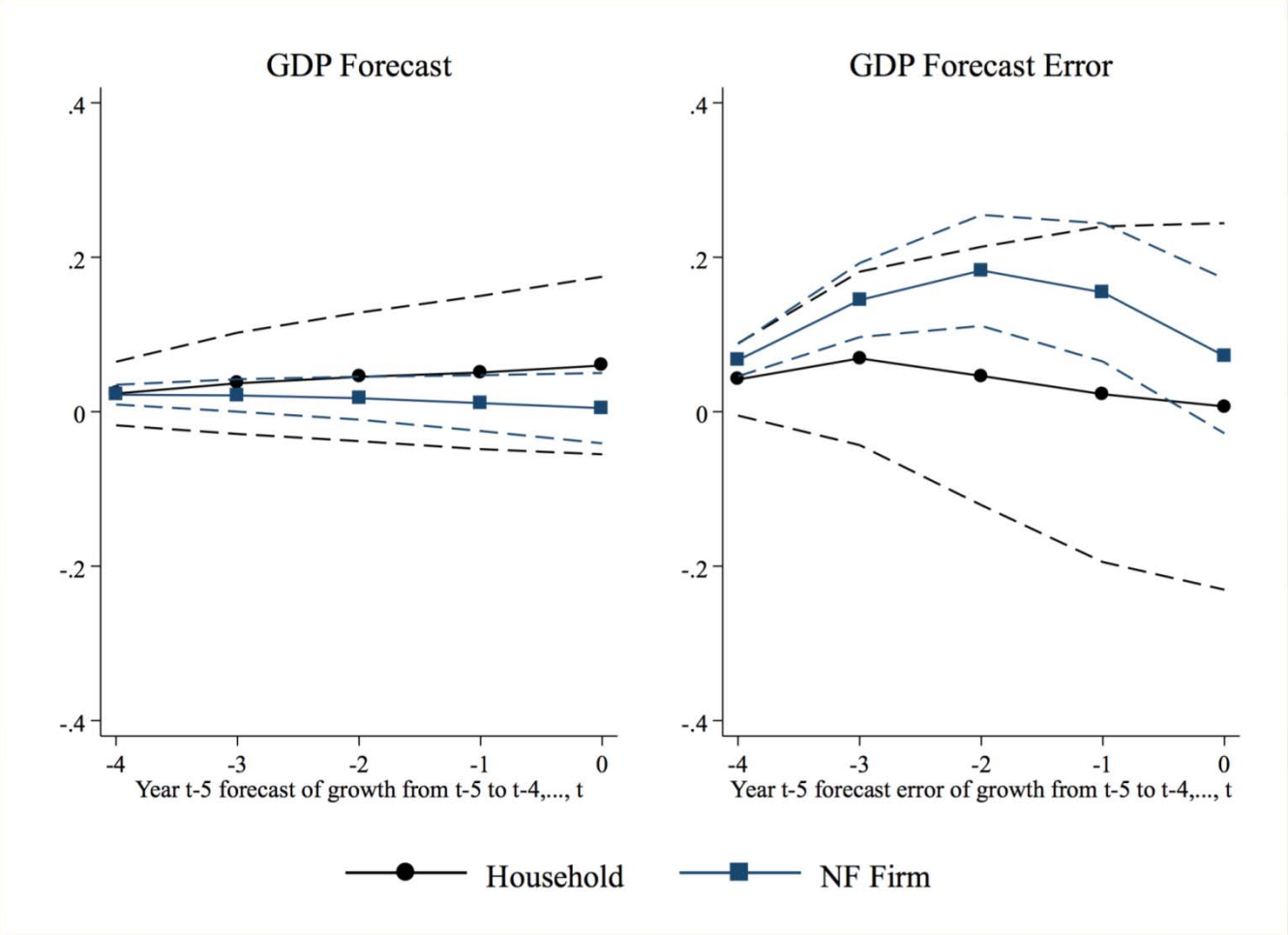
Does debt predict stronger growth?



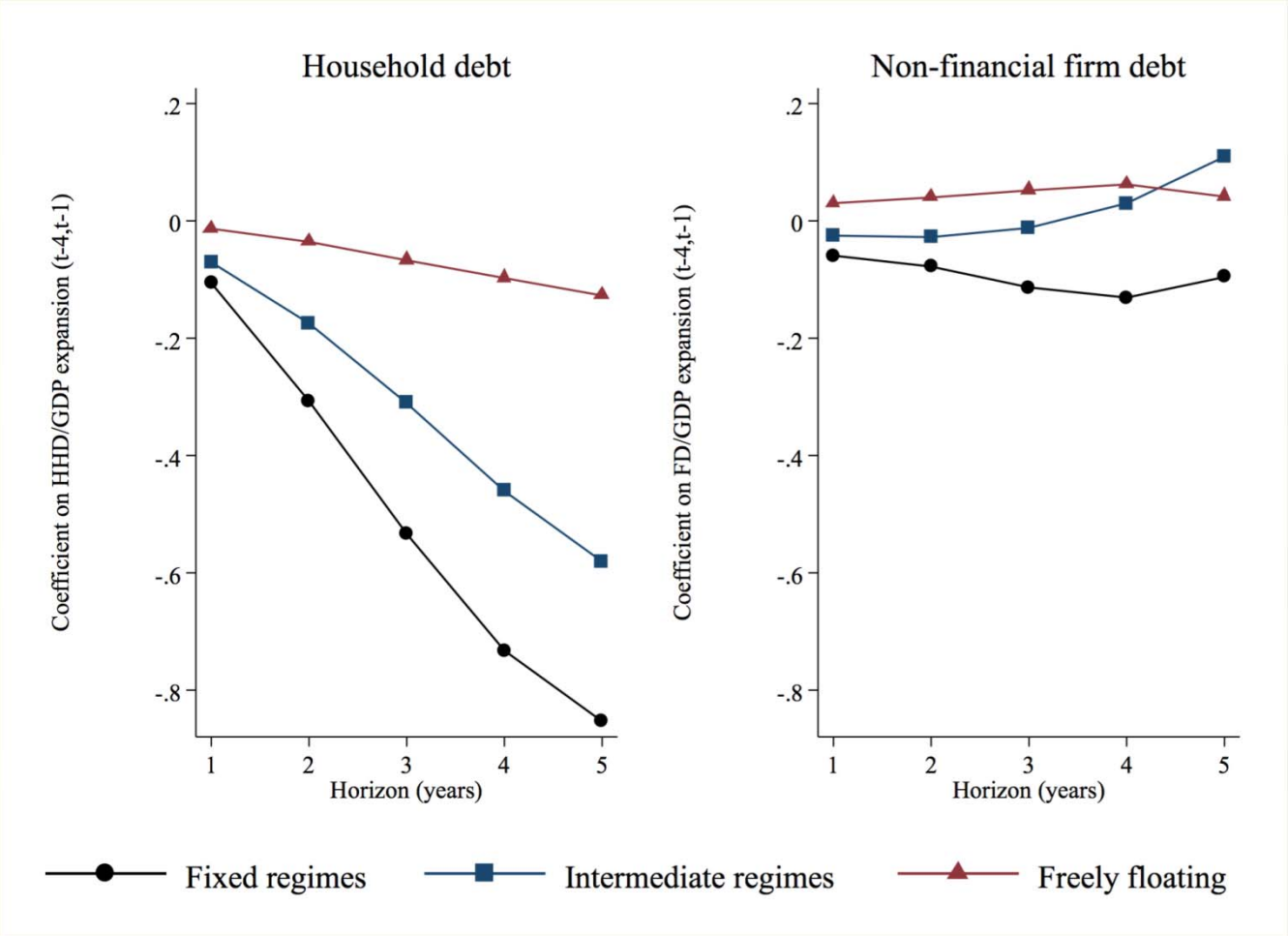
Do we understand debt?



Is debt growth preceded by high growth expectations?



Debt and Monetary Policy frictions



Instrumenting debt growth

Panel A: Country spread in $t-4$ spr_{it-4} as an instrument for credit expansion

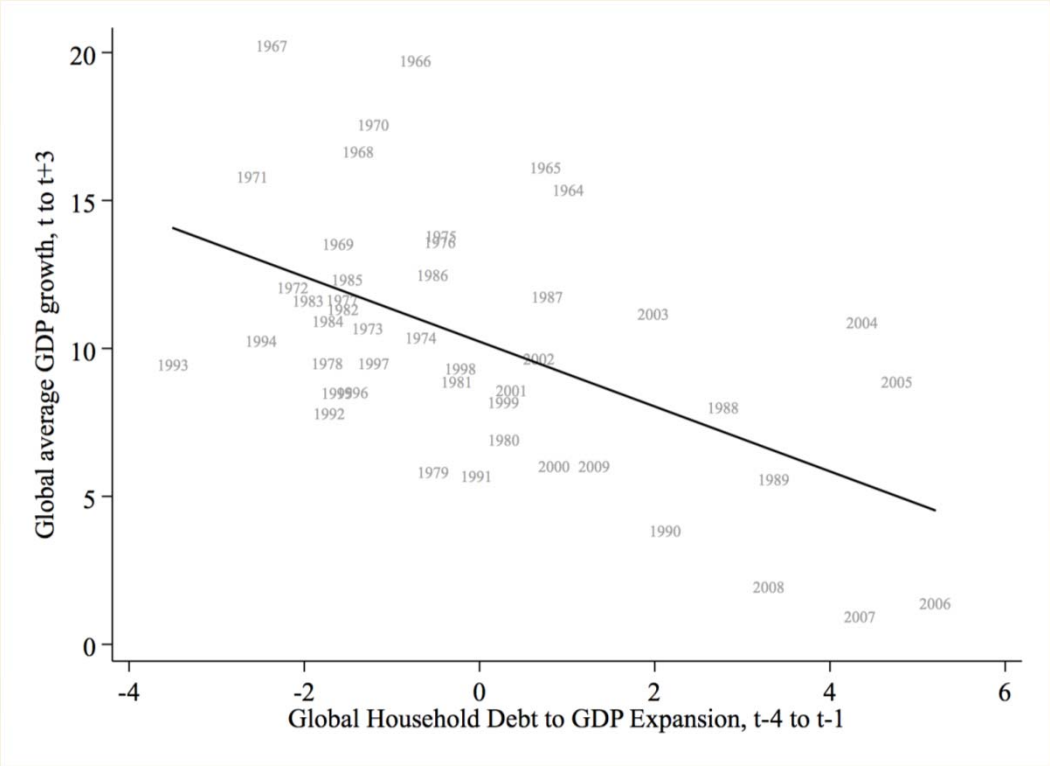
	IMF Forecast	First stage			IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	$\Delta_3 y^{IMF}_{t-1\|t-4}$	$\Delta_3 \frac{PD}{Y}_{it-1}$	$\Delta_3 \frac{HHD}{Y}_{it-1}$	$\Delta_3 \frac{HHD}{Y}_{it-1}$	$\Delta_3 y_{it+3}$	$\Delta_3 y_{it+3}$	$\Delta_3 y_{it+3}$
spr_{it-4}	0.0147	-2.715**	-0.934**	-0.917**			
	(0.121)	(0.696)	(0.240)	(0.218)			
$\Delta_3(PD/Y)_{it-1}$					-0.249**		
					(0.0791)		
$\Delta_3(HHD/Y)_{it-1}$						-0.723**	-0.746**
						(0.237)	(0.246)
R^2	0.000	0.136	0.112	0.127	0.211	0.206	0.197
Country Fixed Effects	✓	✓	✓	✓	✓	✓	✓
Distributed Lag in Δy				✓			✓
F statistic		15.2	15.2	17.6			
Observations	434	547	547	547	547	547	547

Debt growth, consumption and external margin

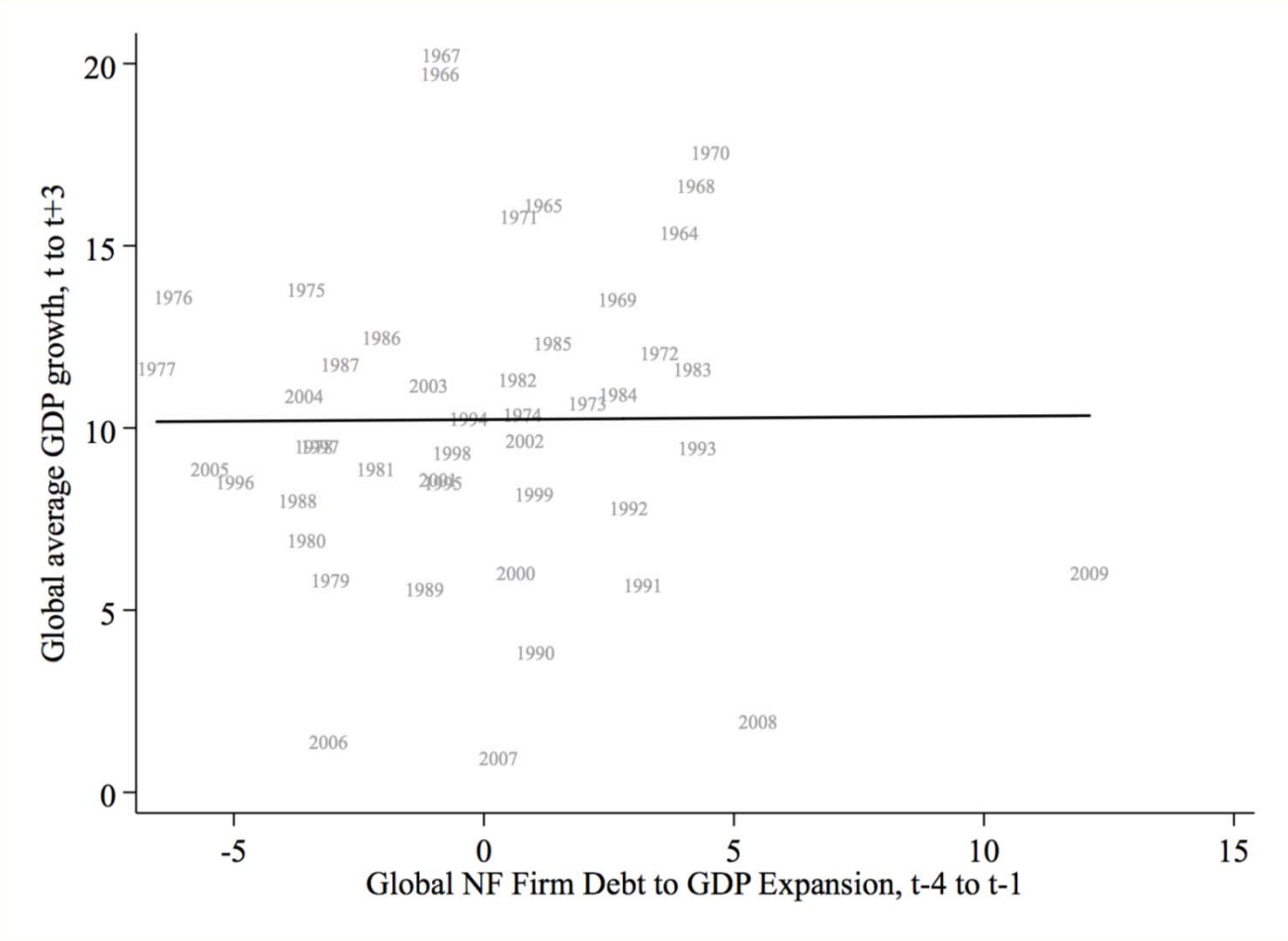
Table 8: Household Debt Increases Finance Consumption Booms

	(1) $\Delta_1 \frac{C}{Y}_{it}$	(2) $\Delta_1 \frac{NX}{Y}_{it}$	(3) $\Delta_1 \frac{CA}{Y}_{it}$	(4) $\Delta_1 s_{it}^{MC}$	(5) $\Delta_1 s_{it}^{XC}$	(6) $\Delta_1 \ln REER_{it}$
$\Delta_1(HHD/Y)_{it}$	0.120**	-0.173*	-0.185*	0.152**	0.0371	0.153
	(0.0402)	(0.0665)	(0.0843)	(0.0361)	(0.0326)	(0.130)
$\Delta_1(FD/Y)_{it}$	0.0249^{+}	-0.0167	-0.0125	-0.0261	-0.0400^{+}	-0.235*
	(0.0126)	(0.0205)	(0.0186)	(0.0167)	(0.0204)	(0.100)
R^2	0.082	0.041	0.037	0.042	0.013	0.030
Country Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	688	695	648	695	695	614

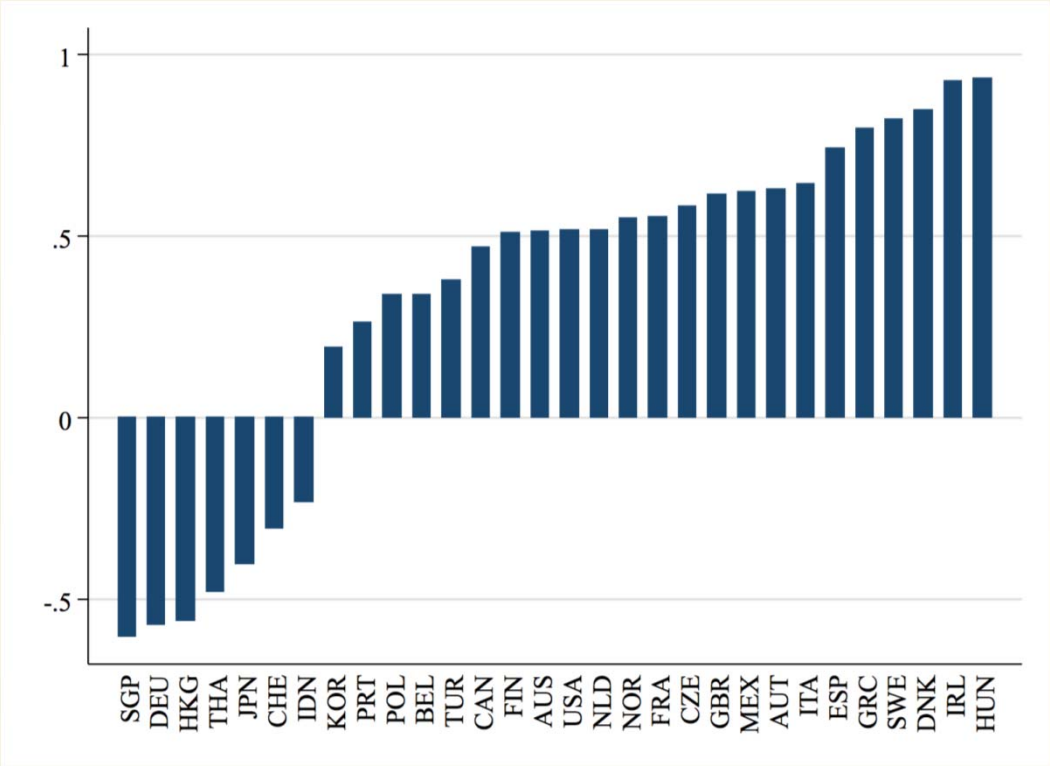
Global HH debt cycle



Global NF corporate debt cycle



Global cycle beta

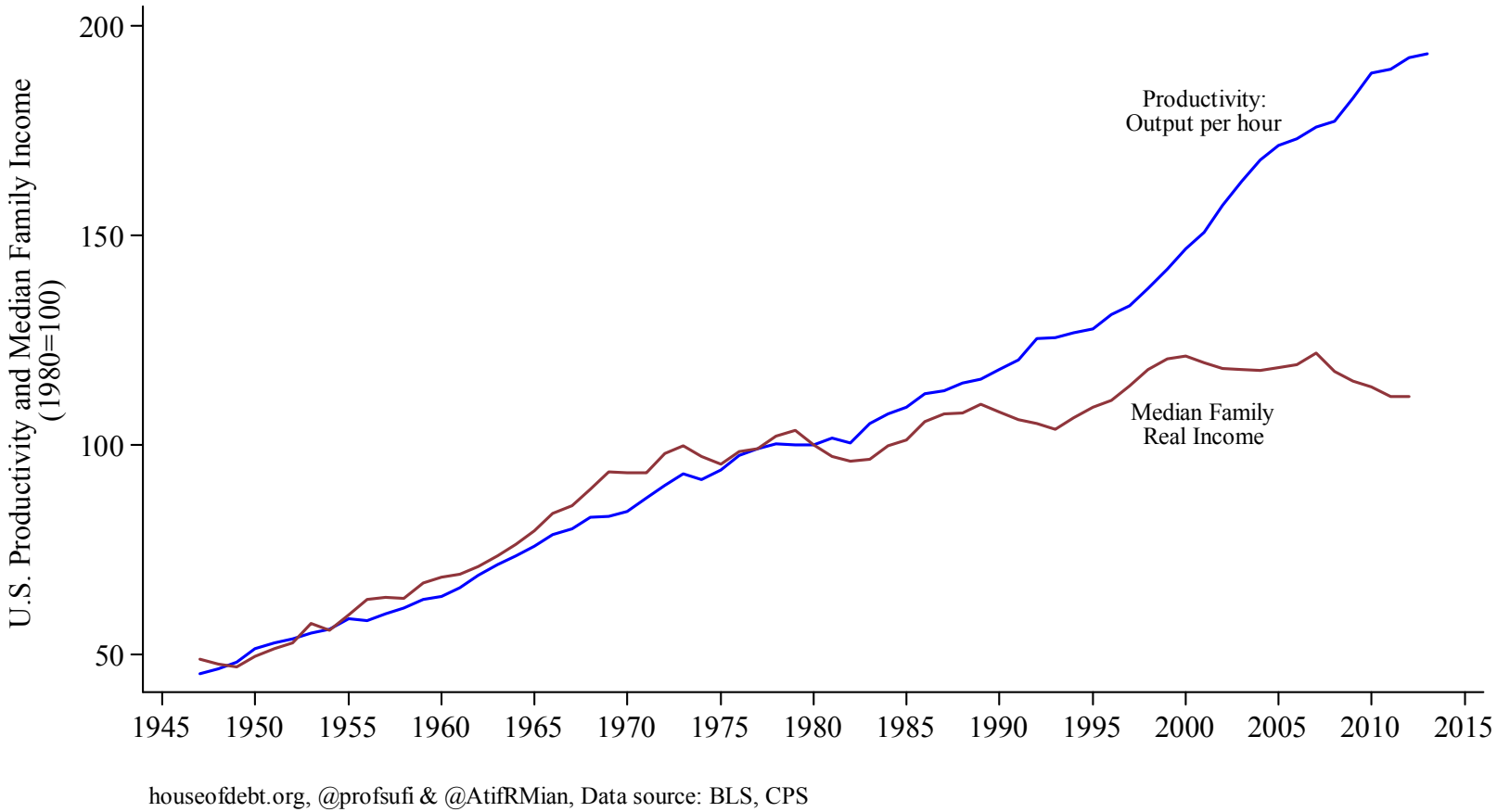


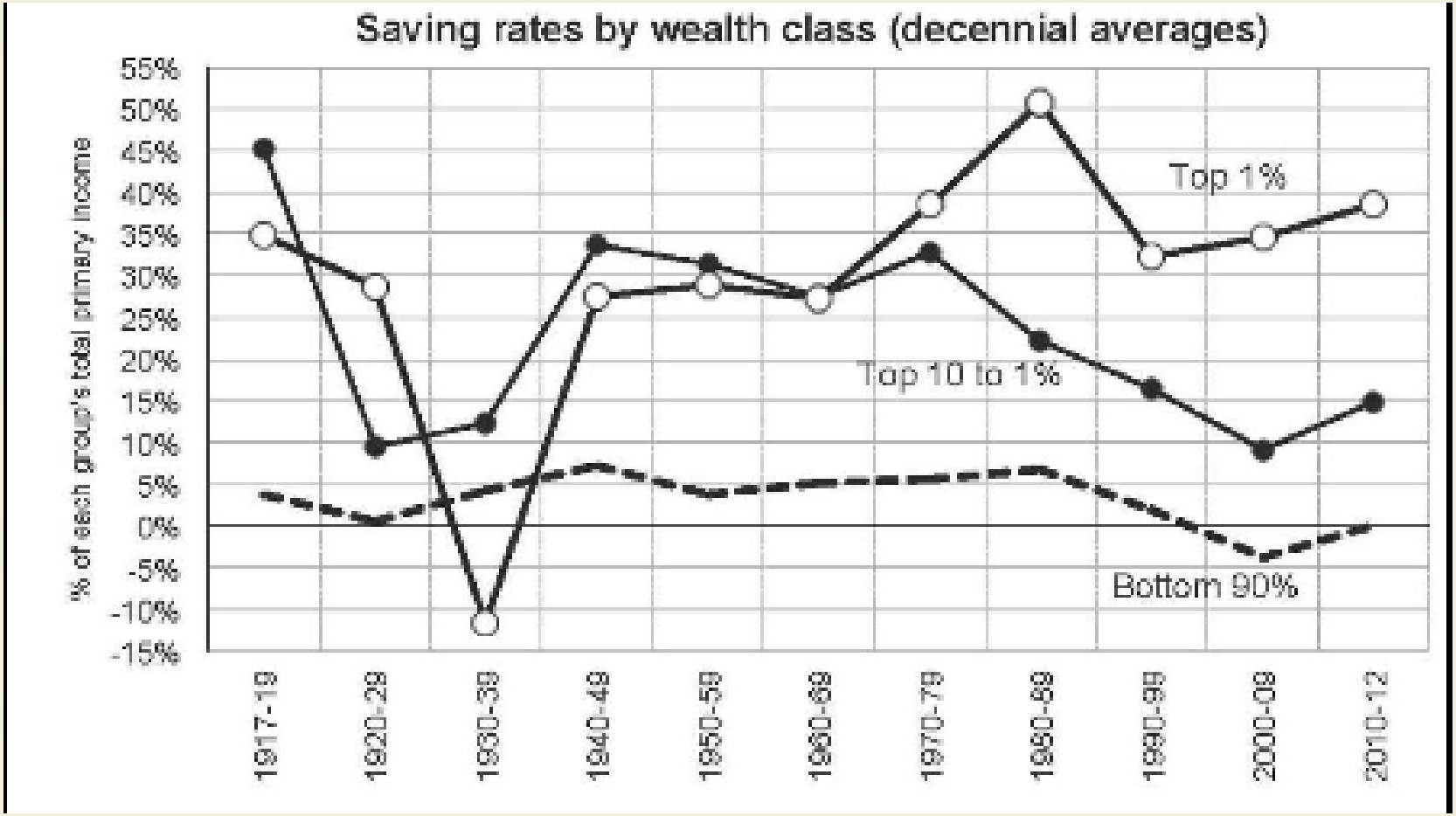
Global cycle and HH debt

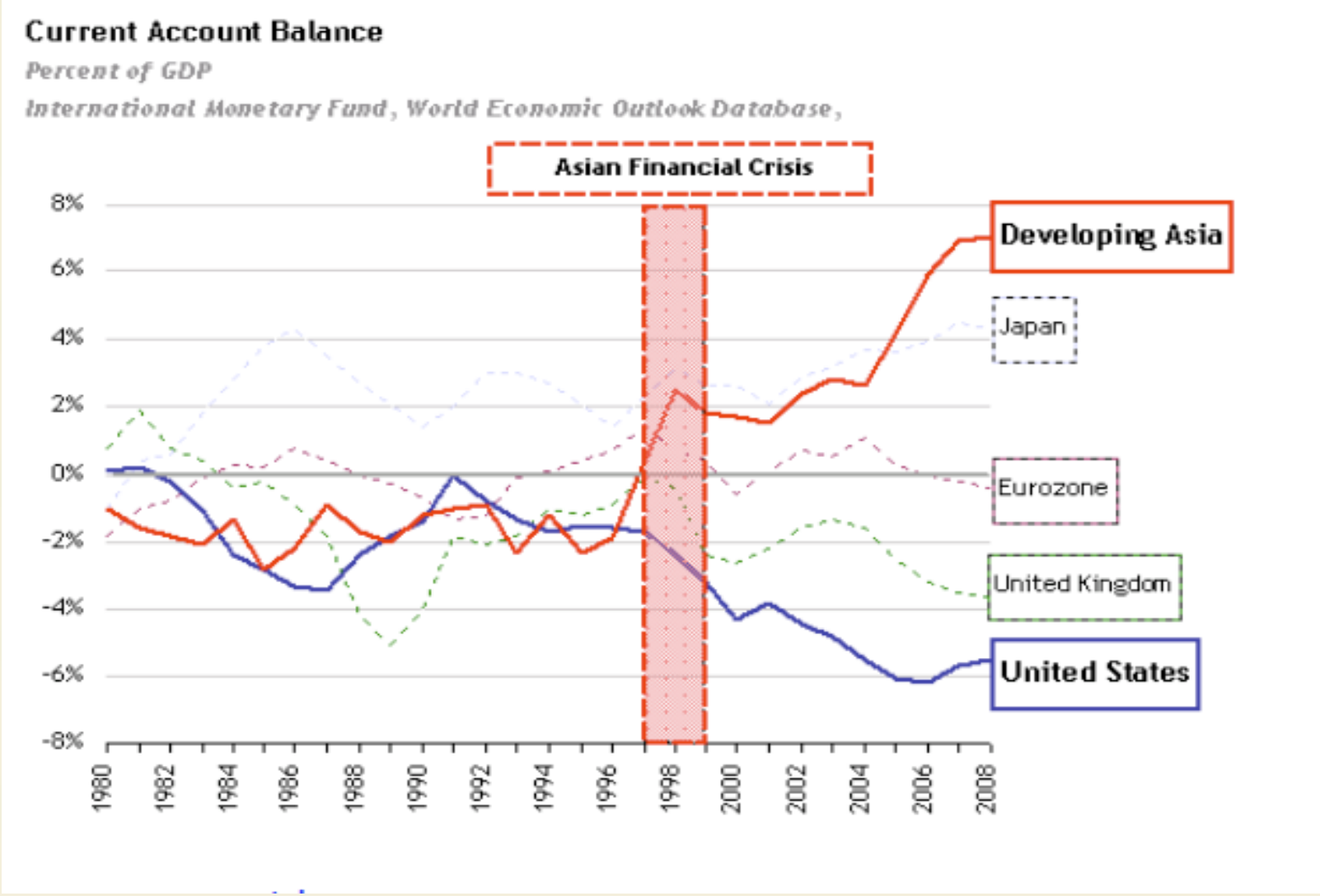
Table 11: Debt Expansions, Growth, and the Correlation with the Global Household Debt Cycle

	$\Delta_3 y_{it+3}$				$\Delta_3 \frac{NX}{Y}_{it+3}$		$\Delta_3 \frac{X}{Y}_{it+3}$	$\Delta_3 \frac{M}{Y}_{it+3}$
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta_3(HHD/Y)_{it-1}$	-0.222*	-0.221**	-0.216*	-0.216*	0.204**	0.206**	0.261*	0.0576
	(0.0975)	(0.0693)	(0.0904)	(0.0880)	(0.0492)	(0.0522)	(0.126)	(0.118)
$\Delta_3(FD/Y)_{it-1}$	-0.0385	-0.0379	-0.0377	-0.0579*	0.0114	0.00457	-0.00116	-0.0125
	(0.0330)	(0.0298)	(0.0309)	(0.0268)	(0.0134)	(0.0131)	(0.0349)	(0.0348)
$\Delta_3(HHD/Y)_{it-1} \times \rho_t^{Global}$	-0.333+		-0.0239	-0.0333	-0.210*	-0.105	-0.512*	-0.302
	(0.179)		(0.173)	(0.171)	(0.0869)	(0.0887)	(0.203)	(0.188)
$\text{Global}_{-t}\Delta_3 \frac{HHD}{Y}_{it-1}$				-0.718**		-0.252*		
				(0.152)		(0.0950)		
R^2	0.150	0.493	0.493	0.214	0.077	0.100	0.055	0.021
Country Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓
Year Fixed Effects		✓	✓					
Observations	695	695	695	695	695	695	695	695

Why The Rise In Debt?


U.S. Productivity and Median Family Income
(1980=100)
200
150
100
50
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
Productivity:
Output per hour
Median Family
Real Income
houseofdebt.org, @profsufi & @AtifRMian, Data source: BLS, CPS


Saving rates by wealth class (decennial averages)
% of each group's total primary income
55%
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
-5%
-10%
-15%
Top 1%
Top 10 to 1%
Bottom 90%
1917-19
1920-29
1930-39
1940-49
1950-59
1960-69
1970-79
1980-89
1990-99
2000-09
2010-12


Current Account Balance
Percent of GDP
International Monetary Fund, World Economic Outlook Database,
Asian Financial Crisis
8%
6%
4%
2%
0%
-2%
-4%
-6%
-8%
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
Developing Asia
Japan
Eurozone
United Kingdom
United States

U.S. Credit Boom Facts (Mian and Sufi 2015b)

- Random sample of about 300,000 *same* individuals followed from 2000-10
- Growth in debt, and subsequent defaults concentrated in low credit score individuals (also see Mian and Sufi (2009))
- Same individuals a lot more sensitive to house price growth (also see Mian and Sufi (2011))
- Income overstatement and fraudulent reporting also extensive in same areas (Mian and Sufi 2015a)

Figure 3: Growth in Debt, by 1997 Credit Score

This figure plots the growth in debt for individuals sorted into quintiles by their 1997 credit score. Each quintile contains 20% of the sample. The left panel shows cumulative growth since 2000, and the right panel shows growth from 2000 to 2007.

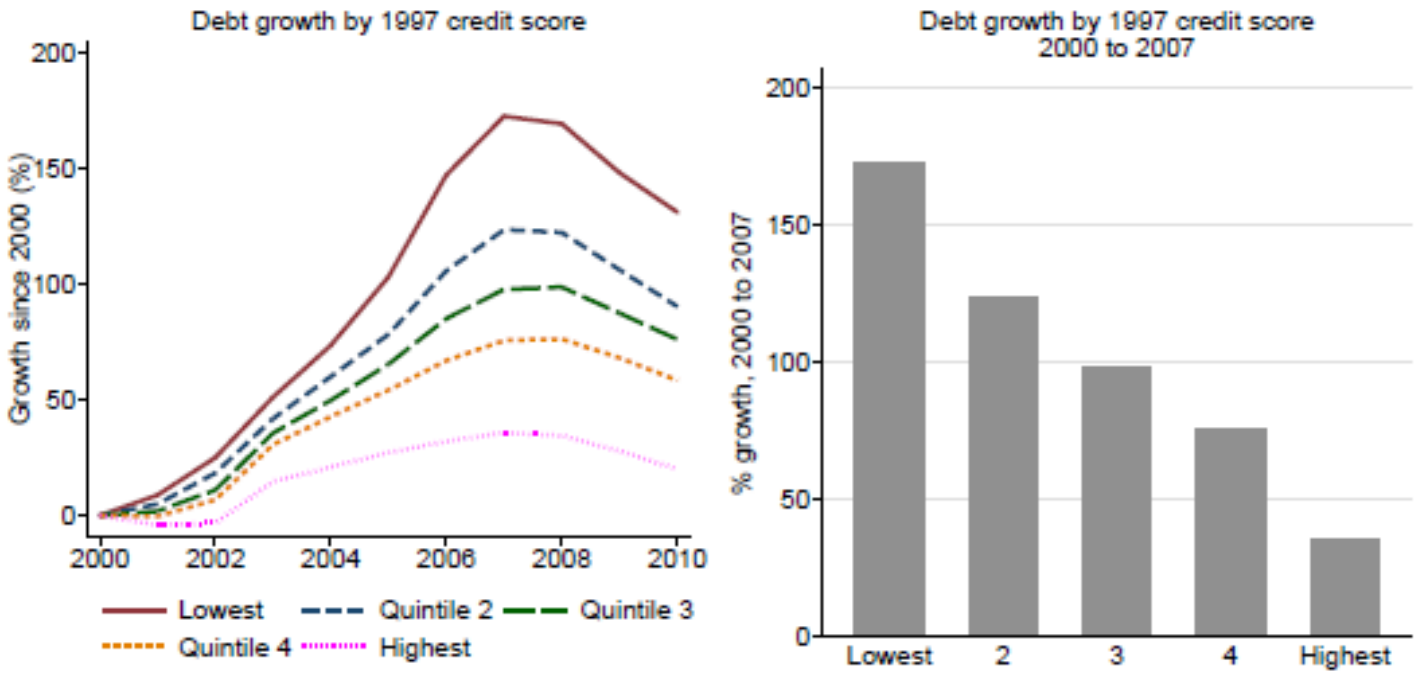


Table 5: Growth in Debt, by Credit Score and House Price Growth

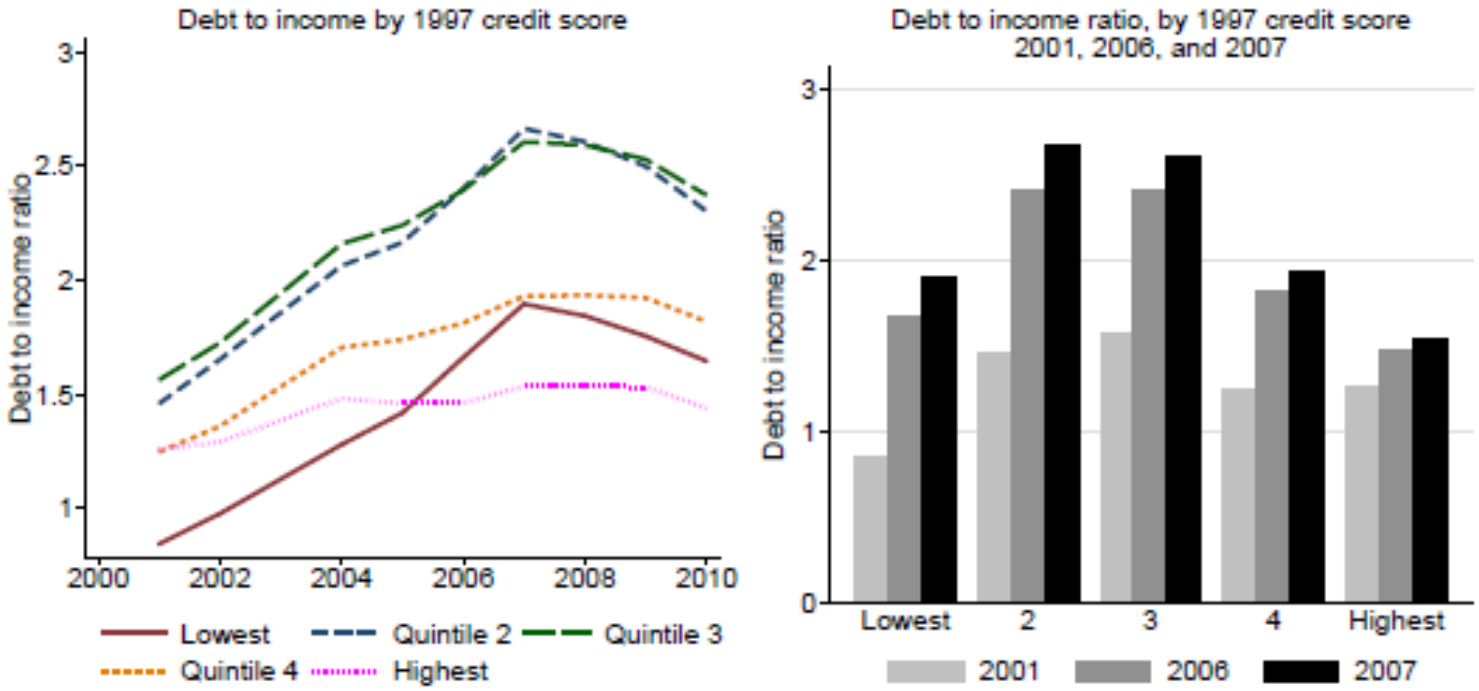
This table shows the growth in debt from 2000 to 2007 by 1997 credit score quintile and by house price growth from 2000 to 2007. Each individual is assigned the house price growth from 2000 to 2007 of the zip code in which they reside in 2000.

	Debt growth, 2000 to 2007 (%)				
Credit Score	House Price Growth Category				
Quintile	lt 40%	40-75%	75-105%	105-130%	gt 130%
1	106.7	175.7	181.5	194.5	207.1
2	83.5	126.8	133.2	138.2	142.4
3	76.2	102.7	107.1	100.4	109.6
4	61.3	74.0	78.8	80.1	93.2
5	33.0	38.7	35.1	36.4	38.9

**,* Coefficient statistically different than zero at the 1% and 5% confidence level, respectively.

Figure 7: Debt to Income, by 1997 Credit Score

This figure plots the debt to income ratio for individuals based on their 1997 credit score. Income is measured as average adjusted gross income per tax return in the zip code in which the individual resides. Each quintile contain 20% of the sample.



Debt and Monetary Policy

Figure 9
Is Zero Lower Bound a Constraint on Mortgage Rates?

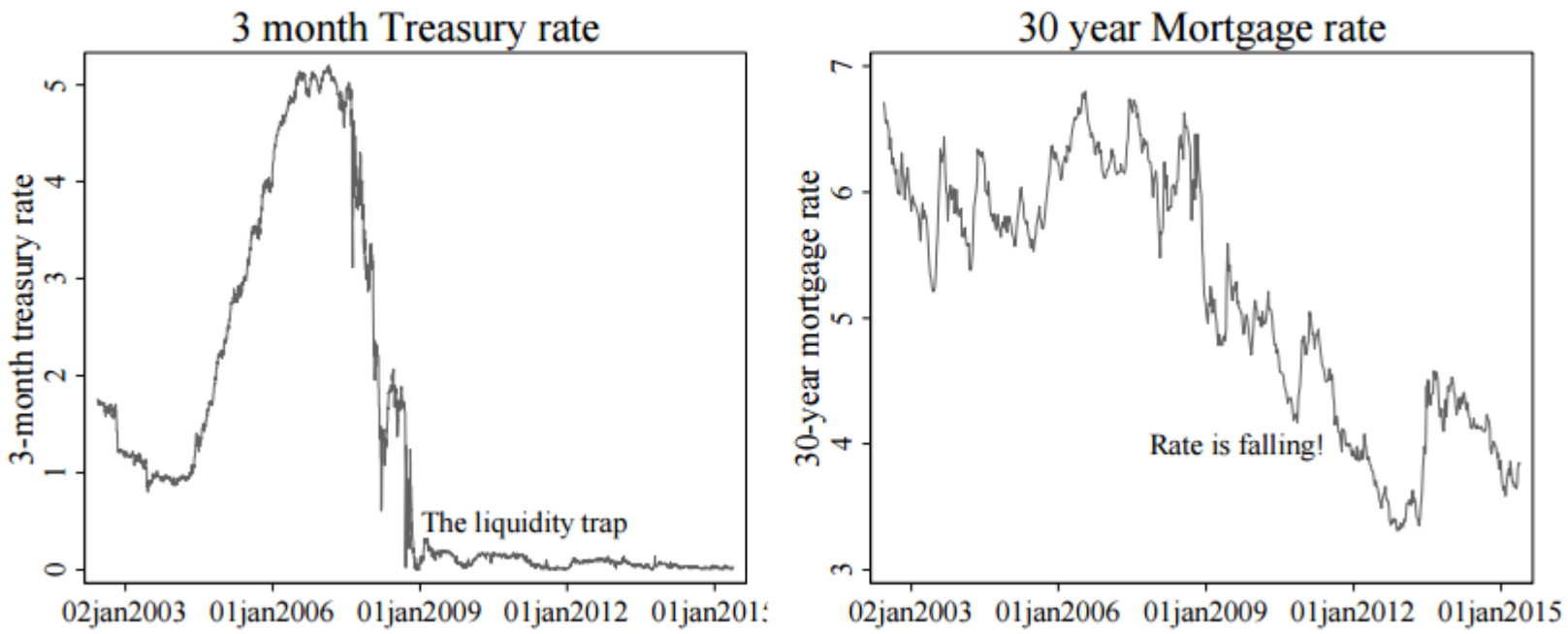
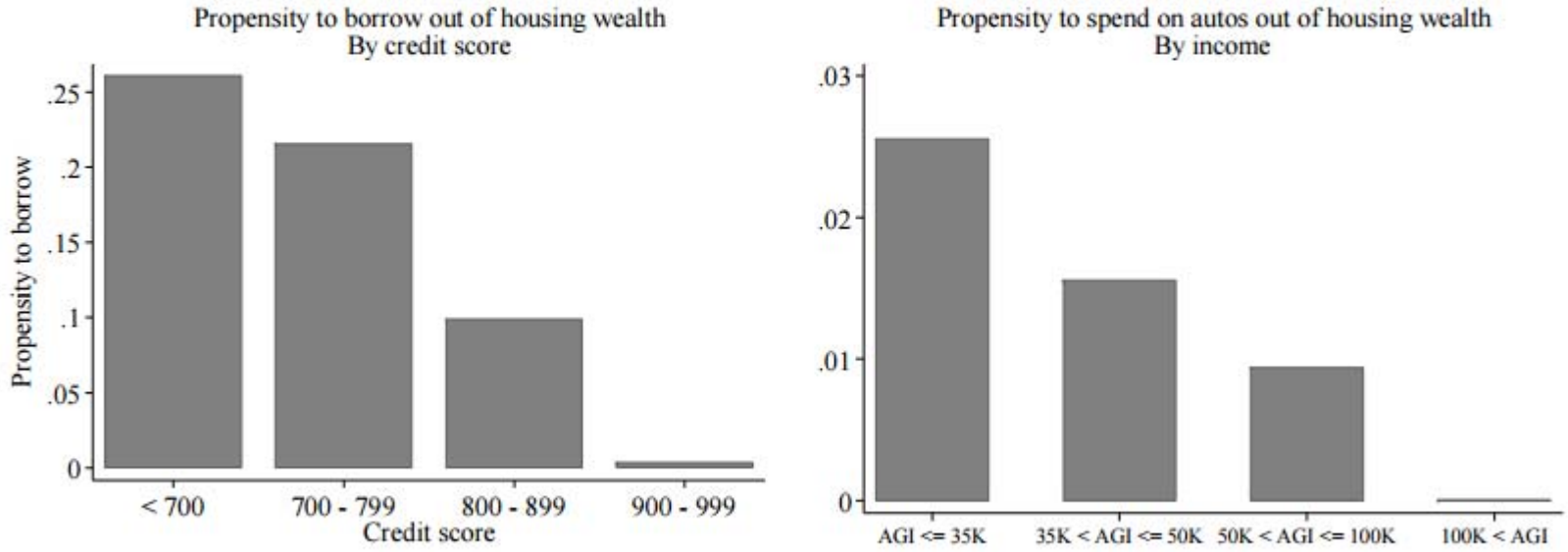
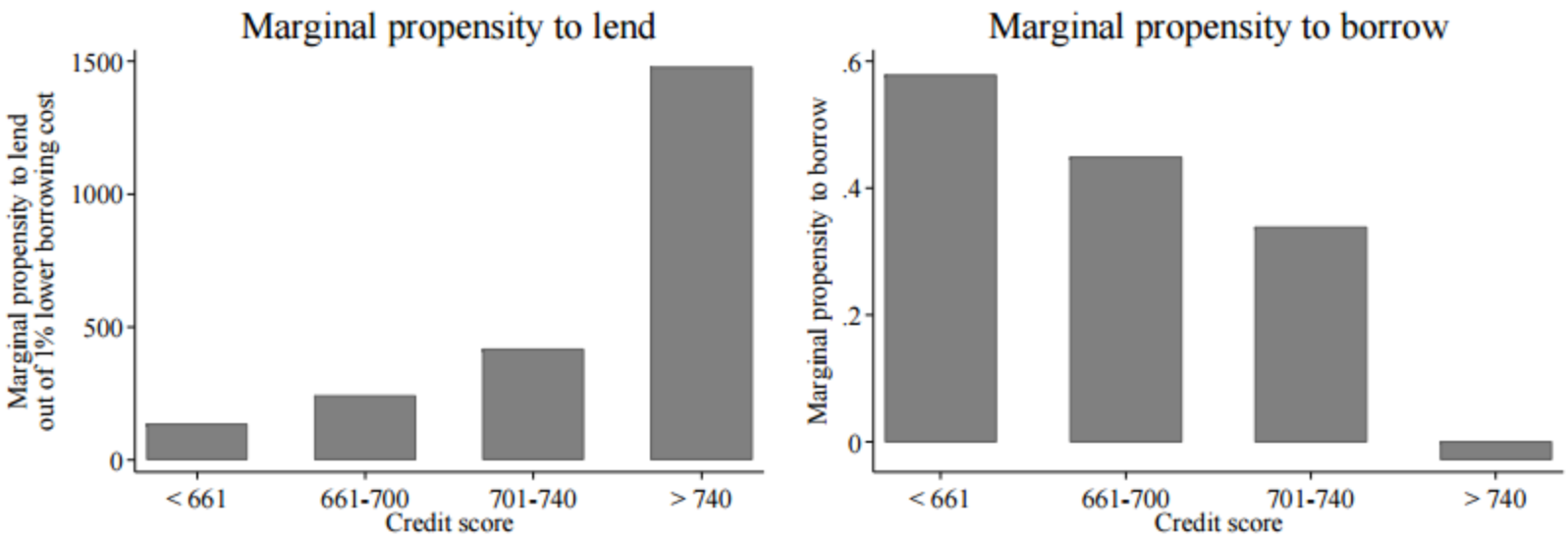


Figure 3
Marginal Propensity to Borrow and Spend out of Housing Wealth



Note: This chart is directly from Mian and Sufi (2014).

Figure 7
Credit Card Companies Lend to People Who Do Not Spend



Note: This chart is directly from Agarwal, Chomsisengphet, Mahoney, and Stroebel (2015).

Conclusion

- Macro Theory:
  Models with borrower / lender heterogeneity and GE spillovers like the aggregate demand externality.

- Macro Policy:
  Promoting state-contingent contracting.