Giving up on the Home? How Down Payment Requirements Shape Consumption and Saving

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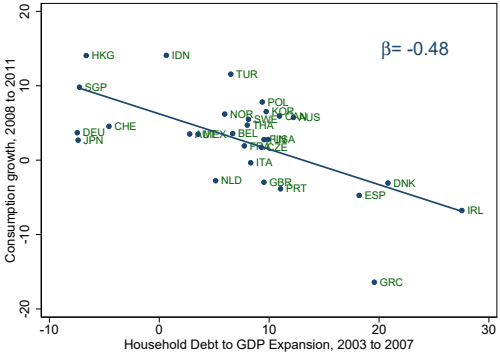
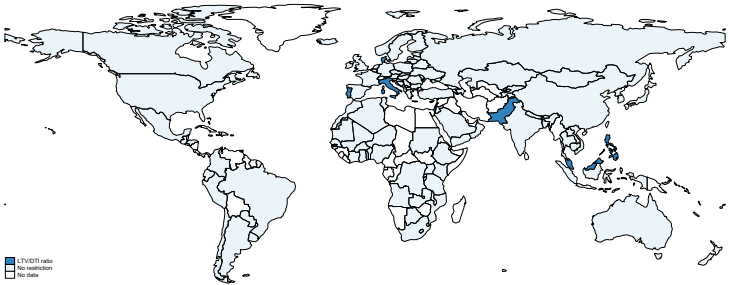
The views expressed here are those of the authors, and not necessarily those of the Norges Bank.

Household Debt and Consumption



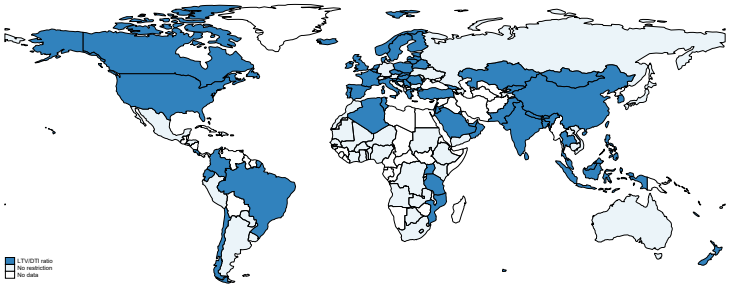
Increase in HH debt before the GFC predicts a decline in consumption during GFC

Macroprudential Policies in 2000



As a result, many countries have implemented borrowing restrictions on HH

Macroprudential Policies in 2021



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Borrowing Restrictions Beyond the Housing Market

- **Macropru** aims to improve welfare
  - $\rightarrow$ How? Tighten the borrowing constraints of households who want to be homeowners
  - $\rightarrow$ Aim: Mitigate externalities (e.g., pecuniary externality)
  - $\rightarrow$ Mortgage default $\Downarrow$ Home prices $\rightarrow \Downarrow$ Collateral value of other HHs $\rightarrow \Downarrow$ Consumption
  - $\rightarrow$ Weaken the channel in which household debt affects consumption

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  → Weaken the channel in which household debt affects consumption
- **This paper:** Introducing a borrowing constraint creates another channel between household debt and consumption due to households' endogenous reaction to the constraint.
  → LTV ratio restriction in Norway
  → Households who are renters when the policy is implemented

Findings so far

Households who are renters when the policy is implemented **increase their consumption**!

- **Households stay as renters (Renters)**
  1. Increase their consumption
     → Why? Purchase is delayed/discouraged
  2. Have lower savings, higher debt
- **Households purchase a home (Homebuyers)**
  1. Reduce their consumption before home purchase
     → To accumulate savings for the down payment requirement
  2. Lower consumption during home purchase
  3. **Lower consumption after the purchase**

What do we know from the literature?

- **Macroprudential policies**
  On the positive side: Mitigating negative externalities (Farhi & Werning (2016), Davila & Korinek (2018), Cerutti et al. (2017), Peydro et al. (2024))
  On the negative side: Reducing access to housing (Ortalo-Magné and Rady (2006), Karlman, Kinnerud, Kragh-Balke (2023))
  → **Focus on both renters and homebuyers**
  → **How HHs adjust their consumption, depending on their housing choice**
- Tighter borrowing constraints reduce liquidity and increase the fragility of homebuyers (Aastveit et al. (2020), van Bekkum et al. (2019))
  → **Consumption reaction vs depleting liquidity**
- Interaction between the housing markets and consumption (Benmelech et al. (2023), Bernstein & Koudijs (2024), Zator (2024))
  → **Unintended effects of a housing market policy via consumption**

LTV Restriction & Data

LTV Restriction & Data

- Due to strong growth in house prices and household debt levels, LTV ratio restriction is announced in **Spring 2010** and introduced in Fall 2010.
  $\rightarrow$ LTV cap is at **90%** (later at 85%)
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- Consumption, housing transactions, tax filings, individual characteristics
  $\rightarrow$ Consumption: Credit card, digital invoice, direct remittances. App. 80% of the total consumption. 26 COICOP categories
- 2006-2018, annual, household-level

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  → Consumption: Credit card, digital invoice, direct remittances. App. 80% of the total consumption. 26 COICOP categories
- 2006-2018, annual, household-level
- 3 groups: Renters, homebuyers, homeowners
  → Renters: Do not have housing wealth, no housing transactions before the restriction
  → Homebuyers: First-time homebuyers
  → Homeowners: Have housing wealth before 2006

Summary Statistics

	Homeowners		Renters		Homebuyers	
	Mean	SD	Mean	SD	Mean	SD
Consumption	317698.22	218072.53	146281.93	101972.68	255876.97	179545.47
Durables	82031.58	158536.61	19429.83	39759.87	51331.32	102477.94
Nondurables	77103.29	87022.82	40472.60	39496.36	69669.73	52398.99
Cyclical Consumption	154428.19	239164.70	56045.28	68219.28	119840.88	127926.36
Noncyclical Consumption	55100.10	100166.38	21538.28	41286.29	44888.61	54592.80
Income	483908.74	251825.26	266012.47	122436.86	439845.57	236303.68
Consumption/Income	0.68	0.48	0.56	0.35	0.60	0.35
Deposits	498076.10	1023084.58	178067.56	404855.90	193592.39	346618.12
Financial Assets	948773.09	10134181.84	223206.71	1345910.36	284966.19	1217273.93
Debt	831014.26	1247105.12	124082.52	316083.81	1215027.02	1202791.21
Net Savings	117758.83	10121203.50	99124.19	1381657.36	-930060.83	1612800.91
Age	57.96	15.07	53.82	17.87	36.51	11.48
Obs.	6,325,380		751,079		60,147	

Renters

Empirical Strategy-Renters

$$y_{it} = \beta \, Renter_i \times Post_t + \gamma_1 Renter_i + \gamma_2 Post_t + \epsilon_{it}$$

- $Renter_i$: =1 if HH is a renter until 2010, 0 if HH is a homeowner in 2006
  $\rightarrow$ Renters include HHs that purchase a home after the restriction
- $Post_t$: =1 if year$\geq$2010

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  $\rightarrow$ Renters include HHs that purchase a home after the restriction
- $Post_t$: =1 if year$\geq$2010
- **Identifying assumption**
  1. Without the restriction, the difference between renters and homeowners would be the same
     $\rightarrow$ The levels can be different
  2. Homeowners are not affected by the restriction
     $\rightarrow$ The restriction can reduce homeowners' access to credit

Consumption reaction of Renters

	Consumption/Income		
	(1)	(2)	(3)
Renter × Post	0.0453***	0.0447***	0.0398***
	(9.84)	(9.55)	(10.47)
Renter	-0.149***	-0.148***	
	(-60.64)	(-60.60)	
Post	-0.0152***		
	(-3.00)		
Fixed Effects:			
Year FE		✓	✓
Household FE			✓
Obs.	7,147,662	7,147,662	7,147,662
R^2	0.007	0.008	0.425
Mean(Dependent Var.)	0.663		

Renters increase their consumption after the LTV restriction

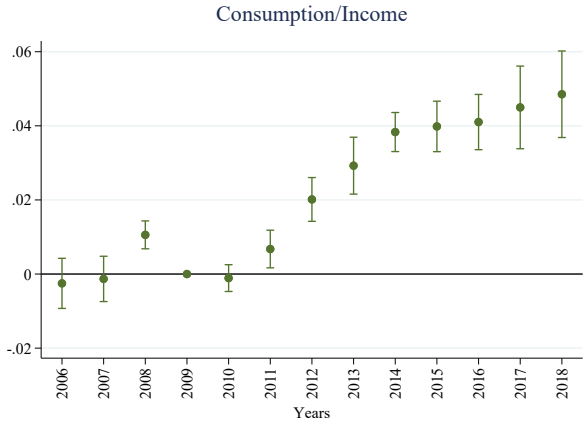
Homeowners as control

Do homeowners form a good control group for renters?

Possible issues

- Homeowners are different than renters
  - → Creates a bias only if the trends are different
  - → Parallel trends before the restriction?
  - → Difference in characteristics start to affect consumption differentially in 2010
- The restriction can limit homeowners' borrowing
  - → Suggesting that the consumption difference is due to homeowners' lower consumption
- The restriction can lower home prices and hence housing wealth

Consumption reaction of Renters



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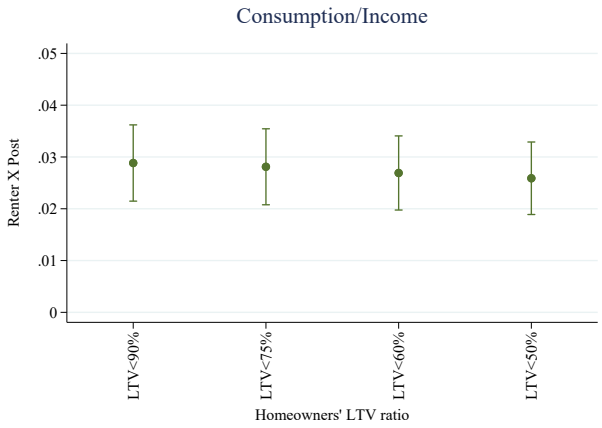
Homeowners as control

	Consumption/Income					
	(1)	(2)	(3)	(4)	(5)	(6)
Renter × Post	0.0389***	0.0368***	0.0292***	0.0224***	0.0778***	0.0414***
	(13.92)	(11.00)	(8.19)	(6.28)	(15.13)	(11.88)
Fixed Effects:						
Household FE	✓	✓	✓	✓	✓	✓
Age × Year FE	✓					
Deposit bins × Year FE		✓				
Financial Asset bins × Year FE			✓			
Debt bins × Year FE				✓		
Housing wealth bins × Year FE					✓	
Municipality × Year FE						✓
Obs.	7,147,236	6,790,767	6,758,576	6,790,767	6,790,767	7,147,662
R^2	0.426	0.422	0.422	0.422	0.422	0.427
Mean(Dependent Var.)	0.663					

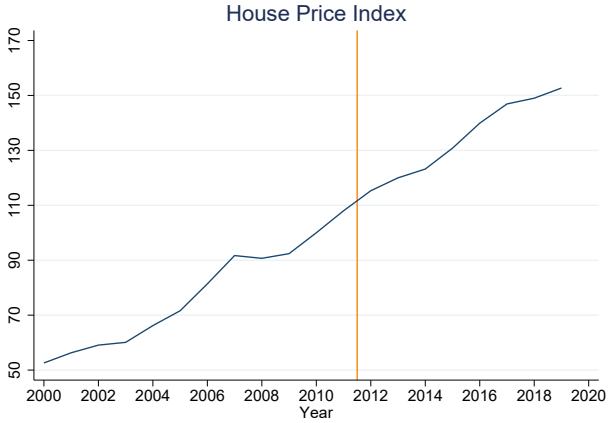
Tightening the comparison with granular FEs does not change the results

Homeowners' access to credit



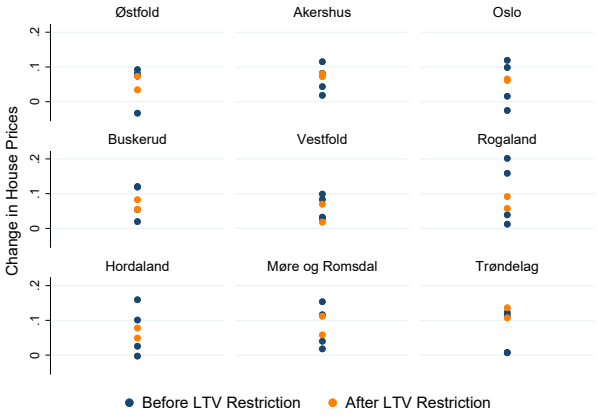
Removing homeowners who are more likely to be constrained by the policy does not change results

House Prices



The aggregate house price index does not suggest a big effect

House Prices



The regional house price growth rates are similar to the previous ones

Why do renters increase their consumption?

- The borrowing restriction is likely to influence HH's housing choices
  $\rightarrow$ Don't purchase at all, or delay the home purchase

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  $\rightarrow$ Don't purchase at all, or delay the home purchase
- How can delay in home purchase increase consumption? (Karlman et al. (2023))
  $\rightarrow$ HHs need to reduce their consumption to accumulate savings
  $\rightarrow$ Leads to deviation in consumption smoothing, which is stronger for low-income HHs
  $\rightarrow$ The disutility of this deviation can be larger than the benefits of a house
  $\rightarrow$ Low-income HHs that consider being homeowners delay both savings and home purchase

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  $\rightarrow$ The disutility of this deviation can be larger than the benefits of a house
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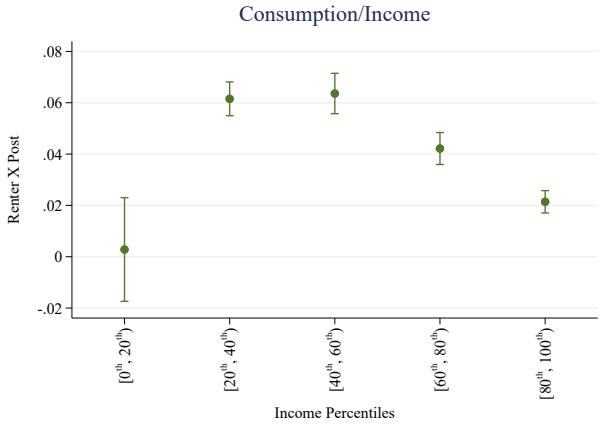
- Heterogeneity regarding income levels
  1. High-income HHs are less likely to adjust their consumption
  2. Lowest-income HHs are less likely to purchase a home, hence a smaller effect
  3. The effect should be the largest for low-income HHs who want to purchase a home

Renters-Heterogeneity regarding income levels



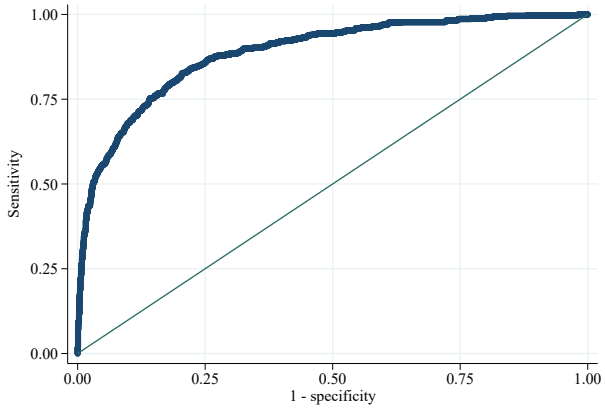
The effect has an inverse U-shape regarding the income levels

Renters that never considered buying a home

- Some renters might have decided to stay as renters regardless of the restriction
  $\rightarrow$ Always renters
- If the effect is due to housing choices/delay, it shouldn't be driven by such renters and we should find insignificant change in their consumption.
- How do we define such always renters?
  $\rightarrow$ Renters who are able to buy a home before the restriction
  1. Split the sample into two: homeowners up to 2010 and renters
  2. Use XGBoost to predict the probability of being a homeowner by using 2006 information

  $\rightarrow$ Renters with high probability have observables suggesting that they should be homeowners but they are not

Renters that never considered buying a home



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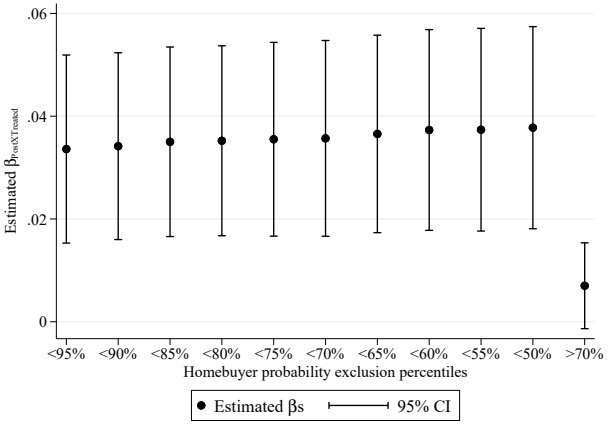


Renters' balance sheet items

	Debt/Income	Deposits/Income	Fin. Assets/Income	Net Savings/Income
	(1)	(2)	(3)	(4)
Renter × Post	0.329***	-0.175***	-0.212***	-0.542***
	(14.74)	(-19.89)	(-19.55)	(-17.12)
Fixed Effects:				
Year FE	✓	✓	✓	✓
Household FE	✓	✓	✓	✓
Obs.	7,147,662	7,147,662	7,147,662	7,147,662
R^2	0.660	0.714	0.677	0.735
Mean(Dependent Var.)	1.506	1.049	1.556	0.050

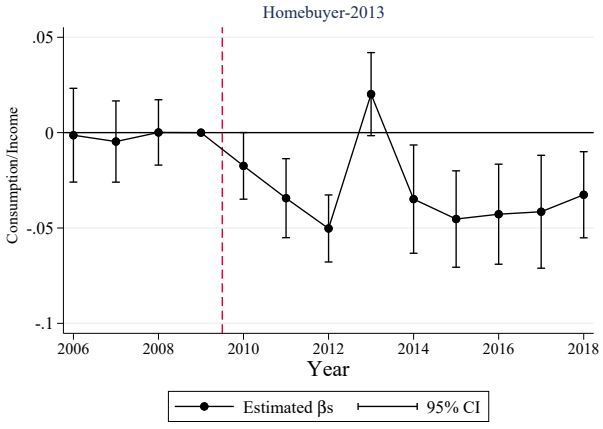
In line with higher consumption, we find lower savings and higher debt use

Other findings

- The effect is driven by the increase in consumption. Renters' income increases
- Consumption of non-durables and cyclical increase more
- The effect is stronger in rural areas

Homebuyers

Consumption around home purchase



Empirical Strategy-Homebuyers

- Challenge in homebuyer analysis: Home purchase affects consumption
  - → Aim is to estimate the restriction's effect in addition to the home purchase effect
  - → Compare homebuyers in 2013 ($HB'13$) to homebuyers in 2009 ($HB'09$)
  - → Due to home purchases in different years, use homeowners to control for time effects
  - → Model the home purchase effect explicitly

$$
\begin{aligned}
y_{it} = & \beta_1 \, HB'13 \times Prepurchase + \beta_2 \, HB'13 \times Purchase + \beta_3 \, HB'13 \times Postpurchase \\
& \gamma_1 HB \times Prepurchase + \gamma_2 HB \times Purchase + \gamma_3 HB \times Postpurchase \\
& \alpha_1 HB'13 + \alpha_2 HB + \alpha_3 Prepurchase + \alpha_4 Purchase + \alpha_5 Postpurchase + \epsilon_{it}
\end{aligned}
$$

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\end{aligned}
$$

- **Identifying assumption**
  1. Without the restriction, the difference between $HB'13$ and $HB'09$ would be the same
     → Time effects are differenced out by using homeowners
  2. The restriction should not change the homebuyer characteristics

Consumption Dynamics around the Home Purchase

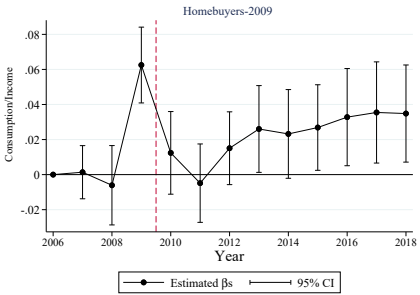

Figure 1: Homebuyers-09

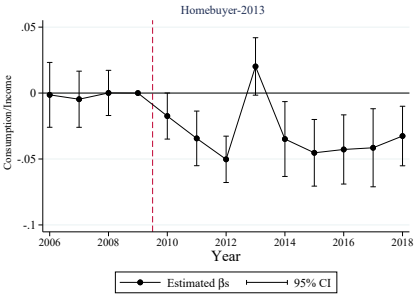

Figure 2: Homebuyers-13

Consumption Dynamics around the Home Purchase

	Consumption/Income		
	(1)	(2)	(3)
HB'13 × Prepurchase	0.0237**	-0.0238*	-0.0206*
	(1.97)	(-1.91)	(-1.79)
HB'13 × Purchase	-0.0176	-0.0302**	-0.0272**
	(-1.43)	(-2.49)	(-2.13)
HB'13 × Postpurchase	-0.0186	-0.0563***	-0.0475***
	(-1.49)	(-4.68)	(-4.35)
Prepurchase	-0.0493***	0.00571	0.00368
	(-3.88)	(0.56)	(0.39)
Purchase	0.0312*	0.0708***	0.0695***
	(1.82)	(5.29)	(5.58)
Postpurchase	-0.0137	0.0402***	0.0361***
	(-0.65)	(2.92)	(3.34)
HB	-0.0509***	-0.0997***	
	(-4.58)	(-13.63)	
HB'13	-0.0297**	0.00969	
	(-2.18)	(0.83)	
Fixed Effects:			
Year FE		✓	✓
Household FE			✓
Obs.	7,240,872	7,240,872	7,233,040
R^2	0.000	0.002	0.416
Mean(Dependent Var.)	0.671		

HB'13 have lower consumption before and after the home purchase

Robustness

- The findings are robust to including granular FEs and removing homeowners with high LTVs
- **Selection:** The characteristics of the homebuyers change due to the restriction
  $\rightarrow$ How does this selection affect the findings?
  $\rightarrow$ Match HB'13 to HB'09 and reestimate the main model

Homebuyers-Matching

	HB'13	HB'09		HB'09-Matched	
	Mean	Mean	Diff.	Mean	Diff.
Consumption	147.77	150.93	3.17	151.47	3.70
Income	255.14	245.74	-9.40*	255.10	-0.04
Consumption/Income	0.63	0.64	0.01	0.63	0.00
Deposits	111.61	107.89	-3.72	115.06	3.44
Financial Assets	148.62	144.03	-4.59	153.28	4.66
Debt	192.55	177.99	-14.55	186.11	-6.44
Net Savings	-43.93	-33.97	9.96	-32.83	11.10
Age	32.93	32.63	-0.30	33.12	0.19
# of Adults	1.31	1.38	0.06***	1.34	0.03
# of Children	0.19	0.19	0.01	0.19	0.01
Observations	4826			3103	

Matching reduces the differences

Homebuyers-Matching

Matched Sample	Consumption/Income		
	(1)	(2)	(3)
HB'13 × Prepurchase	0.00774	-0.0400***	-0.0363**
	(0.52)	(-2.59)	(-2.48)
HB'13 × Purchase	-0.0286*	-0.0413**	-0.0363**
	(-1.74)	(-2.59)	(-2.26)
HB'13 × Postpurchase	-0.0302*	-0.0679***	-0.0606***
	(-1.77)	(-4.20)	(-4.31)
Prepurchase	-0.0321**	0.0229*	0.0205
	(-1.98)	(1.66)	(1.59)
Purchase	0.0441**	0.0836***	0.0805***
	(2.10)	(4.98)	(5.52)
Postpurchase	0.000459	0.0543***	0.0519***
	(0.02)	(3.03)	(3.97)
HB	-0.0740***	-0.123***	
	(-4.86)	(-11.17)	
HB'13	-0.00897	0.0304*	
	(-0.49)	(1.87)	
Fixed Effects:			
Year FE		✓	✓
Household FE			✓
Obs.	7,220,875	7,220,875	7,213,047
R^2	0.000	0.002	0.417
Mean(Dependent Var.)	0.672		

The decline in consumption gets larger

Tentative Conclusion & Next Steps

- We study how renters adjust their consumption when a borrowing constraint is introduced
  - $\rightarrow$ The adjustment depends on the housing choice
  - $\rightarrow$ On average, renters increase their consumption
  - $\rightarrow$ Homebuyers reduce their consumption before and after the purchase

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- We study how renters adjust their consumption when a borrowing constraint is introduced
  - → The adjustment depends on the housing choice
  - → On average, renters increase their consumption
  - → Homebuyers reduce their consumption before and after the purchase
- What other mechanisms suggest a higher consumption for the renters?
- Why do HB'13 have lower consumption after the purchase?
  - → Rebuild liquidity, cheaper areas, purchasing another home, habit formation
- What are the implications of consumption reaction for other individual outcomes?

Thank You!