The effects of a macroprudential loosening: the importance of borrowers' choices

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A disclaimer

This work is preliminary and unpublished.
The views presented in this paper are those of the authors and do not necessarily represent the official views of the Central Bank of Ireland or the European System of Central Banks.

Introduction

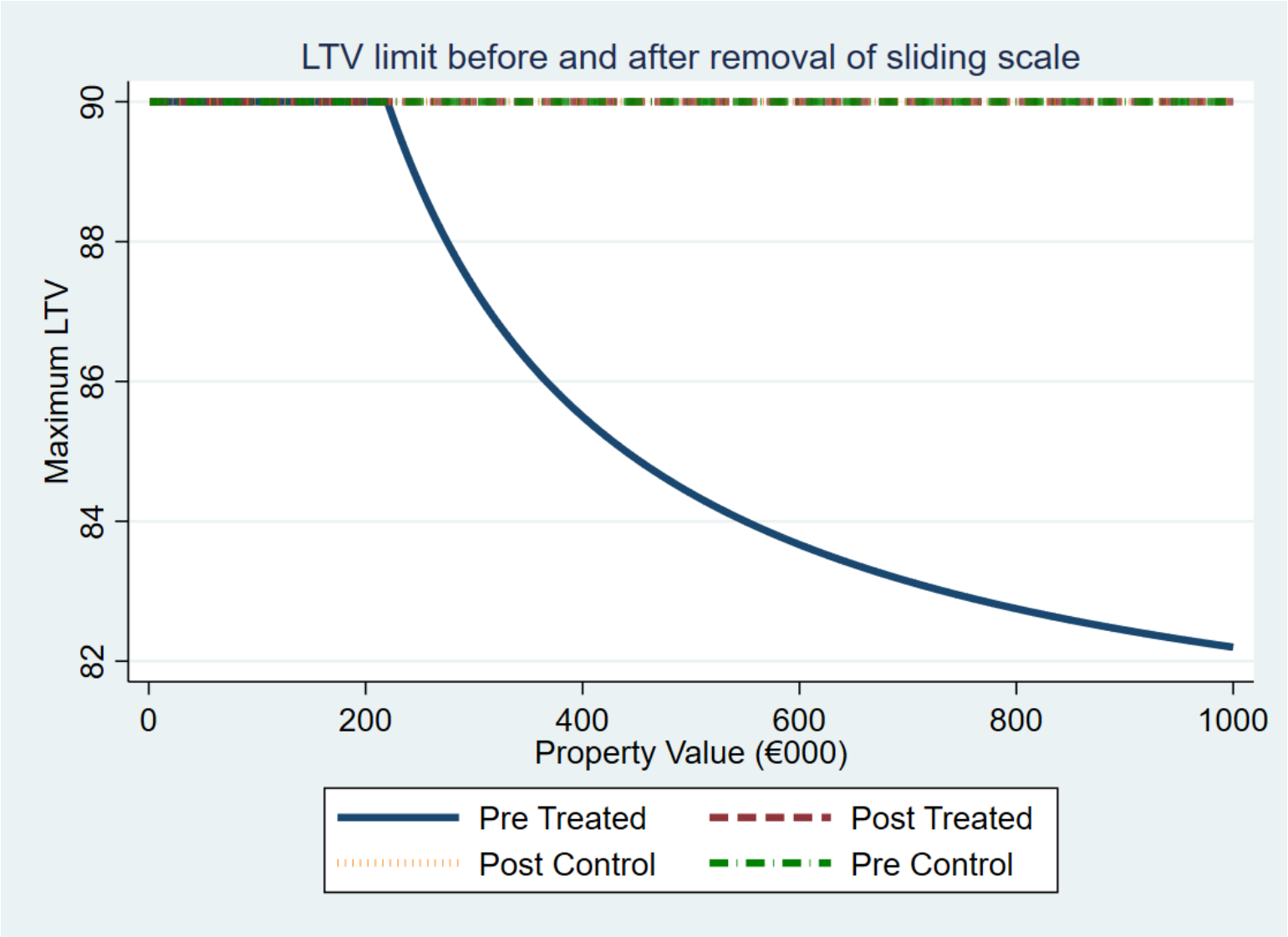
- Macroprudential policies have grown hugely in popularity after the Global Financial Crisis.
- These policies have broadly taken three forms:
  1. **Bank capital measures**: Counter-Cyclical (CCyB); Systemic Risks (SyRB); Interconnectedness and Systemic Importance (OSII)
  2. **Bank funding**: Liquidity Coverage Ratio (LCR), Net Stable Funding Ratio (NSFR)
  3. **Borrower-Based Measures**: Specific to a loan or borrower type.
- Such measures bring with them:
  - **Benefits**: less cyclical volatility, more sustainable credit flows, lower Pr(Financial Crisis), lower risk of damaging and scarring recessions.
  - **Costs**: less lending, less growth, less real estate activity, potentially strong effects on would-be homeowners.

Motivation

- Macroprudential policy tightenings are more common than loosenings - especially in the case of household or mortgage measures.
- A large literature has built up on the effects of such tightenings.
- Episodies of loosening are much rarer but ... discussion of loosening is becoming even more important:
  - **Crisis memories fade!**
  - **Pandemic**: capital measures loosened. Some jurisdictions loosened mortgage restrictions as a stabilization tool.
  - **Public scrutiny on central banks** has increased in the era of quantitative easing and macroprudential policy.

This Paper - in a picture

Figure: Pre-reform policy environment - LTV maximum



This Paper - in some words

- Mortgage measures were introduced in 2015 in Ireland, with differential LTV limits for First Time Buyers (FTBs) across the property price distribution.
- We study a unique policy change in Ireland in 2017 which equalised LTV requirements for all FTBs.
- The design of the policy change creates quasi-experimental conditions for studying
  - Borrowers' leverage responses to the policy loosening
  - The adjustment mechanism: more debt? more expensive house? less downpayment, more cash?
- FTBs choose 1.1 pp higher LTV as a result of this policy reform (increase of 0.5 in $\frac{debt}{equity}$).
- This appears driven by smaller downpayments, rather than leverage fuelling more expensive property purchase.

2016 policy review

- *First, the property value threshold of €220,000, above which a lower LTV limit applies for FTBs, was re-considered. The €220,000 threshold level was originally calibrated with reference to median house prices in Dublin.*
- *The existence of a fixed nominal threshold value as part of the LTV limits for FTBs means that the Regulations would have to be updated every year.*
- *Taking into account the medium-term orientation of the measures and considering the evidence arising from the review, the property value threshold for FTBs will be removed and a 90 per cent LTV limit will apply for FTBs at all house prices from 1 January 2017*

Why is this a useful setting?

- Classic challenge for causal identification after policy change: Policy responds endogenously to conditions $\rightarrow$ search for "announcement' shocks' Romer and Romer (2004).
- Recent innovations in macroprudential policy: similar approach to identify LTV tightening shocks Richter et al. (2019).
- Alternate approach: granular data, time-varing shock, shift-share Bartik-like exposure (Acharya et al., 2020).
- Our case: much cleaner "classic" applied micro research design due to policy motivation: "simplificiation" of regime, only applying to one group. No response to economic conditions.
- $\rightarrow$ skip traditional concern of endogenity of policy response, **while** creating treat-control groups.

Data and Empirical Strategy

Data

- “Monitoring Template” (MT) data, proprietary, Central Bank of Ireland.
- Obligatory loan-level return for all lenders originating more than €50m per year since 2015.
- Comprehensive information on loan features, household income, LTI, LTV, location, valuation etc..
- 5 major retail lenders.
- The focus of the paper is on FTBs loans for property purchase only.

Empirical Strategy

- Simple DiD set up:

$$Y_i = \beta_0 + \beta_1 Post + \beta_2 Treat + \beta_3 Post * Treat + \beta_4 X_i \epsilon_i \quad (1)$$

- Y: origination LTV on a new mortgage; $Post$ = 1 from start of 2017; $Treat$ = 1 if property valued above €220k.
- Note: **not** a panel dataset! Mortgages only drawn down once per household.
- Assumptions:
  - LTV choices of FTBs are being influenced causally by the policy change at start-2017 in the $Treat$ group
  - Any changes in LTV are not attributable to changing composition of borrowers across Pre/Post, Treat/Control

Identification worry (1): FTBs composition

Table: Summary Statistics: Pre and Post period for Treated and Control group

	Treatment	**Control**
Pre Period		
Property size	1423.77	1253.20
Marital status	0.84	0.56
Total income	95170.72	53431.53
Post Period		
Property size	1394.64	1322.21
Marital status	0.85	0.56
Total income	96235.42	55561.66

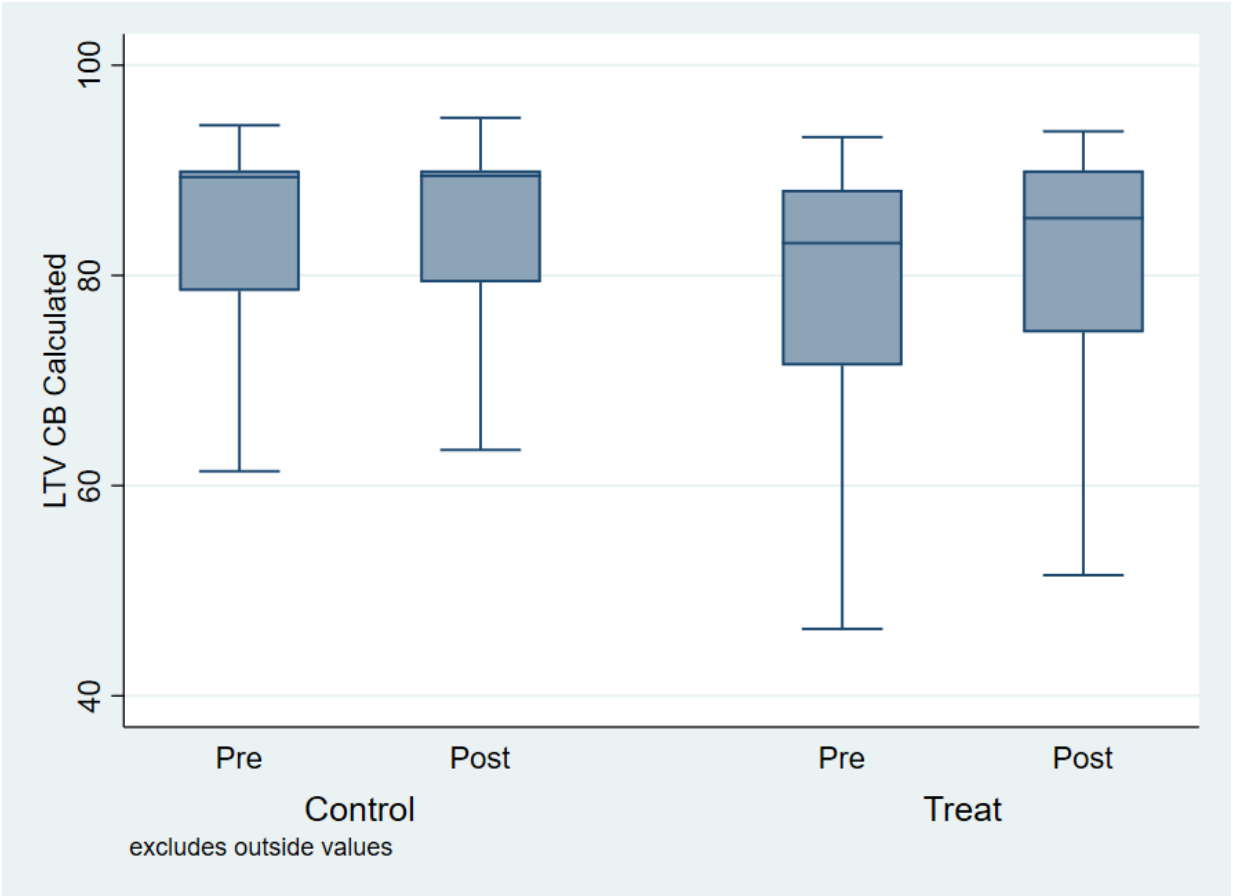
Note: MT data (2015-2020). Pre=2015-2016; Post=2017-2020.

Identification worry (2): non-parallel house price trends

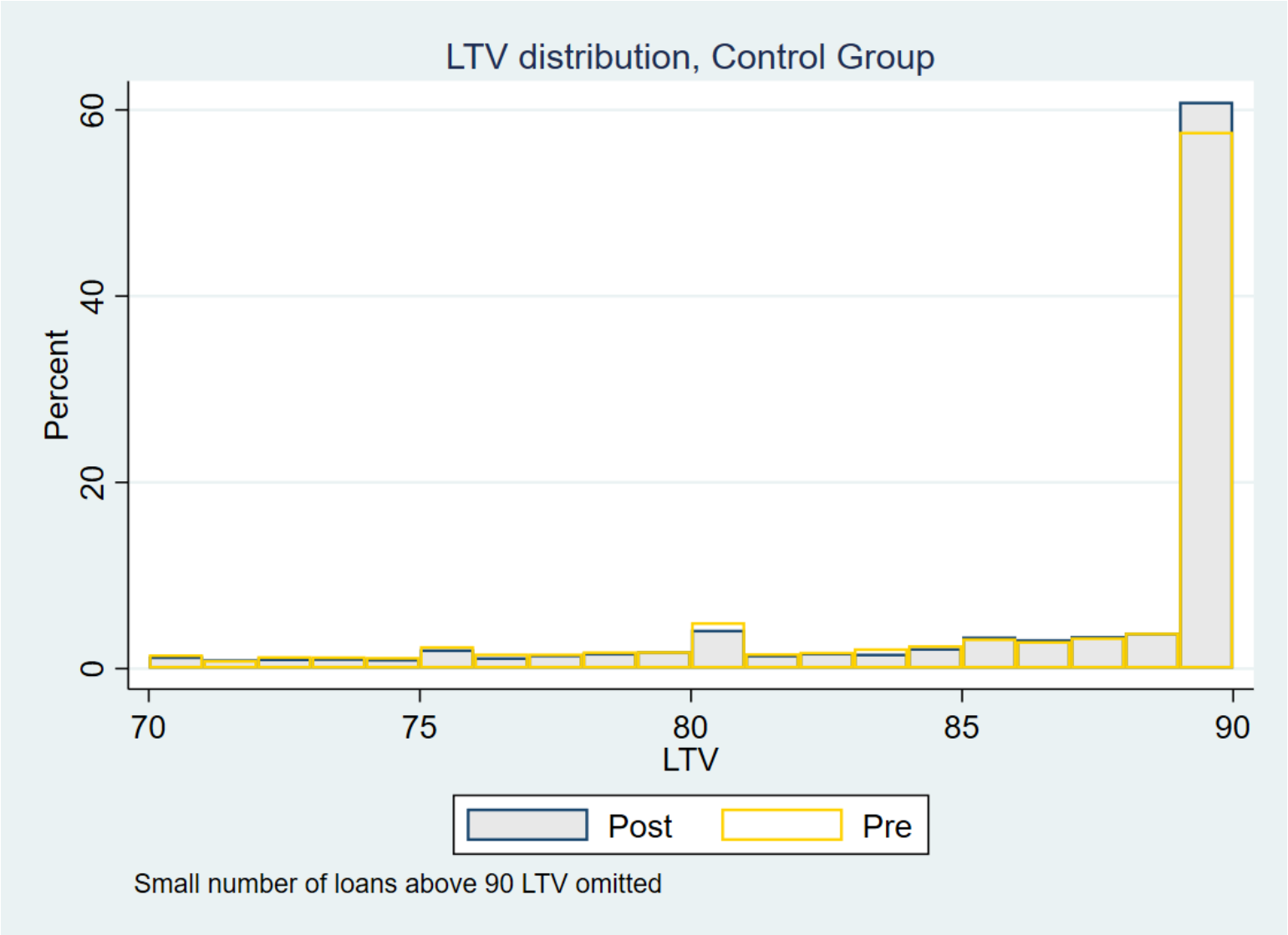
- **Intuition**: our *Treat* and *Control* may not be good groups to use for causal identification because the housing market is evolving differently across the two.
- **Worry**: house price growth from 2016 into 2017 is higher among more expensive properties
- $\rightarrow$ house price growth could explain higher LTVs among *Treat* loans, rather than the policy change.
- **Empirical evidence**: price growth was actually *weaker* among higher-priced properties, suggesting identification is not polluted through this channel
- **How to deal with it empirically?** We control for county-time varying house price indices in some specifications.

Empirical Results 1 - LTV effects

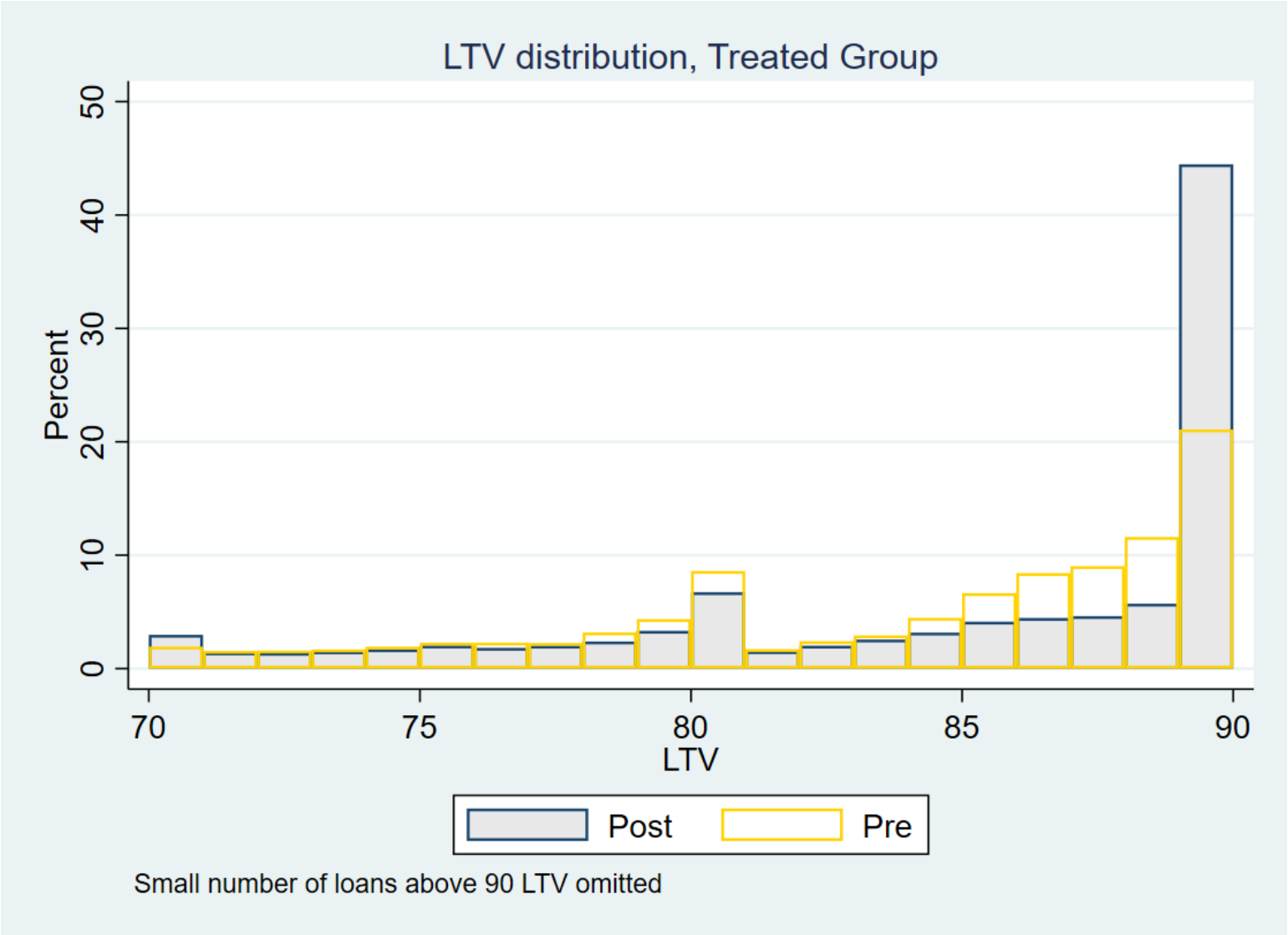
LTV distribution across the four groups



Detailed LTV Bunching - Control



Detailed LTV Bunching - Treated



Baseline model of LTVs

Table: Baseline DiD results for LTV ratios

	(1)	(2)	(3)	(4)	(5)	(6)
Post	0.389**	0.354*	-0.295	-0.416**	-0.613***	-0.053
	(0.196)	(0.197)	(0.181)	(0.197)	(0.190)	(0.199)
Treatment	-4.825***	-4.864***	-14.415***	-14.641***	-15.390***	-14.027***
	(0.198)	(0.199)	(0.209)	(0.228)	(0.220)	(0.227)
DiD	1.700***	1.631***	1.341***	1.034***	1.088***	1.279***
	(0.264)	(0.264)	(0.242)	(0.262)	(0.252)	(0.258)
Observations	47634	47634	47634	40783	40731	38573
r2	0.019	0.023	0.179	0.186	0.246	0.265
Bank FE	No	Yes	Yes	Yes	Yes	Yes
Loan Controls	No	No	Yes	Yes	Yes	Yes
Property Size	No	No	No	Yes	Yes	Yes
Borrower Chars	No	No	No	No	Yes	Yes
County HPs	No	No	No	No	No	Yes

Note: Standard errors in parentheses, *** p$<$0.01, ** p$<$0.05, * p$<$0.1. *Post* indicates all loans originated after Jan 1st 2017. Treatment Group is all loans against properties valued above €220k. Borrower characteristics: marital and employment status. Loan characteristics: loan size, LTI and property size. MT data (2015-2018)

Baseline model of $\frac{debt}{equity}$

Table: Baseline DiD results for leverage ratios

	(1)	(2)	(3)	(4)	(5)	(6)
Post	-0.009	-0.019	-0.113***	-0.157***	-0.199***	-0.107**
	(0.042)	(0.042)	(0.041)	(0.045)	(0.043)	(0.045)
Treatment	-1.488***	-1.476***	-2.916***	-2.973***	-3.129***	-2.882***
	(0.043)	(0.043)	(0.047)	(0.052)	(0.050)	(0.052)
DiD	0.634***	0.630***	0.585***	0.560***	0.573***	0.612***
	(0.057)	(0.057)	(0.055)	(0.059)	(0.057)	(0.059)
Observations	47622	47622	47622	40776	40724	38567
r2	0.036	0.039	0.111	0.115	0.169	0.181
Bank FE	No	Yes	Yes	Yes	Yes	Yes
Loan Controls	No	No	Yes	Yes	Yes	Yes
Property Size	No	No	No	Yes	Yes	Yes
Borrower Chars	No	No	No	No	Yes	Yes
County HPs	No	No	No	No	No	Yes

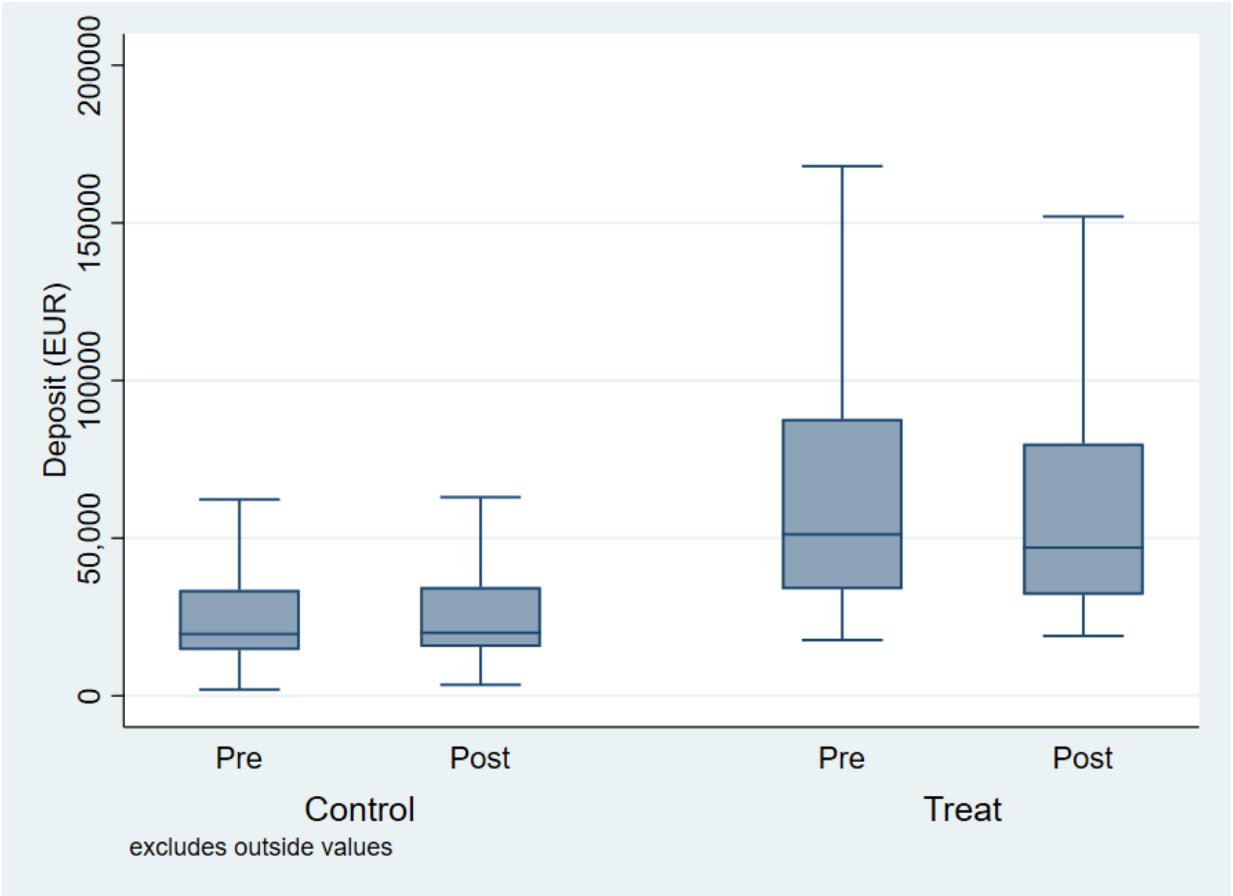
Note: Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. *Post* indicates all loans originated after Jan 1st 2017. Treatment Group is all loans against properties valued above €220k. Borrower characteristics: marital and employment status. Loan characteristics: loan size, LTI and property size. MT data (2015-2018)

Empirical Results 2 - Underlying Mechanisms

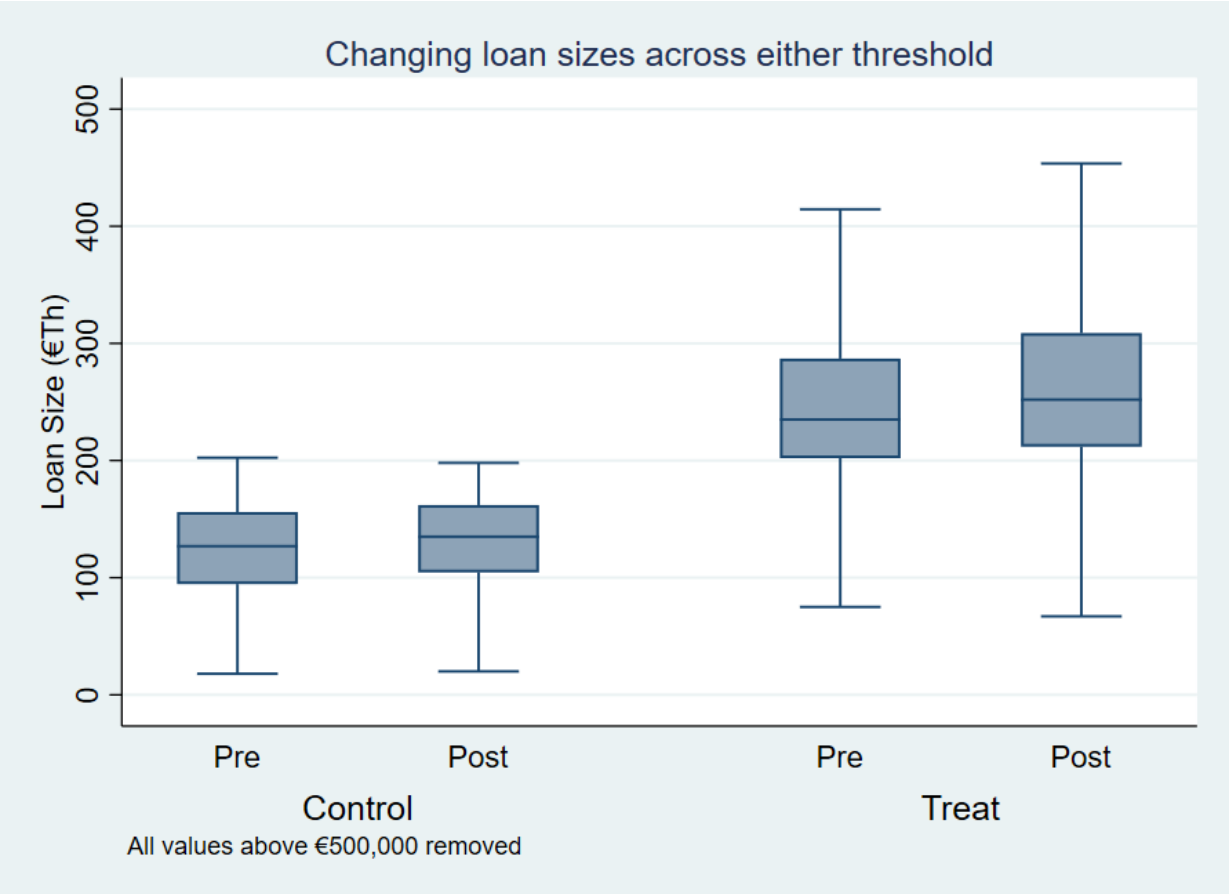
... A policy loosening leads to higher FTB leverage

- **So what?**
- Classic intuition on housing-credit: Leverage $\uparrow \rightarrow$ House Prices $\uparrow$
- **Here**: we have a rich granular data to look at mechanisms.
- Mechanisms available may muddy the above intuition: if the MaP authority loosens LTV requirements, I can:
  1. "Classic accelerator": Post similar downpayment, buy more expensive house.
  2. "Liquidity preference": Buy similar house, post smaller downpayment, retain more liquidity
- Here we test reactions on downpayments, loan sizes, and property values (in EUR and relative to income)
- **Policy implication**: during a period of economic stability, a macroprudential loosening may not necessarily lead to increased housing cyclicality, if (2) is in operation

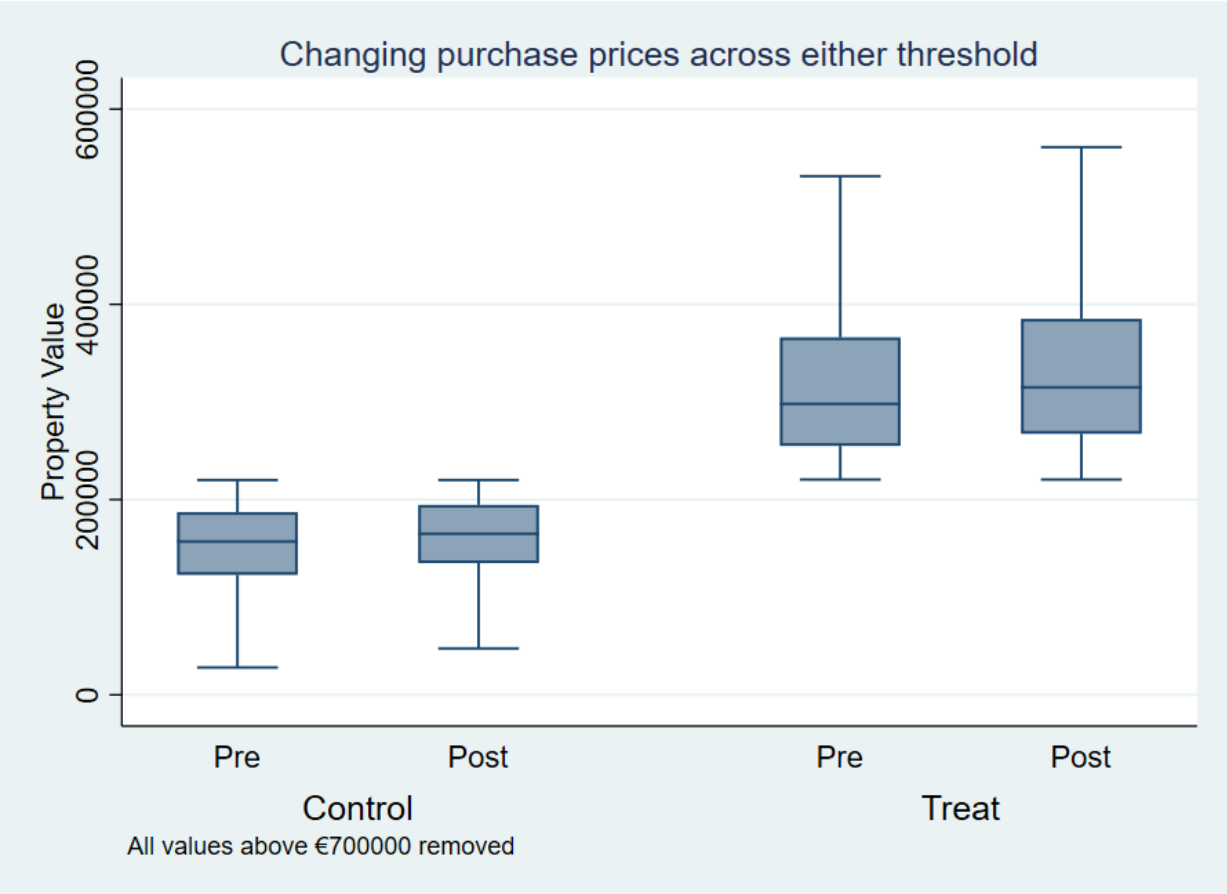
Downpayment distribution across the four groups



Loan size distribution across the four groups



Property value distribution across the four groups



Summarising the pictures

- Downpayments visibly shrink in the *Treat* group, both in €, and relative to income
- Loan sizes are rising in both groups, but appear larger in *Treat*. LTIs appear similar.
- Purchase prices are rising in both groups, but rising more relative to incomes in the *Control* group.
- Strong suggestion that *Treat* borrowers are adjusting to looser LTV requirements by shrinking downpayments, rather than amplifying the housing-credit cycle.

Three modes of adjustment: more liquidity, more debt, no asset price effect

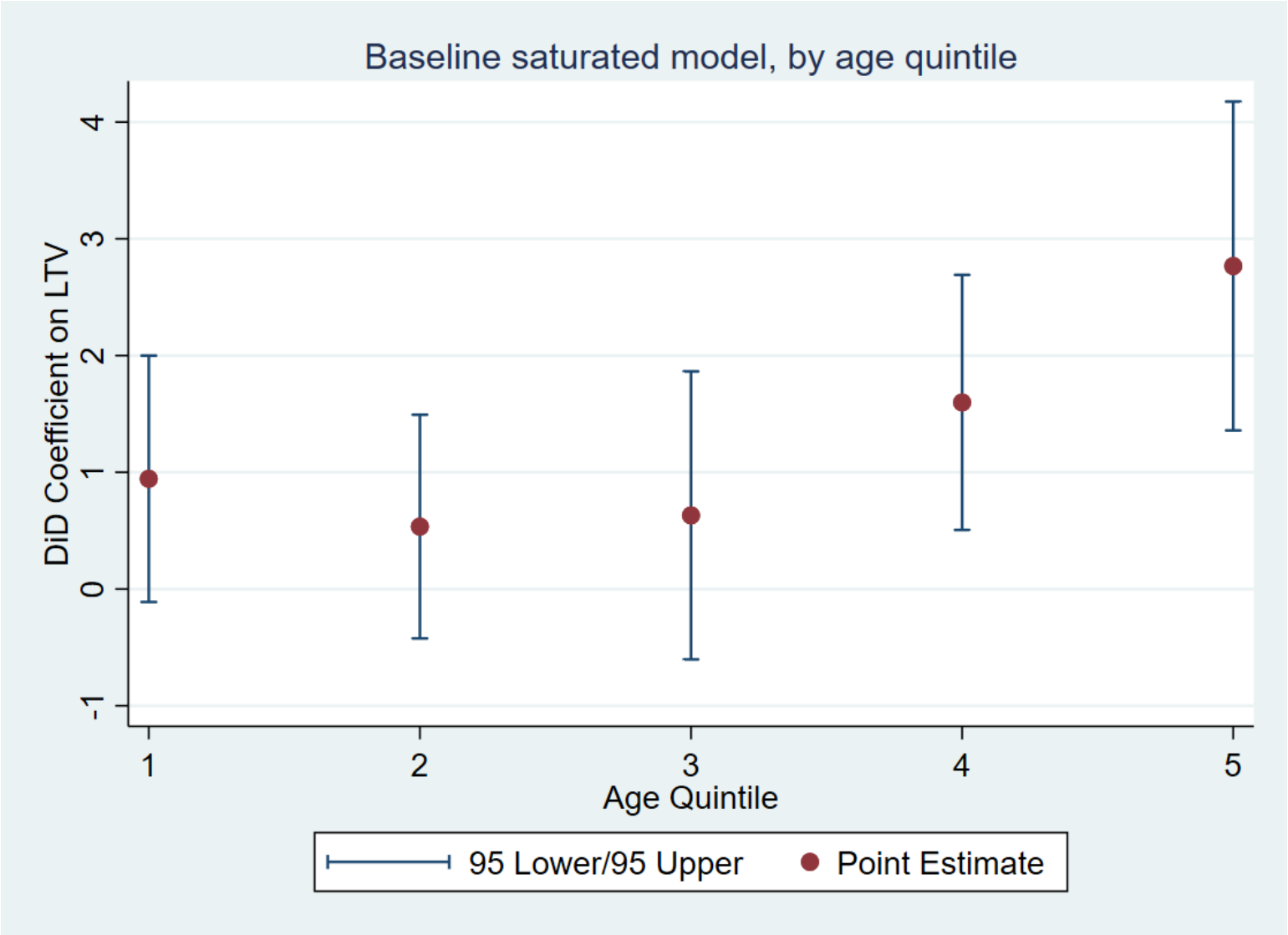
Table: Saturdated model; three adjustment mechanisms

	(1) Downpayment	(2) Loan Size	(3) Property Value
Post	-770.232	-750.802	-1521.035
	(1173.427)	(494.209)	(1272.483)
Treatment	51985.768***	3222.265***	55208.033***
	(1336.228)	(562.776)	(1449.026)
DiD	-3309.173**	5470.000***	2160.826
	(1521.081)	(640.630)	(1649.485)
Observations	38573	38573	38573
r2	0.148	0.916	0.699
Bank FE	Yes	Yes	Yes
Loan Controls	Yes	Yes	Yes
Property Size	Yes	Yes	Yes
Borrower Chars	Yes	Yes	Yes
County HPs	Yes	Yes	Yes

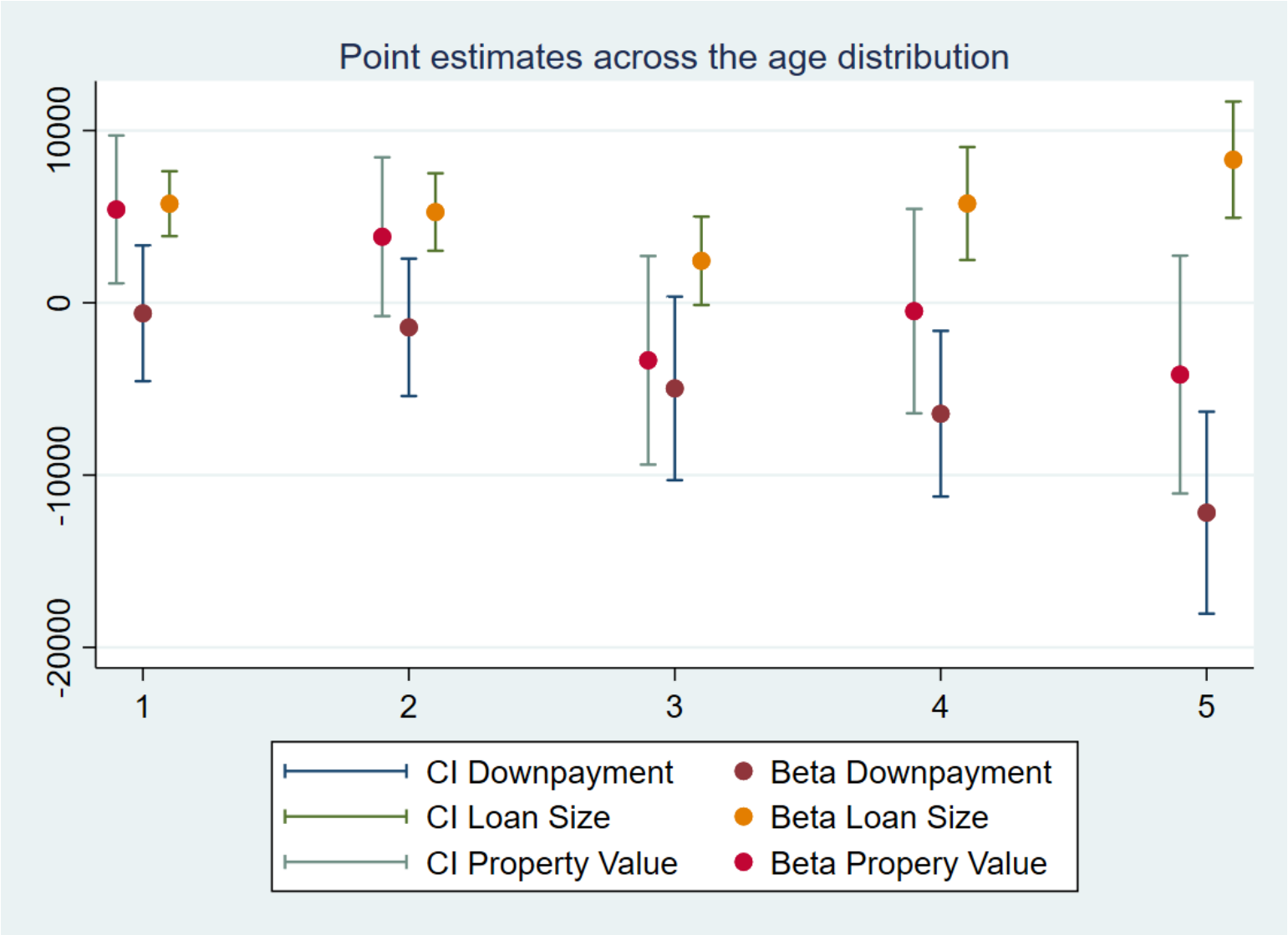
Note: Standard errors in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$. *Post* indicates all loans originated after Jan 1st 2017. Treatment Group is all loans against properties valued above €220k. Borrower characteristics: marital and employment status. Loan characteristics: income, LTI and property size. MT data (2015-2018)

Heterogeneity - age

Heterogeneity by age



Adjustment mechanisms by age quintile



Discussion on heterogeneity results

- Older borrowers dominate the response.
- They increase leverage in response to a policy loosening, through the deposit-reduction channel.
- Why do older borrowers drive this response? Variation in liquidity preferences due to higher non-mortgage expenses?

Conclusions and Extensions

- 2017 policy reform introduced a looser LTV requirement for a cohort of Irish borrowers.
- Treated borrowers increase leverage by 1.1 pp in response to the loosening (an increase of 0.5 in $\frac{debt}{equity}$).
- Choice: retain liquidity rather than purchase more expensive properties.
- Indebtedness does rise, as the trade-off to retain liquidity. Common across the age distribution.
- Both LTV increases and liquidity retention appear driven by older FTBs.
- Policy implications: liquidity reduction is a cost of macroprudential policy. Leverage loosening need not lead to most-intuitive cyclical amplification, if borrowers choose to retain liquidity instead.
- Multi-country evidence base will help policymakers in forming a comprehensive view of the risks associated with policy loosening.

Thank you!
Go raibh mile maith agaibh!
Grazie!

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