LTV Limits and Borrower Risk

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Motivation

- The general objective of LTV limits, a common MPP tool, is to reduce the systemic risk in the financial system.
- There are important transmission channels of LTV limits at the borrower level that are not well explored in the literature.
- LTV limits may also influence the housing and credit choices of affected individuals.
- This paper uses rich data to examine a topic that is important to policy makers and that supports policy design.

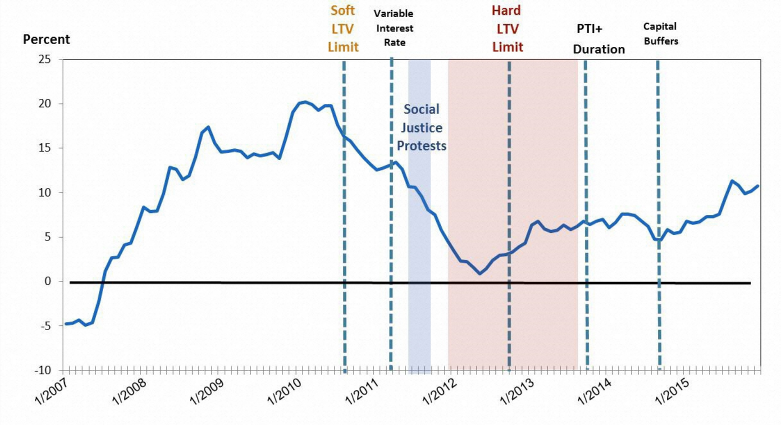
Literature

- Mainly focuses on the effect of MPPs on banks' stability (Kuttner and Shim, 2013; Cerutti et al., 2015).
- A few papers that use loan-level data: Igan and Kang (2011), Han et al. (2015).
- Recent papers that examine the borrower's response to LTV limits: de Araujo et al. (2016), Braggion et al. (2017).

Background

The Housing Market in Israel and MPPs

The rate of change in housing prices in Israel, 01/2007-12/2015:



Source: Israel Central Bureau of Statistics.

[1] The line represents the monthly change in home prices (in annual terms). MPP tools are shown on the vertical lines.

Hard LTV Limit

- In October 2012, the Bank of Israel required banks (the only mortgage providers) to limit the LTV ratio to:

1. 75 percent for First-Time Home Buyers.
2. 70 percent for Upgraders (who need to sell their first home within 18 months).
3. 50 percent for Investors (own two homes or more).

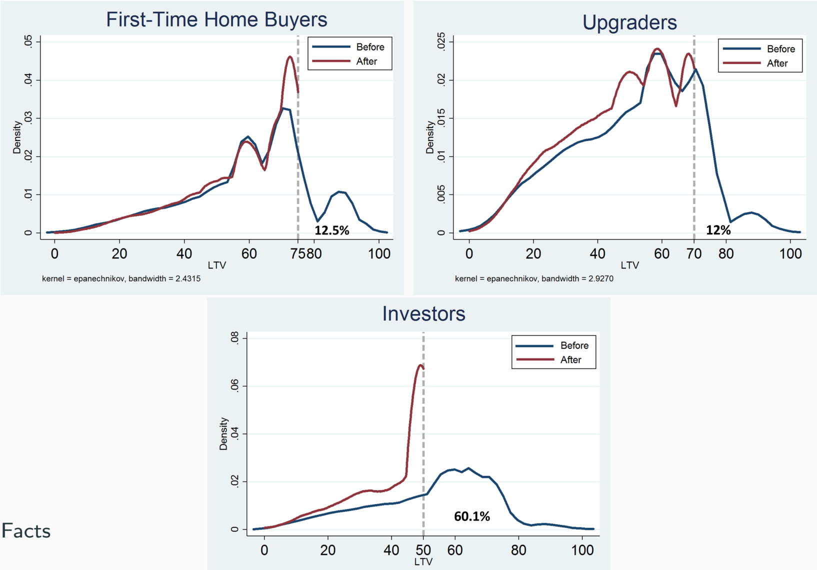
Data and Stylized Facts

Data

1. Loan-level data from the Bank of Israel - mortgage contracts and borrower characteristics (104K obs. from Jan. 2012 to August 2013).
2. Housing unit characteristics from the Israel Tax Authority - (Merged: 34k obs).

- 1+2 - Detailed information on the mortgage (interest rate, LTV, etc.), the borrower (age, income), and the housing unit (size, location etc.).

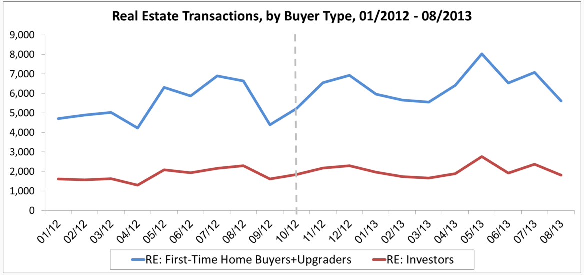
Changes in the LTV Distribution - by Buyer Types

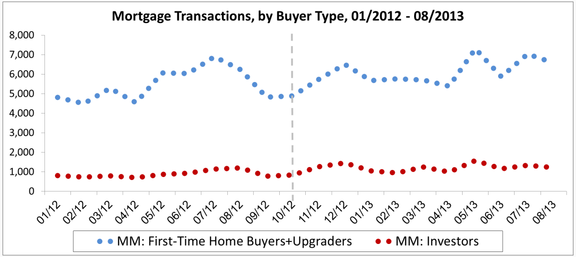


Research Questions

- Decline in the amount of mortgages (15% = NIS 7.5 billion).
- Due to the LTV limit, did the borrowers decide to:
  1. Leave the credit and housing markets?
  2. Buy cheaper and more affordable homes?
  3. Use other financial resources?

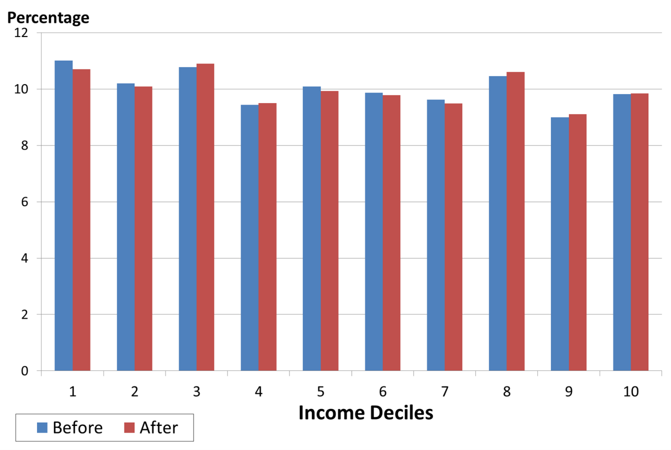
Borrowers' Activity in the Housing and Credit Markets





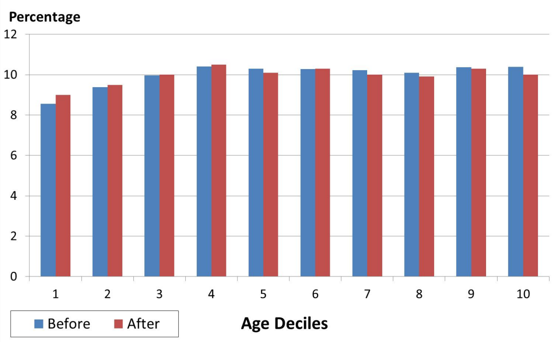
Changes in the Distribution of Borrowers' Characteristics

Income distribution before and after the LTV limit:



Changes in the Distribution of Borrowers' Characteristics

Age distribution before and after the LTV limit:



- No significant change in the distribution of the borrowers' characteristics.

Identification Approach

Identifying Affected Borrowers

- This paper focuses on the policy's effect on constrained borrowers.
- Treated borrowers: would violate the LTV limit, if they were allowed to do so.
- However, the treatment status is observed only before the policy.
- This paper predicts the borrower's leverage choices as if the limitation did not occur.

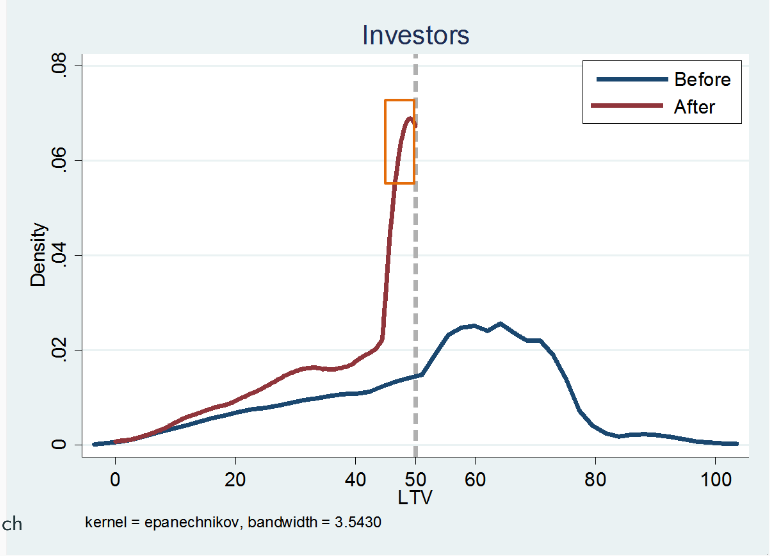
Predicted LTV Distribution

- Abadie (2005): "Determine the treatment status from some individual characteristics observed in both periods".
- Individual characteristics: Age and Income (De Araujo et al., 2016).
- Other borrower characteristics have been tested.

Predicted LTV Distribution

- Diff-in-Diff Matching approach: Examine households that are (slightly) below the cutoff after the policy.
- Match the closest household from the period before based on observed characteristics.
- Two groups:
  1. Control group - households that chose the same LTV ratio before the policy, slightly below the cutoff.
  2. Treatment group - households that chose before the limitation to be above the LTV cutoff.

Predicted LTV Distribution



Results

Diff-in-Diff Matching

	FTHB	Upgraders	Investors
	70-75 VS 75-80	65-70 VS 70-75	45-50 VS 50-55
Real home prices (NIS)	-78,504***	-48,760**	-182,722***
	(15,252)	(16,901)	(27,522)
Size (SM)	-8.05***	-3.1*	-14.9***
	(2.19)	(2.42)	(3.01)
Distance from TA	7.1***	3.3**	12.0***
	(1.61)	(1.57)	(2.97)
Neighborhoods quality	-1.2***	-0.4	-2.0***
	(0.39)	(0.43)	(0.57)
Interest Rate (p.p.)	0.41***	0.15	0.62***
	(0.13)	(0.14)	(0.22)
Maturity (years)	1.8***	0.5	1.5***
	(0.45)	(0.42)	(0.59)
Default (p.p.)	-0.2***	-0.15***	0.06
	(0.06)	(0.05)	(0.07)

Diff-in-Diff Matching - Percentage Change

	FTHB	Upgraders	Investors
	70-75 VS 75-80	65-70 VS 70-75	45-50 VS 50-55
Real home prices (NIS)	-0.10***	-0.05**	-0.22***
Size (SM)	-0.09***	-0.03**	-0.14***
Distance from TA	0.14***	0.06**	0.24***
Neighborhoods quality	-0.12***	-0.04	-0.18***
Interest Rate (p.p.)	0.41***	0.15	0.62***
Maturity (years)	0.07***	0.02	0.09***
Default (p.p.)	-0.2***	-0.15***	0.06

Interim Summary

- No segment of the borrower types was crowded out of the credit and housing markets.
- In terms of housing characteristics, affected borrowers bought lower quality assets, especially farther from the center.
- Magnitude: total reduction in the value of acquired properties of NIS 3.5 billion.
- Investors were affected more by the LTV limit.

Additional Perspectives

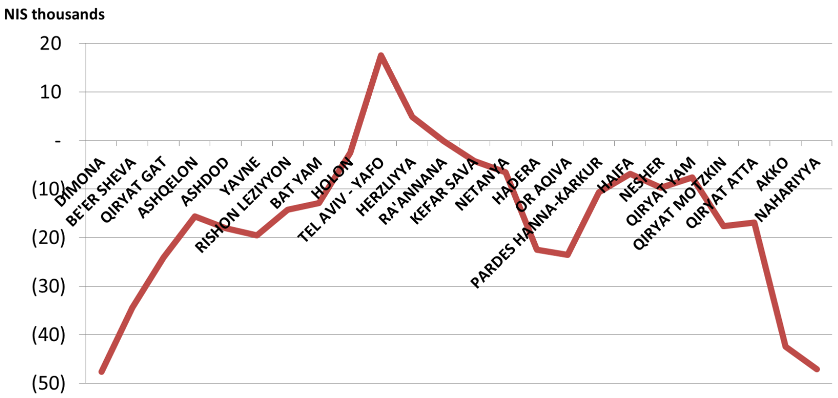
Additional Perspectives

Increase in interest rate and maturity could have happened due to:

1. The banks' risk perspective changed due to the signal from the regulator on systemic risk among highly leveraged borrowers (De Araujo et al., 2016).
2. Borrowers buying assets farther from the center in riskier areas.
3. Increase in unsecured credit.

Are Housing Assets Farther from the Center Riskier?

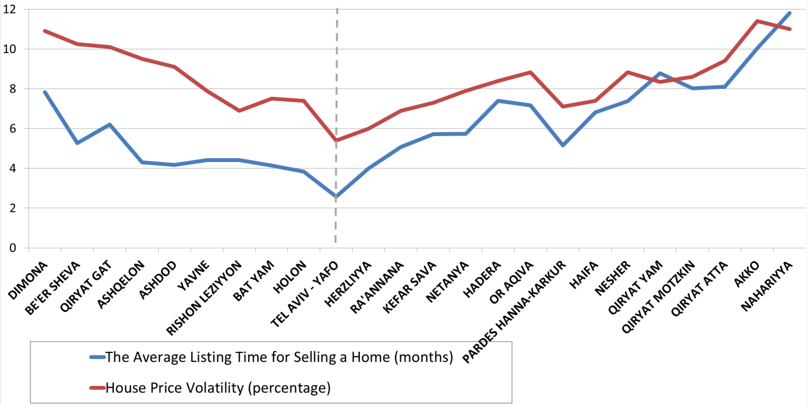
Price gap between the first asking price and the last asking price, along the Israeli coastline:



Source of data: "Homely" datatset on transaction from "YAD2" website, online listings of asking price on homes for sale, between the years 2013-2016. Dotted lines represents Tel-Aviv -Yafo city.

Are Housing Assets Farther from the Center Riskier?

Risk measures of property assets, along the Israeli coastline:



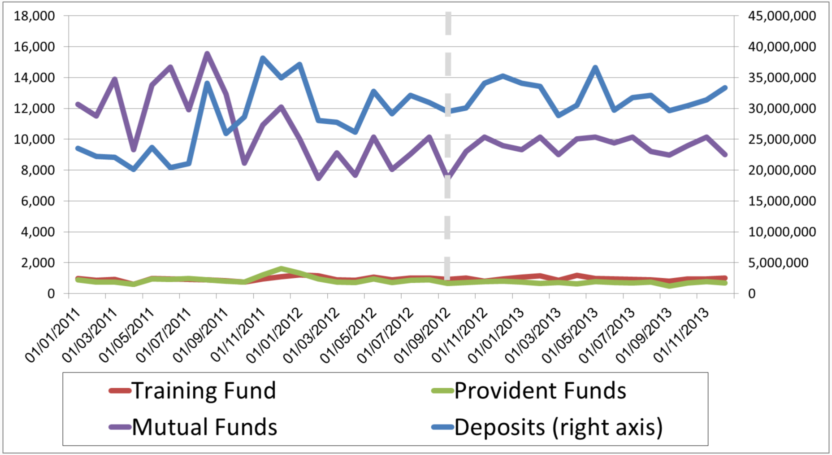
Source of data: Listing time - "Homely" datatset on transactions from "YAD2" website for years 2013-2016. House Price Volatility - dataset on ousing unit characteristics (CARMEN) from the Israel Tax Authority, between the years 1998-2016. House Price Volatility was calculated according to standard error of home prices (monthly). Dotted lines represent Tel-Aviv -Yafo city.

Shifts in the Demand for Unsecured Credit?

- Net amount of mortgages that were withdrawn from the market - NIS 7 billion.
- They stayed in the credit market, some of them bought cheaper assets (only explains half of the reduction in mortgages).
- How did borrowers raise the additional amount of money?

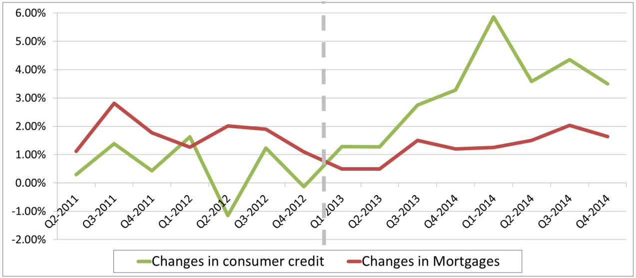
Shifts in the Demand for Consumer Credit

Withdrawals from several financial resources (NIS thousands), 2011-2013:



Shifts in the Demand for Consumer Credit

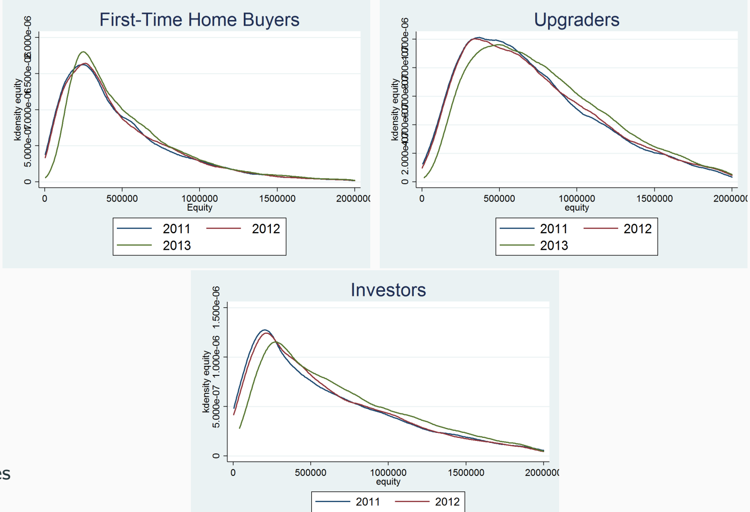
Changes in mortgages and consumer credit, 01/2011-04/2014:



- Riskier credit: unsecured and short-term credit, more expensive, higher monthly payments and increasing overall exposure to risk of recession and unemployment.

Shifts in the Demand for Consumer Credit

Changes in downpayment distribution before and after the LTV limit:



Shifts in the Demand for Consumer Credit

- The total increase in down-payment amounts to NIS 3.2 billion, half of the amount of mortgages that were withdrawn from the market.
- Consumer credit is typically of shorter duration, thereby increasing the borrower's monthly debt payment.
- In order to stay on the same monthly debt payment, some borrowers increased their mortgage duration, resulting in an increase in the mortgage interest rate.

Summary and Conclusions

- The LTV limit encouraged borrowers to buy cheaper assets, farther from the center, in lower graded neighborhoods.
- Borrowers paid a higher interest rate and higher maturity:
    1. Riskier assets, farther from the center.
    2. Increase in unsecured credit.
- Understanding market participants' response to LTV limits is crucial for the development of appropriate policy tools in the future.

Thank you!

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