The impact of interest rate ceilings on households'credit access

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Introduction

- Interest rate ceilings (in Chilean law, TMC) may have several positive and negative effects:
  - **a reduction in credit supply, especially among low income and riskier borrowers** (Villegas, 1982, Rigbi, 2013);
  - an increase in informal credit (Zinman, 2008) or illegal types of loans (Collard et al., 2006, Reifner et al., 2010);
  - a reduction in the interest rates of borrowers with less information or inattentive (SBIF, 2015, 2016, 2017);
  - fewer "bad" loans - less credit may improve welfare (Melzer, 2011).

- Chile introduced a law in December of 2013 which gradually reduced the TMC from above 50% to around 35%. Based on an analysis of all the debtors in 2013 which did not get new loans over the period 2014-2017, the SBIF (2017) estimates that the new law may have denied banking credit to a range of 151-227 thousand consumers. **My estimate:** 9.7% of households (197 thousand consumers).

A credit exclusion model applied to EFH-SBIF sample

This work estimates credit exclusion using a sample of 4,118 households from the EFH-SBIF panel: survey (2007-2014) + loan history (2013-2015). Households just below TMC (ex: $tar_{i,t} \in [TMC_t - 5\%, TMC_t]$) should receive more credit offers than families just above the TMC ($tar_{i,t} > TMC_t$), even if their risk is similar: robust to macro shocks.

Well above $\text{TMC}^S_{i,t}$: $1(tar^S_{i,t} > TMC^S_t + BW)$
Slightly above $\text{TMC}^S_{i,t}$: $1(tar^S_{i,t} \in (TMC^S_t, TMC^S_t + BW])$
Almost in $\text{TMC}^S_{i,t}$: $1(TMC^S_t - BW \leq tar^S_{i,t} \leq TMC^S_t)$
bandwidth BW=5% (2.5%, 1%).
S is segment: all loans, exclusive users of 0-50 UF, 50-200 UF, or both.

$\Pr(NC_{i,t} = 1 \mid t, tar^S_{i,t}, (tar^S_{i,t})^2, age - D, \ln(P_{i,t})$, dummies for well above, slighly above, almost in $\text{TMC}^S_{i,t}$)

Exclusion Ratio: $\dfrac{E\left[\Pr(NC_{i,t} = 1 \mid t, x_{i,t}(No - TMC))\right]}{E\left[\Pr(NC_{i,t} = 1 \mid t, x_{i,t}(TMC^S_t))\right]} - 1$

Delinquency model

$$(1 + CA + TC_t) = (1 + tar_{i,t}) \left[(1 - \Pr(Df_{i,t})) + (1 - LGD) \times \Pr(Df_{i,t}) \right]$$

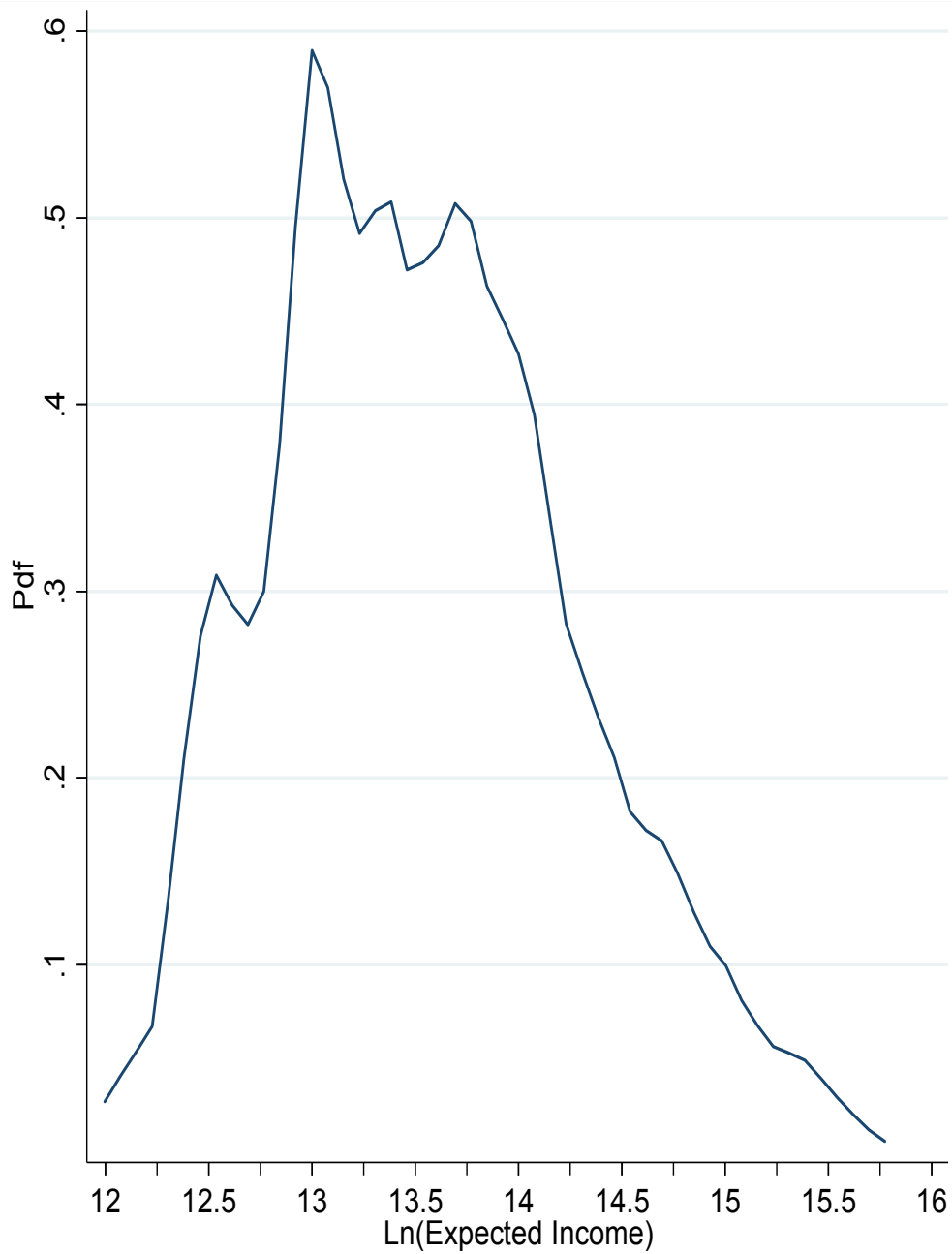
$$\Rightarrow tar_{i,t} = \frac{CA + TC_t + LGD \times \Pr(Df_{i,t})}{1 - LGD \times \Pr(Df_{i,t})}$$

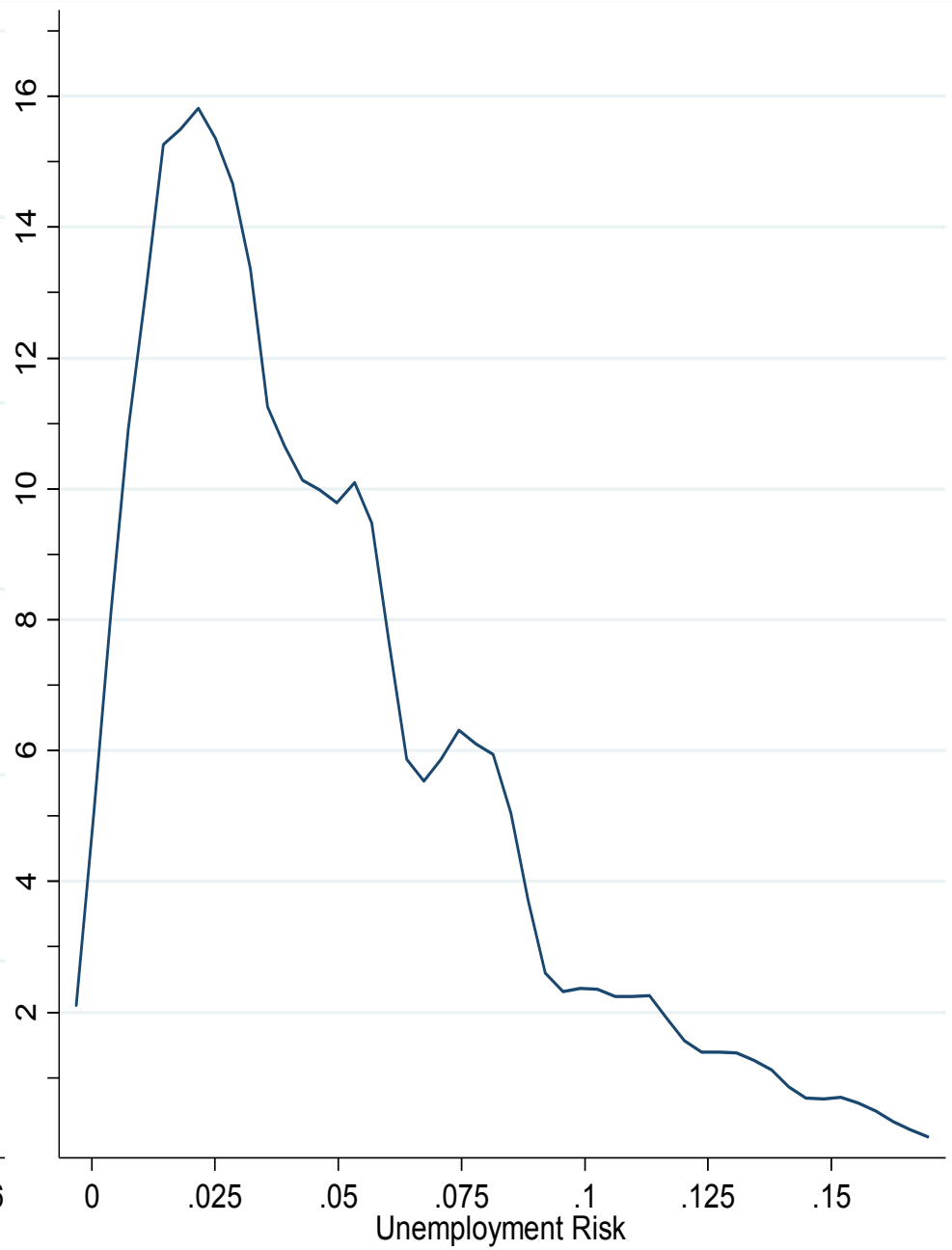
$$LGD = 0.50,\ CA \in \{7.5\%, 10\%\},\ \Pr(Df_{i,t}) \equiv \Pr(Df_{i,t} = 1 \mid \beta, x_{i,t})$$

$x_{i,t} \equiv$ (Household income $Y_{i,t}$ in log, $\frac{D_{i,t}}{12 \times P_{i,t}}$, $\frac{CF_{i,t}}{Y_{i,t}}$, nr of hh members, hh unemployment risk $u_{i,t}$, region and high income county, sex-age-education-marriage status of hh head)

Expected income and unemployment risk (Madeira, 2015, 2017):
$P_{k,t} = Y_{k,t}(1 - u_{k,t}) + Y_{k,t} RR_{k,t} u_{k,t}$, $P_{i,t} = a_i + \tilde{P}_{i,t} = a_i + \sum_k P_{k(i),t}$
$u_{i,t} = \sum_k \frac{P_{k(i),t}}{\tilde{P}_{i,t}} u_{k(i),t}$

Income and Unemployment Risk (EFH-SBIF hhs in 2013)

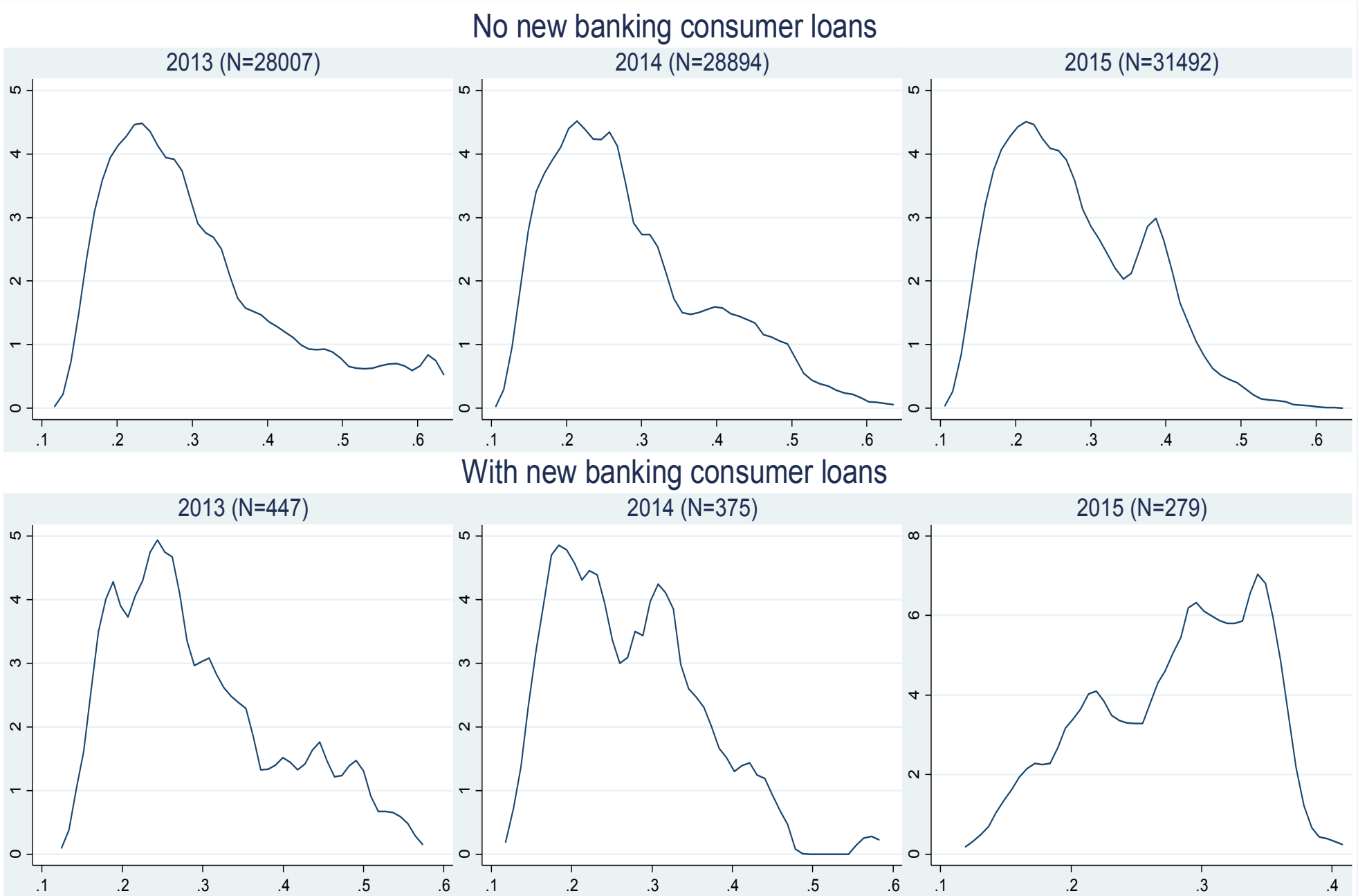




Delinquency model - probit (EFH)

$\Pr(Df_{i,t} = 1 \mid x_{i,t})$	2007-14	2007-11
$\ln(Y_{i,t})$	-0.135***	-0.144***
Debt to Expected Annual Income $\frac{D_{i,t}}{12 \times P_{i,t}}$	1.210***	0.915***
Financial charge to monthly income $\frac{CF_{i,t}}{Y_{i,t}}$	0.224**	0.439***
Nr of hh members	0.110***	0.104***
Age	-0.007***	-0.007***
Married man is hh head	-0.149***	-0.174***
Female	0.0737	0.0845
Technical college	0.0367	0.0495
College	-0.236***	-0.202***
Unemployment risk $u_{i,t}$	1.640***	2.073***
Metropolitan capital	-0.0429	-0.0843*
High income county	0.0348	0.0419
Constant	0.470*	0.596*
Observations	8,588	5,696

TAR of those with / without loans in 2013-15 (CA=10%)



Regresions: All instalment consumer loans

Probability of a new loan (with population weights)

Logit ($NC_{i,t} = 1$)	M1	**M2**	M3	M4	**M5**
Well above $TMC_{i,t}^{0-50}$	-2.430***	-2.742***	-5.958***	-5.996***	-3.690***
Slightly above $TMC_{i,t}^{0-50}$	-2.823***	-3.007***	-6.027***	-6.047***	-3.667***
Almost in $TMC_{i,t}^{0-50}$	0.401***	0.217***	0.0644	-0.0339	0.0494
Before the Law_t	0.578***		0.0951*		
$tar_{i,t}^{0-50}$	-11.19***	-1.981*	-7.853***	14.18***	-7.208***
$(tar_{i,t}^{0-50})^2$	16.73***	7.256***	2.800	-19.99***	14.41***
$\ln(P_{i,t})$	-0.0341	0.151***	-0.123	0.135	0.142***
Other controls:		Constant, 5-year age dummies			
Fixed effects: Time		Yes		Yes	Yes
Fixed effects: HH			Yes	Yes	RE
Observations	374,710	374,710	374,379	374,379	374,710

Regresions: 3 segments (mutually exclusive)

Probability of a new loan (with population weights)

Logit ($NC_{i,t} = 1$)	**M2**	**M5**	**M2**	**M5**	**M2**	**M5**
	Only 0-50 UF		Only 50-200 UF		Both	
Well a. $TMC^S_{i,t}$	-2.513***	-3.183***	-3.735***	-3.948***	-2.306***	-3.308
Slightly a. $TMC^S_{i,t}$	-2.440***	-2.691***	-4.592***	-4.585***	-2.941***	-3.555
Almost in $TMC^S_{i,t}$	0.540***	0.423***	0.0777	0.0134	0.168	-0.098
$tar^S_{i,t}$	-3.202	-10.81***	-2.011	-8.862***	0.369	-4.309
$(tar^S_{i,t})^2$	7.006*	18.33***	9.587***	19.39***	3.421	9.772*
$\ln(P_{i,t})$	0.0594	0.0459	0.291***	0.265***	0.188***	0.137*
Other controls:	Constant, 5-year age dummies					
FE: Time	Yes	Yes	Yes	Yes	Yes	Yes
FE: Household		RE		RE		RE
N	116,196		122,264		136,250	
Households	930		1,397		1,791	

Other regresions

Probability of a new loan (with population weights)

Logit ($NC_{i,t} = 1$)	**M2 (BW=2.5%)**			
	All	Only 0-50	Only 50-200	Both
Well a. $TMC^S_{i,t}$	-2.848***	-3.022***	-3.844***	-2.312***
Slightly a. $TMC^S_{i,t}$	-3.341***	-2.397***	-4.847***	-3.951***
Almost in $TMC^S_{i,t}$	0.176*	0.382**	0.146	0.236
$tar^S_{i,t}$	-2.063*	-4.295*	-2.016	0.681
$(tar^S_{i,t})^2$	7.781***	9.862***	9.610***	3.054
$\ln(P_{i,t})$	0.153***	0.0585	0.291***	0.190***
Other controls:	Constant, 5-year age dummies			
FE: Time	Yes	Yes	Yes	Yes
FE: Household	No	No	No	No
N	374,710	116,196	122,264	136,250
Households	4,118	930	1,397	1,791

Counterfactual analysis of the impact of new TMC

Households excluded from new consumer banking loans (percentage of the population of loan users)*

Year	Quarter	All	0-50	50-200	Both	TMC	
	Flow	FE time year-month (M2)				0-50	50-200
2013	3	12.7%	8.6%	18.0%	9.5%	53.9%	53.9%
2013	4	15.3%	11.2%	20.9%	11.8%	50.0%	48.6%
2014	1	14.8%	10.6%	19.9%	11.9%	47.3%	45.3%
			(.....)				
2015	3	22.8%	17.1%	28.9%	21.4%	36.5%	32.1%
2015	4	22.4%	16.7%	30.3%	21.0%	36.7%	30.4%
2015Q4-2013Q3		9.7%	8.0%	12.3%	11.5%		

Conclusions

Estimates show that families Almost in TMC have much more credit than those Slightly above TMC. New law reduces flow of new loans by 9.7% (2015), equivalent to 197 thousand consumers.

Segment of (exclusive) users of loans with 0-50 UF had a lower increase in exclusion (% of consumers), but it represents a smaller population than the (exclusive) users of 50-200 UF or the users of both credits.

Robustness check relative to CA

Households excluded from new consumer banking loans (percentage of the population of loan users)*, with alternative values of administrative costs

		CA					
Year	Quarter	CA=6%	8%	9%	**10%**	11%	12%
	Flow			FE time year-month (M2): BW=5%			
2013	3	6.6%	10.8%	10.7%	12.7%	13.3%	13.4%
2013	4	8.7%	12.5%	12.6%	15.3%	16.3%	15.9%
2014	1	8.8%	12.4%	12.4%	14.8%	15.7%	15.7%
			(.....)				
2015	3	14.2%	19.1%	19.7%	22.8%	24.4%	25.0%
2015	4	13.9%	18.8%	19.4%	22.4%	23.3%	24.6%
2015Q4-2013Q3		7.2%	8.0%	8.7%	9.7%	9.9%	11.2%