

# The Counter-Cyclical Capital Buffer of Basel III: Does it affect Mortgage Pricing?

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UFSP Jahrestagung June 2, 2014

\* Work in progress.

The views expressed are those of the authors and do not necessarily reflect the position of FINMA.

# 1 Basel Accords to regulate Banks

The Basel Committee on Banking Supervision publishes **Capital Accords** as international regulatory framework to strengthen the stability of the international financial system.

## Basel II

- 8% minimum capital ratio based on risk-weighting scheme
- Capital requirements turned out **pro-cyclical** : Lower (higher) in booms (busts)
- CH implementation 2007

## Basel III

- 8% minimum capital ratio based on risk-weighting scheme
- Capital Conservation Buffer: In Switzerland 2.5-6.4% of RWAs
- CH implementation 2013

On top authorities can temporarily require

- **Counter-Cyclical Capital Buffer (CCB):**
  - extra equity for up to 2.5% of RWA
  - Goals:
    - **more** equity to bear potential losses
    - **slow down** total lending growth

# 1 Switzerland and the CCB

The Counter-Cyclical Capital Buffer (CCB) ...

- became a legal option in July 2012.
- first activated on February 13, 2013:
  - extra equity worth 1% of ***risk-weighted domestic residential mortgages***
  - transition until September 2013
- raised to 2% in January 2014.  
(not investigated here)

# 1 Research Question(s)

*How does the CCB affect mortgage issuance and pricing in Switzerland?*

We examine...

- bank sensitivity measures,
- risk-weighting schemes
- banks and insurers,
- the **willingness** of lenders to make loans and their **pricing**.

# 1 Our Findings

Sensitivity, after CCB

- **more capital constrained** and **specialized** banks charge more; banks with higher **corporate capital** and **equity growth** charge more.
- banks with higher **equity ratio, reserves** and **ROE** charge less.

LTV Thresholds:

**Both types of lenders** charge extra on high LTVs, but risk-weighting schemes do **not amplify** CCB effects.

Banks and insurers **raise** mortgage rates after the CCB, but **insurers** raise their rates by on average **8.8 bps more** than banks. => No Leakage

**No** differential CCB effect on the **willingness** to make mortgages.

# Outline

- 1 Motivation
- 2 Data and Sample Construction
- 3 CCB Effects and Possible Amplifiers
- 4 Results
- 5 Summing Up

# 2 Data and Sample Construction

# 2 Data on Swiss Mortgage Market

Online mortgage platform [www.comparis.ch](http://www.comparis.ch)

Customer ...

- provides info on finances, the real estate property, the requested mortgage amount & maturity,
- pays CHF 148.

Lenders (banks and insurers) ...

- receive anonymized customer data («our set of information»),
- submit offers or rejections,
- if offer: Interest rates on (tranches) of the mortgage,
- cannot see the responses of competitors.

Comparis

- Collects responses and sends them to the customer.



# 2 Data: Our Sample

10-year Fixed Rate Mortgages

Key outcome variable: Tranche-weighted offered mortgage interest rate

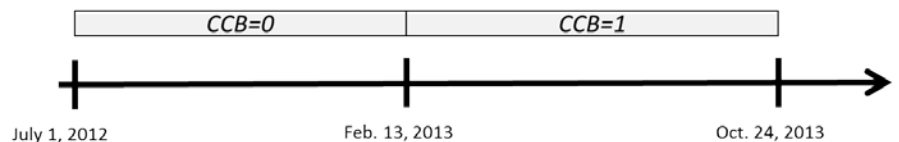
Sample period: July 2012 – October 2013

Why July 2012?

(i) new mortgage market regulation (LTV limit 90%, faster amortization)

(ii) CCB became legal option

1177 requests and 6334 responses (5459 offers)



# 3 CCB Effects & Possible Amplifiers

# 3 Bank Sensitivity as Amplifier

*Which banks exhibit the highest sensitivity to the CCB?*

The CCB applies to ...

- mortgages on balance sheets
- new mortgage issuance

To comply with the CCB, a bank can...

- reject more requests,
- **pass on** higher costs to **new** mortgage customers => charge more ,
- **raise** equity capital.

ASSETS	LIABILITIES
Cash	Debt Deposits Other Debt
Securities	Bonds
Loans Mortgages Other Loans	Equity
Other Assets	Other Liabilities
Total	Total

# 3 Bank Sensitivity as Amplifier

*Which banks exhibit the highest sensitivity to the CCB?*

Our Sensitivity measures:

## Capitalization

- Capital Constrained
- Equity/TA
- Corporate Capital/TA
- Reserves/TA
- $\Delta$ Equity
- ROE

## Business Model

- Mortgages/Equity
- $\Delta$ Mortgages
- Customer Funds/Mortgages

ASSETS	LIABILITIES
Cash	Debt Deposits Other Debt
Securities	Bonds
Loans Mortgages Other Loans	Equity
Other Assets	Other Liabilities
Total	Total

# 3 Risk-Weighting Schemes as Amplifier?

*Do Risk-Weighting Schemes on mortgages amplify the basic CCB effect?*

Loan-to-value (LTV) ratios determine risk weights:

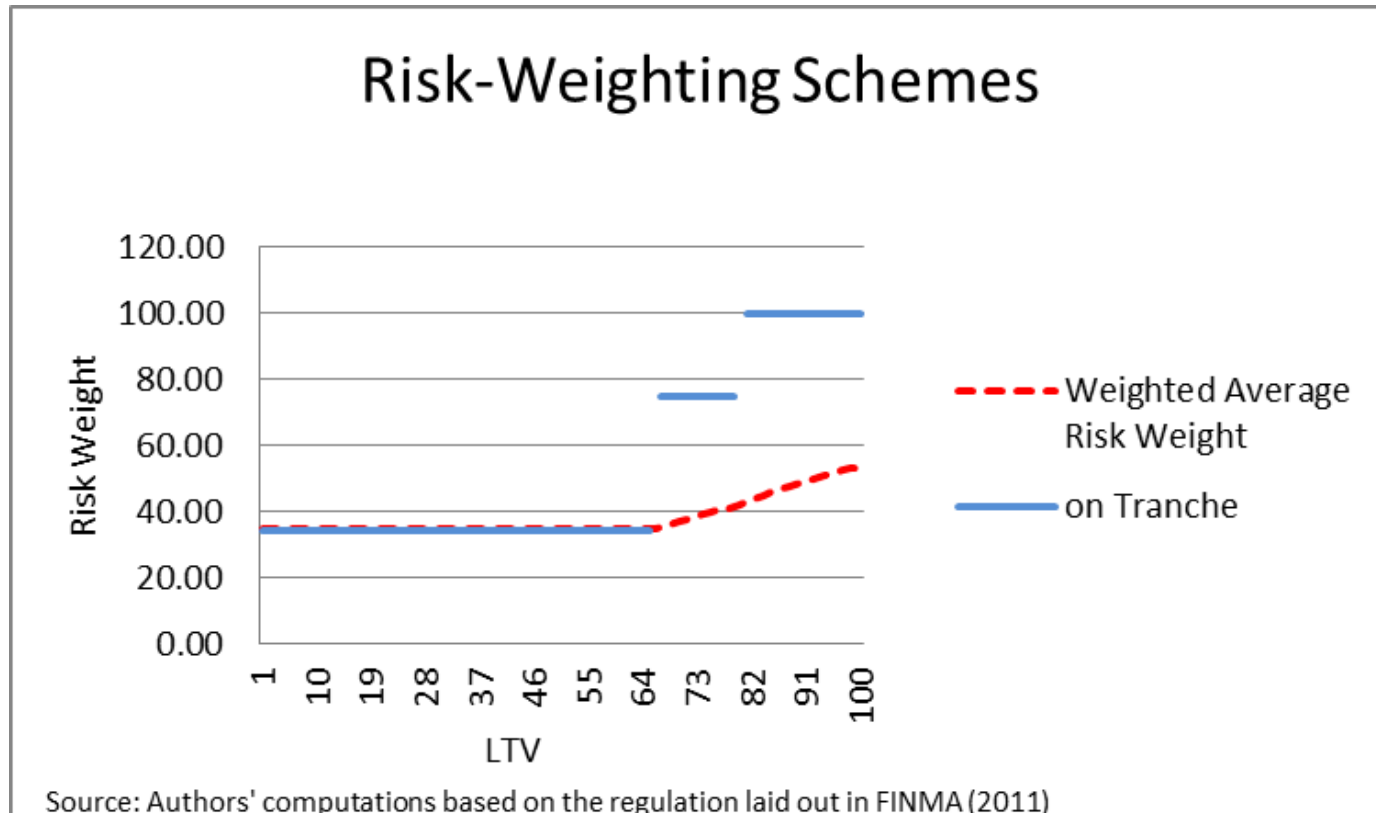
- **35%** risk weight on tranches **LTV ≤ 66**
- But **75%** risk weight on tranches **66 < LTV < 80**
- Risk weight of **100%** on tranches **LTV ≥ 80**

=> **Weighted average** risk weight function has two key points:

LTV ≥ 67:  $LTV_{67} = I(LTV \geq 67)$

LTV ≥ 80:  $LTV_{80} = I(LTV \geq 80)$

### 3 Risk-Weighting Schemes as Amplifier?



Do banks charge extra for LTVS above these **LTV thresholds**?

# 3 Risk-Weighting Schemes as Amplifier?

*Do Risk-Weighting Schemes on mortgages amplify the basic CCB effect?*

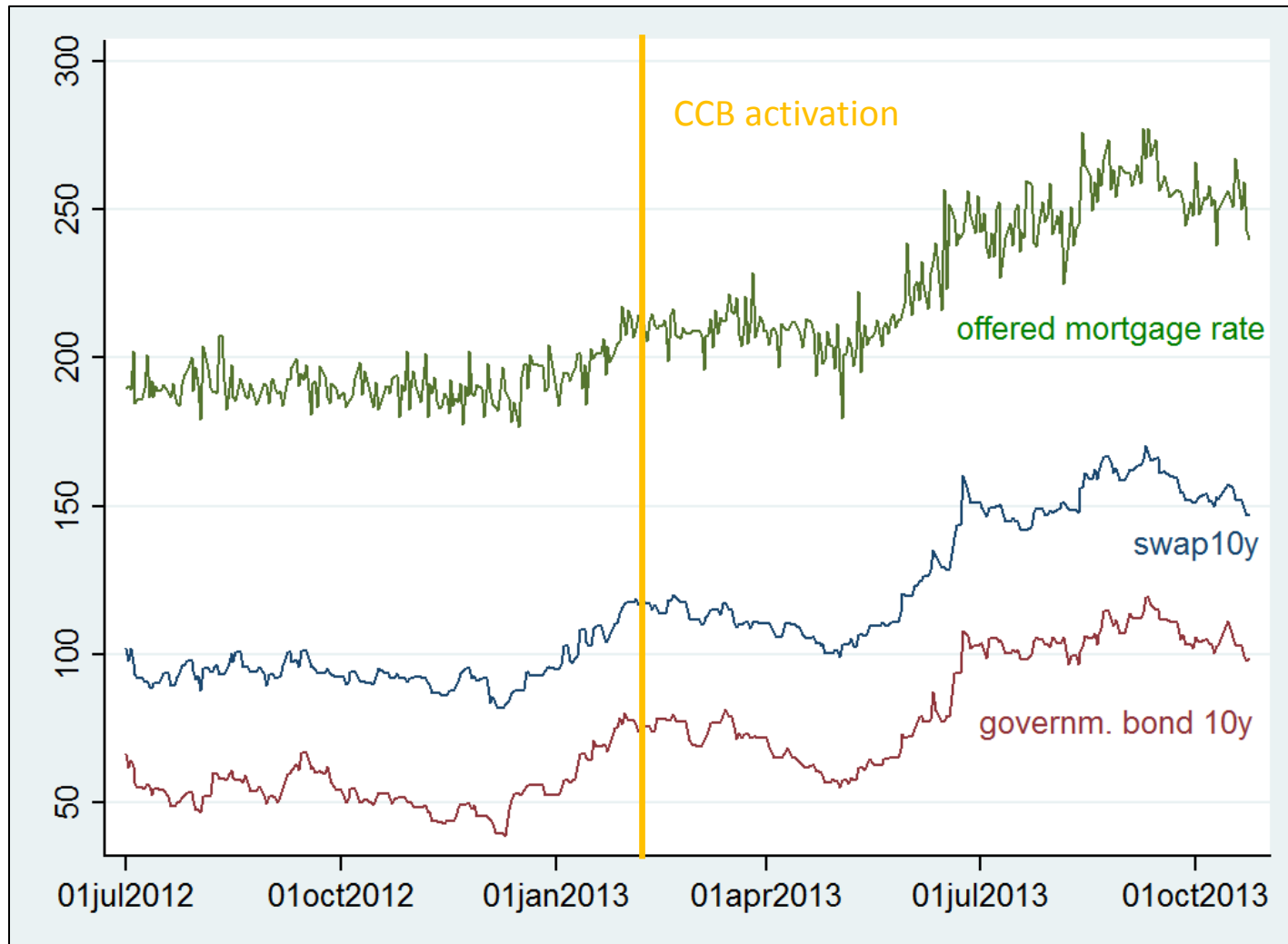
But, LTV threshold effects might ensue from:

- Risk-weighting schemes (supply)
- Lenders perceive loans  $LTV \geq 67$  and  $LTV \geq 80$  as particularly risky  
=> **both** lenders demand a risk premium (supply)
- Since July 2012: tranches with  $LTV \geq 66$  have to be repaid within 20 years.  
(demand)

# 4 Results



# 4 Evolution of Rates in bp



Sources: SNB for swap 10y & gov. bond 10y;  
**offered mortgage rate** as daily averages of our sample based on 10y fixed rate mortgages.

*Which characteristics render a **bank** particularly **sensitive** to the CCB effects?*

# Table 1

## Bank Sensitivity Measures

With FE-request and FE-lender, robust SE.

### Find:

#### Generally: Banks that...

- are specialized in retail business and expanding it (Mort/Equity; ΔMortg. ; Customer Funds)
- have higher corporate capital
- have raised equity offer **cheaper** mortgages.

#### After CCB: Banks that...

- are constrained
- are specialized
- report high corporate capital
- have raised equity charge **more**,

and banks with more

- Equity capital
- Capital reserves
- ROE

charge **less**.

### Offered Mortgage Rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
<b>Sensitivity Measures</b>									
Constrained	6.8883 (5.9641)								
CCB*Constrained	6.2789*** (0.9325)								
Mortgages/Equity Capital		-7.6884*** (0.8925)							
CCB*Mortgages/Equity Capital		6.5307*** (0.9604)							
Equity Capital/TA			1.0708 (3.4065)						
CCB*Equity Capital/TA			-8.8509*** (0.9922)						
Corporate Capital/TA				-4.9685** (2.3202)					
CCB*Corporate Capital/TA				8.3259*** (0.8766)					
Capital Reserves/TA					-11.5118 (12.4785)				
CCB*Capital Reserves/TA					-8.7294*** (0.9274)				
ΔEquity Capital						-4.7533*** (0.7278)			
CCB*ΔEquity Capital						2.5683** (1.2662)			
ΔMortgages							-2.2854*** (0.7056)		
CCB*ΔMortgages							0.8470 (1.1763)		
Customer Funds/Mortgages								-22.3350** (11.3287)	
CCB*Customer Funds/Mortgages								-0.1036 (1.1002)	
ROE									-1.1818 (2.0306)
CCB*ROE									-1.8902** (0.8741)
Constant	242.7159*** (7.3538)	246.7853*** (6.1920)	199.6107*** (6.5295)	242.9582*** (5.3274)	249.4647*** (3.5127)	200.9042*** (6.2541)	219.6279*** (5.4697)	252.3132*** (4.0835)	243.3556*** (5.8023)
Observations	4,045	4,045	4,045	4,045	4,045	4,045	4,045	4,045	4,045
R-squared	0.8281	0.8297	0.8306	0.8305	0.8309	0.8277	0.8255	0.8248	0.8252

***Do LTV thresholds***  
*(risk-weighting schemes?)*  
***amplify the CCB effect?***

## Table 2

### LTV Threshold Pricing of BANKS

With controls and  
FE (time, lender, type, canton),  
robust SE

#### Find:

LTV per se *insignificant*.

Banks charge extra for *LTV>66*  
*and LTV> 80*.

*LTV Threshold s* do *not* amplify  
the CCB effect.

=> CCB does *not* effectively  
discriminate against very risky  
customers.

#### Offered Mortgage Rate

	(1)	(2)	(3)	(4)	(5)
<i>Mortgage Characteristics</i>					
LTV	0.0282 (0.0206)	0.0261 (0.0205)	0.0264 (0.0204)	0.0267 (0.0205)	0.0251 (0.0207)
LTV67 (0/1)	2.1329*** (0.6950)	2.5814*** (0.6923)	2.3856*** (0.6954)	2.3825*** (0.6960)	2.3527*** (0.6966)
LTV80 (0/1)	1.8084** (0.7500)	1.8488** (0.7441)	1.5700** (0.7462)	1.5591** (0.7476)	1.5391** (0.7476)
CCB*LTV67 (0/1)	-1.4976 (0.9193)	-1.4916 (0.9122)	-1.4856 (0.9111)	-1.4931 (0.9108)	-1.5161* (0.9115)
CCB*LTV80 (0/1)	0.8679 (1.1688)	1.3353 (1.1508)	1.4530 (1.1509)	1.4593 (1.1516)	1.4828 (1.1516)
<i>Refinancing Control</i>					
Swap Rate 10y	73.6928*** (4.6923)	75.1129*** (4.6574)	74.4085*** (4.6616)	74.3725*** (4.6695)	74.2675*** (4.6725)
<i>Request Controls</i>					
Income		-3.9127*** (0.4673)	-3.1353*** (0.5086)	-3.1514*** (0.5114)	-3.2027*** (0.5191)
Wealth			-0.8430*** (0.2241)	-0.8406*** (0.2240)	-0.8085*** (0.2278)
				0.1442 (0.5425)	0.1768 (0.5434)
Age					-0.0158 (0.0227)
Constant	120.4573*** (8.7060)	166.4232*** (9.8368)	168.8237*** (9.8425)	185.1407*** (9.9337)	186.3524*** (10.0654)
Observations	4,045	4,045	4,045	4,045	4,045
R-squared	0.7593	0.7635	0.7643	0.7644	0.7644

## Table 2

### LTV Threshold Pricing of INSURERS

With controls and  
FE (time, lender, type, canton),  
robust SE

#### Find:

LTV per se **significantly positive.**

Insurers charge extra for **LTV>66  
and LTV> 80.**

LTV Thresholds do **not** amplify  
the CCB effect.

=> Threshold LTVs might just  
reflect a risk premium on high  
LTVs.

#### Offered Mortgage Rate

	(1)	(2)	(3)	(4)	(5)
<i>Mortgage Characteristics</i>					
LTV	0.1507*** (0.0348)	0.1499*** (0.0345)	0.1475*** (0.0341)	0.1483*** (0.0341)	0.1478*** (0.0341)
LTV67 (0/1)	6.6847*** (1.0847)	6.9681*** (1.0828)	6.5557*** (1.0786)	6.5349*** (1.0776)	6.5224*** (1.0917)
LTV80 (0/1)	3.6740*** (0.9723)	3.7831*** (0.9744)	3.1694*** (0.9672)	3.1527*** (0.9694)	3.1436*** (0.9700)
CCB*LTV67 (0/1)	0.8544 (1.4874)	0.9346 (1.4838)	0.8412 (1.4743)	0.8499 (1.4739)	0.8482 (1.4745)
CCB*LTV80 (0/1)	0.5225 (2.0359)	0.8913 (2.0383)	1.3460 (2.0267)	1.2923 (2.0310)	1.2966 (2.0310)
<i>Refinancing Control</i>					
Swap Rate 10y	61.3407*** (7.4244)	61.5667*** (7.4073)	59.9856*** (7.3323)	59.7529*** (7.3466)	59.7382*** (7.3547)
<i>Request Controls</i>					
Income		-2.4769*** (0.7591)	-0.8542 (0.8249)	-0.9247 (0.8338)	-0.9366 (0.8382)
Wealth			-1.6483*** (0.3626)	-1.6483*** (0.3620)	-1.6414*** (0.3664)
				0.7108 (0.7995)	0.7220 (0.7961)
Age					-0.0044 (0.0367)
Constant	91.5392*** (11.2571)	121.7826*** (14.4120)	126.3001*** (14.1873)	126.7725*** (14.2044)	127.0520*** (14.4077)
Observations	1,414	1,414	1,414	1,414	1,414
R-squared	0.7789	0.7807	0.7841	0.7843	0.7843

*Does the CCB differentially affect  
mortgage **issuance** and **pricing**  
by banks and insurers?*



## Table 3a

### Comparison of Means:

Do banks vs. insurers submit fewer offers?

#### Find

**Banks** always *more* likely to *offer*.

If at all, banks and insurers become more likely to offer.

**No** DiD effect.

=> No negative effect on the willingness to make loans

	<i>OFFER(0/1)</i>		
	Banks (1)	Insurers (2)	Difference (1)-(2)
CCB=0	0.8710*** (0.0064)	0.8175*** (0.0115)	0.0535*** (0.0132)
CCB=1	0.8874*** (0.0074)	0.8238*** (0.0156)	0.0636*** (0.0172)
Difference	0.0164* (0.0097)	0.0063 (0.0194)	0.0101 (0.0217)



## Table 3b

### Comparison of Means

Do banks vs. insurers charge more?

#### Find

**Insurers** are on average 11.5 bp **cheaper**.

After the **CCB's** activation, on average:

- Banks charge 30.4 bp more.
- Insurers charge 29.9 bp more.

The **pricing gap** remains constant however.

<i>Offered Mortgage Rate</i>			
	Banks	Insurers	Difference
	(1)	(2)	(1)-(2)
CCB=0	195.647*** (0.294)	184.324*** (0.538)	11.323*** (0.613)
CCB=1	226.033*** (0.624)	214.274*** (1.024)	11.786*** (1.200)
Difference	30.386*** (0.690)	29.924*** (1.157)	<b>0.463</b> (1.347)

=> But, not controlling for demand, supply or time effects.

## Table 3c

### Who charges more after the CCB?

With LTV thresholds, other controls and FE (time, lender, type, canton), robust SE

### Find:

After **CCB**, on average

- both, banks and insurers charge more.
- insurers charge 8.8 bp even more than banks.

LTV thresholds matter.

Income & wealth *reduce* rates.

	<i>Offered Mortgage Rate</i>						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) CCB*BANK	18.1311*** (2.9282)	18.7369*** (2.9042)	18.0803*** (2.8706)	17.7655*** (2.8755)	17.8320*** (2.8842)	17.9357*** (2.8860)	
(a) CCB*KANTONBANK							14.0554*** (2.9824)
(a) CCB*FOREIGNBANK							19.5148*** (2.9216)
(a) CCB*OTHERBANK							20.6944*** (2.8853)
(b) CCB*NONB	26.9625*** (3.0176)	27.5509*** (2.9943)	26.8791*** (2.9620)	26.5553*** (2.9652)	26.6166*** (2.9725)	26.7209*** (2.9763)	26.8837*** (2.9617)
<i>Refinancing Control</i>							
Swap Rate 10y	72.5580*** (4.1694)	71.9349*** (4.1393)	72.9096*** (4.1210)	71.9478*** (4.1210)	71.8929*** (4.1282)	71.8162*** (4.1309)	72.1620*** (4.0720)
<i>Mortgage Characteristics</i>							
LTV	0.1600*** (0.0113)	0.0476*** (0.0183)	0.0458** (0.0181)	0.0459** (0.0181)	0.0463** (0.0181)	0.0449** (0.0182)	0.0449** (0.0179)
LTV67 (0/1)		3.1308*** (0.5445)	3.5347*** (0.5424)	3.2709*** (0.5448)	3.2630*** (0.5450)	3.2274*** (0.5480)	3.3118*** (0.5425)
LTV80 (0/1)		2.6726*** (0.5138)	2.9084*** (0.5082)	2.6146*** (0.5103)	2.6032*** (0.5108)	2.5909*** (0.5111)	2.6349*** (0.5081)
<i>Request Controls</i>							
Income			-3.4705*** (0.4118)	-2.4471*** (0.4494)	-2.4696*** (0.4530)	-2.5118*** (0.4586)	-2.4437*** (0.4494)
Wealth				-1.0885*** (0.1969)	-1.0860*** (0.1969)	-1.0598*** (0.2000)	-1.0799*** (0.1954)
Debt (0/1)					0.2066 (0.4682)	0.2359 (0.4686)	
Age						-0.0136 (0.0199)	
Constant	118.6651*** (12.3072)	122.6677*** (12.5125)	162.3979*** (13.5326)	165.5466*** (13.5074)	165.6442*** (13.4919)	166.5243*** (13.5910)	166.5272*** (14.0626)
Observations	5,459	5,459	5,459	5,459	5,459	5,459	5,459
R-squared	0.7602	0.7632	0.7664	0.7678	0.7678	0.7678	0.7702
DID estimate (a)-(b)	-8.831	-8.814	-8.799	-8.790	-8.785	-8.785	
Wald test (a)-(b) p-value	0	0	0	0	0	0	

# 5 Summing up

# 5 Conclusions

## *How does the CCB affect mortgage issuance and pricing in Switzerland?*

- Bank **sensitivity** measures
- **LTV Thresholds** associated with risk-weighting schemes
- Banks vs insurers

Find:

- **Sensitivity**, after CCB:
  - **constrained** and **specialized** banks; banks higher **corporate capital** and **equity growth** charge more.
  - banks with higher **equity ratio**, **reserves** and **ROE** charge less.
- **LTV Threshold** :  
**both** charge more on high LTVs, but risk-weighting schemes do **not amplify** CCB.
- Banks and insurers **raise** mortgage rates after the CCB,  
but **insurers** raise their rates by on average **8.8 bps more** than banks. => No Leakage
- **No** differential CCB effect on the **willingness** to make mortgages.

# 5 Policy Discussion

- (1) **Average effect** in present case **limited**, likely due to:
  - **Low calibration:** Only 1% of Residential Mortgage RWAs
  - **High capitalization:**  
Role of capitalization confirmed by sensitivity of identified effects to capitalization.
  
- (2) Incentive Effect I:  
**Risk-weighting schemes (LTV Thresholds)** do not amplify the CCB.  
=> very risky mortgages still granted
  
- (3) Incentive Effect II:  
**Constrained** and **specialized** banks charge more  
=> loan volumes grow more for unconstrained banks with fewer mortgages
  
- (4) **Leakage** NOT a problem here, quite to the contrary.  
→ Due to low profitability at CCB=0?

Thank you!