Macroprudential Regulation, Quantitative Easing, and Bank Lending

Andrea Orame[1], Rodney Ramcharan[2] and Roberto Robatto[3]

[1]Bank of Italy, [2]University of Southern California, [3]University of Wisconsin-Madison

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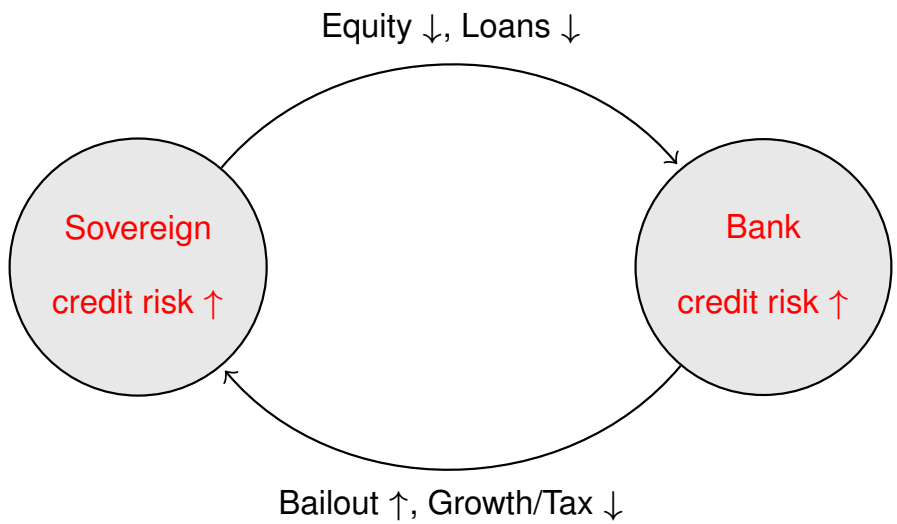
Outline

Main question

- Two important stabilization tools used since 2008-09
  - Macroprudential regulation to stabilize the banking system
  - Unconventional monetary policy
- Question: Do macroprudential tools mediate the transmission of (unconventional) monetary policy to bank lending to firms?
  - ECB's Public Sector Purchase Programme (QE)
  - Historical cost vs mark-to-market accounting (HCA/MMA) $\rightarrow$ prudential tool used for macroeconomic stabilization
  - Bank lending in Italy
- Answer: HCA weakens the response of bank lending to QE

Sovereign-bank diabolic loop

- Historical cost accounting (HCA) and macroeconomic stability
  - Banks ordinarily hold government bonds (10-20% of total assets in Italy)
  - Sovereign-bank diabolic loop: concerns about joint sovereign-banking defaults [Brunnermeir et al. 2016]



- HCA: policy intervention to contain the diabolic loop

Accounting regime and QE

- Impact of accounting regime on QE (bank lending) is uncertain
  - HCA, changes in yields not transmitted to regulatory capital
  - But HCA irrelevant if other channels are at work (e.g. liquidity, market value)
- Broader implications
  - We highlight a link between HCA and capital requirements
  - We propose alternative policies

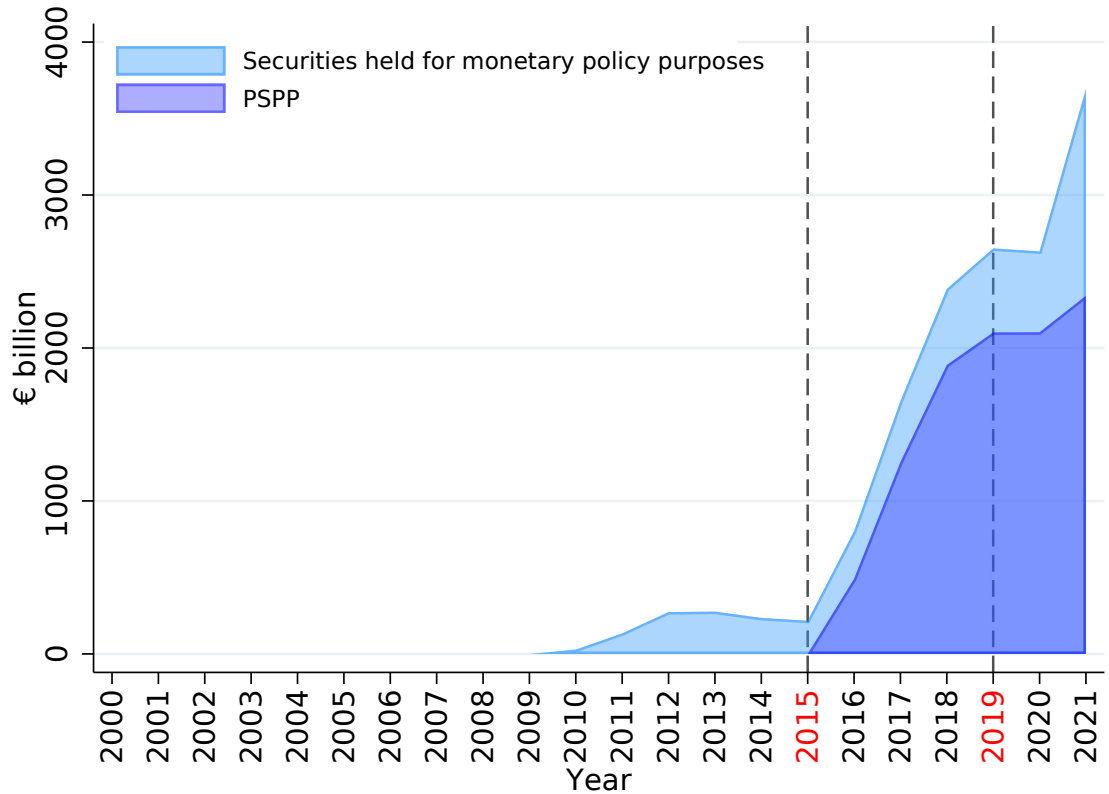
Conceptual framework

Assets	Liabilities
loans l_{t-1}	deposits d_{t-1}
government debt $p\, g_0$	$capital_t$

- Amount g_0 of government securities, evaluated at price p
  - $capital_t = l_{t-1} + p\, g_0 - d_{t-1}$
  - If $p = p_t$: mark-to-market accounting (MMA)
  - If $p = p_0$: historical cost accounting (HCA)
- Risk-weighted capital requirement: $capital_t \geq \zeta\, l_t$
- Lending growth: $\frac{l_t - l_{t-1}}{l_{t-1}} \propto p\, g_0$
- Changes in yields affect lending only if $p = p_t$ (i.e., only if MMA)

Outline

QE: Public Sector Purchase Programme (PSPP)

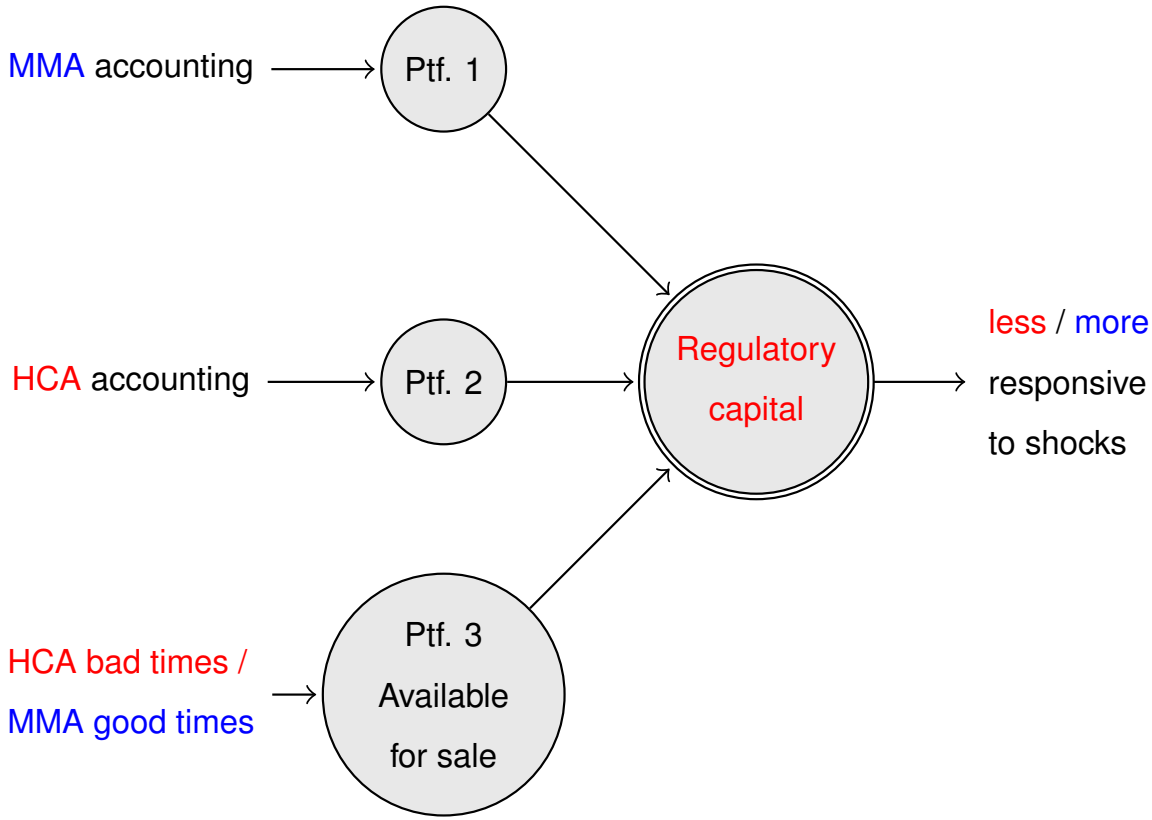


- PSPP announced in January 2015 and September 2019
  - Government or international institutions in the euro area
  - Euro-denominated, residual maturity 2-30 years
  - Quality standard: fulfil ECB collateral eligibility
  - $\approx$ €50 billion per month

Sovereign bonds and banks' balance sheets

- Ordinarily, banks hold sovereign bonds in different sections of their balance sheets. For each bond:
  - trade it at will: *trading book* (HFT or FVPTL), portfolio 1
  - keep it until maturity: *held to maturity* (HTM or AC), portfolio 2
  - leave open the option to sell it: *available for sale* (AFS or FVOCI), portfolio 3
- Reclassification (essentially) not permitted
- Large amount of sovereign securites in portfolio 3 (AFS)

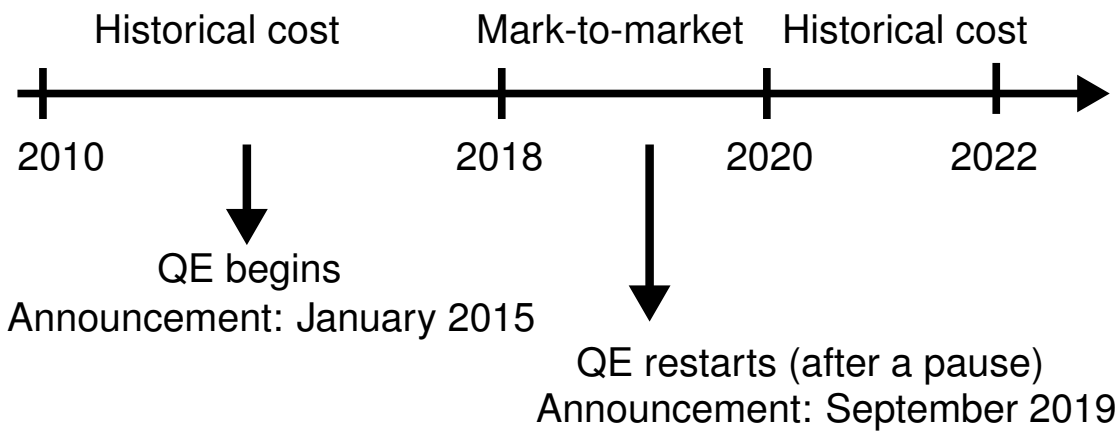
Accounting framework and regulatory capital



- From MMA to HCA when macroeconomic conditions deteriorate
  - 2010 → 2017: Historical Cost Accounting (HCA)
  - 2018 → 2019: Mark-to-Market Accounting (MMA)
  - 2020 → 2022: Historical Cost Accounting (HCA)

Accounting as a time-varying policy tool

- PSPP occurred under two different accounting regimes



Outline

QE and bank lending supply: research design

$$\Delta \log \underbrace{L_{b,f,t}}_{\substack{\text{Loans} \\ \text{firm } f \\ \text{bank } b}} = \underbrace{\beta_t \times QE_b}_{\text{Exposure to PSPP}} + \underbrace{\gamma_t \times \mathbf{Y}_b + \delta Z_{b,t}}_{\text{Controls: Size, Reserves, ECB borrowing}} + \underbrace{\psi_{f,t} + \psi_b}_{\text{Fixed effects}} + \varepsilon$$

- Fixed effects
  - Firm-time $\psi_{f,t}$ ≈[Khwaja and Mian, 2008]
  - Bank ψ_b
- Set of controls
- QE_b
  - holdings of all PSPP-eligible securities/total assets
  - holdings of MMA PSPP-eligible securities only/total assets
- Estimates for 2015 and 2019

2015 QE announcement

	Broad measure of exposure	Mark-to-market exposure	Mark-to-market exposure	Mark-to-market exposure, dummy
[2014m7] × QE_b	-0.050	0.079	0.111	0.362
	[0.040]	[0.133]	[0.133]	[0.633]
[2014m8] × QE_b	-0.156***	0.183	0.287	0.439
	[0.056]	[0.180]	[0.199]	[0.635]
[2014m9] × QE_b	-0.003	0.278	0.287	0.836
	[0.055]	[0.234]	[0.228]	[0.582]
[2014m10] × QE_b	-0.089	-0.105	-0.051	-0.910
	[0.055]	[0.243]	[0.249]	[0.938]
[2014m11] × QE_b	-0.010	0.232	0.245	-0.363
	[0.063]	[0.284]	[0.276]	[0.925]
[2015m1] × QE_b	-0.080	**0.437****	**0.498****	**1.759****
	[0.054]	**[0.182]**	**[0.196]**	**[0.733]**
[2015m2] × QE_b	-0.078**	0.139	0.192	0.022
	[0.039]	[0.187]	[0.196]	[0.703]
[2015m3] × QE_b	0.009	0.058	0.055	0.368
	[0.055]	[0.171]	[0.162]	[0.558]
[2015m4] × QE_b	-0.085*	0.084	0.139	0.022
	[0.045]	[0.172]	[0.181]	[0.569]
[2015m5] × QE_b	-0.119**	0.039	0.114	-0.563
	[0.051]	[0.194]	[0.199]	[0.766]
[2015m6] × QE_b	0.007	0.055	0.054	0.207
	[0.055]	[0.138]	[0.126]	[0.504]
HCA exposure	No	No	Yes	No
Observations	5,867,308	5,867,308	5,867,308	5,867,308
R-squared	0.394	0.394	0.394	0.394

2019 QE announcement

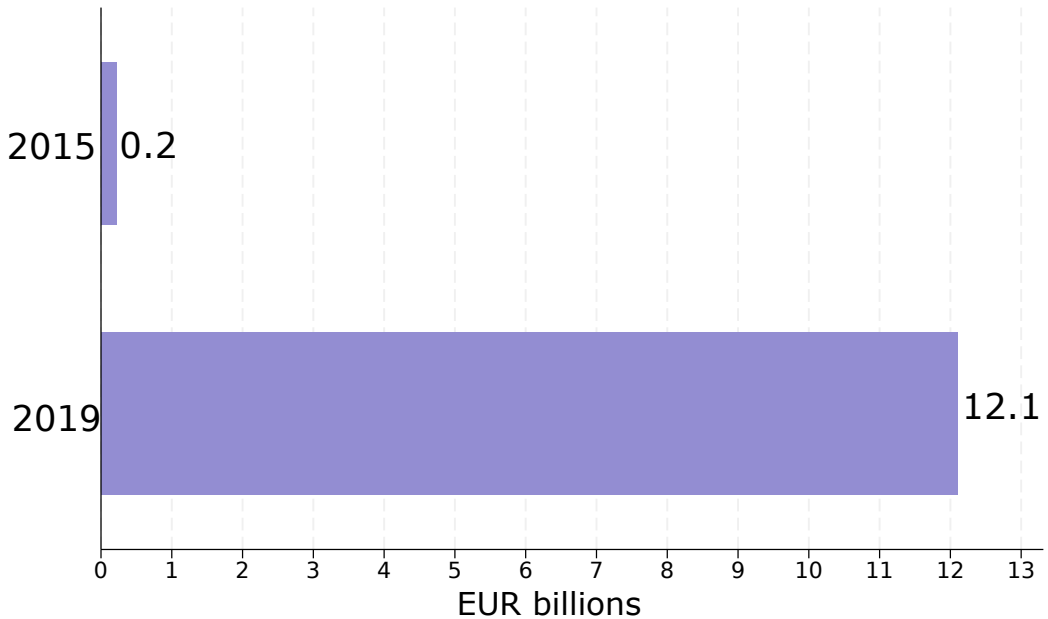
	Broad measure of exposure	Mark-to-market exposure	Mark-to-market exposure	Mark-to-market exposure, dummy
[2019m3] × QE_b	-0.008	0.021	0.023	0.845
	[0.015]	[0.078]	[0.079]	[0.970]
[2019m4] × QE_b	0.147***	0.106	0.070	-0.197
	[0.036]	[0.161]	[0.143]	[1.739]
[2019m5] × QE_b	0.054**	0.084	0.072	0.833
	[0.025]	[0.068]	[0.060]	[0.689]
[2019m6] × QE_b	0.004	0.042	0.042	1.349
	[0.024]	[0.125]	[0.130]	[1.554]
[2019m7] × QE_b	0.115***	0.045	0.013	0.028
	[0.033]	[0.149]	[0.138]	[1.715]
[2019m9] × QE_b	0.111**	**0.244****	**0.223****	**2.610****
	[0.047]	**[0.116]**	**[0.100]**	**[1.038]**
[2019m10] × QE_b	0.127**	-0.071	-0.102	1.136
	[0.061]	[0.152]	[0.160]	[1.501]
[2019m11] × QE_b	-0.016	0.111	0.112	1.928
	[0.029]	[0.114]	[0.117]	[1.501]
[2019m12] × QE_b	0.104**	**0.339*****	**0.324*****	**3.367*****
	[0.040]	**[0.107]**	**[0.099]**	**[0.700]**
[2020m1] × QE_b	0.111***	0.071	0.047	-0.455
	[0.035]	[0.146]	[0.131]	[1.758]
[2020m2] × QE_b	-0.024	0.031	0.030	-0.161
	[0.015]	[0.051]	[0.051]	[0.379]
HCA exposure	No	No	Yes	No
Observations	8,346,925	8,346,925	8,346,925	8,346,925
R-squared	0.370	0.370	0.370	0.370

Overall effect on lending

- Lending by highly-exposed banks: +1.8% in 2015, +2.7% in 2019
- Very few banks exposed to the PSPP in 2015

	2015	2019
Mark-to-market	0.5%	6.0%

- Back-of-the-envelope increase in lending



Additional results and robustness checks

- Long list of robustness checks: results are unchanged
  - Selection into exposure (no anticipation)
  - Controlling for banks' exposure to other policies
  - Exposure and other bank characteristics
  - Larger time window 23/32 mln obs in 2015/2019
  - Falsification test: exposure in December 2013 (12-month window) No effects

- Anatomy of supply
  - Lower interest rates
  - Extensive margin Increase in supply to new customers
  - Portfolio rebalancing only explains a fraction of the increase in lending
  - Capital-constrained banks increased lending more than non-capital constrained banks

Outline

Back to the conceptual framework

- Recall: $capital_t^{HCA} = l_{t-1} + \underbrace{\frac{1}{1 + i_0 + s_0}}_{=p_0} g_0 - d_{t-1}$
- If regulators want to allow monetary policy to pass through but shield capital from sovereign spread volatility
  - Hybrid rule: $p_{hybrid} = \frac{1}{1+i_t+\boldsymbol{s_0}}$
- We show that HCA is equivalent to MMA with a specific time-varying capital requirement
  - E.g. Italy 2014: yields +3 pp $\rightarrow$ effective capital requirement -24%
  - MMA but with a specific time-varying capital requirement: $capital_t^{MMA} \geq \boldsymbol{\zeta_t^\star} l_t$

Final remarks

- The PSPP led banks to increase their supply of credit to firms
- HCA, against sovereign-bank nexus, limits monetary policy
- Alternative rules can be implemented