Quantitative Easing, Bank Lending, and Competition

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study impact of the ECB's Quantitative Easing (QE) program on Italian bank lending

On January 22, 2015, the ECB announced its intention to purchase about EUR 50 billion in sovereign and official agency secondary market debt monthly

"financial intermediaries to increase their provision of liquidity to the interbank market and credit to the euro area economy"

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32015D0010

[at least] two related mechanisms

Liquidity

(Allen and Gale, (1994), Diamond and Rajan (2005), Drechsler, Savov and Schnabl (2015), Gertler and Kiyotaki (2015) , Holmstrom and Tirole (1998)

Capital

(Brunnermeier and Sannikov (2015), Gertler and Kiyotaki (2011),He and Krishnamurthy (2014)

What if…only some banks are exposed to QE?

Substitute lending of non-exposed banks

Gain market power

Only help connected firms

No guarantee that credit goes to rationed firms

(Gertler and Gilchrist, 1994, Klenow and Hsieh (2009) and Jermann and Quadrini (2012)

Hard problem…

Endogenous economy wide policy response

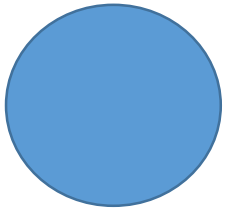
research design

use potential exposure to QE from pre-existing trading book assets

Bank A
(has sovereign assets)

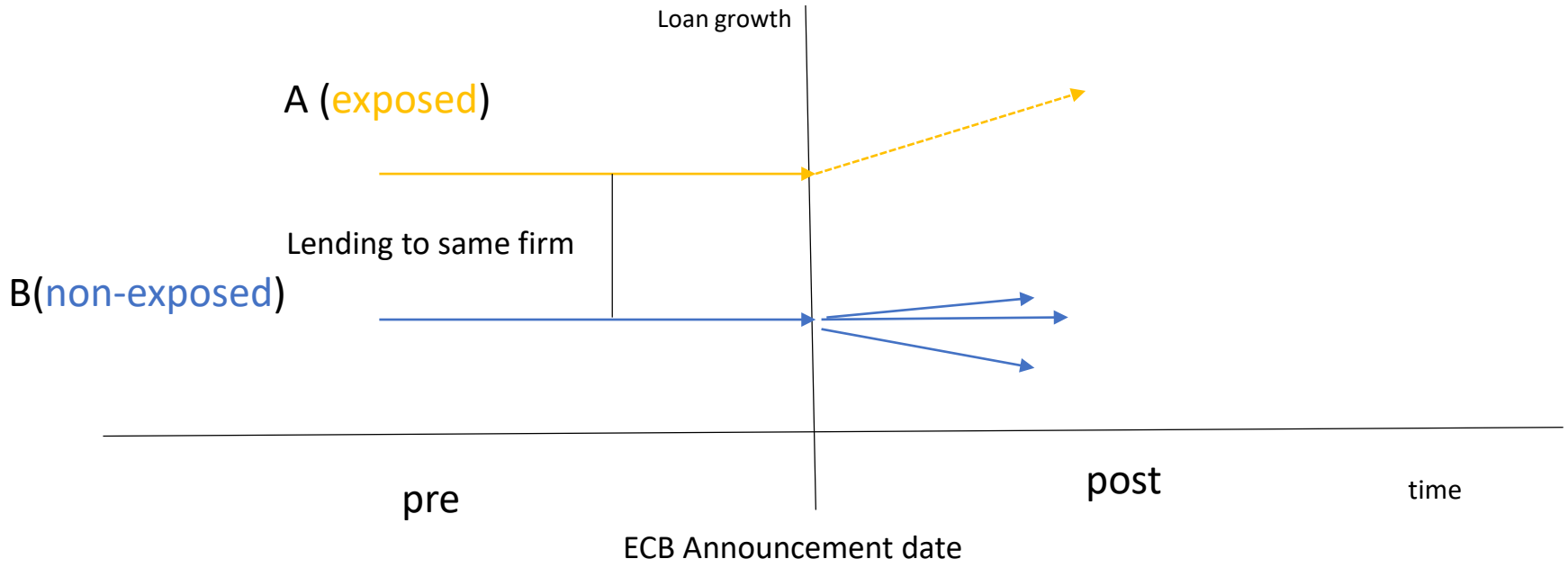
14 banks “exposed” (median, conditional on positive assets)

Bank B
(no sovereign assets)



81 banks not “exposed”

difference-in-difference research design



difference-in-difference

$$\Delta \log L_{b,f,t} = \sum_{\tau \neq 2014m12} \beta_\tau \times I_\tau \times QE_b + \sum_{\tau \neq 2014m12} \gamma_\tau \times I_\tau \times \boldsymbol{Y_b} + \delta Z_{b,t} + \psi_b + \psi_{f,t} + \varepsilon_{b,f,t}$$

Various fixed effects

Loan growth (intensive margin)

6 months window on either side of QE exposure

time-varying bank controls: size/borrowings from ECB/other assets

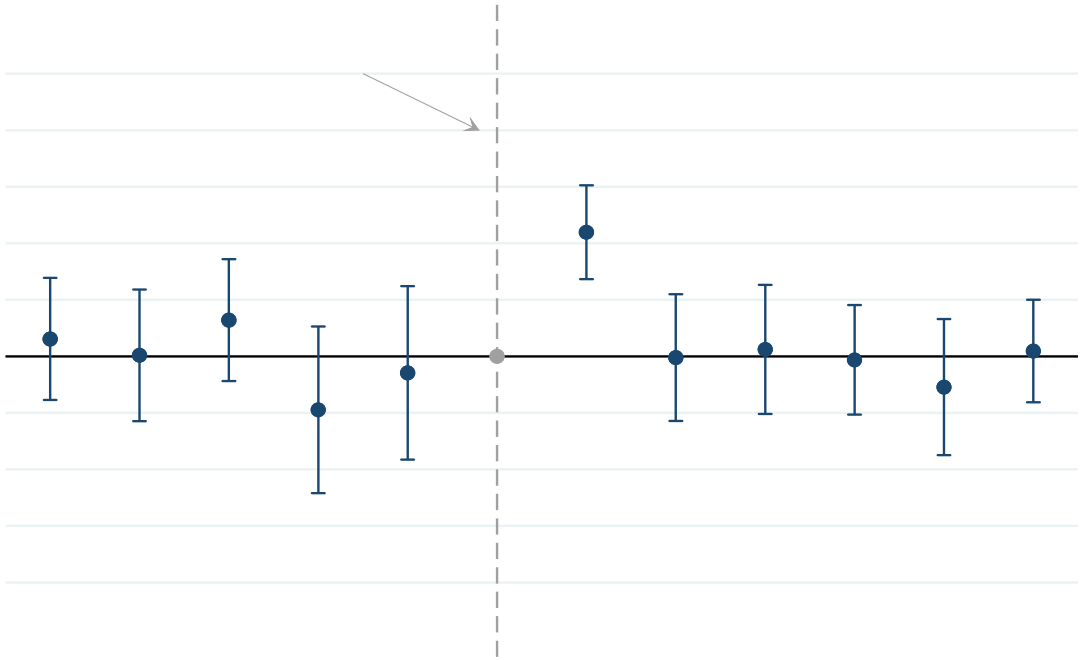
$$\beta = \left[E(\Delta L_{A,post}) - E(\Delta L_{A,pre})\right] - \left[E(\Delta L_{B,post}) - E(\Delta L_{B,pre})\right]$$

response among exposed

response among non-exposed

intensive margin

- Banks did not select into exposure
- robust to different measures of exposure
- Implied economic magnitude: €180 million



2015m6

mechanism

At top quartile liquidity, effect is **85**% smaller

At top quartile solvency, effect is 25% smaller

	Capital	Liquidity	Liquidity
[2015m1] × QE_b	2.321***	3.111***	2.380***
	[0.588]	[0.796]	[0.605]
[2015m1] × QE_b × [tier1 ratio]	-0.632		
	[2.602]		
[2015m1] × QE_b × [liquidity/assets]		-2.649***	
		[0.997]	
[2015m1] × QE_b × [deposits/loans]			-1.989
			[1.783]
[2015m1] × (QE_b + QE_b × [capital or liquidity])	1.688	0.462	0.391
	[2.419]	[0.473]	[1.586]
Observations	5,867,308	5,867,308	5,867,308
R-squared	0.394	0.394	0.394

extensive margin: new credit relationships (credit registry data)

1: loan application is either successful—a new loan was granted over the next three months in response to the application

0: the application was rejected

(Jiménez, Ongena et al. 2012).

extensive margin

Controlling for endogenous matching

	Firm F.E.	Firm-by-month FEs
PostxQE_b	**0.043** **[0.017]**	**0.084**** **[0.041]**
Obs	**359,026**	**27,219**
R-squared	**0.705**	**0.585**

mechanism

Liquidity is the dominant mechanism

	Capital	Liquidity	Liquidity
[Post] × QE_b	0.103***	0.156***	0.106**
	[0.037]	[0.042]	[0.042]
[Post] × QE_b × [Tier1 ratio]	-0.084		
	[0.108]		
[Post] × QE_b × [liquidity/assets]		-0.170**	
		[0.066]	
[Post] × QE_b × [deposits/loans]			-0.240**
			[0.118]
[Post] × (QE_b + QE_b × [Capital or liquidity])	0.0190	-0.0147	-0.133
	[0.103]	[0.061]	[0.110]
Observations	27,219	27,219	27,219
R-squared	0.585	0.585	0.585

Substitution: do QE exposed banks attract **new** business [from non exposed banks]?

post xQE_b + post xQE_bx Firm has no past relationship with QE exposed banks

	Firm-by-time fixed effects
post xQE_b+post xQE_bx Firm has no past relationship with QE exposed banks	0.258*

is substitution stronger for rationed firms?

applied for credit in the 6 months before the PSPP (between July and December 2014);

rejected

No significant increase in credit from either incumbent lender between July-December 2014

+

No new credit relationship

Results: do rationed firms get credit?

QE exposed banks are 1.7 p.p more likely to meet a previously rejected firm's credit demand.

Impact 5x bigger if firm did not have a previous relationship with QE exposed banks

Did QE exposed banks expand lending at the **expense** of non exposed banks?

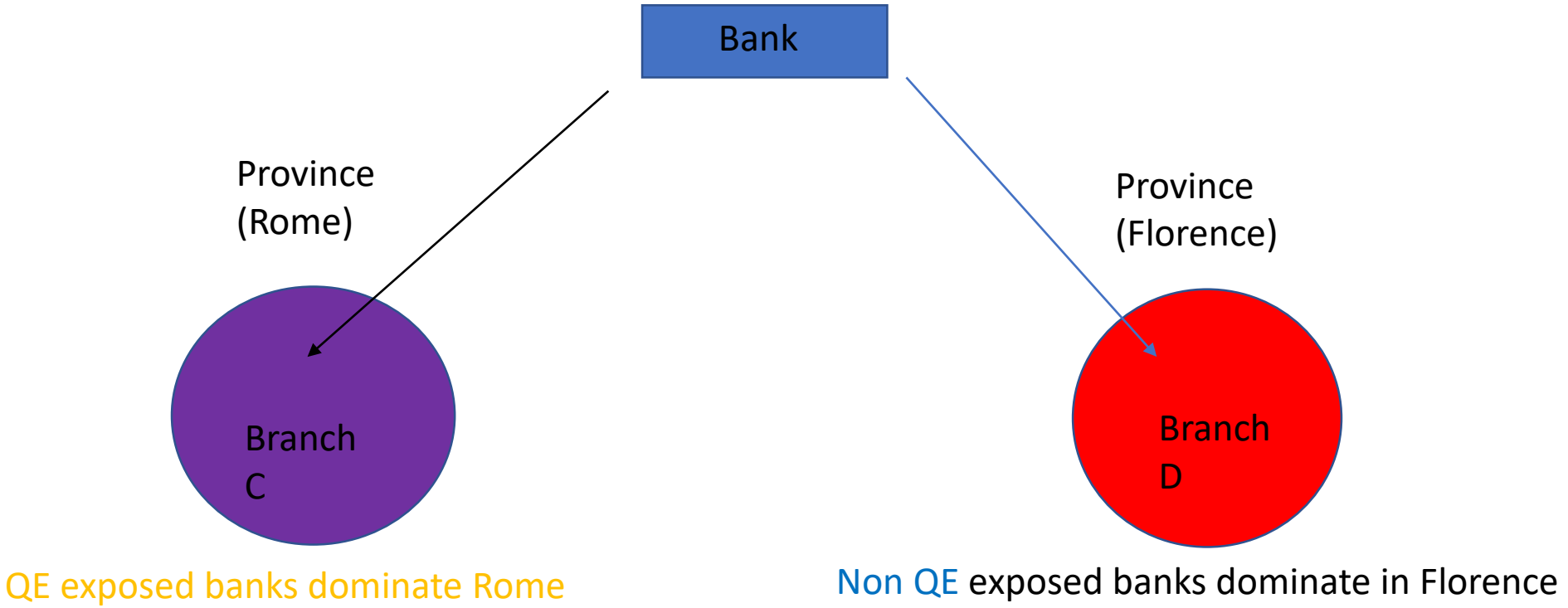
$$\beta = \left[E(\Delta L_{A,post}) - E(\Delta L_{A,pre})\right] - \left[E(\Delta L_{B,post}) - E(\Delta L_{B,pre})\right]$$

Small "treatment effect" but big "aggregate effect"

	β=1	β=2
$E(\Delta L_{A,post})$	6	6
$E(\Delta L_{A,pre})$	4	5
$E(\Delta L_{B,post})$	5	3
$E(\Delta L_{B,pre})$	4	4

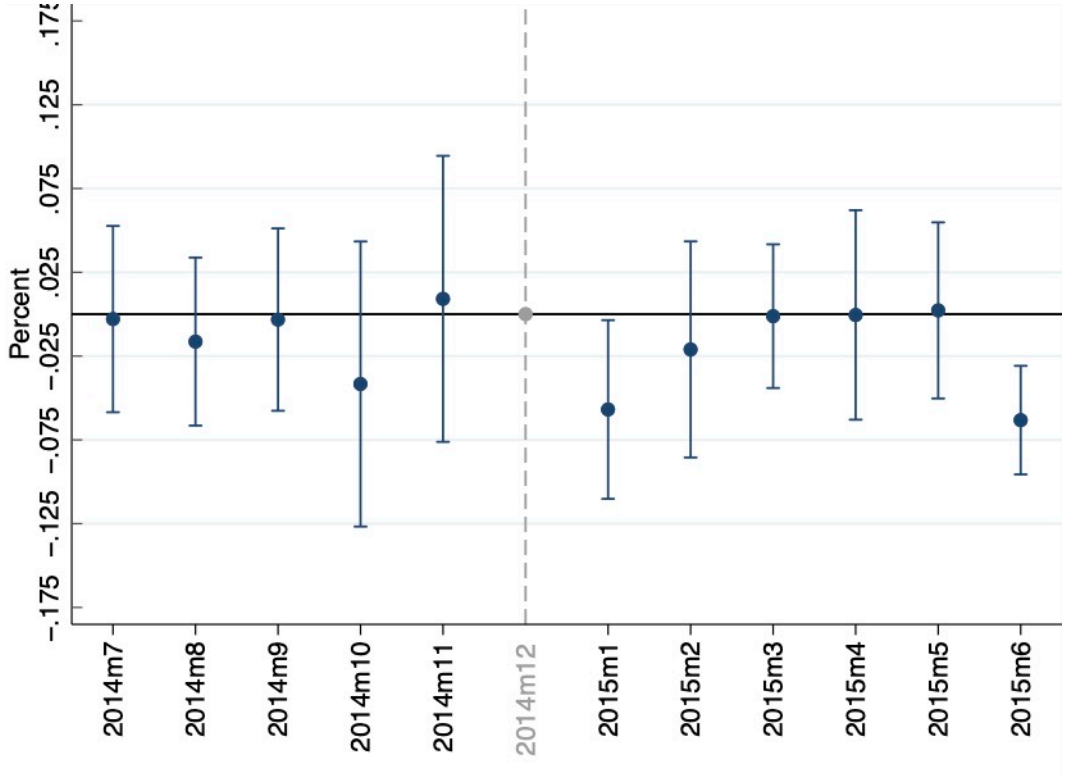
Big "treatment effect" but non-exposed banks contract lending!!

Branch-province-level evidence (110)

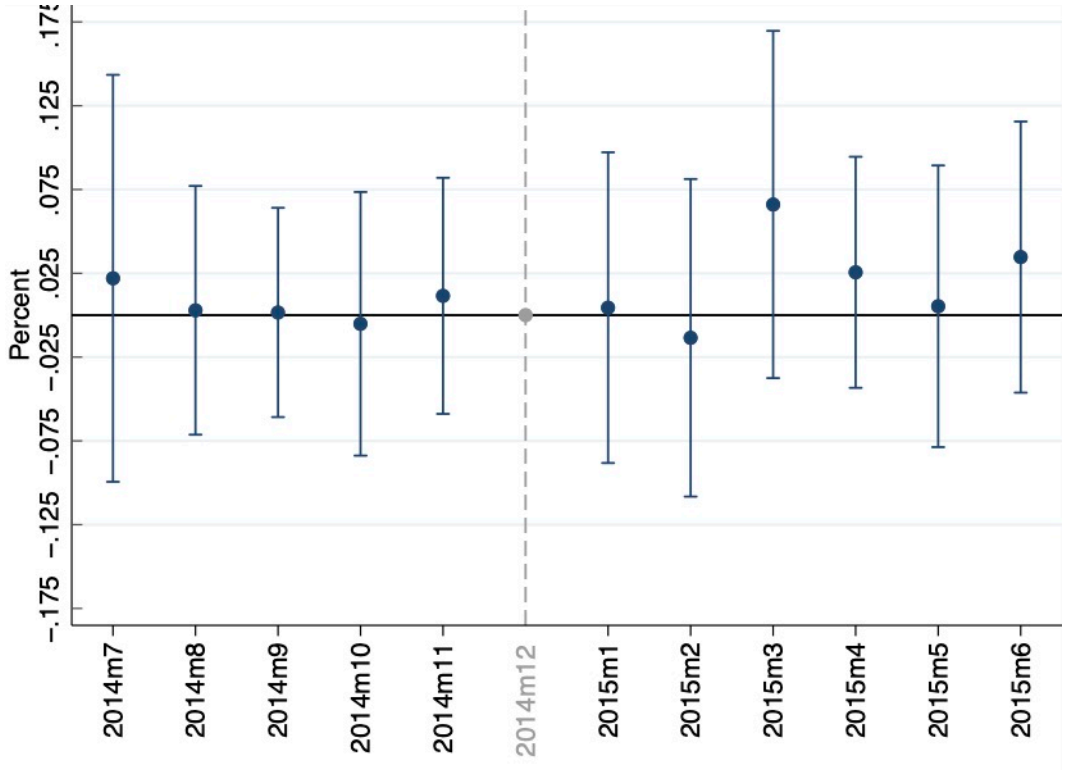


lending growth by bank branch in province “i” over time

non-exposed banks



exposed banks



no aggregate expansion in lending

	(1)
[2014m7]×C_p	0.010
	[0.050]
[2014m8]×C_p	0.021
	[0.027]
[2014m9]×C_p	0.009
	[0.008]
[2014m10]×C_p	-0.029
	[0.018]
[2014m11]×C_p	-0.000
	[0.053]
[2015m1]×C_p	-0.027
	[0.042]
[2015m2]×C_p	-0.029
	[0.023]
[2015m3]×C_p	-0.008
	[0.029]
[2015m4]×C_p	0.042
	[0.051]
[2015m5]×C_p	0.020
	[0.021]
[2015m6]×C_p	-0.026
	[0.015]
Observations	1,320
R-squared	0.181

questions and to-do list

Intensive and extensive margin lending increases relatively more at QE exposed banks

Did QE exposed banks substitute lending from non-exposed banks—no aggregate effect?

Would a more widely targeted program across banks be more effective?

Test province-level substitution hypothesis using extensive margin (new lending)—results could be more positive

Interest rates: Do QE exposed banks price loans more cheaply?