Informational Asymmetries and Interbank Competition: Evidence from Branch Pruning

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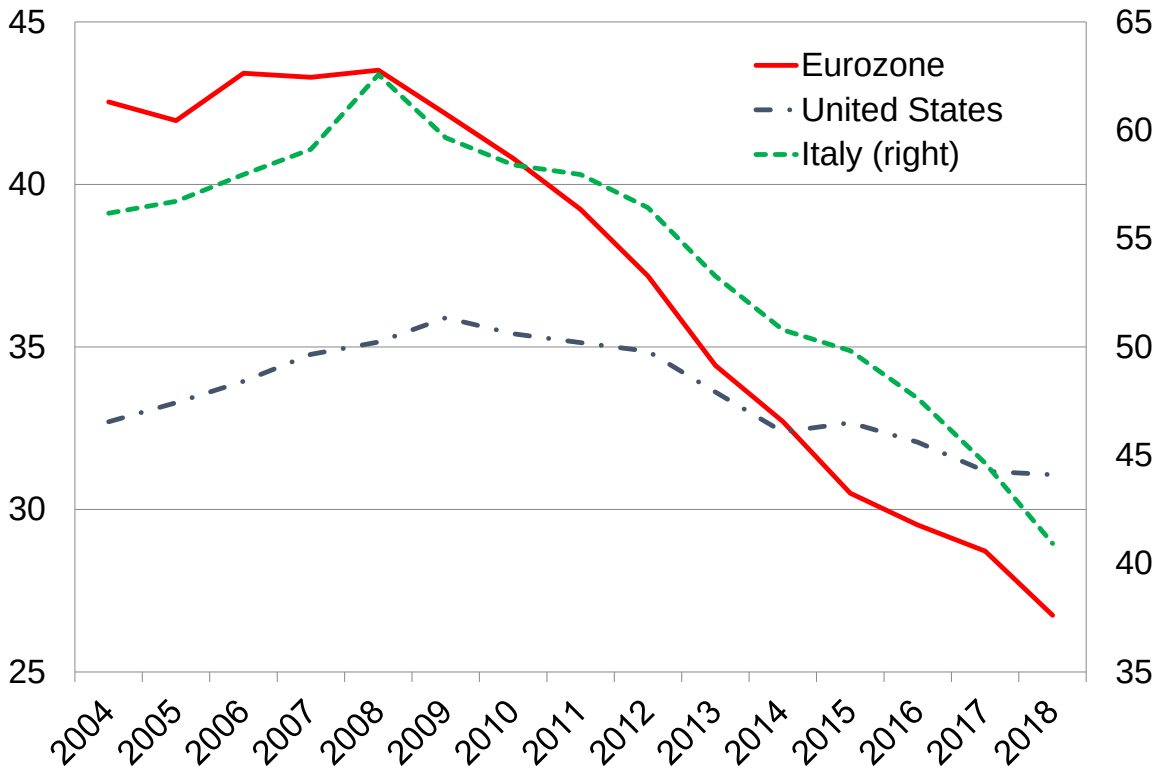
Disclaimer: The views expressed in the paper are of the authors only and do not necessarily reflect those of the Banca d'Italia

A Global Phenomenon



Notes: Bank branches per 100,000 adults. Data from the IMF Financial Access Survey.

Evidence

- Loan amount: Evidence on reallocation between banks has been detected for Italy (Garrì, BoI WP 2019) and also for the US (Nguyen, AEJ 2019), where the substitution of new relationships for the ones with the closing branches was only partial, with a consequent decline in lending for small businesses.

- Loan interest rate: After the closure of a branch of an inside bank, firms that transfer to another bank do not get lower interest rates while other switchers do (Bonfim, Nogueira & Ongena, RoF 2021)

  $\Rightarrow$ What is behind these effects?

Branch closures and informational asymmetries

- In a *frictionless economy* branch closures would have no impact on credit markets

- Branch closures would affect bank lending if:
  1. Information (soft) is gathered at the branch level (Hertzberg, Liberti, and Paravisini JF 2010)
  2. Soft information is only partially hardened and transferred within banks (Stein, JF 2002)

- Conditional on 1 and 2:
  1. Branch closures lead to an informational loss for the inside bank that closes the branch
  2. Informational asymmetries between inside and outside banks reduce
  3. Interbank competition becomes fiercer: a) firms are more prone to look for a new lending relationship; b) their ability to establish a new relationship increases; c) the probability of substituting the incumbent (closing) bank for a new one is higher

Research Questions and Data

1. Does the *willingness to search* increase after a branch closure?
   - From the *preliminary information service* of the Credit Register (CR) of Banca d'Italia we obtain individual loan applications to new banks to identify the *willingness to search*
2. Are firms affected by a branch's closure able to start new credit relationships?
   - For each application to a bank we observe through the CR if the bank grants the loan
3. Do firms cut the bank-firm relationship after a branch closure?
   - We observe if the relationship with the incumbent bank is terminated
4. Do firms switching banks after a branch closes obtain a discount?
   - Individual loan rates priced by a large sample of Italian banks on credit lines (Sample Survey of Lending Rates)

Specification 1

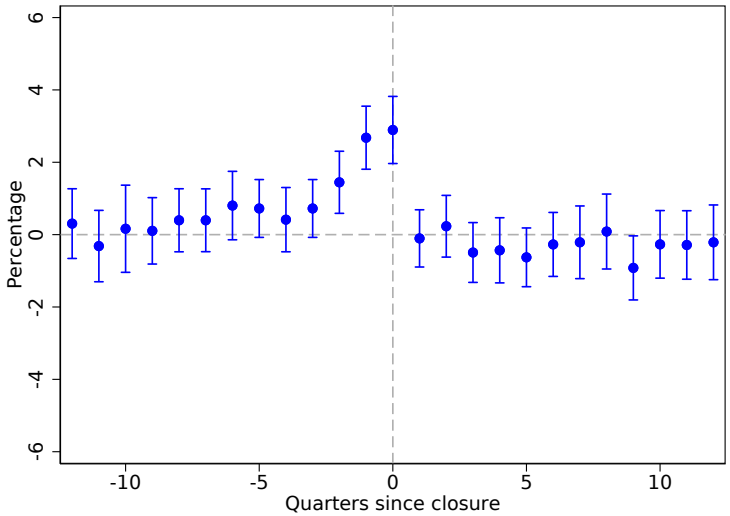
$$Y_{ict} = \alpha_i + \sum_{\tau} \delta_{\tau}(D_t^{\tau} \times Closure_{ic}) + (\gamma_t \times \sigma_c) + \beta X_{it} + u_{ict} \quad (1)$$

where

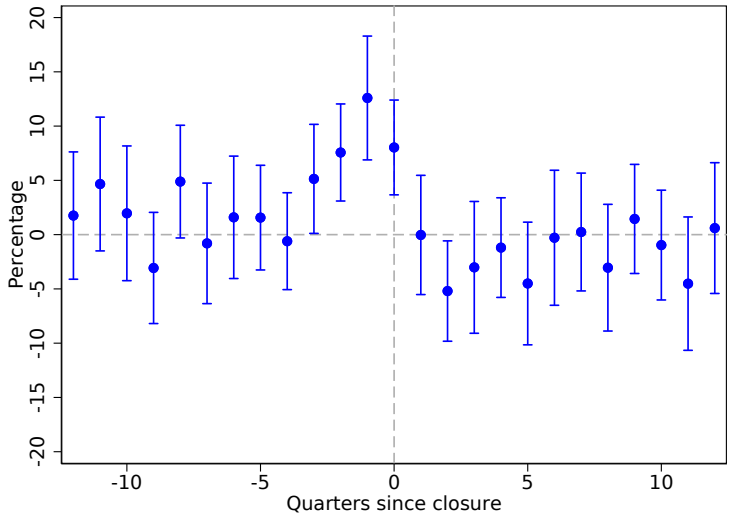
- i is the firm, c the municipality, t quarters from 2009 to 2017
- Y_{ict} identifies our dependent variables:
  - a dummy that equals 1 if at least a bank lodged an inquiry to the CR
  - a dummy that equals one if the search is successful
  - a dummy taking value one if the firm terminates the old relationship after the creation of a new one
- $Closure$ is a dummy equal to one if firm i had a relationship with the closing branch
- D_t^{τ} is a dummy equal to one if quarter t is τ quarters from the closure

Inspecting the mechanism ▸ (1) ▸ (2)

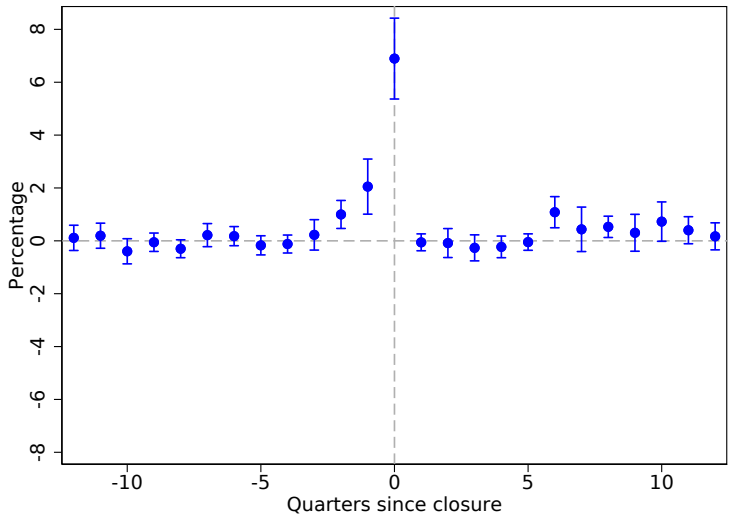
Searching for a new bank



Successful Searching



Switching Bank



The Role of Soft Information

$$Rate_{ict} = \alpha_i + (\gamma_t \times \sigma_c) + \omega Size_{it} + \kappa SingleLending_{it} + \\ + \ell Age_{it} + \sum_{r=0}^{9} \beta^r Score_{it}^r + \epsilon_{ict} \quad (2)$$

where $Rate_{ict}$ is the interest rate paid to incumbent banks by the borrowers on credit lines.
We use this model to proxy soft information by estimating how much the actual rate deviates from the one the model would predict:

$$\hat{\epsilon^2} = (Rate_{ict} - \hat{Rate}_{ict})^2.$$

Then, to minimize possible mismeasurements we construct three categorical variables accouinting for soft information.

The Role of Soft Information

$$
\begin{aligned}
Y_{ict} = (\delta_{Low} \times LowSoftInfo_{it} + \delta_{Med} \times MediumSoftInfo_{it} + \\
\delta_{High} \times HighSoftInfo_{it}) \times (D_t^{rel} \times Closure_{ic}) + \\
+ \beta^M MediumSoftInfo_{it} + \beta^H HighSoftInfo_{it} + \\
\alpha_i + (\gamma_t \times \sigma_c) + \beta X_{it} + u_{ict}
\end{aligned}
\tag{3}
$$

where:

- Y_{ict}, $D_t^{rel} \times Closure$ and all the other variables are as defined before
- $LowSoftInfo_{it}$ equals 1 if the level of soft information embedded in the loan rate paid by the borrower belongs to the first quartile
- $HighSoftInfo_{it}$ equals 1 if the level of soft information embedded in the loan rate paid by the borrower is above the third quartile
- $MediumSoftInfo_{it}$ if the level of soft information is above the first and below the fourth quartile

The Role of Soft Information (1)

VARIABLES	Searching	Successful	Switching
$D_t^{rel} \times Closure_{ic} \times LowSoftInfo$	0.001	0.024***	0.026***
	(0.009)	(0.006)	(0.004)
$D_t^{rel} \times Closure_{ic} \times MediumSoftInfo$	0.014***	0.019***	0.021***
	(0.006)	(0.004)	(0.003)
$D_t^{rel} \times Closure_{ic} \times HighSoftInfo$	0.018**	0.028***	0.023***
	(0.007)	(0.004)	(0.003)
$MediumSoftInfo$	0.001	0.002	-0.000
	(0.001)	(0.002)	(0.000)
$HighSoftInfo$	-0.005***	-0.005**	-0.000
	(0.001)	(0.002)	(0.000)
Observations	2575764	1112636	5266283
Adjusted R^2	0.149	0.109	0.115

Interest rate paid by the borrower

$$Rate_{ict} = \alpha_i + \delta_{rel}(POST_t \times Closure_{ic}) + (\gamma_t \times \sigma_c) + \beta X_{it} + u_{ict} \tag{4}$$

where:

- $Rate_{ict}$ is the interest rate paid to incumbent banks by the borrowers on credit line
- $Closure$ is a dummy equal to one if firm i had a relationship with the closing branch
- $POST_t$ is a dummy equal to one since 2 quarters before the closure.

Interest rate paid by the borrower

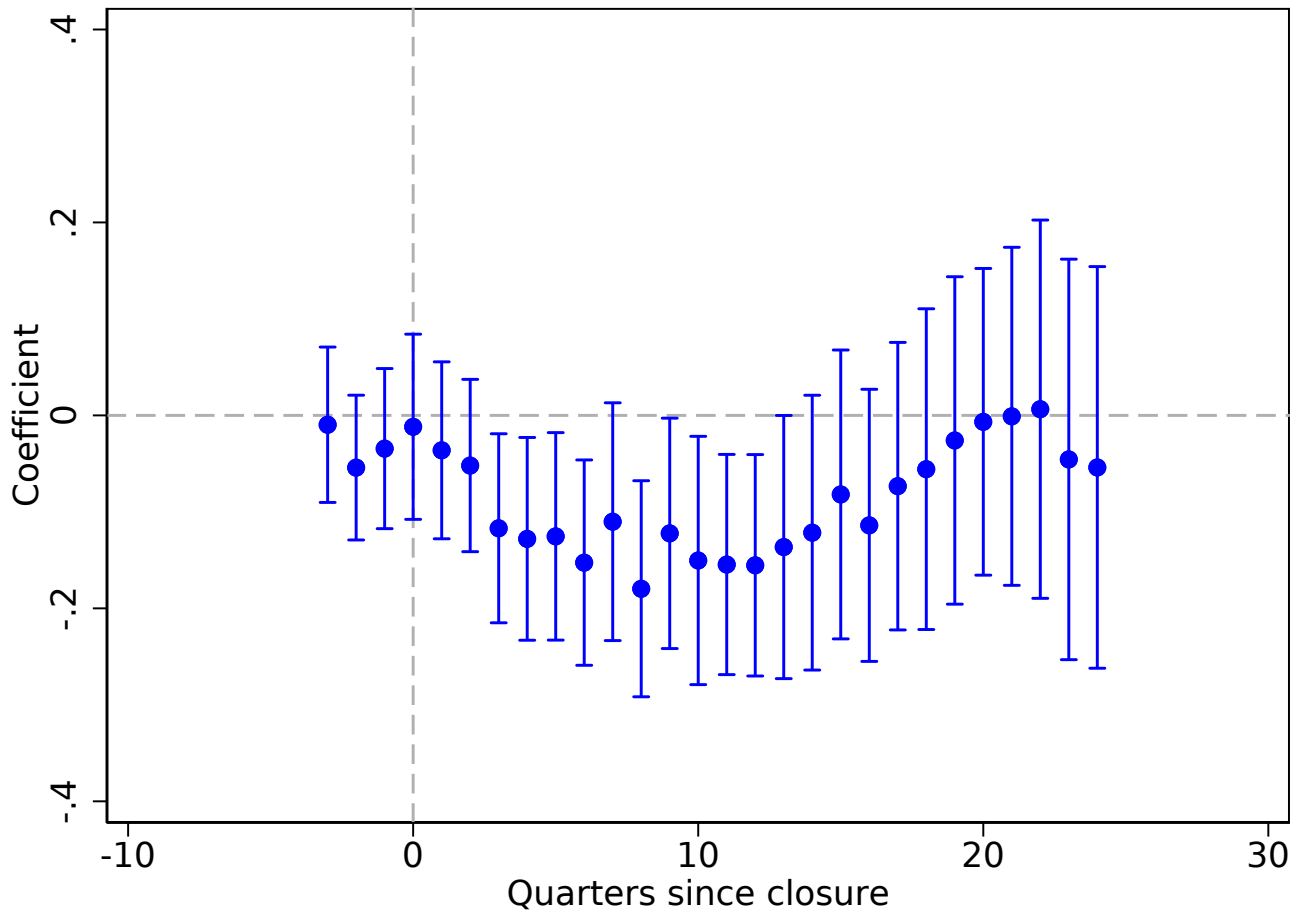
VARIABLES	(1) All	(2) SB	(3) Non-SB	(4) Single	(5) Multiple	(6) Unscored	(7) Scored	(8) HighRisk
$POST_t \times Closure_{ic}$	-0.038	0.035	-0.078**	-0.073	-0.029	0.053	-0.092**	-0.066
	(0.033)	(0.056)	(0.039)	(0.054)	(0.038)	(0.053)	(0.039)	(0.049)
Observations	7013098	2162592	4798325	3332909	3629602	2353349	4607652	2535187
Adjusted R^2	0.674	0.706	0.664	0.717	0.636	0.708	0.660	0.644

Interest rate paid by the borrower

VARIABLES	(1) Stayers	(2) Movers	(3) Switchers	(4) Non-Switchers
$POST_t \times Closure_{ic}$	-0.092	-0.084**	-0.133***	0.022
	(0.088)	(0.037)	(0.044)	(0.078)
Observations	1443699	3443788	2152841	1240090
Adjusted R^2	0.743	0.630	0.611	0.664

Notes: The dependent variable is the average interest rate paid by the borrowers on their credit lines. Robust standard errors are clustered at the municipality level. Column "*Stayers*" includes only borrowers that do not start new credit relationships; "*Movers*" only borrowers that start new relationships;"*Switchers*" borrowers that after the start of a new relationship terminate the old one, and *Non-Switchers* borrowers increasing the number of lenders. Robust standard errors in parentheses are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

Interest rate paid by borrowers switching bank



Notes: This figure plots the relationship between exposure to closure and the interest rate paid by borrowers on their credit lines if they switch bank. The bars show 95 percent confidence intervals, $\tau = 0$ is the quarter of the closure.

Summing up

The results show that:

- branch closures raise the probability that a borrower searches for a new lending relationship
  $\Rightarrow$ credit relationships are branch-specific
- branch closures raise the probability that a borrower starts new credit relationships and substitutes the incumbent bank for a new one
- switching firms obtain a lower price, at least temporally
  $\Rightarrow$ the winners' curse problem is mitigated
  $\Rightarrow$ competition is fiercer

This evidence is consistent with the informational asymmetry hypothesis: branch closures lead to an informational loss for the incumbent banks and thus informational frictions hampering interbank competition are mitigated.

Thank you!

Soft information Transmission

VARIABLES	$I\{Search=1\|_{Closure=1}\}$ (1)	(2)	(3)	(4)
$D_t^{two} \times ByLargest$	0.020***			0.017***
	(0.006)			(0.006)
$D_t^{two} \times ByOutside$		0.014**		
		(0.007)		
$D_t^{two} \times ByNoOtherBranch$			0.024**	0.008
			(0.010)	(0.007)
Observations	180183	182763	101164	180183
Adjusted R^2	0.143	0.141	0.126	0.143

Notes: The estimation sample includes only borrowers that experienced more than one branch closure over time. Column (1) includes only borrowers for which at least one of the closure was by a largest bank. Column (2) includes only borrowers for which at least one of the closure was by a bank outside the borrower's province. Column (3) includes only borrowers for which at least one of the closure was by a bank without other branches in the same municipality. *** p<0.01, ** p<0.05, * p<0.1.

back

Becoming a non performing loan

VARIABLES	(1) PastDue	(2) PastDue	(3) UnlikelyToPay	(4) UnlikelyToPay
Closure	-0.002***	-0.007***	-0.003***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)
Z-Score		Yes		Yes
SB, SL		Yes		Yes
Observations	2243773	1946620	2243773	1946620
Adjusted R^2	0.004	0.013	-0.000	0.007

Notes: The estimation sample includes firms searching for a new loan between 2009 and 2017. The dependent variable PastDue is an indicator variable that equals 1 if the borrower goes past-due. The dependent variable UnlikelyToPay is an indicator variable that equals 1 if the borrower goes unlikely to pay. All regressions include municipality by time fixed effects. Errors are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.

back

Heterogeneity across firms' characteristics

VARIABLES	All	SB	Non-SB	Single	Multiple	Unscored	Scored	HighRisk
				Searching				
$D_t^{rel} \times Closure_{ic}$	0.022***	0.025***	0.021***	0.035***	0.015***	0.023***	0.022***	0.015***
	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)
Observations	7978227	2903774	5026940	3656638	4274887	3139526	4792295	1860619
Adjusted R^2	0.144	0.103	0.150	0.114	0.140	0.113	0.148	0.148
				Successful Searching				
$D_t^{rel} \times Closure_{ic}$	0.031***	0.033***	0.030***	0.045***	0.026***	0.034***	0.030***	0.032***
	(0.003)	(0.005)	(0.003)	(0.004)	(0.003)	(0.005)	(0.003)	(0.004)
Observations	1677282	351102	1271317	622924	997511	389602	1232078	573185
Adjusted R^2	0.110	0.131	0.106	0.108	0.112	0.136	0.104	0.100
				Switching				
$D_t^{rel} \times Closure_{ic}$	0.021***	0.019***	0.023***	0.012***	0.026***	0.018***	0.024***	0.025***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
Observations	7930496	2949517	4931835	3715598	4166429	3108162	4774047	1852569
Adjusted R^2	0.099	0.093	0.110	0.038	0.153	0.092	0.111	0.103

back

Robustness - Instrumenting Closure using M&A

VARIABLES	(1) Search	(2) Successful	(3) Switching
	Reduced Form		
$D_t^{rel} \times Expose_{ic}$	0.016***	0.017***	0.019***
	(0.005)	(0.004)	(0.004)
Observations	7930496	1190079	7930496
Adjusted R^2	0.124	0.108	0.099
	IV		
$D_t^{rel} \times Closure_{ic}$	0.016***	0.018***	0.020***
	(0.005)	(0.004)	(0.004)
	(0.001)	(0.003)	(0.000)
Observations	7930496	1190079	7930496
Adjusted R^2	0.124	0.108	0.099

Additional Robustness checks

VARIABLES	(1) Search	(2) Successful	(3) Switching
Excluding borrowers affected by M&A			
$D_t^{rel} \times Closure_{ic}$	0.029***	0.038***	0.023***
	(0.003)	(0.003)	(0.002)
Observations	5983630	1114727	5983630
Adjusted R^2	0.123	0.111	0.091
Considering the whole municipality as affected			
$D_t^{rel} \times Closure_{ic}$	0.003***	0.026***	0.004***
	(0.001)	(0.003)	(0.000)
Adjusted R^2	0.141	0.113	0.106

Loans Granted

VARIABLES	All	SB	Non-SB
$POST_t \times Closure_{ic}$	-0.016*	-0.024**	-0.008
	(0.009)	(0.012)	(0.013)
Observations	7978227	2903774	5026940
Adjusted R^2	0.904	0.876	0.9

Notes: The dependent variable is the logarithm of the loans granted. Robust standard errors in parentheses are clustered at the municipality level. *** p<0.01, ** p<0.05, * p<0.1.