Access to Credit After Bankruptcy

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Outline

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- **Method** : difference-in-difference identification on an exogenous change in credit rating on SMEs
- **Results** : the flag removal leads to a 1.7% credit growth via new banking relationships

Two main contributions

1. **The reaction of banks to the debt-restructuring of firms**
   - Divided literature between a support of banks...
     - Berlin and Mester 1999, Peek and Rosengreen 2005, Rosenfeld 2014, Schäfer 2019, Micucci and Rossi 2017
   - ... and the absence of support
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→ In this paper, I show no support of former banks

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- Vast literature that acknowledges a real impact of external credit rating
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→ Real impact of a change of credit rating on SMEs' access to bank credit

→ External credit rating is

- used by banks to screen potential new borrowers
- not used by banks to extract information on existing borrowers

Two public debt-restructuring bankruptcy procedures

	Sauvegarde (treated group)	**Redressement judiciaire, "RJ"** (control group)
Filing	Preventive	Mandatory
Plan	Debt-restructuring with creditors, repayment schedule of 10 years on average ▸ Example	
Bankruptcy flag	3 years	5 years

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Credit rating after bankruptcy :

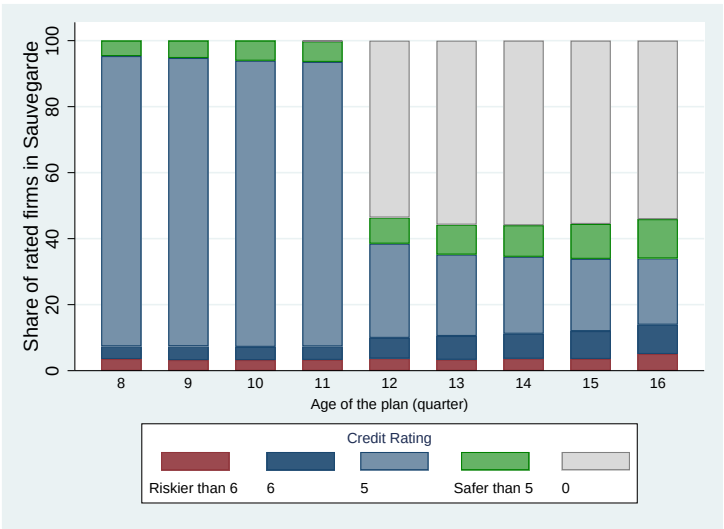


Figure : in Sauvegarde

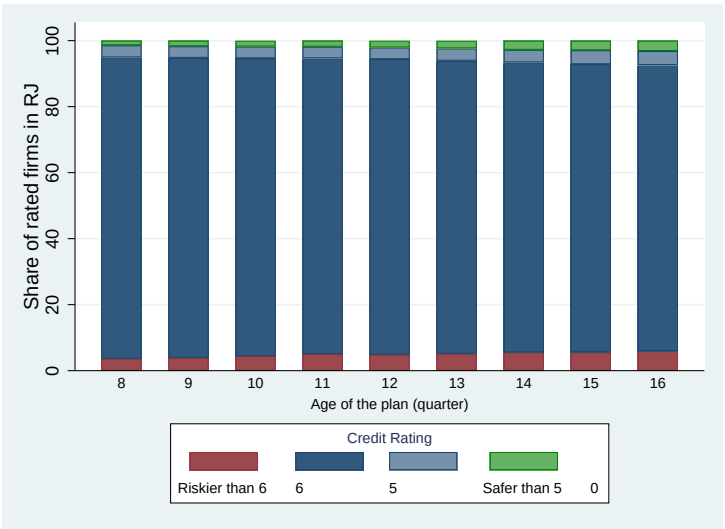


Figure : in RJ

Data

- **Bank-firm data : French credit register**
  - Monthly credit line ($\geq$ €25K total)
- **Firm data : FIBEN**
  - Bankruptcy information : date of filing, date of the debt-restructuring plan, date of liquidation (if any), duration of the repayment schedule...
  - Financial variables : annual asset, turnover, number of employees, industry...
  - Firm credit rating
- **Final sample** : about 1,000 Sauvegarde and 5,000 RJ filing firms observed each quarter between 2012 and 2019.

▸ Summary Statistics

Outline

Difference-in-difference identification

$$\Delta Credit_{i,t} = \sum_{q \neq 12} \alpha_q \mathbb{1}_q + \sum_{q \neq 12} \beta_q (\mathbb{1}_q \times Treated_i) + \gamma_i + \gamma_{s \times t}$$

where :

- $\Delta Credit_{i,t} = \frac{Credit_{i,t} - \overline{Credit}_{i,t=pre-bankruptcy}}{\overline{Credit}_{i,t=pre-bankruptcy}}$
- $\mathbb{1}_q$ is a dummy for each quarter of the plan
- $Treated_i = 1$ for Sauvegarde filers, 0 for RJ filers
- γ_i and $\gamma_{s \times t}$ firm and industry $\times$ quarter fixed effects
- Clustered standard errors at the firm level

Main Results

Figure : Raw credit growth

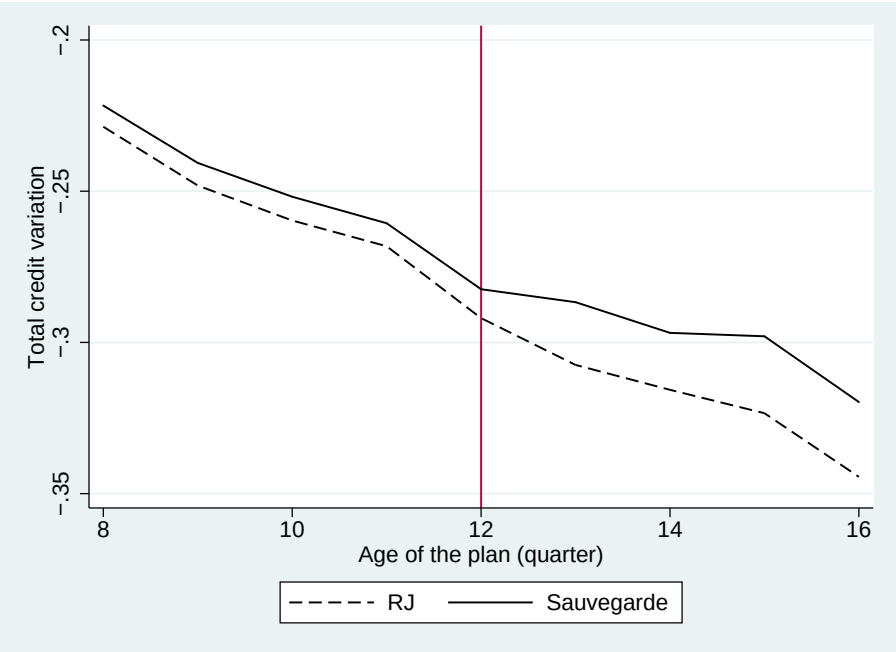
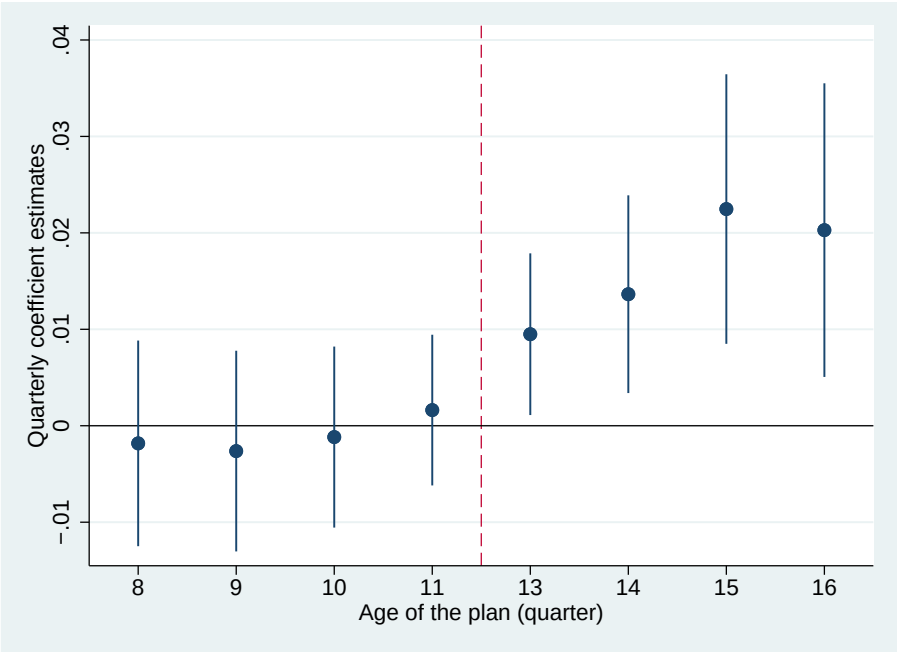


Figure : Quarterly effect of flag removal



- Parallel trends before the flag removal
- 1.7% credit rise on average for treated firms

Outline

Mechanisms

How to explain the credit rise once the flag is removed ?

Two possible supply effects :

- The removal of the information about the past bankruptcy leads to new banking relationships (i)
- The change of rating brings new, positive information to less informed lenders (ii)

Mechanisms

How to explain the credit rise once the flag is removed ?

Two possible supply effects :

- The removal of the information about the past bankruptcy leads to new banking relationships (i)
- The change of rating brings new, positive information to less informed lenders (ii)

$\Rightarrow$ My empirical tests show that only mechanism (i) is at play.

(i) DiD : Probability of new banking relationships

$$P(New_{i,q} = 1) = \alpha Post_q + \beta(Post_q \times Treated_i) + \gamma_i + \gamma_t + \epsilon_{i,t}$$

where :

- $New_{i,q}$
  - equals 1 before $q = 12$ if the firm starts borrowing from a new bank before $q = 12$, 0 otherwise.
  - equals 1 after $q = 12$ if the firm starts borrowing from a new bank after $q = 12$, 0 otherwise.
- $Post_q = 1$ when the firm's plan is older than 3 years (q$\geq$12), 0 otherwise.
- $Treated_i = 1$ for Sauvegarde filers, 0 for RJ filers
- γ_i and γ_t firm and quarter fixed effects
- Clustered standard errors at the firm level

Raw probability of
$P(New_{i,q} = 1)$

	Control firms	Treated firms
Post=0	0.047	0.068
Post=1	0.048	0.094

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	Pr(New Bank)			
	(1) Logit	(2) Logit	(3) OLS	(4) OLS
Post	-0.199***	0.0628	-0.00273	0.00509
	(0.001)	(0.298)	(0.200)	(0.218)
Treated × Post	**0.623*** **	**0.308*** **	**0.0186** **	**0.0218** **
	(0.000)	**(0.008)**	**(0.038)**	**(0.042)**
Lag Log(Total assets)		0.434***		0.0221***
		(0.000)		(0.000)
Lenght of the plan (years)		-0.0352		-0.00266
		(0.158)		(0.303)
Long term/Total credit		-0.657***		-0.0279***
		(0.000)		(0.000)
Credit/Total asset		0.131**		0.00896**
		(0.022)		(0.032)
Firm FE	✓		✓	
Quarter FE	✓			
Quarter × Industry FE		✓	✓	✓
Observations	6,285	31,766	48,518	31,680
Area under ROC curve		0.749		
R^2	0.004	0.101	0.425	0.053
Adj. Within R^2			0.000	0.015

p-values in parentheses – * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

- The removal of information about the past bankruptcy increases firms' probability of forming new banking relationships by 2 percentage points.

$$\Delta Credit_{i,t} = \sum_{q \neq 12} \alpha_q \mathbb{1}_q + \sum_{q \neq 12} \beta_q (\mathbb{1}_q \times Treated_i) + \gamma_i + \gamma_{s \times t}$$

Figure : Former bank credit

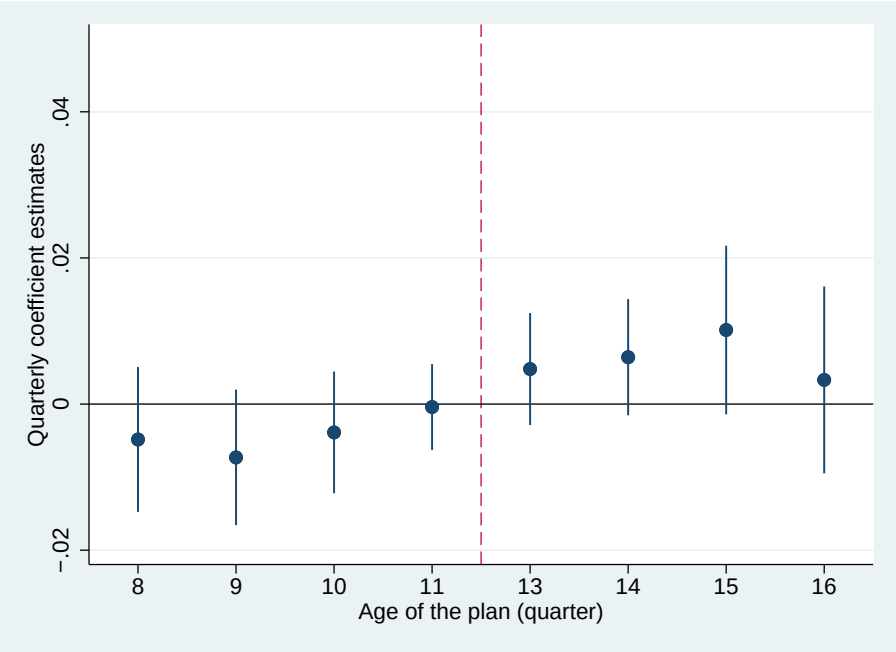
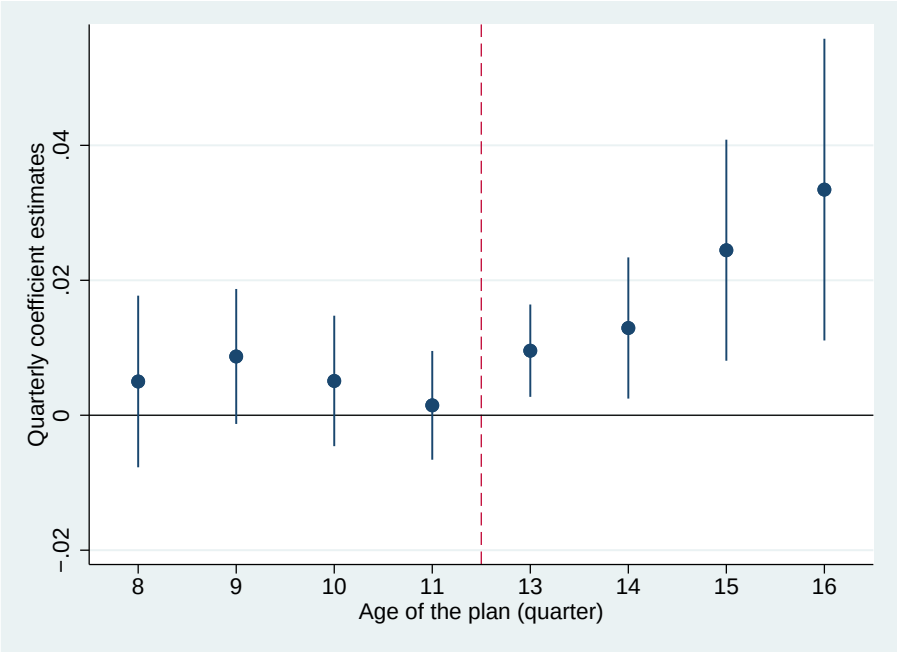


Figure : New bank credit



- The increase in $\Delta Credit$ comes from new banks' credit

(ii) DiD : Test for heterogeneity in former banks' behavior

Less informed lenders are more likely to find new, positive information in the flag removal

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Measures of information :

1- The length of the relationship as proxy for the level of information
   - Age of the relationship
   - Was the lender present during the bankruptcy procedure ?

2- The bank is the firm's main lender
   - Largest share of bank credit in the firm's total credit

3- Informational distance as proxy for high monitoring costs
   - Physical distance between a firm and its banks

4- Relaxation of strict capital requirement guidelines
   - Bank's tier 1 ratio = Tier 1 Capital / Risk-Weighted Assets

(ii) DiD : Test for heterogeneity in former banks' behavior

$$\begin{aligned}\Delta Credit_{i,b,t} = &\beta_0 Post_q + \beta_1(Post_q \times Treated_i) \\ &+ \beta_2 D_{i,b,t} + \beta_3(D_{i,b,t} \times Treated_i) + \beta_4(D_{i,b,t} \times Post_q) \\ &+ \boldsymbol{\beta_5(Post_q \times Treated_i \times D_{i,b,t})} \\ &+ \gamma_i + \gamma_b + \gamma_{s\times t}\end{aligned}$$

with $D_{i,b,t}$ the variables between 0 and 1 (close to 1 when the bank is less informed) :

1- Age of the relationship :
   - $Young_{i,b,t} = 1$ if the bank has been lending to the firm for less than 5 years
   - $Absent_{i,b,t} = 1$ if the bank was not present during the bankruptcy procedure

2- $Secondary_{i,b,t} = 1$ if the bank is not the main lender

3- $Distance_{i,b,t} = 1$ if the bank is in a different department than the firm's HQ

4- $Low_{i,b,t-1} = 1$ if the bank is in the lower quartile of the CR ratio distribution

	Age of the relationship		Secondary	Distance	CR
	(1)	(2)	(3)	(4)	(5)
Post	-0.00609***	-0.00846***	-0.0124***	-0.0157***	-0.00419*
	(0.003)	(0.000)	(0.000)	(0.000)	(0.059)
Treated × Post	0.0111***	0.0125***	0.0110**	0.0161***	0.0150***
	(0.001)	(0.000)	(0.034)	(0.000)	(0.000)
$D_{i,b,t}$	-0.0620***	-0.0833***	-0.284***	-0.00858	-0.00308
	(0.000)	(0.000)	(0.000)	(0.603)	(0.794)
Treated	-0.0411	-0.0365	-0.0289	-0.0391	-0.0830
	(0.476)	(0.524)	(0.574)	(0.499)	(0.195)
$D_{i,b,t}$ × Treated	-0.0230	-0.0245	-0.0198	-0.0136	0.0224
	(0.267)	(0.503)	(0.262)	(0.597)	(0.431)
$D_{i,b,t}$ × Post	0.0237***	0.0438***	0.0349***	0.0342***	-0.0106
	(0.004)	(0.000)	(0.000)	(0.000)	(0.145)
$D_{i,b,t}$ × Treated × Post	**0.00217**	**0.00621**	**-0.00374**	**-0.0104**	**-0.0298**
	(0.920)	**(0.827)**	**(0.650)**	**(0.399)**	**(0.141)**
Firm FE	✓	✓	✓	✓	✓
Quarter × Industry FE	✓	✓	✓	✓	✓
Bank FE	✓	✓	✓	✓	✓
Observations	81,646	81,646	81,646	79,767	46,871
Adj. R^2	0.833	0.833	0.879	0.833	0.869
Adj. Within R^2	0.008	0.007	0.281	0.002	0.001

p-values in parentheses – * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

- The level of information does not explain the credit supply after the flag removal
- Credit is increasing with time for less informed lenders

Outline

Effect on firms' real outcomes

$$Y_{i,t} = \alpha Post_q + \beta(Post_q \times Treated_i) + \gamma_i + \gamma_{s\times t} + \epsilon_{i,t}$$

	(1) Supplier Debt/Debt	(2) Debt/Asset	(3) Investment	(4) Δ Turnover
Post	0.00169	0.00117	0.00288	0.00406
	(0.564)	(0.941)	(0.486)	(0.679)
Treated × Post	-0.00851***	0.0232	0.00402	0.00218
	(0.006)	(0.186)	(0.373)	(0.824)
Firm FE	✓	✓	✓	✓
Year × Industry FE	✓	✓	✓	✓
Observations	6,908	6,908	6,908	6,908
Adj. R^2	0.887	0.908	0.955	0.869
Adj. Within R^2	0.002	0.000	-0.000	-0.000

p-values in parentheses

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- The mix of debt has changed

Outline

Conclusion

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- Results are robust ▸ More
- In the aftermath of the crisis, public authorities want to support firms' investment
  - Demmou et al. 2021 : risk of debt overhang and need for debt-restructuring
  - Measures taken in France in 2020 to reduce the stigma effect :
    - Flag removal at 2 years after Sauvegarde and RJ
    - Introduction of the "post-money" privilege

Outline

Firm quarterly characteristics

	Panel A : Firm quarterly characteristics					
	N	Mean	Median	St.Dev.	5th Pct.	95th Pct.
Treated group : Sauvegarde filers						
Turnover	7,030	1,261.8	671	1,736.1	77	4,776.0
Asset	7,710	1,025.7	514	1,322.4	76	4,149.1
Total Debt/Asset	7,022	1.181	0.934	0.958	0.489	2.587
Supplier Debt/Debt	7,009	0.181	0.137	0.150	0.018	0.486
Cash/Asset	7,122	0.111	0.070	0.122	0.002	0.379
Total credit	8,322	387.9	164	660.0	33.0	1,560.3
Short term/Total credit	8,281	0.499	0.475	0.416	0	1
Long term/Total credit	8,281	0.460	0.435	0.420	0	1
Number of banks	8,322	1.8	1	1.273	1	4
Control group : RJ filers						
Turnover	30,782	782.7	382	1,231.8	56	2,856.1
Asset	36,363	539.4	277	863.9	24	1,902.5
Total Debt/Asset	30,133	1.454	1.103	1.2	0.544	3.537
Supplier Debt/Debt	29,940	0.180	0.141	0.147	0.022	0.477
Cash/Asset	30,719	0.096	0.056	0.113	0.000	0.344
Total credit	40,196	206.2	90	742.137	28.0	670.3
Short term/Total credit	39,891	0.535	0.550	0.4	0	1
Long term/Total credit	39,891	0.428	0.310	0.426	0	1
Number of banks	40,196	1.4	1	0.892	1	3

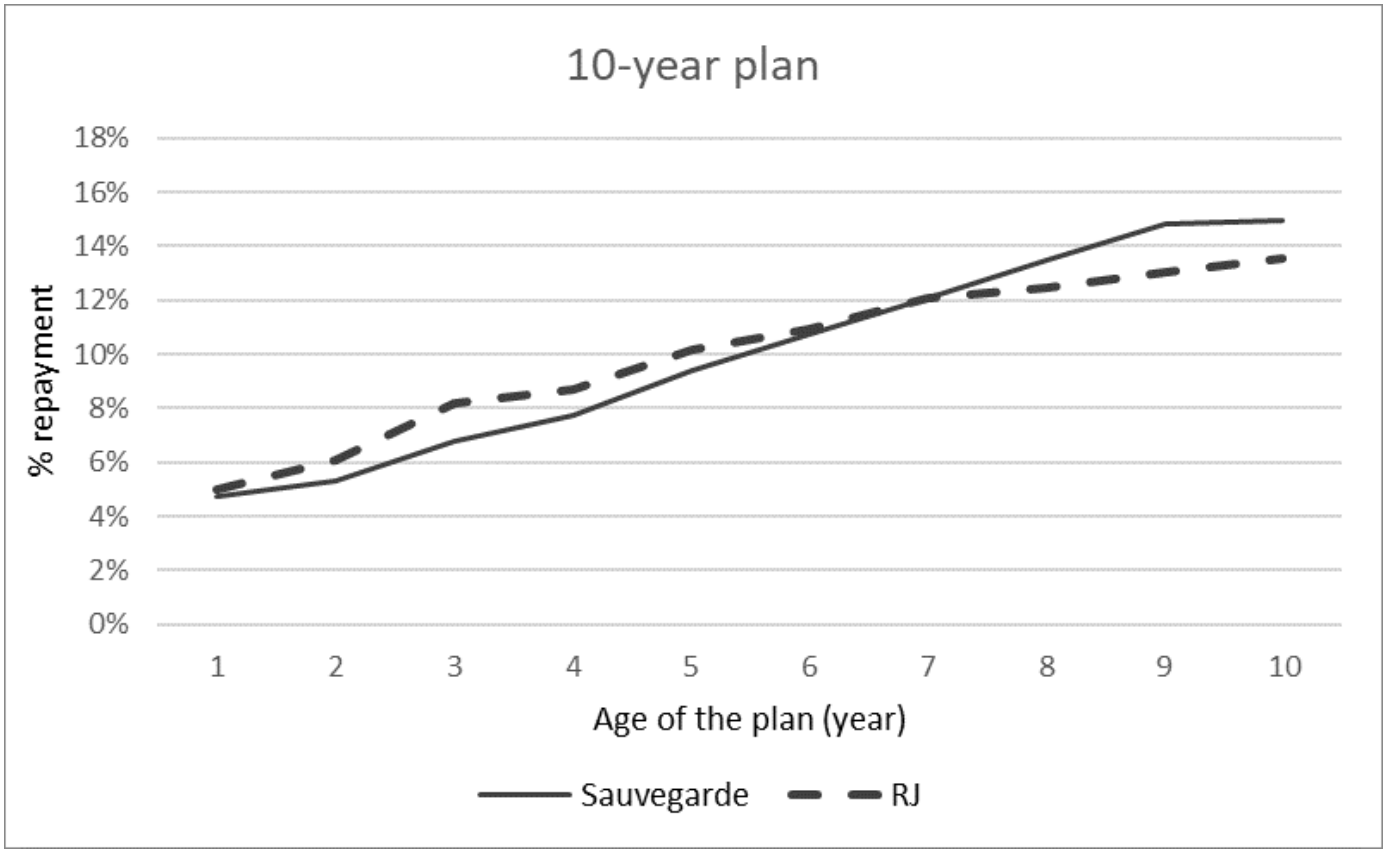
Firm characteristics

	Panel B : Firm characteristics					
	N	Mean	Median	St.Dev.	5th Pct.	95th Pct.
Treated group : Sauvegarde filers						
Lenght of the plan (years)	825	9.566	10	1.212	7	10
Control group : RJ filers						
Length of the plan (years)	3,475	9.590	10	0.995	8	10

Back

Note : sample of firms that started their restructuring plan between 2008 and 2016, and which plan lasted for at least 4 years. Firms are observed between the 2nd and 4th year of restructuring, and between 2012 and 2019. Balanced sample that excludes holdings, agricultural and subsidiary firms.

Figure : Plan repayment schedules at 10-year horizon



Note : Repayment schedule of 13 Sauvegarde filing firms and 27 RJ filing firms in the Commercial Court of Paris between 2006 and 2015.
Source : Despierre et al. 2018

Back

Robustness

Results are robust to alternate specifications

- PSM-DID
- TWFE robustness to potential time, group, cohort treatment effect heterogeneity (Roth et al. 2022, De Chaisemartin and D'Haultfoeuille 2022, Callaway and Sant'Anna 2020, Sun and Abraham 2021...)

Propensity score matching

	Pre-Match			Post-Match		
			Summary Statistics			
	Control	Treatment	Diff	Control	Treatment	Diff
Lenght of the plan (years)	9.595	9.517	0.078**	9.578	9.534	0.044
	(0.888)	(1.029)	[1.985]	(0.955)	(1.015)	[0.906]
Log(assets)	5.932	6.521	-0.589***	6.224	6.501	-0.277
	(1.041)	(1.137)	[-12.970]	(1.000)	(1.126)	[-5.290]
Investment	0.597	0.559	0.038***	0.588	0.559	0.030
	(0.326)	(0.344)	[2.716]	(0.334)	(0.343)	[1.762]
Leverage	1.276	1.060	0.217***	1.143	1.062	0.080
	(0.611)	(0.452)	[8.768]	(0.455)	(0.453)	[3.562]
Long term/Total credit	0.571	0.604	-0.034**	0.593	0.606	-0.012
	(0.368)	(0.374)	[-2.139]	(0.366)	(0.373)	[-0.671]
Cash	0.064	0.068	-0.004	0.063	0.068	-0.005*
	(0.08)4	(0.081)	[-1.263]	(0.078)	(0.082)	[-1.340]
Rating (Y/N)	0.535	0.627	-0.092***	0.581	0.623	-0.043
	(0.499)	(0.484)	[-4.338]	(0.494)	(0.485)	[-1.749]
Log(Number of banks)	2.271	2.562	-0.291***	2.429	2.549	-0.121
	(1.920)	(2.265)	[-3.399]	(2.038)	(2.270)	[-1.135]
Observations	2,415	701	-	959	701	-

Standards errors in parentheses, t-statistics in brackets

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Results on matched sample

	Δ Credit	Pr(New Bank)
	(1)	(2)
Post	-0.0119**	-0.0208**
	(0.025)	(0.010)
Treated × Post	0.0232***	0.0335**
	(0.006)	(0.021)
Firm FE	✓	✓
Quarter × Industry FE	✓	✓
Observations	12,944	12,944
Adj. R^2	0.922	0.445
Adj. Within R^2	0.003	0.002

p-values in parentheses

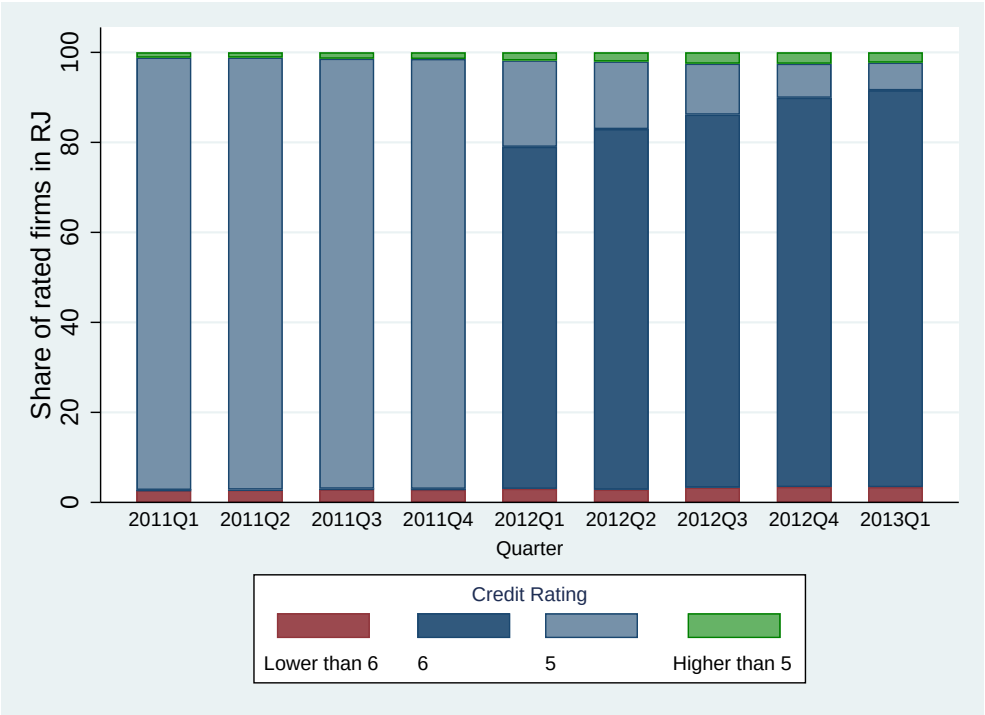
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Back

The 2012 credit rating policy change

- Up to 2011, the credit rating of firms executing a plan in RJ was 5.
- From 01/01/2012, it has been changed to 6 to better convey the credit risk carried by firms that filed for RJ Back

Figure : Rating of restructured firms in RJ around the 2012 policy change



Results

$$\Delta Credit_{i,t} = \sum_{t \neq 2012Q1} \beta_t \left(\mathbb{1}_t \times (1 - Treated_i) \right) + \gamma_q + \gamma_i + \gamma_s$$

Figure : Raw credit growth

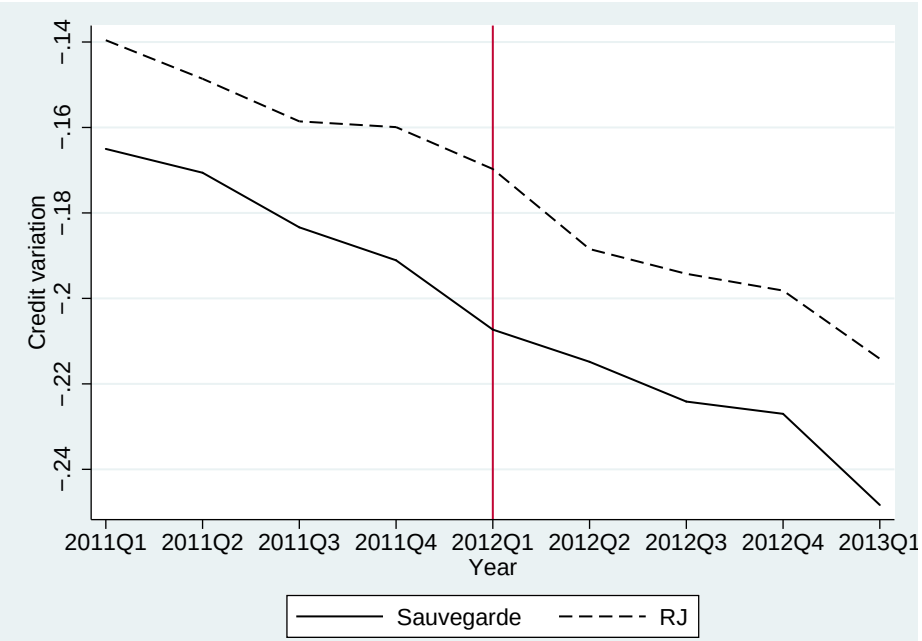
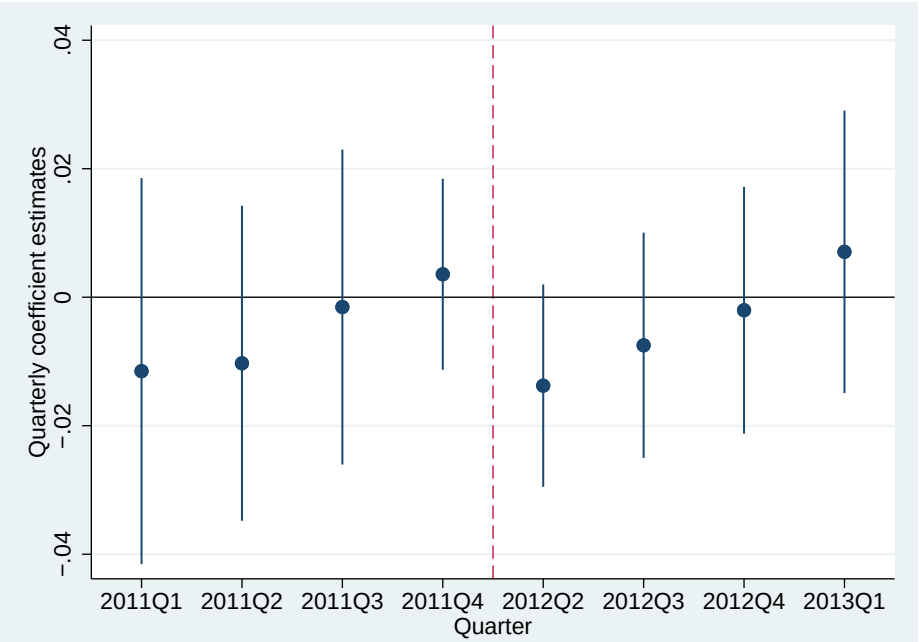


Figure : Effect of policy change



- Banks do not differentiate between restructured firms in RJ according to whether their rating is 5 or 6. Back

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