

Insurance Between Firms The Role of Internal Labor Markets

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CEPR-Bol labor market conference

Labour market participation: Forces at work and policy challenges

Rome, March 15-16, 2018

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 - ▶ larger (on average 4 times) both in terms of assets and employment.
 - ▶ twice more likely to export (and conditional on exporting they export more)
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- Why? How do business groups, multidivisional firms and stand-alone firms differ from each other?

Research questions

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This paper deals with the first question

This paper: ILM within business groups

Focus on ILM within **BUSINESS GROUPS**:

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Focus on networks of firms that are separate legal entities; benefits from reallocation of human resources across subsidiaries traded off against many hurdles (minority shareholder protection, contractual costs, and the fear of “piercing the corporate veil” between parent and subsidiary)

Business Groups are widespread

Firms belonging to BGs account for a **LARGE FRACTION OF THE ECONOMIC ACTIVITY** in both emerging and developed economies:

- In India, in 2006 affiliated firms accounted for 80% of total assets of the top 100 firms (Sarkar 2010)
- In 1996, the 30 largest chaebols accounted for 40% of Korean's total output (Chang and Hong, 2000)
- In Germany, from 1996 to 1999, top 15 family groups controlled 25% of listed corporate assets, 22% in Italy (Faccio and Lang 2002).
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 - ▶ In **MANUFACTURING**, such a percentage is as high as 70% (above 90% in automotive and energy).

Related Literature

- Internal Labor Markets **WITHIN FIRMS**:

- ▶ Internal careers (vertical ILM) as solution to agency problems within the firm (Doeringer and Piore 1971, Lazear and Rosen 1981, and many others).
- ▶ Limited attention to **HORIZONTAL ILMs** in complex organizations.
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- Internal **CAPITAL** Markets within business groups and multi-divisional firms:
 - ▶ ICMs allow affiliated firms to respond to shocks better than stand-alone firms (Almeida and Kim 2012; Kuppaswamy and Villalonga 2012; Boutin, Cestone, Fumagalli, Pica, Serrano-Velarde 2013, Giroud and Muller 2015).

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- **INSURANCE** within firms: wage (Guiso, Pistaferri, Schivardi, 2005) and employment insurance within firms (Sraer and Thesmar, 2010; Ellul, Pagano, Schivardi, 2014).

Outline

- 1 DATA
- 2 Preliminaries: (average) ILM activity
- 3 Internal Labor Markets as a response to positive shocks
- 4 Internal Labor Markets as a response to adverse shocks

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The Data

We merge **DADS** (tracks workers year-to-year movements), **LIFI** (identifies firms affiliated with groups) and **FICUS** (includes firms financial statements) for the period 2002-2010.

- DADS Postes Files: administrative matched employer-employee data
 - ▶ covers *all* employed people in the economy.
 - ▶ for each individual, information on plant/firm identifier **IN YEAR t** and **IN YEAR $t - 1$** .
 - ▶ for each year, information on: wage, number of working days, number of hours, type of occupation, full time/part time status, plant and firm geographical location, industry classification, etc.
- LIFI Files: survey collected by INSEE
 - ▶ unique data set to study BG activity
 - ▶ available information: financial links between firms → identification of ultimate owner. Group structure: all firms (directly and indirectly) controlled by a common owner.
 - ▶ covers the vast majority of French BGs.
- FICUS: administrative fiscal data
 - ▶ based on mandatory reporting of firms' financial statements to tax authorities.
 - ▶ available information: usual balance sheet and income statement items.
 - ▶ covers the universe of French firms.

INTERNAL LABOR MARKETS AS A RESPONSE TO POSITIVE SHOCKS

Parmalat exit: an unexpected growth opportunity

Look for firms' (unexpected) expansion opportunities

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- Starting point: **PARMALAT COLLAPSE CASE STUDY**, December 2003
 - ▶ Large multinational owning over 130 subsidiaries in 30 different countries
 - ▶ A **MAJOR COMPETITOR FOR FRENCH FIRMS** active in the production and sale of milk products
 - ▶ An **UNEXPECTED EXIT**: following Parmalat's default on €150 million bond, Bank of America revealed that a €3.9 billion bank account *did not exist* → Parmalat filed for bankruptcy

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- Was Parmalat's collapse a **POSITIVE SHOCK** for its main French competitors?
 - ▶ Compare change in performance around Parmalat's 2004 collapse:

Sample:	firms in 2-DIGIT sector in which Parmalat was present
Treatment group:	firms in 4-DIGIT sectors in which Parmalat was present
Control group:	firms in 4-DIGIT sectors in which Parmalat was not present

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 - ▶ DDD: effect on large (top 10) firms

Top French competitors' performance after Parmalat collapse

Sample: firms in 2-digit sector in which Parmalat was present

Treatment group: firms in 4-digit sectors in which Parmalat was present

Control group: firms in 4-digit sectors in which Parmalat was not present

Variables	Sales (1)	Employment (2)	Total Assets (3)	Fixed Assets (4)
Top 10 × Wholesale Milk Trade × Post2004	0.1779*** (0.0459)	0.2383*** (0.0324)	0.1210* (0.0511)	0.1278** (0.0466)
Top 10 × Other Milk Production × Post2004	0.4343*** (0.0466)	0.2282*** (0.0324)	0.5029*** (0.0509)	0.3438*** (0.0473)
Top 10 × Milk Production × Post2004	0.0124 (0.0459)	-0.3459*** (0.0324)	0.2670*** (0.0512)	-0.1436** (0.0468)
Top 10 × Butter × Post2004	0.1058* (0.0467)	0.0637 (0.0327)	0.0661 (0.0539)	-0.9385*** (0.0472)
Top 10 × Cheese × Post2004	-0.1081* (0.0465)	0.0253 (0.0324)	-0.1438** (0.0511)	-0.0537 (0.0471)
N	1,489,260	1,004,524	1,321,175	1,215,149
Sector FE	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES

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Shocked sectors: **WHOLESALE MILK TRADE** and **OTHER MILK PRODUCTION**

Bilateral employment flows following Parmalat shock

- Study the flow of workers between firm pairs (origin/destination) in which the destination firm is BG-affiliated *and* operates in one of the shocked sectors.
- **DIFF-IN-DIFF APPROACH:** compare flows after the Parmalat shock with flows before the shock in firm pairs that belong to the same group (“ILM partners”) versus pairs that are just “external labor market partners”.

$$f_{ijt} = \alpha_t + \beta_{ij} + BG_{jt} + SameBG_{ijt} + shock_{it} + shock_{it} \times BG_{jt} + shock_{it} \times SameBG_{ijt} + \varepsilon_{ijt}$$

where f_{ijt} = ratio of workers hired by BG-affiliated firm i (active in the shocked sectors) in year t and previously employed in firm j to total number of job-to-job movers hired by firm i in year t .

Bilateral employment flows following Parmalat shock

Variables	SHOCKED SECTORS		NON SHOCKED SECTORS	
	Destination FE (1)	Pair FE (2)	Destination FE (3)	Pair FE (4)
Same Group	0.0135 (0.0096)	0.0066 (0.0217)	0.0277*** (0.0055)	0.0230* (0.0107)
Firm of origin group affiliated	0.0003 (0.0037)	-0.0020 (0.0070)	-0.0010 (0.0014)	-0.0013 (0.0027)
Post2004 × firm of origin group affiliated	-0.0040 (0.0046)	-0.0038 (0.0054)	-0.0009 (0.0017)	-0.0002 (0.0018)
POST2004 × SAME GROUP	0.0293* (0.0118)	0.0350* (0.0143)	-0.0035 (0.0066)	-0.0013 (0.0071)
N	22,219	22,219	50,013	50,013
Firm of destination FE	YES	NO	YES	NO
Firm of origin × firm of destination FE	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES

→ Use non shocked sectors as placebo

Reaction to unexpected growth opportunity: beyond Parmalat

- Identify 115 **LARGE CLOSURE EVENTS** taking place in 102 sectors. “Large” means 500+ employees on average 4+ years prior to the closure event.
- Identify 16 **SHOCKED SECTORS**: those in which surviving firms’ sales and employment (at least) expand in **DDD regressions**

Sector Code	Sector description	Number of closures	Size of closing firm in normal times	Year of closure
158H	Manufacture of sugar	1	1689.5	2008
159S	Production of mineral water	1	4339.75	2004
159T	Production of soft drinks	1	620	2004
221E	Publishing of journals and periodicals	1	578.5	2004
241E	Manufacture of other inorganic basic chemicals	1	915.7	2006
292D	Manufacture of lifting and handling equipment	1	847.5	2004
295G	Manufacture of machinery for textile, apparel and leather production	1	830.75	2005
314Z	Manufacture of accumulators, primary cells and primary batteries	1	1244.5	2005
452B	Construction of sundry buildings	1	513.25	2007
513W	Non specialized wholesale of food	2	2471.9	2004
514N	Wholesale of pharmaceutical goods	3	999.1	2007
518L	Wholesale of electric equipment	5	1103.2	2006
526B	Specialized retail sale via mail order	1	767	2007
526H	Vending machine sale	1	1065.25	2005
631B	Non harbour cargo handling	1	713.25	2008
743B	Technical analyses, testing and inspections	1	1063.5	2005

- Use “non shocked sectors” (those in which top industry players’ sales and employment did not improve upon large competitor closure) to run placebos.

Descriptives on bilateral flows in shocked sectors

	Extra group Flows	Intra group Flows
Before the shock	0.0215 (0.0983) [183,429]	0.0638 (0.1875) [6,173]
After the shock	0.0218 (0.1000) [374,814]	0.0717 (0.1957) [10,950]

Bilateral employment flows and large competitor closures

Variables	SHOCKED SECTORS				NON SHOCKED SECTORS	
	(1)	(2)	(3)	(4)	(5)	(6)
					Full sample	Restricted sample
Firm of origin group affiliated	0.00041 (0.00037)	0.00369*** (0.00087)	0.00427*** (0.00088)	-0.00329*** (0.00042)	0.00141*** (0.00031)	0.00198*** (0.00046)
Same Group	0.02709*** (0.00253)	0.00058 (0.00489)	0.00053 (0.00498)	-0.00123 (0.00158)	0.00208 (0.00169)	0.00317 (0.00231)
Post shock × firm of origin group affiliated	-0.00276*** (0.00050)	-0.00365*** (0.00060)		-0.00009 (0.00038)	-0.00367*** (0.00027)	-0.00444*** (0.00040)
Post shock × Same Group	0.00583* (0.00287)	0.01153*** (0.00303)		0.00128 (0.00148)	0.00062 (0.00137)	0.00079 (0.00184)
<i>N</i>	575,366	575,366	575,366	2,301,464	3,817,969	1,956,489
Firm of destination FE	YES	NO	NO	NO	NO	NO
Firm of origin × firm of destination FE	NO	YES	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES	YES
Time to shock dummies	YES	YES	YES	YES	YES	YES

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Closure year × Same Group			0.00618 (0.00401)			
Closure year+1 × Same Group			0.01116* (0.00427)			
Closure year+2 × Same Group			0.01065* (0.00416)			
Closure year +3 × Same Group			0.01996*** (0.00462)			
Closure year+4 × Same Group			0.01159 (0.00704)			
Closure year+5 or more × Same Group			0.00782 (0.00687)			
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Closure year+5 or more × Same Group			0.00782 (0.00687)			
Post shock × Same Group × Managers				0.00531* (0.00236)		
Post shock × Same Group × Intermediate Occupations				-0.00095 (0.00197)		
Post shock × Same Group × Clerical Support				0.00207 (0.00148)		
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Year dummies	YES	YES	YES	YES	YES	YES
Time to shock dummies	YES	YES	YES	YES	YES	YES

ILMs allow to bypass hiring frictions

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- Search and other hiring costs particularly high for skilled labor (Kramarz and Michaud 2010), and asymmetric information on workers' characteristics mitigated within organizations (Greenwald 1986, Jaeger 2016).
- **BOTTOM LINE:** while internal *capital* markets help mitigate financial constraints, ILMs help business groups overcome *human capital constraints* that may curb growth.

ILMs allow to bypass hiring frictions

- Our finding: group-affiliated firms respond to growth opportunity by increasing use of ILM for **SKILLED HUMAN CAPITAL**.
- Search and other hiring costs particularly high for skilled labor (Kramarz and Michaud 2010), and asymmetric information on workers' characteristics mitigated within organizations (Greenwald 1986, Jaeger 2016).
- **BOTTOM LINE:** while internal *capital* markets help mitigate financial constraints, ILMs help business groups overcome *human capital constraints* that may curb growth.

DOES THIS IMPROVE FIRMS' ABILITY TO REACT TO GROWTH OPPORTUNITIES?

Do ILMs improve firms' ability to react to growth opportunities?

Two exercises:

- Compare economic outcomes across **GROUP-AFFILIATED VERSUS STAND-ALONE** firms operating in the positively shocked sectors.

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Zone d'emploi: statistical concept built and used by the INSEE. Definition: *espace géographique à l'intérieur duquel la plupart des actifs résident et travaillent, et dans lequel les établissements peuvent trouver l'essentiel de la main d'œuvre nécessaire pour occuper les emplois offerts.*

Do ILMs improve firms' ability to react to growth opportunities?

Group-affiliated vs. stand-alone firms in shocked sectors

	(1)	(2)	(3)	(4)	(5)
	Sales	Employment	Capital expenditure	Market share	TFP
BG-affiliated	0.448*** (0.0686)	0.187*** (0.0393)	0.168* (0.0718)	0.456*** (0.0741)	0.128*** (0.0316)
Post shock × BG-affiliated	0.0845*** (0.0207)	0.0647*** (0.0156)	0.111*** (0.0302)	0.112*** (0.0241)	0.0142 (0.0176)
<i>N</i>	256,782	158,534	135,301	256,782	93,181
Firm FE	YES	YES	YES	YES	YES
Sector × year dummies	YES	YES	YES	YES	YES

Do ILMs improve firms' ability to react to growth opportunities?

ILM access = average pre-shock employment of all group subsidiaries affiliated with i within the same local labor market (*Zone d'Emploi*), but not in the same 4-digit sector

	(1)	(2)	(3)	(4)	(5)
	Sales	Employment	Capital expenditure	Market share	TFP
PANEL A (BASELINE)					
ILM access \times Post shock	0.0335** (0.0129)	0.0236 (0.0120)	0.0181 (0.0160)	0.0447** (0.0145)	0.0214** (0.00818)
N	12,571	11,890	9,454	12,571	6,916

Firm FE	YES	YES	YES	YES	YES
Sector \times year dummies	YES	YES	YES	YES	YES

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ILM access = average pre-shock employment of all group subsidiaries affiliated with i within the same local labor market (*Zone d'Emploi*), but not in the same 4-digit sector

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N	12,571	11,890	9,454	12,571	6,916
PANEL B (CONTROLLING FOR REST OF THE GROUP EMPLOYMENT)					
Rest of the group employment	-0.0556 (0.0581)	-0.0676 (0.0435)	-0.0796 (0.0576)	-0.0814 (0.0550)	-0.0116 (0.0183)
ILM access \times Post shock	0.0343* (0.0150)	0.0187 (0.0133)	0.00737 (0.0184)	0.0419** (0.0161)	0.0180* (0.00868)
N	11,617	10,975	8,728	11,617	6,356
Firm FE	YES	YES	YES	YES	YES
Sector \times year dummies	YES	YES	YES	YES	YES

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ILM access = average pre-shock employment of all group subsidiaries affiliated with i within the same local labor market (*Zone d'Emploi*), but not in the same 4-digit sector

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<i>N</i>	11,617	10,975	8,728	11,617	6,356
PANEL C (PLACEBO)					
Rest of the group employment	-0.0525 (0.0765)	-0.0529 (0.0601)	-0.157 (0.0846)	-0.0652 (0.0722)	0.00404 (0.0251)
Group employment OUTSIDE region \times Post shock	0.0167 (0.0164)	0.00644 (0.0151)	0.0114 (0.0194)	0.0211 (0.0185)	0.0139 (0.00940)
<i>N</i>	7,657	7,229	5,904	7,657	4,323
Firm FE	YES	YES	YES	YES	YES
Sector \times year dummies	YES	YES	YES	YES	YES

INTERNAL LABOR MARKETS AS A RESPONSE TO ADVERSE SHOCKS

Firm closures within groups

Does ILM also activate in response to **ADVERSE SHOCKS** hitting group-affiliated subsidiaries?
We study displaced workers from closing group units.

- We identify **FIRM CLOSURES**: firms whose employment drops by more than 90% from one year to the other.
- We remove **FALSE CLOSURES**: cases in which more than 70% of the lost employment ends up in the same firm/plant.
- Closing firms have a deteriorating **PERFORMANCE** in the 2-3 year window before closure, and display clear signs of financial distress one year before closure.

	Number of closing firms			Percentage of closing firms		
	All firms	< 10 employees	≥ 10 employees	All firms	< 10 employees	≥ 10 employees
2002	134398	117898	16500	9.03	10.25	4.87
2003	130538	114079	16459	8.68	9.78	4.88
2004	135848	123211	12637	8.92	10.30	3.73
2005	123244	109912	13332	8.13	9.38	3.88
2006	128429	114978	13451	8.21	9.49	3.82
2007	136002	121576	14426	8.54	9.91	3.95
2008	115529	105122	10407	7.15	8.40	2.74
2009	158014	139456	18558	9.63	10.99	5.01

DID on bilateral worker flows exploiting closures

- Look at the flow of workers between pairs of firms (origin/destination) **FOCUSING ON BG FIRMS OF ORIGIN THAT EVENTUALLY CLOSE.**

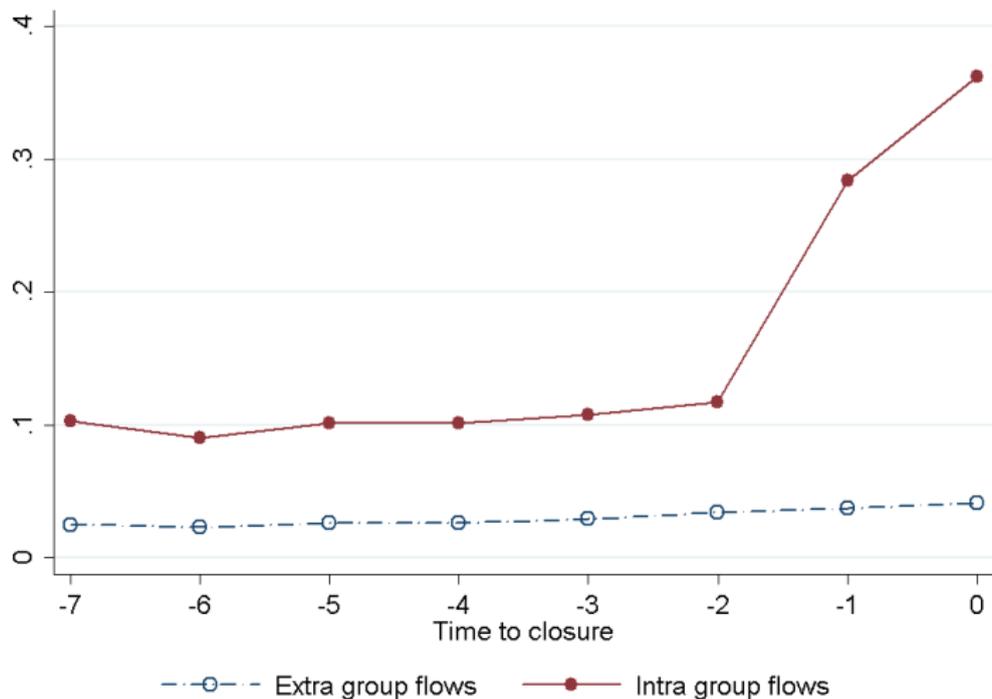
- **DIFF-IN-DIFF APPROACH:** compare worker flows at closure with flows in normal times towards ILM (“Same BG”) partners versus external labor market partners:

$$f_{ijt} = \alpha_t + \phi_{ij} + BG_{jt} + SameBG_{ijt} + c_{it} + c_{it} \times BG_{jt} + c_{it} \times SameBG_{ijt} + \varepsilon_{ijt}$$

- ▶ f_{ijt} = ratio of workers moving from affiliated firm i (eventually closing) to firm j in year t to total number of job-to-job movers from firm i in year t
 - ▶ $c_{it} = 1$ in last two years of firm i 's activity
 - ▶ ϕ_{ij} controls for pair fixed effects
- For each firm i that eventually closes we identify as potential ‘partners’: any firm that at least once has been the destination of 1+ worker moving out of firm i .

Closures within the group trigger ILM response

Outflow of workers from BG firms that eventually close: fraction moving towards **ILM PARTNERS** versus **EXTERNAL LABOR MARKET** partners:



Closures within the group trigger ILM response

Variables	(1)	(2)
Firm of destination group affiliated	-0.0013*** (0.0003)	0.0011 (0.0007)
Same Group	0.0334*** (0.0019)	-0.0122** (0.0041)
Closure × firm of destination group affiliated	0.0004 (0.0004)	0.0025*** (0.0006)
Closure × same group	0.1487*** (0.0039)	0.1187*** (0.0050)
Same group × Managers		
Same group × Intermediate Occupations		
Same group × Clerical Support		
Closure × same group × Managers		
Closure × same group × Intermediate Occupations		
Closure × same group × Clerical Support		
<i>N</i>	1,171,552	1,171,552
Firm of origin FE	YES	NO
Pair FE	NO	YES
Year dummies	YES	YES
Time to closure dummies	YES	YES

Closures within the group trigger ILM response

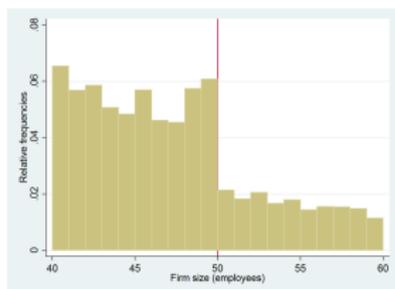
Variables	(1)	(2)	(3)	(4)
Firm of destination group affiliated	-0.0013*** (0.0003)	0.0011 (0.0007)	-0.0021*** (0.000)	0.0015*** (0.000)
Same Group	0.0334*** (0.0019)	-0.0122** (0.0041)	0.0018 (0.001)	-0.0096*** (0.001)
Closure × firm of destination group affiliated	0.0004 (0.0004)	0.0025*** (0.0006)	-0.0001 (0.000)	0.0005 (0.000)
Closure × same group	0.1487*** (0.0039)	0.1187*** (0.0050)	0.0452*** (0.002)	0.0378*** (0.002)
Same group × Managers			0.0161*** (0.002)	0.0161*** (0.002)
Same group × Intermediate Occupations			0.0093*** (0.001)	0.0093*** (0.001)
Same group × Clerical Support			0.0010 (0.001)	0.0010 (0.001)
Closure × same group × Managers			-0.0082** (0.002)	-0.0082** (0.002)
Closure × same group × Intermediate Occupations			-0.0129*** (0.002)	-0.0129*** (0.002)
Closure × same group × Clerical Support			-0.0112*** (0.002)	-0.0112*** (0.002)
<i>N</i>	1,171,552	1,171,552	4,686,112	4,686,112
Firm of origin FE	YES	NO	YES	NO
Pair FE	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES
Time to closure dummies	YES	YES	YES	YES

Labour market frictions: The role of EPL

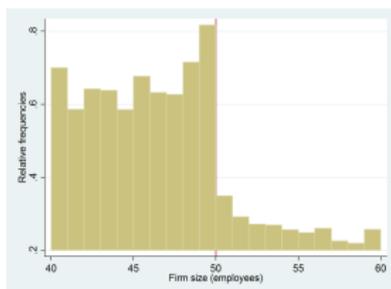
Firms above 50 employees are subject to stricter labour regulation in France: complex procedure for collective dismissals:

- Higher firing costs
- Procedure negotiated with union representatives
- Procedure mandatory also in case of closure

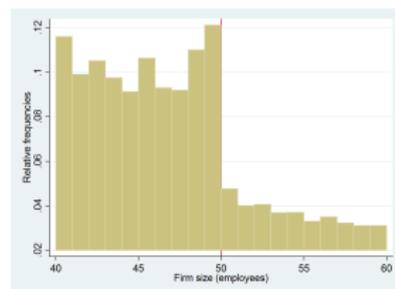
Figure: Firm size distribution around the 50 employee threshold (year 2006)



(a) Stand-alone firms



(b) Business group affiliated firms



(c) All firms

Labour market frictions: The role of EPL

Look at the differential behavior above and below 50.

We address sorting around the threshold by **INSTRUMENTING** current size with (average) firm size in normal times, i.e. 4+ years before closure.

Firm size window	FE estimates		IV estimates		
	40-60	40-60	40-60	35-65	45-55
Same Group	0.0381*** (0.0093)	0.0073 (0.0198)	0.0325** (0.0113)	0.0165 (0.0097)	0.0135 (0.0165)
Destination firm group affiliated	-0.0023 (0.0019)	-0.0027 (0.0045)	-0.0029 (0.0052)	0.0020 (0.0047)	0.0051 (0.0084)
Closure × destination firm group affiliated	0.0018 (0.0027)	0.0080* (0.0037)	0.0072 (0.0042)	-0.0013 (0.0042)	-0.0131 (0.0075)
Closure × Same Group	0.1211*** (0.0158)	0.0785*** (0.0222)	0.0810*** (0.0107)	0.0970*** (0.0106)	0.0933*** (0.0171)
Closure × same group × Firm size > 50	0.0515* (0.0261)	0.0705 (0.0370)	0.0817*** (0.0182)	0.0421* (0.0195)	0.0647* (0.0312)
N	53,544	53,544	40,795	56,387	17,855
Firm of origin FE	YES	NO	NO	NO	NO
Firm of origin × destination firm FE	NO	YES	YES	YES	YES
Year dummies	YES	YES	YES	YES	YES
Time to closure dummies	YES	YES	YES	YES	YES

ILM and job stability: flows to unemployment

Dependent variable: ratio of workers moving from firm i to **UNEMPLOYMENT** to total number of workers leaving firm i .

	(1)	(2)
Firm of origin group affiliated	0.0538*** (0.0030)	0.0143*** (0.0015)
Closure × Firm of origin group affiliated	-0.0785*** (0.0030)	-0.0376*** (0.0016)
Closure × Firm of origin affiliated × Managers		0.0324*** (0.0020)
Closure × Firm of origin affiliated × Intermediate Occ.		0.0218*** (0.0020)
Closure × Firm of origin affiliated × Clerical Support		0.0171*** (0.0021)
N	1,606,734	6,593,384
Firm of origin FE	YES	YES
Year dummies	YES	YES
Time to closure dummies	YES	YES

Wage impact of intra-group job stability

Worker-level dataset of job-to-job movers. Dependent variable: wage change

Variables	CHANGE IN HOURS WORKED		HOURLY WAGE CHANGE		ANNUAL WAGE CHANGE	
	(1)	(2)	(3)	(4)	(5)	(6)
Firm of destination group affiliated	0.0904*** (0.018)	0.0483 (0.055)	0.0426*** (0.006)	0.0295 (0.032)	0.1357*** (0.018)	0.0724 (0.055)
Same Group	0.1667*** (0.033)	0.0482 (0.046)	0.0174 (0.017)	-0.0157 (0.028)	0.1873*** (0.035)	0.0374 (0.054)
Closure × firm of destination group affiliated	-0.0008 (0.024)	0.0353 (0.053)	-0.0123 (0.008)	-0.0142 (0.031)	-0.0136 (0.025)	0.0229 (0.054)
Closure × same group	-0.0962* (0.043)	-0.1005* (0.044)	0.0160 (0.019)	-0.0079 (0.026)	-0.0806 (0.045)	-0.1104* (0.051)
<i>N</i>	905,089	905,089	905,087	905,087	909,556	909,556
Firm of origin FE	YES	NO	YES	NO	YES	NO
Pair FE	NO	YES	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES	YES	YES
Time to closure dummies	YES	YES	YES	YES	YES	YES
Individual controls	YES	YES	YES	YES	YES	YES

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Variables	CHANGE IN HOURS WORKED		HOURLY WAGE CHANGE		ANNUAL WAGE CHANGE	
	(1)	(2)	(3)	(4)	(5)	(6)
Firm of destination group affiliated	0.0904*** (0.018)	0.0483 (0.055)	0.0426*** (0.006)	0.0295 (0.032)	0.1357*** (0.018)	0.0724 (0.055)
Same Group	0.1667*** (0.033)	0.0482 (0.046)	0.0174 (0.017)	-0.0157 (0.028)	0.1873*** (0.035)	0.0374 (0.054)
Closure × firm of destination group affiliated	-0.0008 (0.024)	0.0353 (0.053)	-0.0123 (0.008)	-0.0142 (0.031)	-0.0136 (0.025)	0.0229 (0.054)
Closure × same group	-0.0962* (0.043)	-0.1005* (0.044)	0.0160 (0.019)	-0.0079 (0.026)	-0.0806 (0.045)	-0.1104* (0.051)
Same group × Managers	-0.0985* (0.049)	0.0045 (0.044)	0.1079*** (0.026)	0.0491 (0.038)	0.0157 (0.050)	0.0629 (0.053)
Same group × Intermediate Occupations	-0.0214 (0.044)	0.0934 (0.062)	0.0370* (0.018)	0.0142 (0.024)	0.0086 (0.046)	0.1085 (0.065)
Same group × Clerical Support	-0.0364 (0.057)	-0.0104 (0.067)	0.0091 (0.022)	0.0216 (0.029)	-0.0261 (0.062)	0.0109 (0.070)
Closure × same group × Managers	0.0830 (0.051)	0.0141 (0.044)	-0.0840** (0.028)	-0.0330 (0.039)	-0.0092 (0.051)	-0.0280 (0.053)
Closure × same group × Intermediate Occupations	-0.0098 (0.046)	-0.0888 (0.063)	-0.0262 (0.019)	0.0019 (0.025)	-0.0280 (0.048)	-0.0873 (0.065)
Closure × same group × Clerical Support	0.0415 (0.069)	-0.0047 (0.068)	-0.0238 (0.025)	-0.0175 (0.031)	0.0187 (0.071)	-0.0211 (0.071)
N	905,089	905,089	905,087	905,087	909,556	909,556
Firm of origin FE	YES	NO	YES	NO	YES	NO
Pair FE	NO	YES	NO	YES	NO	YES
Year dummies	YES	YES	YES	YES	YES	YES
Time to closure dummies	YES	YES	YES	YES	YES	YES
Individual controls	YES	YES	YES	YES	YES	YES

Which firms absorb workers within the ILM?

Are employees displaced upon closures/mass layoffs redeployed more intensely, within the ILM:

- towards the group units enjoying **BETTER GROWTH OPPORTUNITIES**:
 - ▶ firms in high-growth sectors
 - ▶ firms with larger Capex in “normal times” (4+ years pre-closure event)
- towards **MORE EFFICIENT** group units (higher TFP)
- towards group units that have the **FINANCIAL MUSCLE** to seize expansion opportunities.

Sectoral growth, investment and productivity

Predetermined (i.e. measured in normal times) characteristics of destination firms

	(1)	(2)	(3)
Firm of destination group affiliated	-0.0107*** (0.0026)	0.0012 (0.0021)	-0.0019 (0.0028)
Same Group	-0.0345*** (0.0157)	-0.0055 (0.0127)	-0.0205 (0.0181)
Closure × firm of destination group affiliated	0.0084*** (0.0025)	0.0050** (0.0018)	0.0042 (0.0024)
Closure × same group	0.1255*** (0.0187)	0.0933*** (0.0155)	0.0622** (0.0218)
Sector Growth of Real Sales below 10pct × Closure × Same Group	-0.0317* (0.0135)		
Sector Growth of Real Sales above 50pct × Closure × Same Group	-0.0098 (0.0153)		
Sector Growth of Real Sales above 90pct × Closure × Same Group	0.0318* (0.0143)		
<i>N</i>	844,031	788,004	495,042
Firm of origin × firm of destination FE	YES	YES	YES
Year dummies	YES	YES	YES
Time to closure dummies	YES	YES	YES

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Sector Growth of Real Sales above 50pct × Closure × Same Group	-0.0098 (0.0153)		
Sector Growth of Real Sales above 90pct × Closure × Same Group	0.0318* (0.0143)		
CAPEX below 10pct × Closure × same group		-0.0290 (0.0253)	
CAPEX above 50pct × Closure × same group		0.0528** (0.0179)	
CAPEX above 90pct × Closure × same group		-0.0122 (0.0104)	
<i>N</i>	844,031	788,004	495,042
Firm of origin × firm of destination FE	YES	YES	YES
Year dummies	YES	YES	YES
Time to closure dummies	YES	YES	YES

Sectoral growth, investment and productivity

Predetermined (i.e. measured in normal times) characteristics of destination firms

	(1)	(2)	(3)
Firm of destination group affiliated	-0.0107*** (0.0026)	0.0012 (0.0021)	-0.0019 (0.0028)
Same Group	-0.0345*** (0.0157)	-0.0055 (0.0127)	-0.0205 (0.0181)
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Sector Growth of Real Sales above 90pct × Closure × Same Group	0.0318* (0.0143)		
CAPEX below 10pct × Closure × same group		-0.0290 (0.0253)	
CAPEX above 50pct × Closure × same group		0.0528** (0.0179)	
CAPEX above 90pct × Closure × same group		-0.0122 (0.0104)	
TFP below 10pct × Closure × same group			-0.0296 (0.0674)
TFP above 50pct × Closure × same group			0.0528* (0.0245)
TFP above 90pct × Closure × same group			0.0187 (0.0145)
<i>N</i>	844,031	788,004	495,042
Firm of origin × firm of destination FE	YES	YES	YES
Year dummies	YES	YES	YES
Time to closure dummies	YES	YES	YES

Financial Muscle

Predetermined (i.e. measured in normal time) characteristics of destination firms

Variables	(1)	(2)	(3)
Firm of destination group affiliated	0.0020 (0.0011)	0.0017 (0.0016)	0.0019 (0.0025)
Same Group	-0.0086 (0.0065)	-0.0062 (0.0087)	-0.0307* (0.0132)
Closure × firm of destination group affiliated	0.0023** (0.0009)	0.0008 (0.0011)	0.0037* (0.0019)
Closure × same group	0.1416*** (0.0081)	0.1541*** (0.0094)	0.1043*** (0.0140)
LEV below 10pct × Closure × same group	-0.0456 (0.0236)		
LEV above 50pct × Closure × same group	0.0133 (0.0118)		
LEV above 90pct × Closure × same group	-0.0483* (0.0233)		
<i>N</i>	700,253	637,665	705,353
Firm of origin × firm of destination FE	YES	YES	YES
Year dummies	YES	YES	YES
Time to closure dummies	YES	YES	YES

Financial Muscle

Predetermined (i.e. measured in normal time) characteristics of destination firms

Variables	(1)	(2)	(3)
Firm of destination group affiliated	0.0020 (0.0011)	0.0017 (0.0016)	0.0019 (0.0025)
Same Group	-0.0086 (0.0065)	-0.0062 (0.0087)	-0.0307* (0.0132)
Closure × firm of destination group affiliated	0.0023** (0.0009)	0.0008 (0.0011)	0.0037* (0.0019)
Closure × same group	0.1416*** (0.0081)	0.1541*** (0.0094)	0.1043*** (0.0140)
LEV below 10pct × Closure × same group	-0.0456 (0.0236)		
LEV above 50pct × Closure × same group	0.0133 (0.0118)		
LEV above 90pct × Closure × same group	-0.0483* (0.0233)		
COV below 10pct × Closure × same group		-0.0367** (0.0107)	
COV above 50pct × Closure × same group		-0.0004 (0.0130)	
COV above 90pct × Closure × same group		-0.0153 (0.0156)	
<i>N</i>	700,253	637,665	705,353
Firm of origin × firm of destination FE	YES	YES	YES
Year dummies	YES	YES	YES
Time to closure dummies	YES	YES	YES

Financial Muscle

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 - ▶ ILMs allow groups to provide **EMPLOYMENT INSURANCE** to workers.
 - ▶ This does not necessarily imply that ILMs are efficient

Ongoing work

- **EFFICIENCY**

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- **FIRM BOUNDARIES AND ENDOGENOUS GROUP FORMATION:**

Ongoing work

● EFFICIENCY

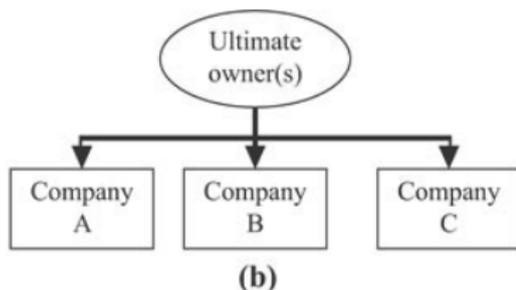
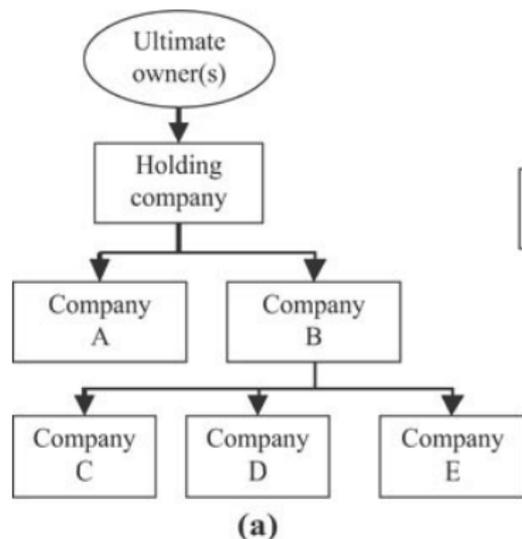
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● FIRM BOUNDARIES AND ENDOGENOUS GROUP FORMATION:

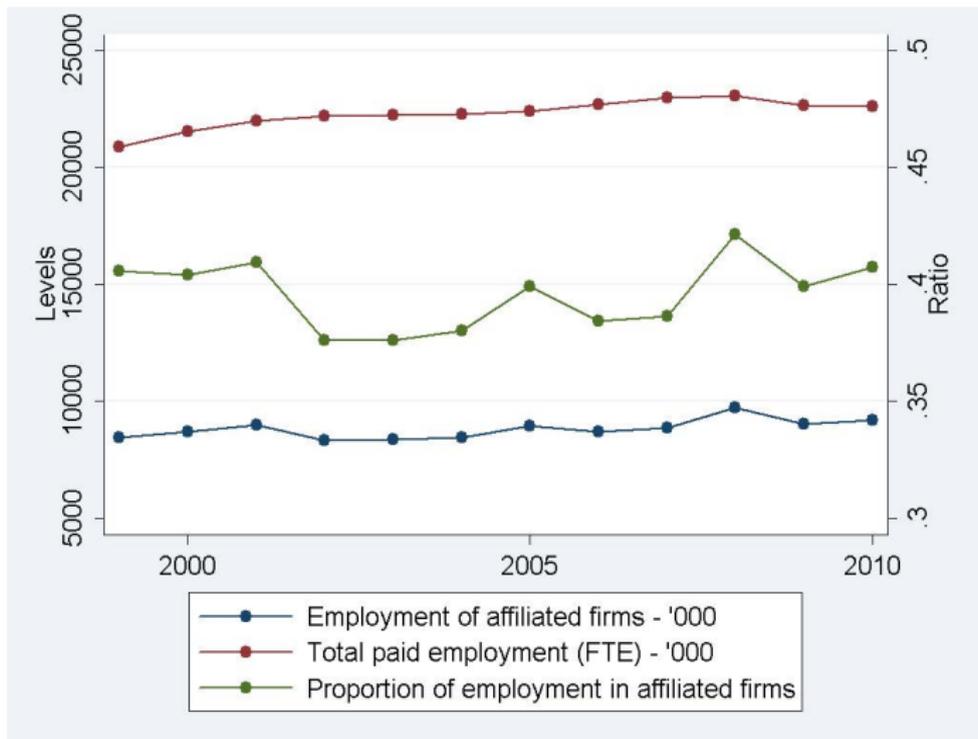
- ▶ what drives the choice between multi-divisional firms and BGs?

What is a Business Group?

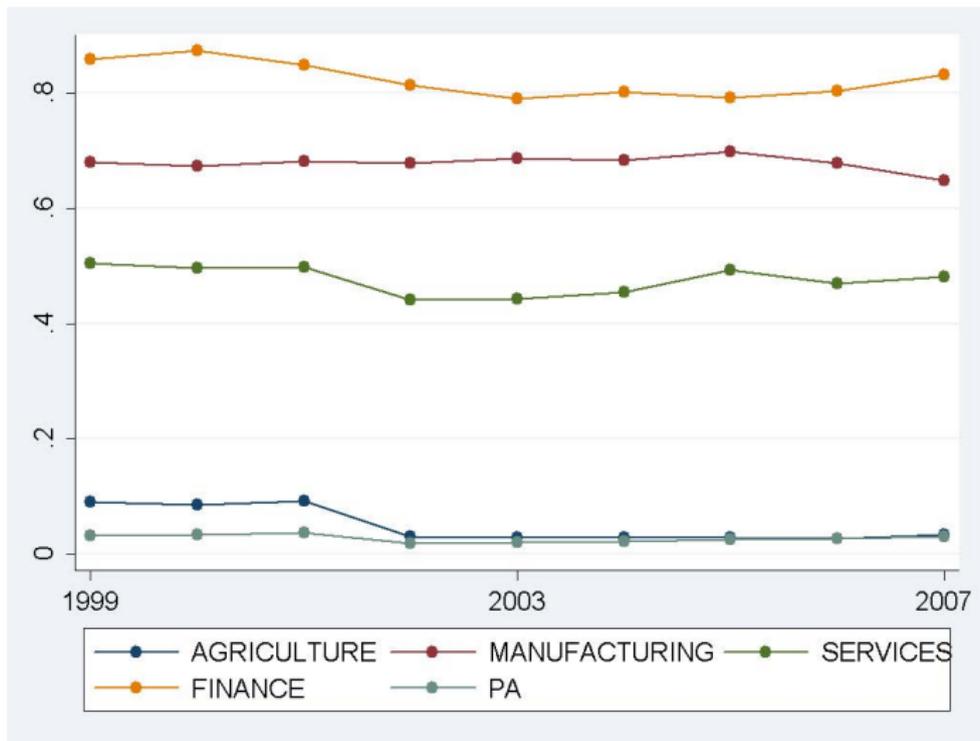
A collection of **LEGALLY INDEPENDENT** firms, possibly operating in multiple industries or locations, partly or wholly owned by a single family or firm that **CONTROLS** the member firms' assets.



Share of total employment in affiliated firms



Share of total employment in affiliated firms across sectors



(French) Business Groups are highly heterogeneous

The size distribution of French business groups is highly **ASYMMETRIC**:

- **RELATIVE FEW LARGE GROUPS**, with many large affiliates, that are **DIVERSIFIED** both from a sectoral and geographical perspective

Groups in the top decile, on average:

- ▶ have 20 firms (top percentile: more than 100 firms).
- ▶ employ in each firm from 600 to 1000 workers (in 1999-2010).
- ▶ operate in 7 different 4-digit industries (top percentile: 15 industries) and in 2 different macrosectors.
- ▶ have firms located in 4 different regions (top percentile: more than 7).

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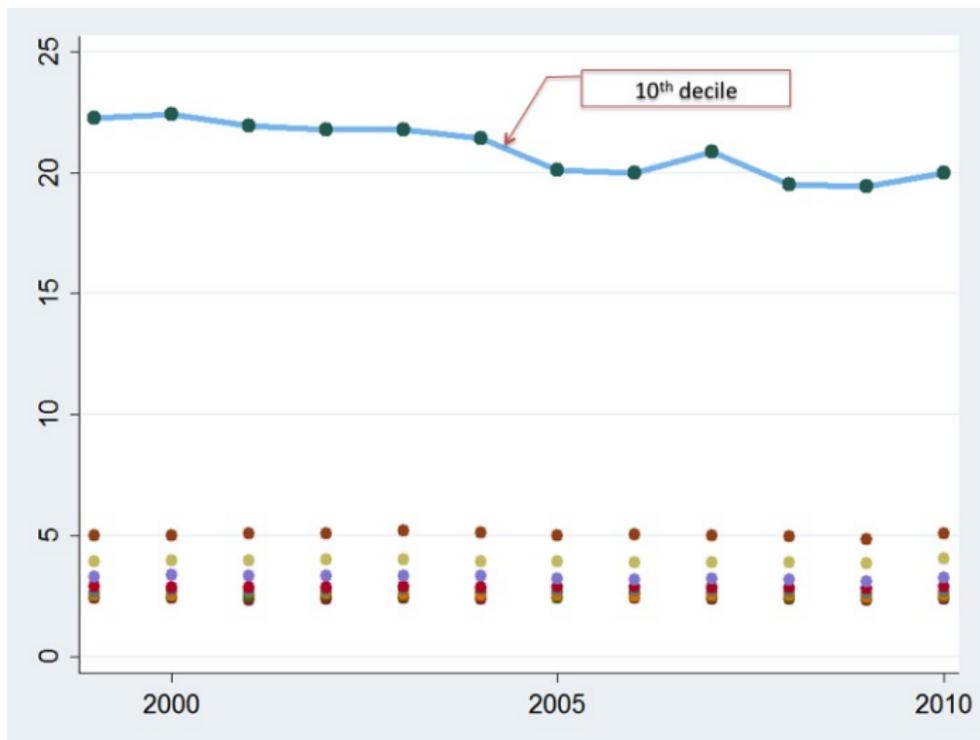
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- **MANY SMALL GROUPS**, with few small affiliates, that are **HARDLY DIVERSIFIED**.

Groups in the rest of the population:

- ▶ have less than 6 firms.
- ▶ employ less than 50 workers per firm.
- ▶ operate in less than 3 different 4-digit sectors.
- ▶ have firms mostly located in the same region.

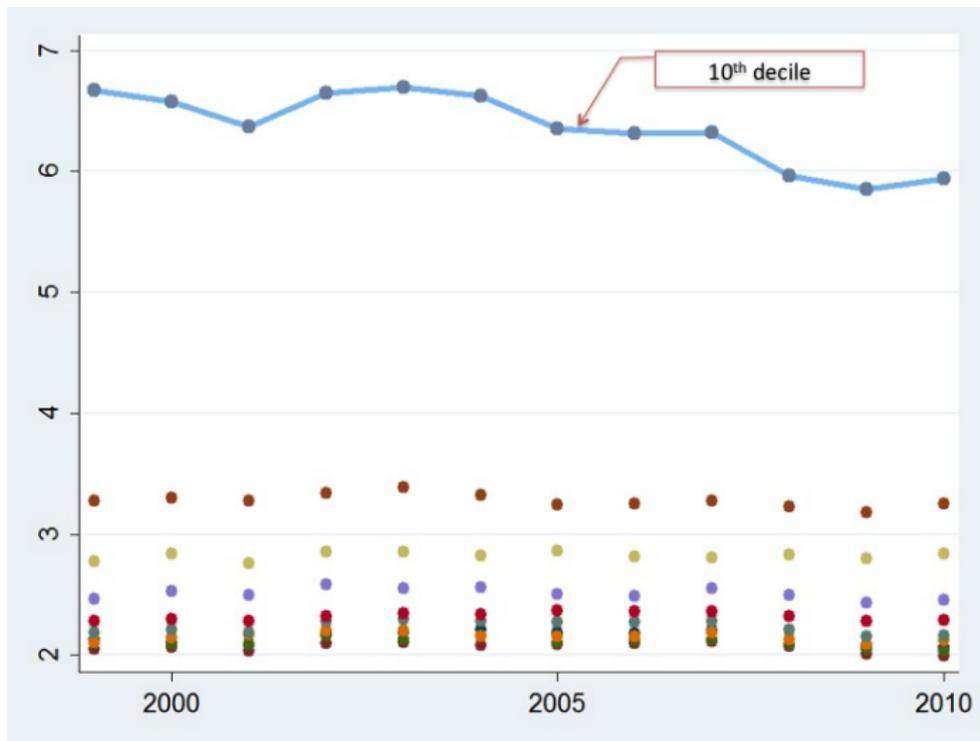
Number of units (by decile of the group size distribution)

[Back](#)

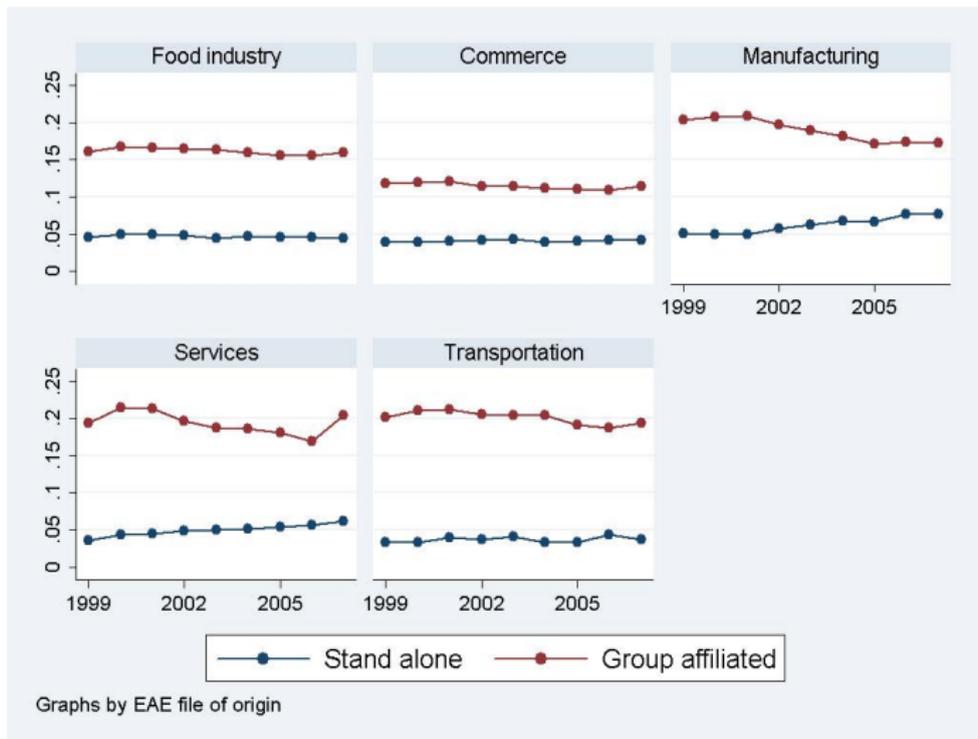
Number of employees per unit (by decile)

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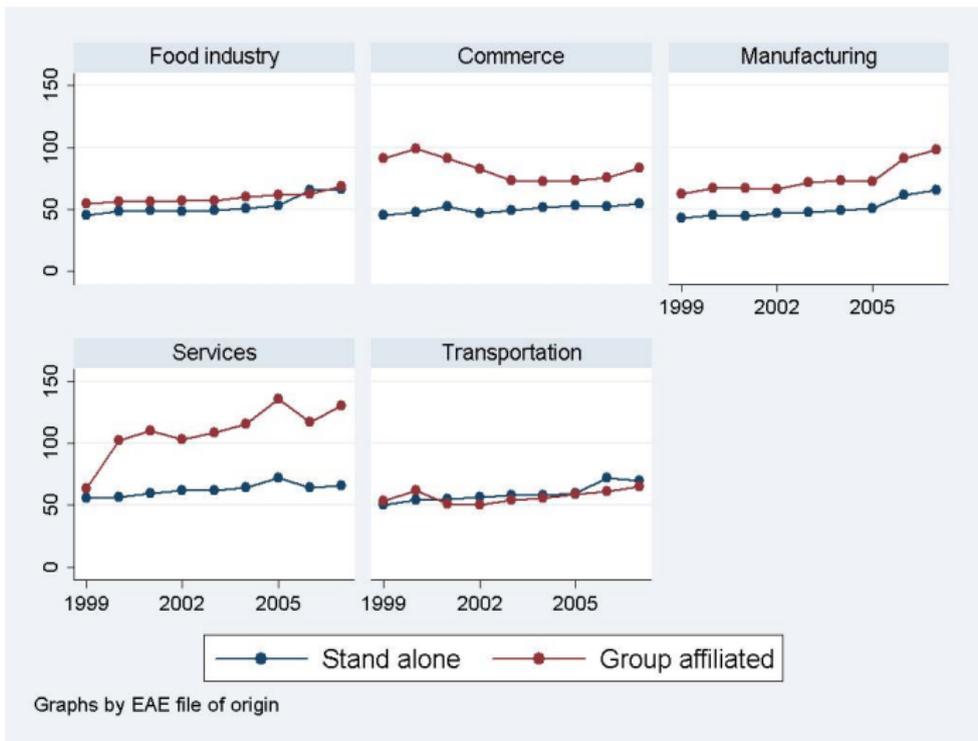
Number of 4-digit participated sectors (by decile)

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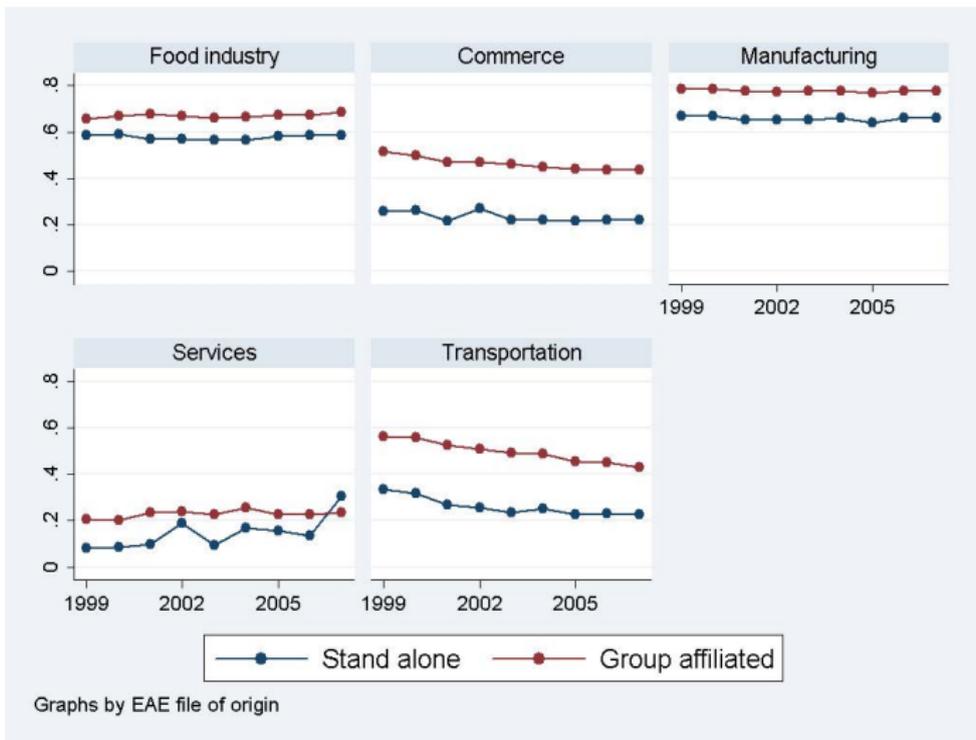
Comparison in terms of size (employment)



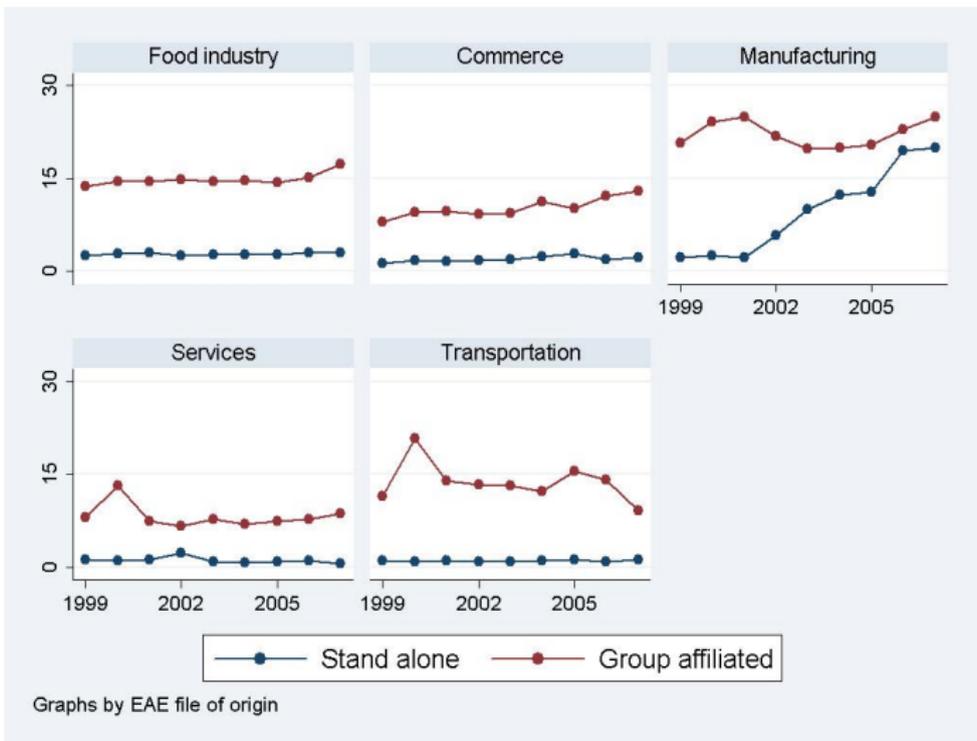
Comparison in terms of value added per worker



Comparison in terms of exports (extensive margin)

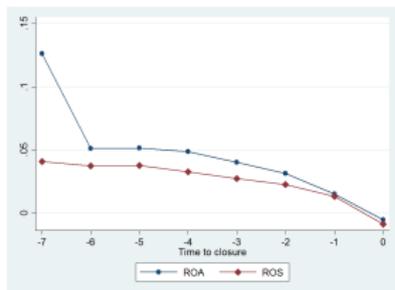


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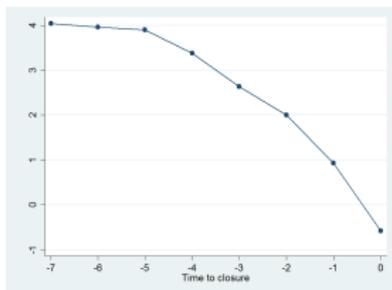


Why do BG affiliated firms close?

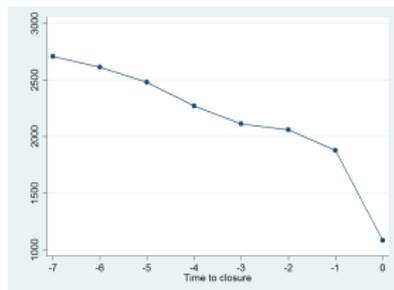
Figure: Performance of group affiliated closing firms



(a) ROA and ROS



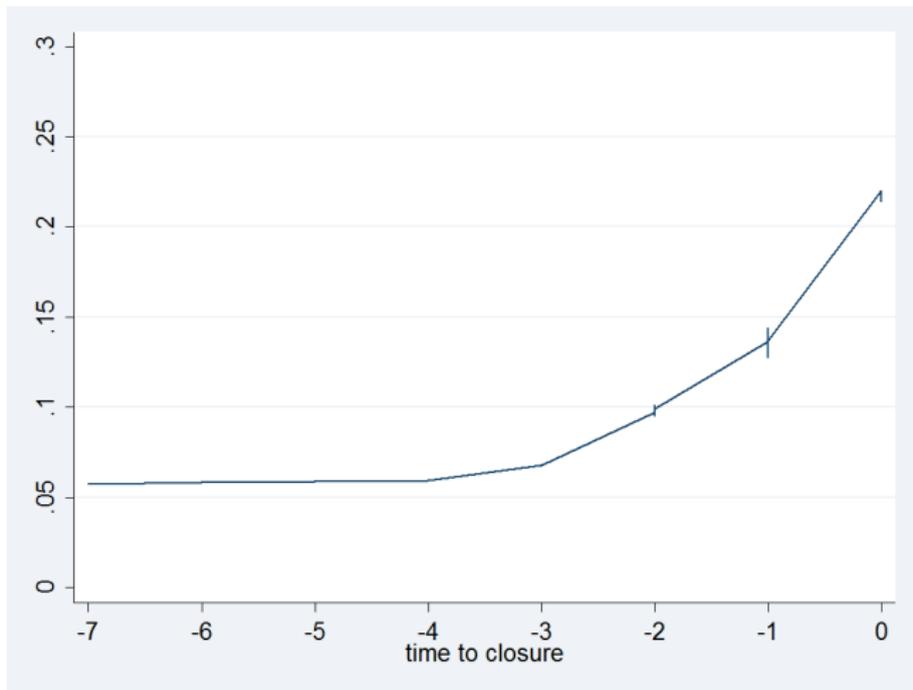
(b) Coverage



(c) Sales

ROA denotes return on assets; ROS return on sales; coverage is the ratio of EBITDA over interest payments.

Excess probability to originate from a closing firm of the same group



Classification of occupations

CODE	CATEGORY
10	Farmers
2	TOP MANAGER/CHIEF OF FIRMS
21	Top managers/chiefs of handicraft firms
22	Top managers/chiefs of industrial/commercial firms with less than 10 employees
23	Top managers of industrial/commercial firms with more than 10 employees
3	MANAGEMENT AND SUPERIOR INTELLECTUAL OCCUPATIONS
31	Healthcare professionals, legal professionals and other professionals
33	Managers of the 'Fonction publique'
34	Professors, researchers, scientific occupations
35	Journalists, media, arts and entertainment occupations
37	Administrative and commercial managers
38	Engineers and technical managers
4	INTERMEDIATE OCCUPATIONS
42	Teachers and other education, training and library occupations
43	Healthcare support occupations and social services occupations
44	Clergy and religious occupations
45	Intermediate administrative occupations in the 'Fonction publique'
46	Intermediate administrative and commercial occupations in firms
47	Technicians
48	Supervisors and 'agents de maitrise'
5	WHITE COLLAR OCCUPATIONS
52	White collar occupations in the 'Fonction publique'
53	Surveillance and security occupations
54	Administrative white collars in firms
55	Sales and related occupations
56	Personal service occupations
6	BLUE COLLAR OCCUPATIONS
62	Industrial qualified workers
63	Handicraft qualified workers
64	Drivers
65	Maintenance, repair and transport qualified workers
67	Industrial non qualified workers
68	Handicraft non qualified workers
69	Agricultural worker

Preliminary step on large closure events: shocked sectors

Coefficients of triple interaction term: Top 10 × Treated Sector × Post shock

Code	Sector	Sales	Employment	Fixed Assets	Total Assets
158H	Manufacture of sugar	2.2373*** (0.1121)	0.1247** (0.0641)	0.8866*** (0.0973)	1.7234*** (0.0950)
159S	Production of mineral water	0.2529*** (0.0763)	0.219*** (0.0573)	0.1773** (0.0695)	0.4395*** (0.0652)
159T	Production of soft drinks	0.8036*** (0.0765)	0.3133*** (0.0572)	0.3011*** (0.0696)	0.455*** (0.0659)
221E	Publishing of journals and periodicals	0.2976*** (0.0705)	0.1672** (0.0784)	0.0845 (0.1149)	0.4163*** (0.0817)
241E	Manufacture of other inorganic basic chemicals	0.2732** (0.1450)	0.3624*** (0.0867)	0.0841 (0.1785)	0.2643** (0.1190)
292D	Manufacture of lifting and handling equipment	0.3458*** (0.0382)	0.1203*** (0.0333)	0.1852*** (0.0421)	0.2665*** (0.0397)
295G	Manufacture of machinery for textile, apparel and leather production	0.1213** (0.0463)	0.1413*** (0.0356)	0.1135*** (0.0413)	0.0172 (0.0427)
314Z	Manufacture of accumulators, primary cells and primary batteries	0.3991** (0.1289)	0.3628*** (0.0841)	0.1303 (0.0888)	0.3601*** (0.0881)
452B	Construction of sundry buildings	0.2568*** (0.0667)	0.3657*** (0.0621)	0.2931*** (0.0681)	0.2557*** (0.0591)
513W	Non specialized wholesale of food	0.8191*** (0.0506)	0.6718*** (0.0429)	1.0424*** (0.0690)	0.6735*** (0.0511)
514N	Wholesale of pharmaceutical goods	0.2061*** (0.0761)	0.4194*** (0.0599)	0.6825*** (0.0940)	0.1433** (0.0631)
518L	Wholesale of electric equipment	0.3374*** (0.0730)	0.2548*** (0.0528)	0.1609** (0.0750)	0.6672*** (0.0592)
526B	Specialized retail sale via mail order	0.317*** (0.0743)	0.2065** (0.0787)	0.2187** (0.1166)	0.3587*** (0.0861)
526H	Vending machine sale	0.5171*** (0.0717)	0.1334** (0.0581)	0.5503*** (0.1044)	0.6267*** (0.0674)
631B	Non harbour cargo handling	0.9739** (0.2930)	0.4194** (0.2032)	1.3155** (0.5487)	0.9637** (0.4063)
743B	Technical analyses, testing and inspections	0.5515*** (0.1431)	0.5986*** (0.1444)	0.6417*** (0.1279)	0.6094*** (0.1957)

← Back

Preliminary step on large closure events: non shocked sectors

Coefficients of triple interaction term: Top 10 × Treated Sector × Post shock

Code	Sector	Sales		Employment		Net PPE		Total Assets	
		Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.
Panel A									
155C	Manufacture of cheese	0.0567	(0.1120)	0.056	(0.0653)	-0.0538	(0.0973)	-0.0885	(0.0948)
158A	Industrial manufacture of bread and fresh pastry	0.0979	(0.0762)	0.0184	(0.0572)	0.1385**	(0.0696)	0.1462**	(0.0653)
158P	Processing of tea and coffee	0.182	(0.1342)	-0.0227	(0.0951)	0.3542**	(0.1309)	0.4039***	(0.1351)
174C	Manufacture of other made-up textile articles	-0.0828	(0.0860)	0.0076	(0.0691)	-0.1659	(0.0992)	-0.101	(0.0626)
211C	Manufacture of paper and paperboard	0.4775	(0.2567)	0.0643	(0.1506)	0.2749	(0.3059)	0.415	(0.2286)
212E	Manufacture of household and sanitary goods and of toilet requisites	0.2567	(0.3281)	0.2485	(0.1699)	-0.1344	(0.2956)	0.3329	(0.2191)
222C	Printing n.e.c.	-0.0648	(0.1245)	-0.1083	(0.1394)	-0.0294	(0.1385)	-0.1544	(0.1018)
241J	Manufacture of fertilizers and nitrogen compounds	0.2246	(0.1708)	0.0677	(0.0800)	0.0539	(0.1530)	-0.0719	(0.1234)
251E	Manufacture of other rubber products	-0.1245	(0.1126)	-0.1283	(0.1078)	-0.2645**	(0.1045)	-0.1652**	(0.0769)
252C	Manufacture of plastic packing goods	-0.0712	(0.1114)	-0.2103	(0.1057)	-0.1239	(0.1036)	-0.1026	(0.0767)
252H	Manufacture of plastic-based technical parts	-0.0422	(0.1054)	-0.0152	(0.0968)	0.0148	(0.0793)	-0.0055	(0.1009)
271Y	Manufacture of basic iron and steel and of ferro-alloys	-0.3344	(0.3665)	-0.3019	(0.2671)	-0.4736	(0.4892)	-0.6421	(0.4019)
284B	Cutting, pressing	-0.3154	(0.2233)	-0.1033	(0.2154)	-0.3335	(0.2529)	-0.3579	(0.2532)
287G	Manufacture of fasteners and screw machine products	-0.0202	(0.0761)	-0.0299	(0.0585)	0.2717***	(0.0830)	-0.0394	(0.0784)
312A	Manufacture of low tension electricity distribution and control apparatus	-0.2312	(0.1588)	0.0022	(0.1029)	-0.2777	(0.1737)	-0.0323	(0.1285)
321C	Manufacture of electronic active components	0.121	(0.1953)	0.1131	(0.1553)	0.1836**	(0.0358)	0.4451	(0.2184)
332B	Manufacture of scientific instruments	0.0783	(0.1251)	0.0791	(0.1001)	-0.0199	(0.1377)	0.244	(0.1410)
333Z	Manufacture of industrial process control equipment	0.3769	(0.4855)	0.2413	(0.4318)	0.1533	(0.4911)	0.3922	(0.5689)
361C	Manufacture of other office and shop furniture	-0.0731	(0.1005)	0.1156	(0.1006)	-0.0469	(0.1334)	-0.0115	(0.0835)
503A	Wholesale of motor vehicle parts and accessories	-0.1897	(0.1397)	0.0043	(0.1005)	-0.1746	(0.2648)	-0.317	(0.1991)
524H	Retail sale of furniture	-0.1131	(0.0745)	0.0526	(0.0787)	-0.1463	(0.1165)	0.0388	(0.0861)
551A	Tourism hotels and motels with restaurant	-0.0594	(0.1271)	0.0069	(0.0691)	-0.1728	(0.0995)	0.0406	(0.0661)
552E	Other provision of tourist lodgings	-0.2419	(0.2629)	0.0171	(0.1911)	-0.2134	(0.2096)	-0.0791	(0.1732)
553B	Fast food restaurants	-0.2298	(0.2077)	-0.0248	(0.1311)	-0.0279	(0.1629)	-0.11	(0.1164)
602M	Interurban freight transports by road	-0.0489	(0.1773)	-0.3054	(0.185)	-0.0777	(0.2802)	-0.1931	(0.2364)
634B	Chartering	0.1338	(0.2922)	0.3158	(0.2025)	0.9454	(0.5502)	0.3389	(0.4055)
642C	Telecommunications, except radio and television transmission	-0.2472	(0.5263)	0.0374	(0.2398)	-0.3482	(0.3337)	-0.2823	(0.3509)
702A	Letting of dwellings	0.2723	(0.1662)	0.213	(0.1452)	0.4838	(0.2982)	0.2892**	(0.1412)
703C	Management of residential building on a fee or contract basis	0.1791	(0.2393)	0.1279	(0.2041)	0.091	(0.34)	-0.0779	(0.216)
723Z	Data processing	-0.0441	(0.2258)	0.1219	(0.1764)	0.0632	(0.2057)	-0.083	(0.2981)
745B	Temporary work	-0.0899	(0.12)	-0.1679	(0.1389)	-0.3882***	(0.1147)	-0.0843	(0.1707)
748B	Film processing	-0.4295	(0.2528)	-0.0335	(0.2390)	-0.1931	(0.2152)	-0.5176	(0.3689)
748D	Packaging activities	-0.0827	(0.2016)	0.0939	(0.1922)	0.1277	(0.1695)	0.1059	(0.2850)

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Preliminary step on large closure events: non shocked sectors

Coefficients of triple interaction term: Top 10 × Treated Sector × Post shock

Code	Sector	Sales		Employment		Net PPE		Total Assets	
		Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.
Panel B									
151E	Industrial production of meat products	-0.1239	(0.0907)	-0.1562***	(0.0544)	-0.1699**	(0.0794)	-0.0827	(0.0791)
158V	Manufacture of other food products n.e.c.	0.125	(0.0765)	-0.1083**	(0.0562)	0.1323**	(0.0661)	0.0044	(0.0646)
159J	Manufacture of cider and other fruit wines	-0.0005	(0.0770)	-0.207***	(0.0572)	-0.0242	(0.0697)	-0.0194	(0.0667)
177C	Manufacture of knitted and crocheted pullovers and similar articles	-0.1914**	(0.0693)	-0.2983***	(0.0459)	-0.2584***	(0.0859)	-0.4604***	(0.0525)
193Z	Manufacture of footwear	0.0465	(0.0470)	-0.1751***	(0.0081)	0.0972	(0.0447)	0.0058	(0.0491)
262C	Manufacture of ceramic sanitary fixtures	-0.2108**	(0.1016)	0.5602***	(0.2001)	-1.2667***	(0.1480)	0.732***	(0.0800)
273G	Wire drawing	-0.7209***	(0.1394)	-0.481***	(0.1054)	-0.076	(0.1905)	-0.3254**	(0.1407)
274C	Production of basic aluminium	-0.1579	(0.1741)	-0.4672***	(0.1300)	-0.4488**	(0.2304)	-0.4841**	(0.1608)
274D	First processing of aluminium	-0.4707***	(0.1388)	-0.1522	(0.1018)	-0.5858***	(0.1919)	-0.4055**	(0.1398)
275E	Casting of light metals	-0.4709***	(0.1307)	-0.203**	(0.0886)	-0.634***	(0.1381)	-0.2364**	(0.1075)
282D	Manufacture of central heating radiators and boilers	-0.2071**	(0.0747)	0.04	(0.0593)	-0.0837	(0.0839)	-0.1415**	(0.0769)
285D	Machining, except turning	-0.3001**	(0.1090)	-0.2024**	(0.0975)	-0.2093	(0.1272)	-0.2665**	(0.1135)
297C	Manufacture of non-electric domestic appliances	-0.2412***	(0.0632)	-0.4931***	(0.0526)	0.0298	(0.0629)	-0.3638***	(0.0526)
311B	Manufacture of high power electric motors, generators and transformers	-0.5346***	(0.0927)	-0.051	(0.0529)	-0.0374	(0.0731)	-0.5803***	(0.0694)
316A	Manufacture of electrical equipment for engines and vehicles n.e.c.	-0.5783***	(0.1686)	-0.876***	(0.1224)	-0.8024**	(0.2476)	-0.3809**	(0.1795)
316D	Manufacture of electric equipments n.e.c	-0.291**	(0.0928)	-0.0673	(0.0528)	0.3278**	(0.0733)	-0.0895	(0.0697)
322B	Manufacture of wired telecommunication equipment	0.0708	(0.1713)	-0.2625**	(0.0839)	-0.4345***	(0.0190)	-0.1622	(0.1865)
351B	Building of civilian ships	-0.1356	(0.1288)	-0.3016**	(0.1390)	-0.632***	(0.1319)	0.1637	(0.1135)
351E	Building and repairing of pleasure and sporting boats	-0.6868**	(0.3232)	-0.0656	(0.2613)	0.283	(0.3742)	0.0203	(0.3353)
361A	Manufacture of chairs and seats	-0.3415***	(0.0949)	-0.3873***	(0.1114)	-0.3353**	(0.1370)	-0.2785***	(0.0892)
402C	Distribution and trade of gaseous fuels through mains	-0.1741**	(0.0719)	-0.7448**	(0.0736)	0.4156**	(0.1277)	-0.6247***	(0.2069)
452C	Construction of civil engineering structures	-0.2342***	(0.0528)	0.1135**	(0.0463)	-0.0794	(0.0482)	-0.2133**	(0.0444)
452D	Underground works	0.1282**	(0.0531)	-0.1348**	(0.0464)	-0.301***	(0.0491)	-0.1686**	(0.0444)
511R	Agents specializing in the sale of particular products	-0.1839**	(0.0756)	0.1707***	(0.0597)	-0.2969***	(0.0964)	-0.3787***	(0.0544)
512A	Wholesale of grain, seeds and animal feeds	-0.2002**	(0.0954)	0.1315**	(0.0740)	-0.0365	(0.1151)	0.2076**	(0.0854)
521A	Retail sale of frozen products	-0.3019***	(0.0626)	-0.0868	(0.0656)	-0.0194	(0.0970)	-0.3047***	(0.0703)
524L	Retail sale of electrical household appliances and radio and television goods	-1.329**	(0.0563)	-1.6156**	(0.0567)	-1.4642***	(0.0567)	-1.6079***	(0.0482)
526A	Home sale	0.5699***	(0.0798)	-0.1062**	(0.0581)	-0.0692	(0.1179)	0.0769	(0.0714)
553A	Traditional style restaurants	-0.8844***	(0.1963)	-0.8128***	(0.1301)	-0.8072***	(0.1646)	-0.7193***	(0.1165)
555C	Collective catering on contract basis	-0.4964**	(0.1819)	-0.296***	(0.0785)	-0.4052**	(0.1298)	-0.1986**	(0.0895)
631D	Refrigerated storage and warehousing	-0.408**	(0.1364)	-0.5204***	(0.1078)	-0.4738	(0.2593)	-0.3923**	(0.1796)
633Z	Activities of travel agencies and tour operators	-0.3732	(0.2202)	-0.4932**	(0.1548)	-0.4787	(0.3994)	-0.4167	(0.3130)
741G	Business and management consultancy activities	-2.8802***	(0.2653)	-2.3639***	(0.2432)	-4.8498***	(0.2156)	-5.0473***	(0.3677)
748K	Related services to production	-1.5058**	(0.1512)	-1.7771***	(0.1508)	-2.9374***	(0.1247)	-2.0213***	(0.1920)
900G	Sanitation, remediation and similar activities	-0.144	(0.1125)	-0.2912**	(0.0799)	-0.7629***	(0.0336)	-0.2052	(0.1154)

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Preliminary step on large closure events: non shocked sectors

Coefficients of triple interaction term: Top 10 × Treated Sector × Post shock

Code	Sector	Sales		Employment		Net PPE		Total Assets	
		Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.	Coeff.	St.Err.
Panel C									
143Z	Mining of chemical and fertilizer minerals	0.1258	(0.0979)	0.1313**	(0.0681)	0.329	(0.2403)	-0.0478	(0.0935)
151F	Cooked meats production and trade	0.22***	(0.0764)	-0.0787	(0.0562)	0.0467	(0.0661)	0.004	(0.0641)
152Z	Processing and preserving of fish and fish products	0.242**	(0.1342)	-0.0409	(0.0951)	-0.1257	(0.1310)	-0.0761	(0.1352)
157C	Manufacture of prepared pet foods	0.0389	(0.0907)	0.1064**	(0.0548)	-0.3305***	(0.0798)	-0.1236	(0.0806)
202Z	Manufacture of veneer sheets, plywood, laminboard, and other panels and boards	0.6224**	(0.1862)	0.2908	(0.2051)	0.5575**	(0.2670)	0.1015	(0.2067)
241A	Manufacture of industrial gases	1.9225***	(0.1857)	0.115	(0.0904)	-0.1902	(0.1573)	1.542***	(0.1373)
244A	Manufacture of basic pharmaceutical products	-0.1494	(0.1453)	0.2146**	(0.0864)	0.6171***	(0.1769)	-0.1511	(0.1187)
287C	Manufacture of light metal packaging	-0.1113	(0.0764)	0.1103**	(0.0586)	-0.2248**	(0.0831)	-0.4511***	(0.0791)
361M	Manufacture of mattresses	0.5525**	(0.1925)	0.1852	(0.1653)	0.4356**	(0.2012)	0.3459**	(0.1623)
365Z	Manufacture of games and toys	0.5282***	(0.1206)	-0.1344	(0.1266)	0.0669	(0.1580)	-0.1034	(0.1055)
515C	Wholesale of metals and metal ores	0.1712**	(0.0754)	0.0838	(0.0598)	0.0112	(0.0932)	0.2622***	(0.0631)
518G	Wholesale of computers, computer peripheral equipment and software	0.2305**	(0.0948)	0.08	(0.0740)	0.3952***	(0.1146)	0.2939***	(0.0840)
602B	Road scheduled passenger land transport	0.3344**	(0.1505)	-0.2067	(0.15)	-0.1365	(0.2971)	0.0184	(0.2183)
631E	Non refrigerated storage and warehousing	0.3621**	(0.1351)	0.0562	(0.1106)	0.6717**	(0.2004)	0.3072	(0.1531)
711A	Short term renting of automobiles	0.6906	(0.545)	0.727**	(0.2702)	-0.1302	(0.5357)	0.3021	(0.4980)
713C	Renting of construction and civil engineering machinery and equipment	0.332	(0.413)	0.631***	(0.1898)	0.3129	(0.3595)	0.2874	(0.3235)
725Z	Maintenance and repair of office, accounting and computing machinery	0.7115**	(0.2189)	-0.0148	(0.1543)	0.7034**	(0.1743)	0.4174	(0.2911)
744B	Advertising agency, advertising consultant	0.1095	(0.1662)	0.4813**	(0.1624)	0.0836	(0.1412)	0.0727	(0.2475)

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