Cracks in the Boards: the Opportunity Cost of Governance Homogeneity

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August, 2022

Are there benefits to diversity?

"Describe what you can bring to this company."

↑ diversity

Are there benefits to diversity?

$\Rightarrow$ We want to test potential changes in firm decisions from $\uparrow$ diversity

Without capturing

- endogenous hiring decisions
- public scrutiny
- cultural change

Policy relevance

This paper

- Uses a gender quota as an exogenous shock on board diversity
- Uses a novel empirical strategy to minimize confounding factors
- Decomposes fully production decisions to identify margin of adjustment
- Identifies the marginal effect of diversification
- *In progress:* Rationalizes empirics with a model on homophily-based hiring

Literature

Gender quotas and outcomes

- Boards of directors: Bertrand et al. (Restud, 2019), Dalvit et al. (Labour economics, 2021), Ahern and Dittmar (QJE, 2012) Matsa and Miller (AEJ, 2013)
- Other: Besley et al. (AER, 2017)

Group diversity and performance

- Hamilton et al. (JPE, 2003), Iranzo et al. (JLE, 2008), Kim and Starks (AER, 2016)

Manager quality and performance

- Bertrand and Schoar (QJE, 2003), Braguinsky et al. (AER, 2015), Rubens (RAND, 2022)

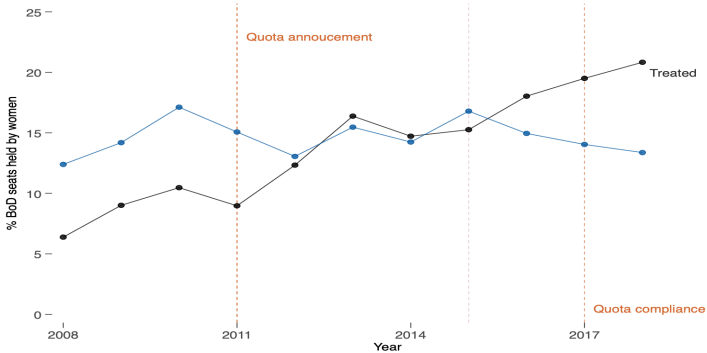
Models on team formation and homophily

- Carley (ASR, 1991), Currarini et al. (Econometrica, 2009)

Outline

Setting

Exogenous ↑ from the French quota



Share of women in BoDs in France by treatment status

Source: Own data

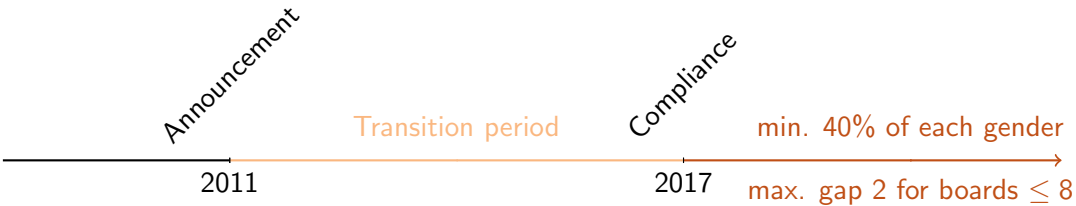
- highest quota and ↑
- Beyond PLCs

types of quota

Equivalent measures in the US: California Senate Bill 826 (2018) & Assembly Bill 979 (2020) ruled unconstitutional.

Specifics of the French quota

- Transition to a high level of diversity



- Firms with a BoD or supervisory board need to comply with the law if
  - ≥ 500 employees for the past three years &
  - net sales or balance sheet ≥ 50 M.euros

More details Enforcement

Firm-level panel

For medium-sized firms

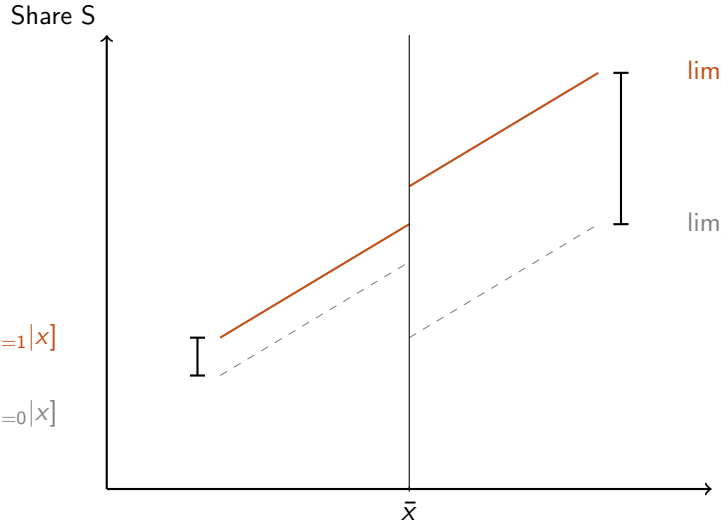
- **Governance composition (BODACC-INPI BoardEx 2008-2018)**
  - Measures of diversity for boards (share/probability of women, foreigners)
  - Other board characteristics (average member experience, # board connections)
- **Administrative fiscal data (FICUS-FARE 2008-2018)**
  - Firm characteristics (2-digit sector code, legal form, age)
  - Balance sheet (production, costs, debt)
- **Annual sectoral survey (ESA 2009-2018)**
  - Decomposed production and cost structure (outsourcing, sub-contracting, advertising)

$\Rightarrow$ 410 individual firms in the private non-agricultural sector

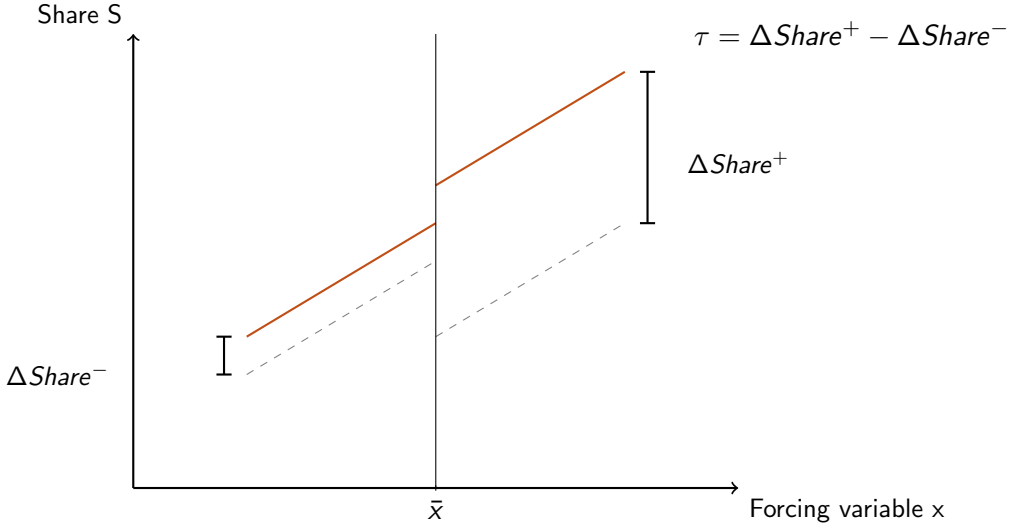
Construction of panel Descriptive statistics

Difference-in-Discontinuity

Identification of Diff-in-Disc



Identification of Diff-in-Disc



Multidimensional fuzzy Diff-in-Disc

First stage:

$$S_{i,t} = \delta_0 + \alpha_1 T_t + \xi_k W_{k,i,t} + \xi_k^* X_{k,i,t}^* + \delta_1 D_{i,t} + ... + \tau(D_{i,t} \times T_t) + \beta_j \Omega_{j(i,t)} + v_{s,t} + \epsilon_{i,t}$$

Second stage:

$$Y_{i,t} = \delta_0' + \alpha_1' T_t + \xi_k' W_{k,i,t} + \xi_k^{*\prime} X_{k,i,t}^* + \delta_1' D_{i,t} + ... + \tau'(\hat{S_{i,t}}) + \beta_j \Omega_{j(i,t)} + v_{s,t} + \epsilon_{i,t}$$

- where:
  - $k = 1, 2$ is one of the forcing variables (employees or revenue)
  - $D_{i,t} = W_{1,i,t} \times W_{2,i,t}$ is a dummy equal to 1 for treated firms
  - $X_{k,i,t}^*$ is the normalized value of the forcing variables
  - "..." stands for the remaining 13 interactions of $X_{k,i,t}^*$, $W_{k,i,t}$ and T_t
  - $v_{s,t}$ are sector-year fixed effects to capture common industry shocks
  - $\beta_j \Omega_{j(i,t)}$ are controls for the log of age, board size, legal form, gender of director and revenue share of debt
  - standard errors are robust clustered at the industry level

Diversity and firm decisions

Profitability ratios

$$\textit{Gross profit margin} = \frac{\textit{Value of production} - \textit{Total costs of production}}{\textit{Value of production}}$$

$$\textit{Net profit margin} = \textit{Gross profit margin} + \frac{\textit{Operating grants} - \textit{Taxes and levies} - \textit{Social costs}}{\textit{Value of production}}$$

$$\textit{Value of production} = \textit{Total revenue} + \textit{stored production} + \textit{capitalized production}$$

$$\textit{Total costs of production} = \textit{cost of goods} + \textit{variation of goods} + \textit{cost of raw materials} + \textit{variation of raw materials} + \textit{external purchases of services} + \textit{labour costs} + \textit{capital costs}$$

Mandate of boards

Governance composition and profitability

Table: Diff-in-disc estimates of profitability ratios

	Share	*Gross π margin*	*Share*	*Net π margin*
Diff-in-Disc	21.42***		21.85***	
	(3.94)		(3.77)	
Share		0.17***		0.19**
		(0.06)		(0.09)
AR confidence set		[0.09 0.23]		[0.08 0.30]
Regression	OLS	IV	OLS	IV
Observations	1,355	1,355	1,354	1,354
Controls	Yes	Yes	Yes	Yes
F-stat	-	29.50	-	33.51
Bandwidths		360-365 to 820-860 employees		

Notes: The regressions use a polynomial of order 1, optimal bands and a uniform kernel. All input shares of production as well as the revenue share of debt that are negative and higher than 100 are excluded. Firms with negative values of grants, taxes, social costs and capitalized production are excluded.All variables are demeaned at the industry year level. All second stage outcome variables are trimmed at the 1% level by year. The regression is ran on firms with boards between 2.5 and 18.5 members in the private non-agricultural sector. The Anderson Rubin confidence sets are calculated following the tf procedure of Lee et al. 2020.

Polynomial robustness Bandwidth robustness

Demand management through external labour

- External labour as a margin of adjustment to variations in demand
  - With a switch from lower-skilled to a lower amount of higher-skilled individuals
  - An across-industry and modern version of Braguinsky et al. (AER, 2015)
    - Arrival of better qualified managers in the cotton-spinning industry in 19th century Japan
    - Efficiency gains in inventory as a proxy for better demand management

External services | External labour

Value of outsider knowledge

Knowledge updating from first newcomer

Table: Diff-in-disc estimates of profitability ratios

	Share	*Gross π margin*	*Share*	*Net π margin*
Diff-in-Disc	0.14***		0.14***	
	(0.03)		(0.03)	
Share		0.26**		0.31**
		(0.11)		(0.12)
AR confidence set		[0.13 0.39]		[0.16 0.46]
Regression	OLS	IV	OLS	IV
Observations	1,355	1,355	1,354	1,354
Controls	Yes	Yes	Yes	Yes
F-stat	-	28.04	-	25.93
Bandwidths		360-365 to 820-860 employees		

Notes: The regressions use a polynomial of order 1, optimal bands and a uniform kernel. All input shares of production as well as the revenue share of debt that are negative and higher than 100 are excluded. Firms with negative values of grants, taxes, social costs and capitalized production are excluded.All variables are demeaned at the industry year level. All second stage outcome variables are trimmed at the 1% level by year. The regression is ran on firms with boards between 2.5 and 18.5 members in the private non-agricultural sector. The Anderson Rubin confidence sets are calculated following the tf procedure of Lee et al. 2020.

Risk of inertia Sudden effort of incumbents

Knowledge and types of diversification

- Within-board diversity ⇑
  - Unique skills/ characteristics of newcomers (age and nationality)
  - with potential to expand knowledge
- Network diversity ⇑
  - Unique board links
  - with potential to imitate competitor/benefit from supplier link

Regression table Implications of homophily

Conclusion

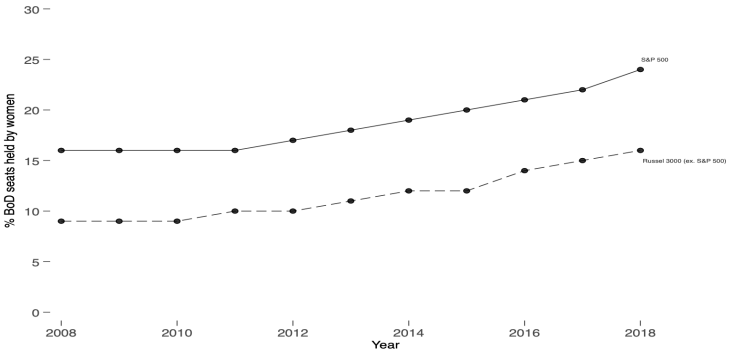
This paper

- Uses a gender quota as an exogenous shock on board diversity
- Uses a novel empirical strategy to minimize confounding factors
  - 0.16% $\uparrow$ in profitability from 1% $\uparrow$ in the share of women
- Decomposes fully production decisions
  - $\Uparrow$ efficiency in demand management by upgrading the quality of external labour
- Identifies the marginal effect of diversification
  - Strongly decreasing returns to newcomers highlight knowledge updating
  - Within-board and network diversity play a role in changing firm decisions on inputs

$\Rightarrow$ Find evidence for an opportunity cost of governance homogeneity

Appendix

Natural ↑ diversity in boards of directors

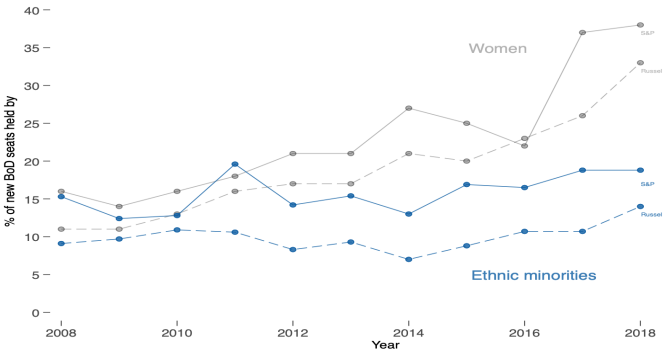


- % women

Share of women in BoDs by capitalization size in the US

Source: Institutional Shareholder Services (ISS)

Natural ↑ diversity in boards of directors



- % women
- % ethnic minorities

Share of new BoD members that are from a minority by capitalization size in the US

Source: Institutional Shareholder Services (ISS)

benefits to diversity?

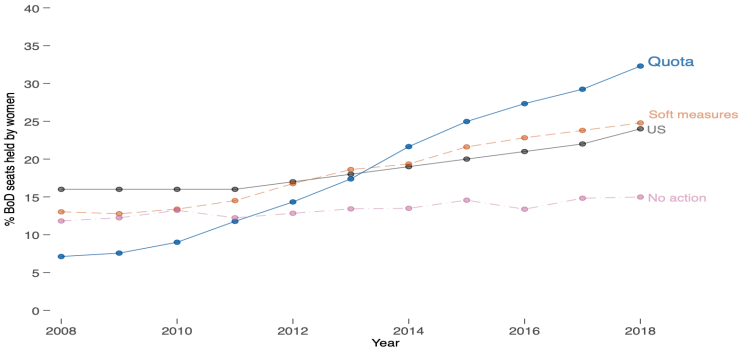
Future policies

- Provisional agreement on "women on boards" deal in the EU
  - in publicly listed companies (PLCs) with $\geq$ 250 employees
  - 40% of non-executive directors should be women by june 2026
  - yearly reports on gender balance and goals to attain them
  - penalties discussed (fines, annulment of nomination)

- Quotas in executive and management committees in France (voted in December 2021)
  - in firms with $\geq$ 1000 employees
  - 30% women in 2027 and 40% in 2030

Diversity in boards

Exogenous ↑ from quotas



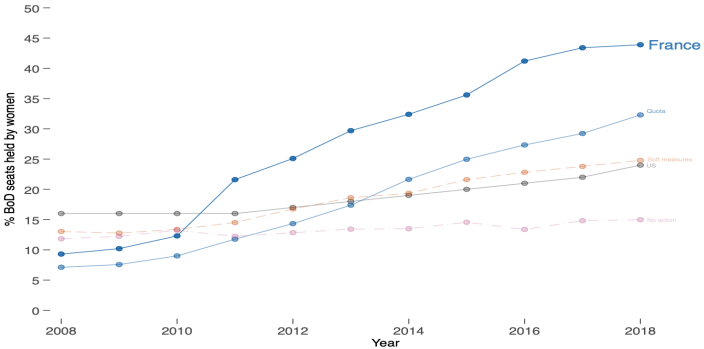
Share of women in BoDs by type of policy in the EU vs US

Source: European Institute for Gender Equality (EIGE) and ISS

Level of constraint & exogeneity of ↑

Equivalent measures in the US: California Senate Bill 826 (2018) & Assembly Bill 979 (2020) ruled unconstitutional.

Exogenous ↑ from the French quota



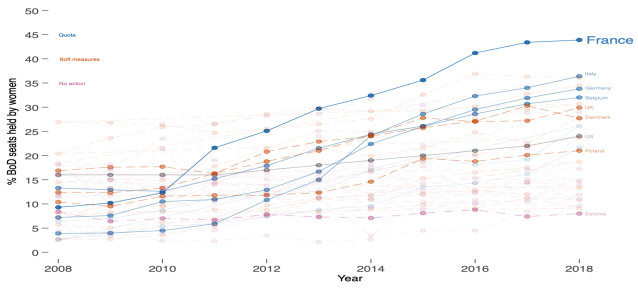
Share of women in BoDs by type of policy in the EU vs US

Source: European Institute for Gender Equality (EIGE) and ISS

- highest quota and ↑

Equivalent measures in the US: California Senate Bill 826 (2018) & Assembly Bill 979 (2020) ruled unconstitutional.

Diversity policies in the EU



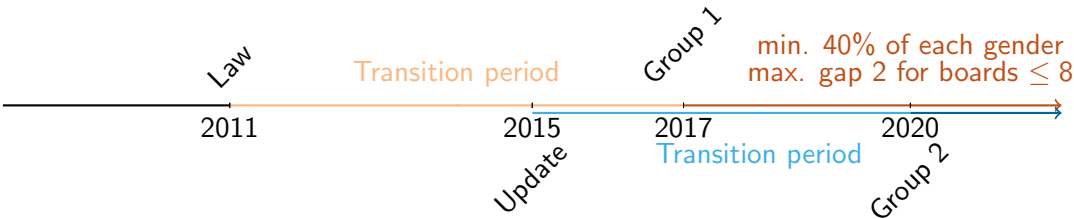
Share of women in BoDs by type of policy in the EU vs US

Source: European Institute for Gender Equality (EIGE) and ISS

The French quota

More details on the French quota

- At the end of 2014, other firms required to comply by 2020 (Law n° 2014-873)



- Firms targeted by the extension (group 2)
  - ≥ 250 employees for the past three years &
  - net sales or balance sheet ≥ 50 M.euros

Main specifics

Enforcement

- BoD members incur high costs for non-compliance
  - Discontinuation of BoD-related salary until compliance achieved
  - Any nomination not leading to compliance is void

Main specifics

Information on corporate governance

- Individual-firm-level information (BODACC-INPI & BoardEx)
  - Board change announcements
    - specific mandate (CEO, board member, president of board, vice-president)
    - start and end dates of mandate
  - individual characteristics (full name, age, nationality)
    - match with repertory of gender-name associations to retrieve gender
    - age and nationality are available for 60% of members

- Individual-firm-level panel (2008-2018)
  - Full job history of individuals
  - Common individuals across firms
    - additional characteristics (board experience, # board seats)

$\Rightarrow$ 5,400 individuals

Panel data

Descriptive statistics

Table: GOVERNANCE CHARACTERISTICS OF FIRMS

	Full sample			Restricted sample		
	Mean	*Sd*	*Count*	*Mean*	*Sd*	*Count*
Size of board	5.96 %	3.09	2,695	6.18 %	3.27	1,414
Share of women in board	15.09 %	17.17	2,695	14.57 %	16.64	1,414
Woman director	7.87 %	26.93	2,695	7.36 %	26.11	1,414
Board of director legal form	87.01 %	33.62	2,695	85.57 %	35.15	1,414

Boards can legally range from 3 to 18 members. In practice, we allow firms with 2.5 to 18.5 members as we calculate month-equivalent presence for each member. We keep firms in the private non-agricultural sector.

Descriptive statistics

Table: Production characteristics of firms

	Full sample			Restricted sample		
	Mean	*Sd*	*Count*	*Mean*	*Sd*	*Count*
Gross Profit Margin	12.91 %	11.51	2,650	13.36 %	11.41	1,387
Net Profit Margin	0.38 %	9.06	2,654	0.56 %	9.44	1,398
Input Share of Production	25.03 %	25.14	2,662	24.38 %	25.31	1,411
External Share of Production	31.59 %	17.04	2,646	32.77 %	17.57	1,395
Labour Share of Production	24.85 %	13.36	2,643	24.67 %	12.94	1,406
Capital Share of Production	4.65 %	5.76	2,665	4.39 %	5.14	1,393
Inventory Share of Production	0.06 %	1.09	2,639	0.08 %	1.01	1,380
Debt Share of Revenue	12.48 %	17.04	2,695	13.86 %	18.10	1,414
Age of Firm	39.57	20.85	2,695	39.47	20.37	1,414

Boards can legally range from 3 to 18 members. In practice, we allow firms with 2.5 to 18.5 members as we calculate month-equivalent presence for each member. We keep firms in the private non-agricultural sector.

Data description

Empirical strategy

A fuzzy difference-in-discontinuity (Grembi et al. (2016))

- $\Uparrow$ share of women is instrumented with eligibility to the law ($T \times D$)
- for firms around the cutoffs of compliance (optimal bands)

Issues with other strategies

Specification

Empirical strategy

Estimating the effect of a diversity quota on firm decisions by:

- instrumenting exposure to the law with the gap to achieve the target
  $\rightarrow$ endogeneity concerns from using past shares

- using a difference-in-difference approach
  $\rightarrow$ potential correlation between firm size and share (public scrutiny)
  $\rightarrow$ potential correlation between firm size and firm outcomes (market power)

- using a regression discontinuity method
  $\rightarrow$ pre-law discontinuity leading to wrong estimation

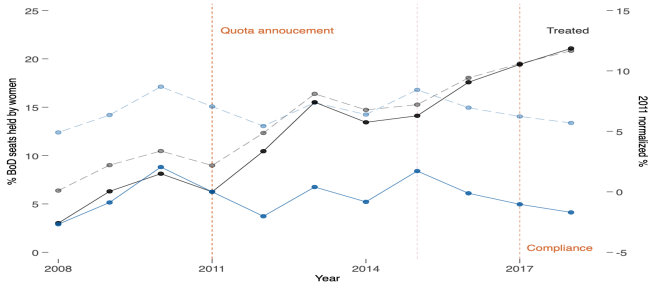
Pre-quota discontinuity

1980s labour code stipulates in firms with $\geq$ 500 employees

- an additional union representative can be elected
  (1982 L412-11, L2143-4)
- union representatives get at least 5 hour more allowed union work per month
  (1985 L412-20, L2143-13)
- get an extra 12 hours to prepare for negotiations with the firms' executives
  (1985 L412-20, L2143-13)

Slight modifications occurred in 2007: union representatives across firm size were allotted additional hours. In firms with $\geq$ 500 employees this was increased by four instead of three for those below that cutoff. Firms with $\geq$ 500 employees also got 2 additional hours to prepare for negotiations.

Pre-quota discontinuity



(Normalized) share of women in BoDs by type of policy in the EU vs US

Source: Own data

Empirical strategy

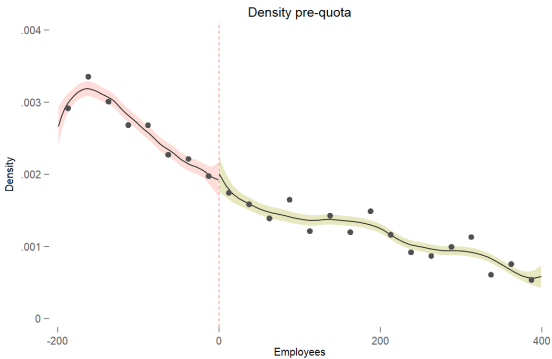
Identification conditions and assumptions

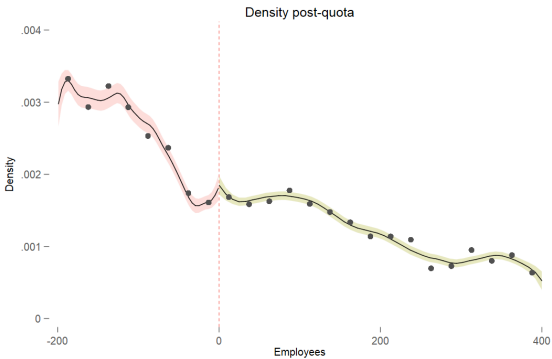
- Conditions
  - Local continuity
    - non-manipulation of the running variables Test
    - balanced covariates Test
  - Local monotonicity
    - probability of treatment jumps at the cutoff First stage
  - Parallel pre-trends Test
- Assumption
  - Local continuity of unobservables

Specification

Density of the running variable

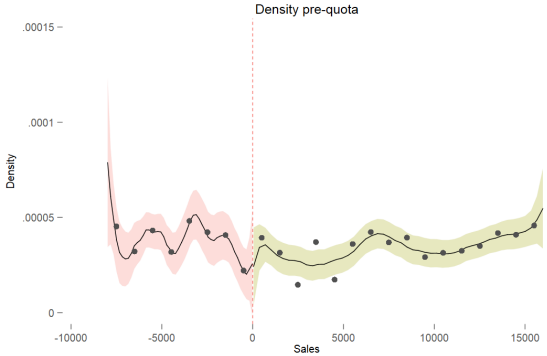
Figure: Employees as the threshold

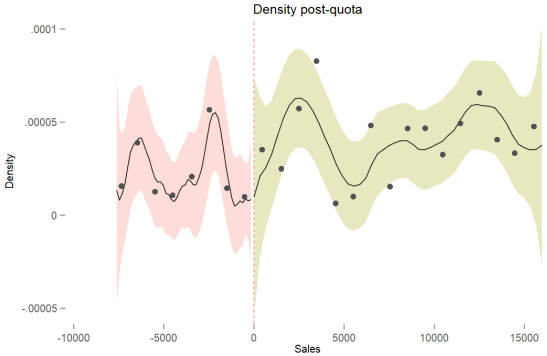




Density of the running variable

Figure: Sales as the threshold





Conditions

Balance test on firm covariates

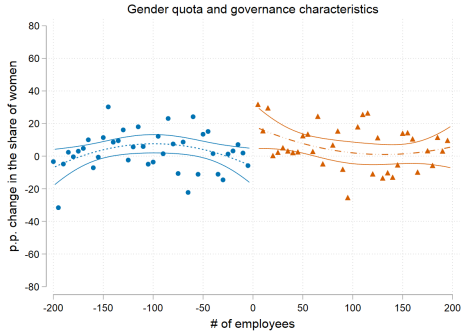
Table: RD ESTIMATES FOR COVARIATES

	Board size	*Age*	*BoD legal form*	*Share debt*	*Woman director*
RD	0.33	0.00	-0.02	-0.13	0.10
	(0.66)	(0.01)	(0.04)	(1.64)	(0.18)
Observations	418	418	365	377	418
Bandwidths			355 to 780-800 employees		

Notes: The regressions follow the usual specification but exclude years after 2010.

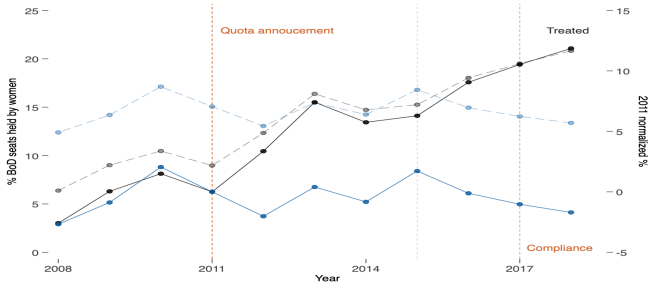
Conditions

Evidence on the first stage



Conditions

Pre-quota parallel trends



(Normalized) share of women in BoDs by type of policy in the EU vs US

Source: Own data

Conditions

Boards are responsible for firm performance

The Board is charged with the overall conduct [...], direction and performance of the Company
Airbus

In practice, a BoD

- co-defines the firms' strategic business plan & determines its main goals
- draws up the firms' annual accounts
- presents a management report to the annual general assembly meeting
- supervises management to ensure the day-to-day consistency with its plan
- appoints and supervises the CEO

Mandate of supervisory boards

Supervisory boards have lower responsibilities than BoDs:

- they only control the regularity of the company's management ex-post
- have co-decision rights only upon approval by the CEO or the management board (Directoire)
- do not draw up the annual accounts
- have lower civil and criminal liability

Boards and performance

Polynomial robustness

Table: Diff-in-disc estimates of profitability ratios

	Share	*Gross π margin*	*Share*	*Net π margin*
Diff-in-Disc	21.34***		21.43***	
	(4.35)		(4.21)	
Share		0.16**		0.23**
		(0.07)		(0.11)
AR confidence set		[0.05 0.25]		[0.10 0.26]
Regression	OLS	IV	OLS	IV
Observations	1,355	1,355	1,354	1,354
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F-stat	-	24.09	-	35.91
Bandwidths		360-365 to 820-860 employees		

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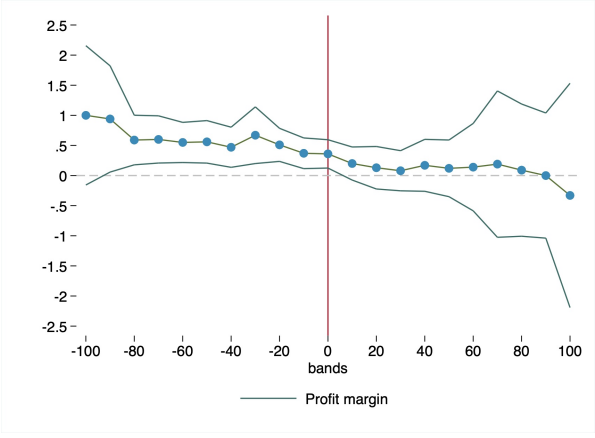
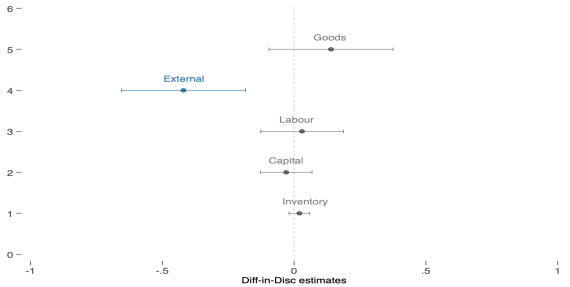
Main results

Diff-in-Disc estimates with different bandwidths



Main results

Changes in quickly adjustable and relevant costs



Notes: Diff-in-Disc estimates of input ratios following the baseline specification.

Prior on input changes | Regression tables | Importance of external purchases

Demand management

Decomposing profitability into firm decisions on inputs

Boards can require management to change firm purchases of

- $\frac{Goods\ and\ raw\ materials}{Value\ of\ production} \rightarrow$ Timing of renegotiation or technological change
- $\frac{External\ purchases\ of\ services}{Value\ of\ production} \rightarrow$ By definition more quickly adjustable
- $\frac{Labour}{Value\ of\ production} \rightarrow$ Strict firing rules and high social costs
- $\frac{Capital}{Value\ of\ production} \rightarrow$ Timing of return on investment

They can also change the level of their inventory $\frac{stored\ production}{Value\ of\ production} \rightarrow$ quick efficiency gains

Summary graph

Input ratios

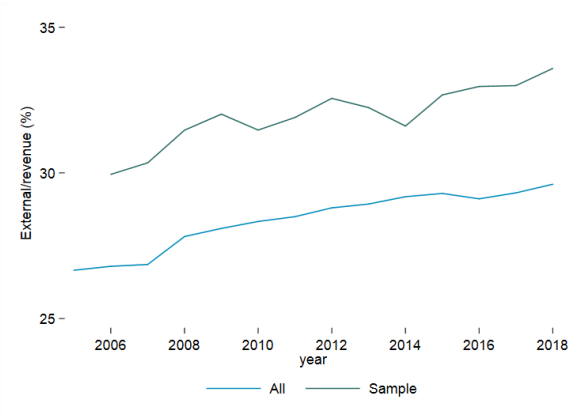
Table: Diff-in-disc estimates of profitability ratios

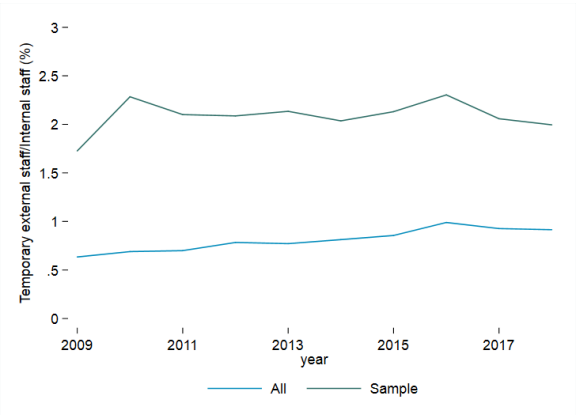
	Share	*Goods*	*External*	*Labour*	*Capital*	*Inventory*
Diff-in-Disc	22.42***					
	(3.77)					
Share		0.14	-0.42***	0.03	-0.03	0.02
		(0.12)	(0.12)	(0.08)	(0.05)	(0.02)
AR confidence set			[-0.56 -0.28]			
Regression	OLS	IV	IV	IV		
Observations	1,348	1,348	1,349	1,349	1,348	1,364
1,351						
Controls	Yes	Yes	Yes	Yes	Yes	Yes
F-stat	-	35.29	35.57	25.26	34.70	34.89
Bandwidths	360-365 to 820-860 employees					

Notes: The regressions use a polynomial of order 1, optimal bands and a uniform kernel. All input shares of production as well as the revenue share of debt that are negative and higher than 100 are excluded. Firms with negative values of grants, taxes, social costs and capitalized production are excluded.All variables are demeaned at the industry year level. All second stage outcome variables are trimmed at the 1% level by year. The regression is ran on firms with boards between 2.5 and 18.5 members in the private non-agricultural sector. The Anderson Rubin confidence sets are calculated following the tf procedure of Lee et al. 2020.

Summary graph

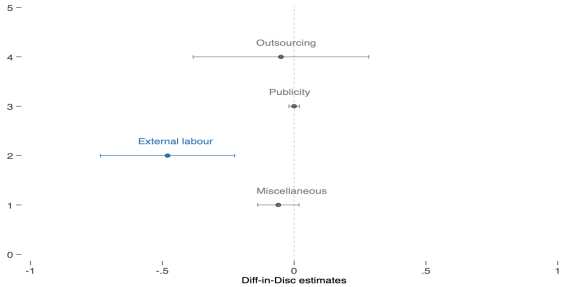
Importance of external costs and interim workforce





Summary graph

Changes in flexibly adjustable labour



Notes: Diff-in-Disc estimates of input ratios following the baseline specification.

Prior on input changes
Regression table
Demand management

Decomposing external purchases of services

External purchases of services are composed of

- $\frac{Outsourcing}{Value\ of\ production}$ → Timing of in/out-house switch
- $\frac{Publicity}{Value\ of\ production}$ → Timing of return on investment
- $\frac{External\ labour}{Total\ labour}$ → By definition more quickly adjustable More details
- $\frac{Miscellaneous}{Value\ of\ production}$ → Fixed types of costs (insurance, rent)

Summary graph

On temporary workers in France

- Temporary contracts can last for max. 18 months
- They can be shorter than 1 month
  - 87 % of temporary contracts
- They are allowed for specific missions
  - seasonal work
  - temporary growth of the firm
- They are used for both low and high-skilled workers

Decomposing external purchases

Changes in External input ratios

Table: Diff-in-disc estimates of revenue/employment shares

	Share	*Outsourcing Revenue*	*Publicity Revenue*	*Miscellaneous Revenue*	*External labour Employment*
Diff-in-Disc	29.14***				
	(6.18)				
Share		-0.05	0.00	-0.06	-0.48***
		(0.17)	(0.01)	(0.04)	(0.13)
AR confidence set					[-0.75 ; -0.21]
Regression	OLS	IV	IV	IV	IV
Observations	876	876	876	876	876
Controls	Yes	Yes	Yes	Yes	Yes
F-stat	-	22.19	22.19	22.19	22.19
Bandwidths		355 to 780-800 employees			

Notes: The regressions have a polynomial of order 1, optimal bandwidth and a uniform kernel. The Anderson Rubin confidence sets are calculated following the tf procedure Summary graph

Risk of inertia in homogeneous groups

The more similar a board is, with directors of the same age, gender, background, education, the more likely they are not to see the iceberg they are driving into
Les Echos

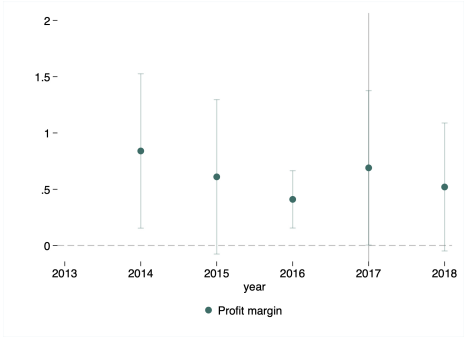
- Lack of knowledge updating → +
- Path-dependency of decisions → unclear
- Incentives of a strongly unified group → -

→ Testing for non-linearities of effect by controlling for squared share

Knowledge updating

Persistence of estimates

(a) Profitability by year



Notes: The figures display yearly estimates which we retrieve by excluding any other year in our instrument.

Diversification of boards

Table: Diff-in-disc estimates of diversity measures

	Within-Board diversity			Network diversity		
	Share	$\frac{young}{directors}$	$\frac{foreigners}{directors}$	*Share*	$\frac{New\ links\ from\ women}{Women}$	$\frac{New\ links\ from\ men}{Men}$
Diff-in-Disc	27.86***			24.90***		
	(6.18)			(5.71)		
Share		0.18***	0.02**		0.27***	0.19
		(0.05)	(0.00)		(0.10)	(0.29)
AR confidence set		[0.04 ; 0.32]			[0.01 ; 0.52]	
Regression	OLS	IV	IV	OLS	IV	IV
Observations	893	893	893	1,226	1,226	1,226
Controls	Yes	Yes	Yes	Yes	Yes	Yes
F-stat	-	20.28	20.28	-	19.08	19.08
Bandwidths	355 to 780-800 employees					

Notes: The regressions have a polynomial of order 1, optimal bandwidth and a uniform kernel. The Anderson Rubin confidence sets are calculated following the tf procedure

Summary results

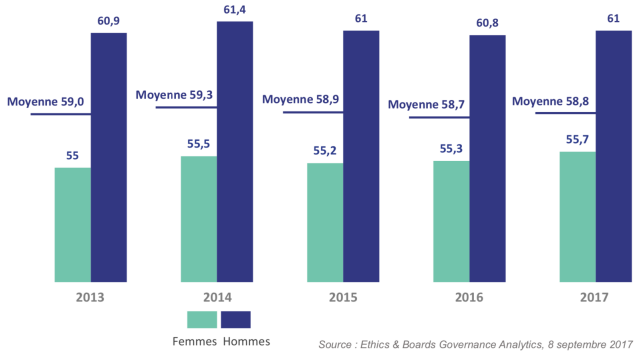
Homophily in groups

- Homophily in boards can lead to costs due to hiring based on proximity
  - rather than individual skills → risk of lower-quality members
  - rather than complementarity → risk of narrow shared knowledge (Carley (ASR, 1991))

Summary results

Age of members

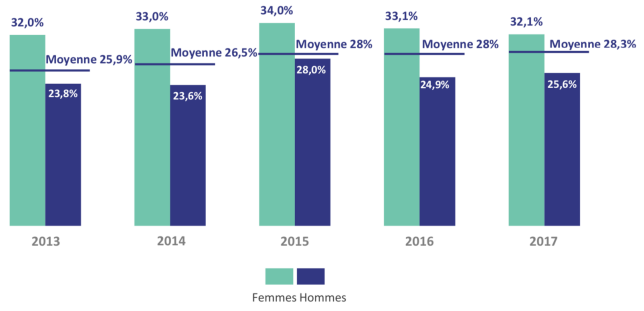
SBF120
Évolution de l'Âge moyen des membres de Conseils 2017



Source : Ethics & Boards Governance Analytics, 8 septembre 2017

Nationality of members

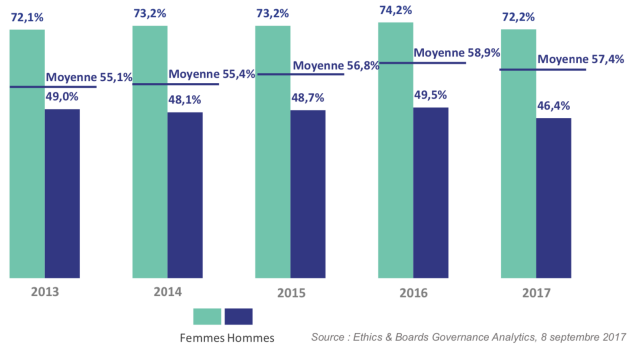
SBF120
Évolution de l'Internationalisation des membres de Conseils



Source : Ethics & Boards Governance Analytics, 8 septembre 2017

Independance of members

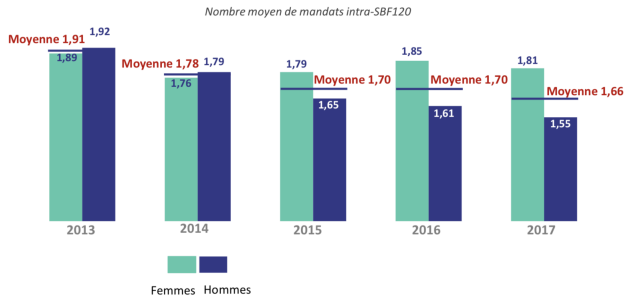
SBF120
Évolution de l'Indépendance des membres de Conseils



Source : Ethics & Boards Governance Analytics, 8 septembre 2017

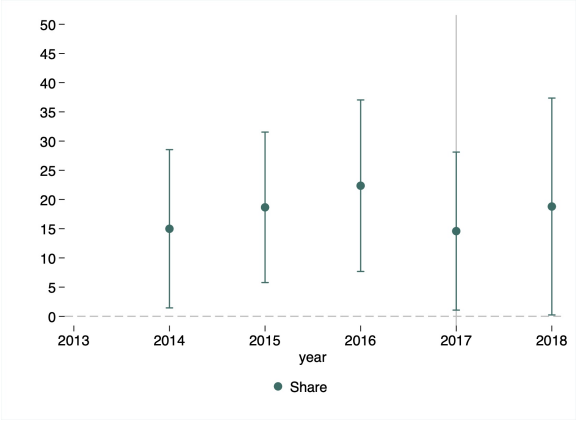
Seats on other boards

SBF 120
Évolution du Cumul de Mandats intra-SBF120 des membres de Conseil



Source : Ethics & Boards Governance Analytics, 8 septembre 2017

Evolution of leadership composition



Evolution of cost structure and performance