
How R&D tax credit and cluster policies interact: the case of the French « Pôles de Compétitivité » for SMEs and mid-sized firms

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(joint work with Vincent Dortet Bernadet)

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Impact of the French cluster policy on the R&D investment decision and business activity of recipient firms

“Pôles de compétitivité” program : impact over the period 2005-2009 :

- **Impact of a cluster policy** : two mechanisms in action, geographic concentration and specialization to build on synergies and cooperation
- **Impact of public support** on firm R&D investment

Goal : estimate the effect of the “Pôles de compétitivité” policy on business activity of recipient firms

Difficulties : the firms participating to this policy are not random + many heterogeneous public R&D policies have changed at the same time
➔ Hard to disentangle the causal effect of each policy instrument

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The context

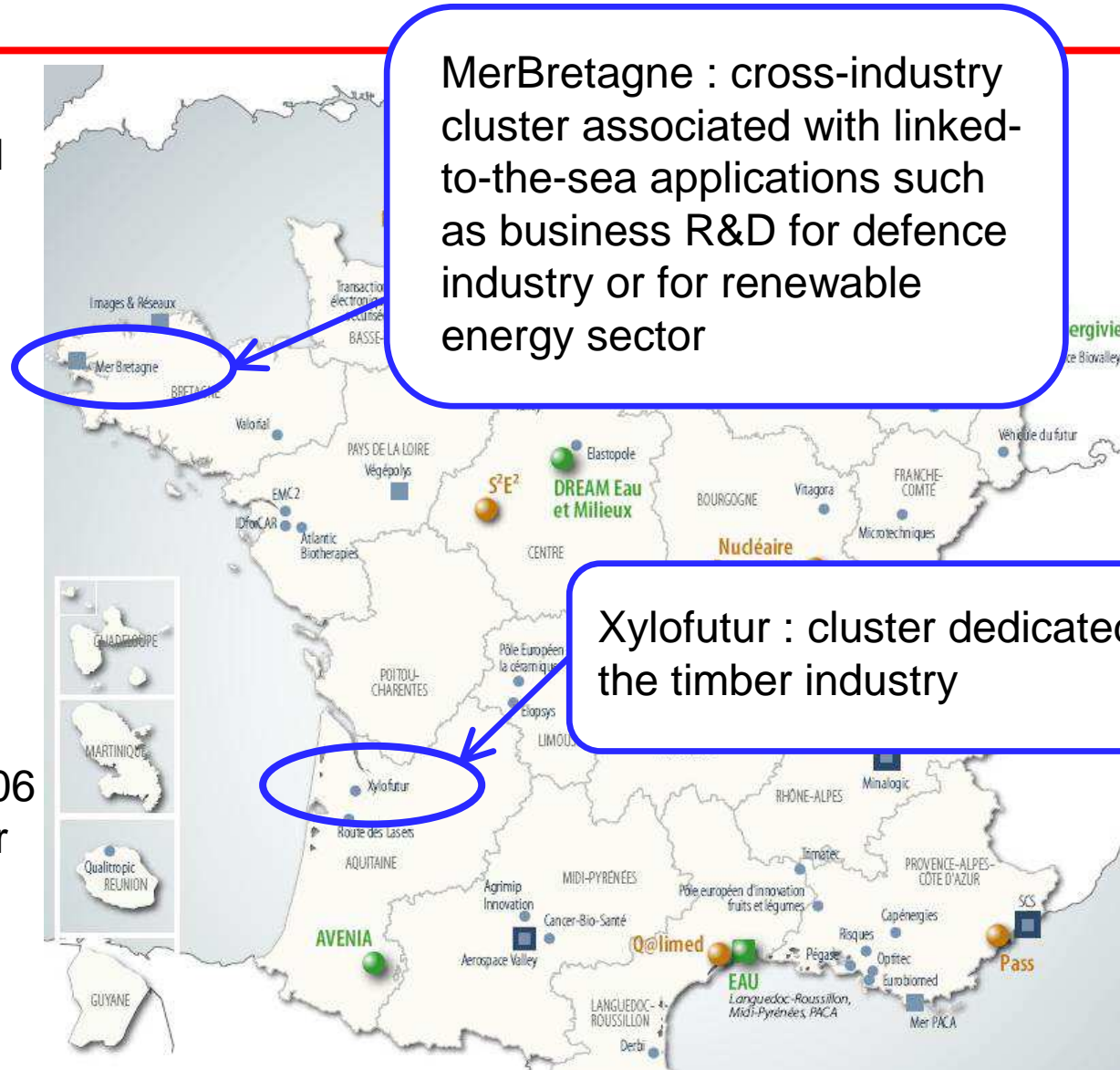
- **Cluster policies and R&D tax credit interact:** member firms of clusters can combine direct and indirect innovation schemes

- **R&D tax credit** (“Crédit d’Impôt Recherche”, CIR): classic indirect instrument with a high incentive in France since 2008
 - In 2005, R&D tax credit equals the sum of 5% of the R&D total amount and to 45% of the R&D growth
 - Extended in 2006 with 10% for the amount and 40% for the growth of R&D expenditures
 - Extended in 2008 with 30% for the amount of R&D expenditures

- **The French cluster policy**
 - Initiated in 2006
 - Firms member of Pôles can benefit from many direct instruments (competitive grants, credit loans and guarantees, repayable advances, ...) and indirect ones (R&D tax credit)
 - Only one instrument is dedicated to the French cluster policy: competitive grants for R&D cooperative projects (between large and small firms, research lab and educational estab.)
 - Focusing on a cluster policy in Japan, Nishimura and Okamuro (2011) find a weak effect of direct R&D support compared to the networking/coordination support

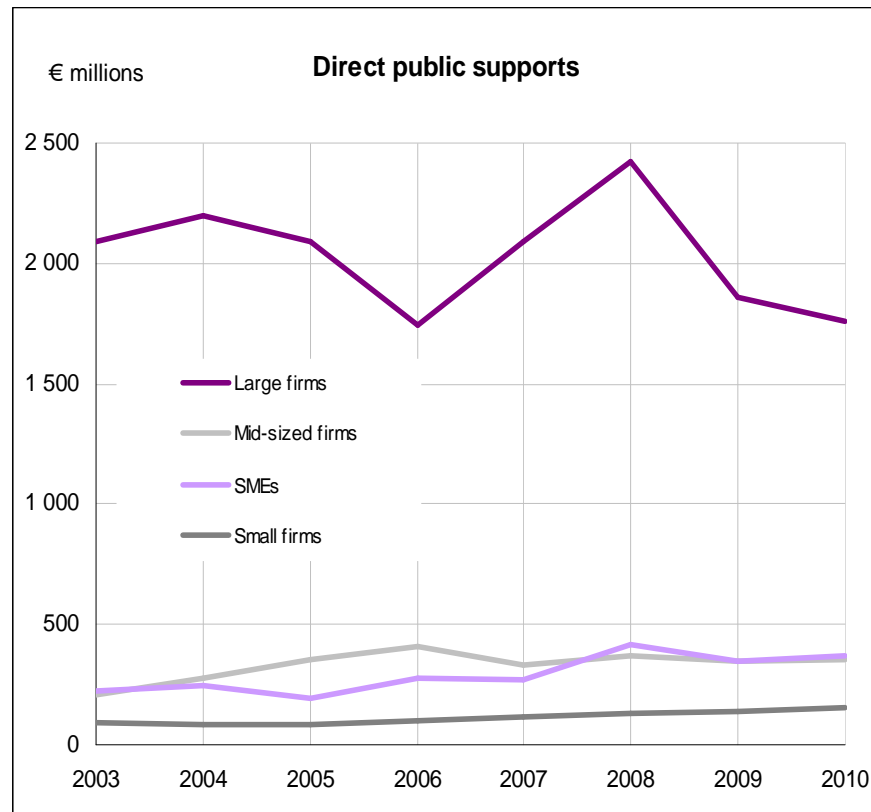
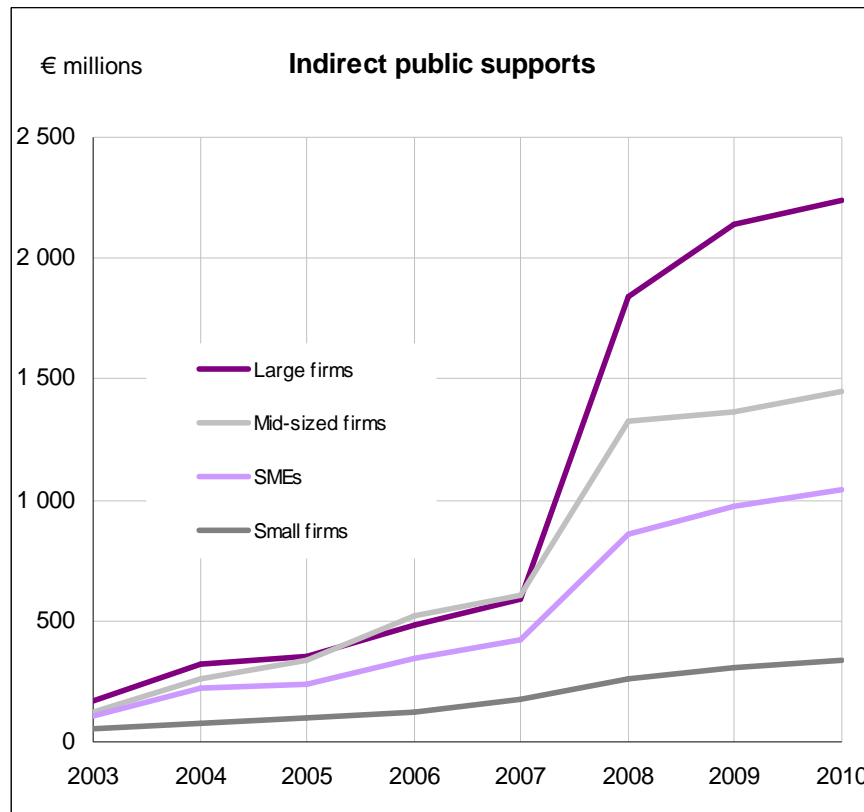
The French cluster policy “Pôles de compétitivité”

- Initiated in 2006
→ certification of 71 innovation clusters
- Every cluster is defined by :
 - a theme
 - a region
 - a governance
- FUI : 2 calls for proposals of R&D cooperative projects each year since 2006
→ 100 projects/year



Public support on firm R&D investment in France

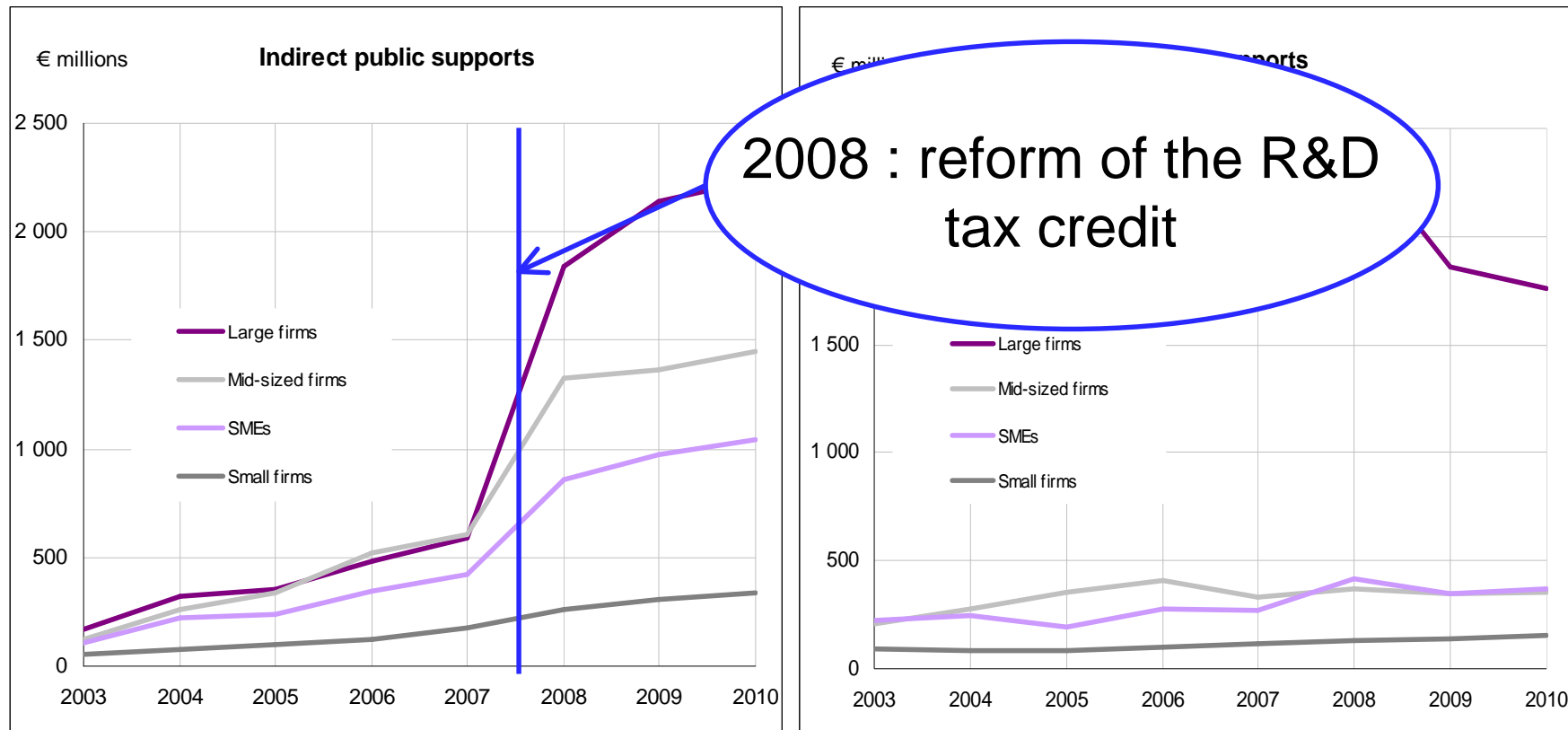
- Indirect financing instruments : (**CIR, CII, JEI**) : \approx €5 billions (2012)
- Direct financing instruments (**ANR, BPI France, FUI**) : \approx €2,5 billions (2012)
- **Pôles de compétitivité** (FUI) accounts for 6% of direct support for firm R&D



Sources : MENESR, GECIR, enquête R&D ; Acoess, base JEI ; Insee, Lifi, Ficus/Fare, DADS | Calcul : Insee (à paraître)

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Problem 1 : many public schemes related to Pôles de compétitivité

Public funding of R&D expenditures for SMEs and Mid-sized firms that invest less than €16M in R&D (field of application of the evaluation)

	2005	2006	2007	2008	2009
Intramural R&D expenditures	4 145	5 106	4 727	5 286	4 623
Direct public support	233	364	371	457	353
European support	34	52	41	87	44
R&D tax credit	251	448	477	929	887

Sources : Dgcis, Insee, MESR

→ Firms member of French clusters use both direct and indirect instruments

Problem 2 : participation the cluster policy is not random

R&D effort of (futur) participants was already higher than for non participants, before the creation of clusters:

Variables	Firms in the control group	Firms member of a French cluster
Total R&D (k euros)	640	1454
Employment	7	12
Public funding of R&D (k euros)	25	142

Means in 2005, before the creation of the French cluster policy | Sources : Dgcis, Insee, MESR

Field of application : SMEs and Mid-sized firms that invest less than €16M in R&D

Data: as much as possible!

- Annual R&D survey (conducted by the Ministry of Higher Education and Research)
 - R&D expenditures
 - R&D funding:
 - Direct public supports (almost complete)
 - Data on local public support is less reliable
 - No data on indirect public support!
- CIR (tax credit) database management (exhaustive)
- JEI database (exhaustive)
- Additional administrative data (fiscal data, financial links, employment...)

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Evaluation: method + field of application

➤ Method: Matching + Diff-in-Diff

- Kernel-based Propensity Score Matching to account for the selection issue
- Diff-in-Diff to control for strong heterogeneity and to obtain a causal impact

➤ Field of application

- 2005-2009 period
- SME and Mid-sized firms (empl.<5000) that invest less than €16M in R&D
- Large firms are excluded

➤ Account for the policy mix

- Control for indirect financing instruments (R&D tax credits) in the propensity score
- Evaluate the impact of participating in the French cluster policy on R&D tax credit (participation + amount of tax credit)
 - ➔ accurate estimation of the effect on private R&D expenditures

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What determine the participation to French clusters?

Participation to a cluster is associated with:

-Ability to develop and benefit from innovation

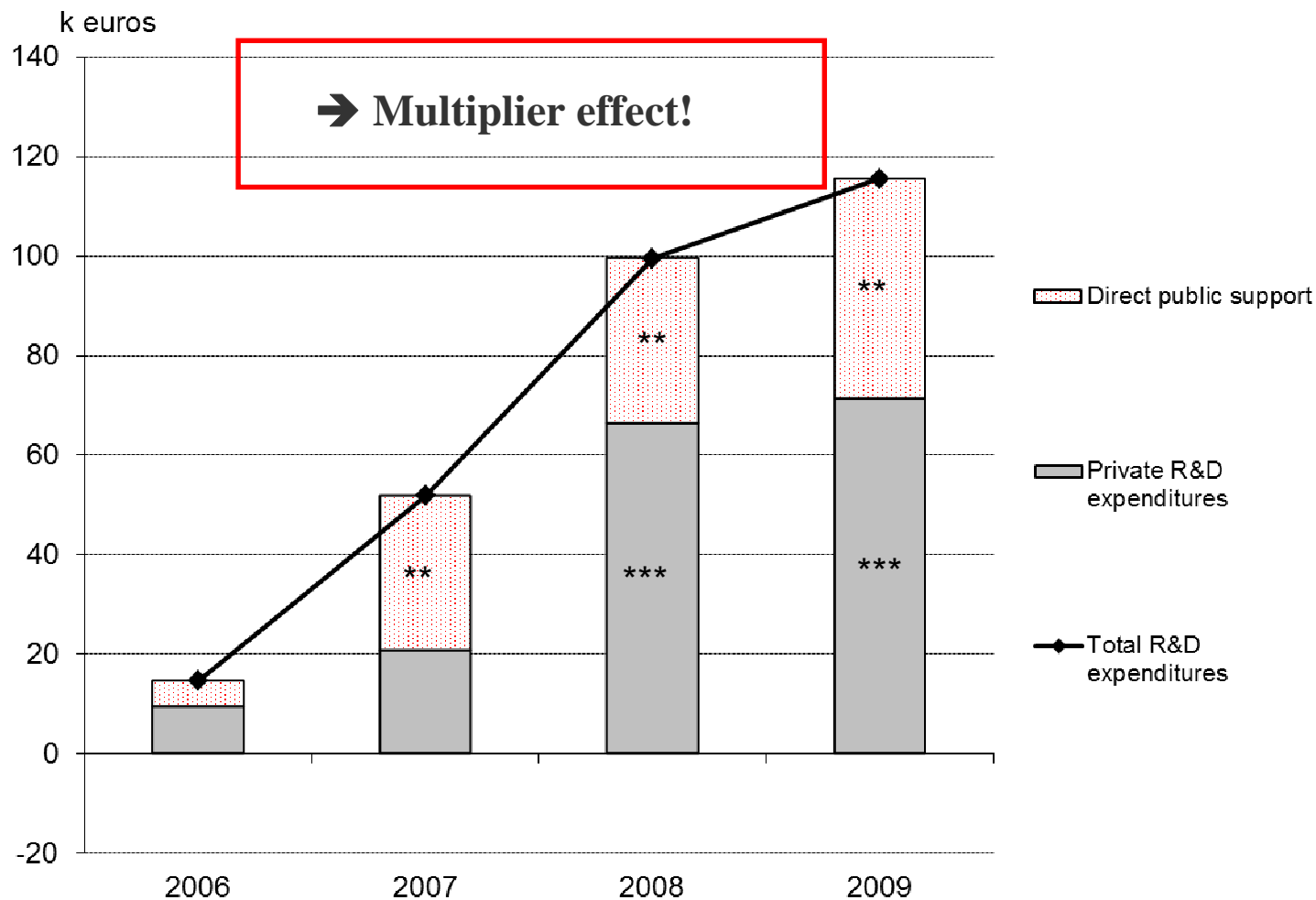
-Previous experience in application to R&D subsidies + subsidies level

-Geographical distance to other potential partners

Characteristics (2005)	Estimated coef.
Employment (log)	0,09***
% of engineer and technical executives	0,64***
Investment (log)	0,08***
JEI	0,47***
CIR (log)	0,03**
Distribution density (x10 ⁵) of:	
- total R&D	2,8**
- R&D of the firm's sector	1,1**
Median of sector's R&D densities	-7,5***
French nationality	0,4***

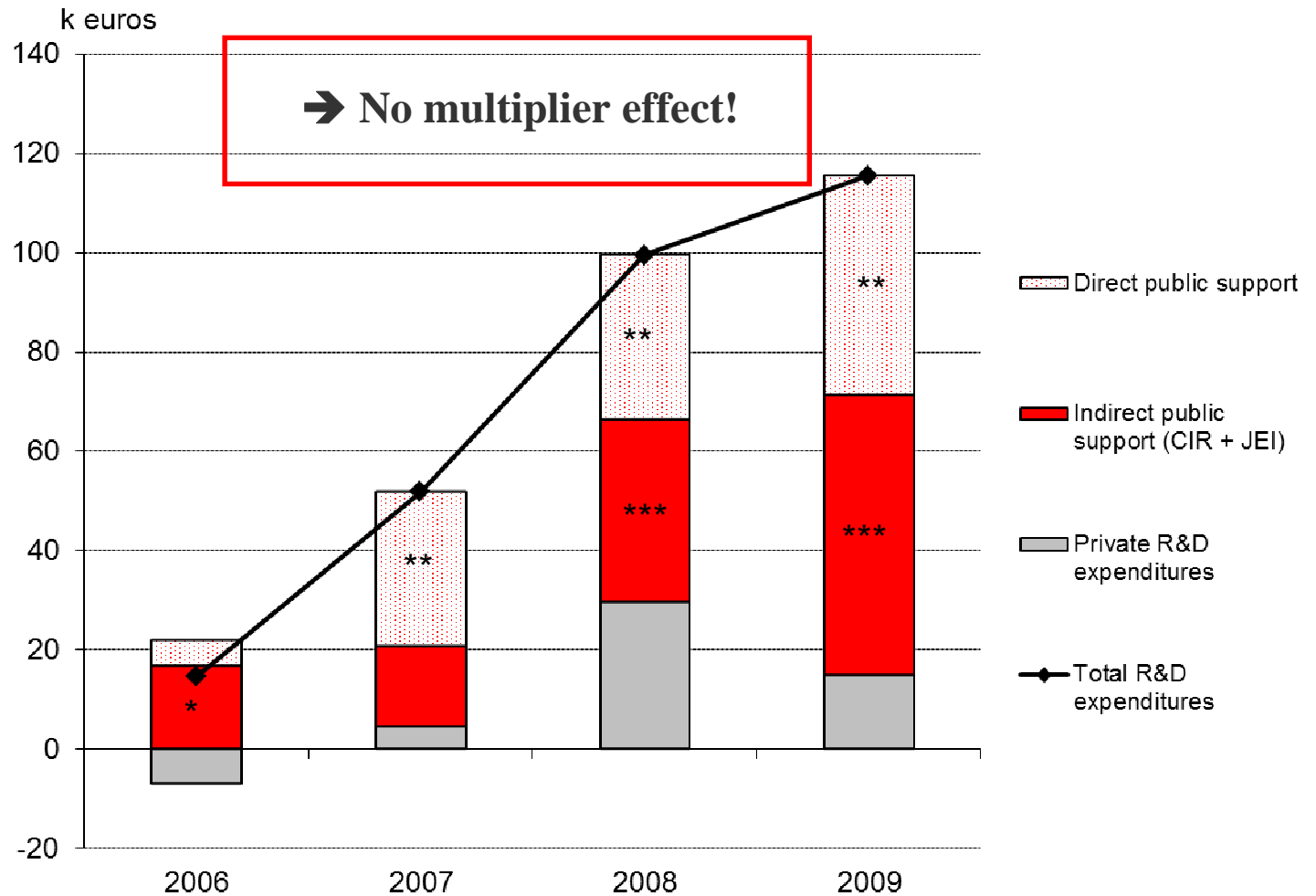
“Misleading” results (without accounting for the overlapping of direct and indirect public supports)

- Average treatment effect
- Decomposed between direct public support and private investment (private = no direct public support)

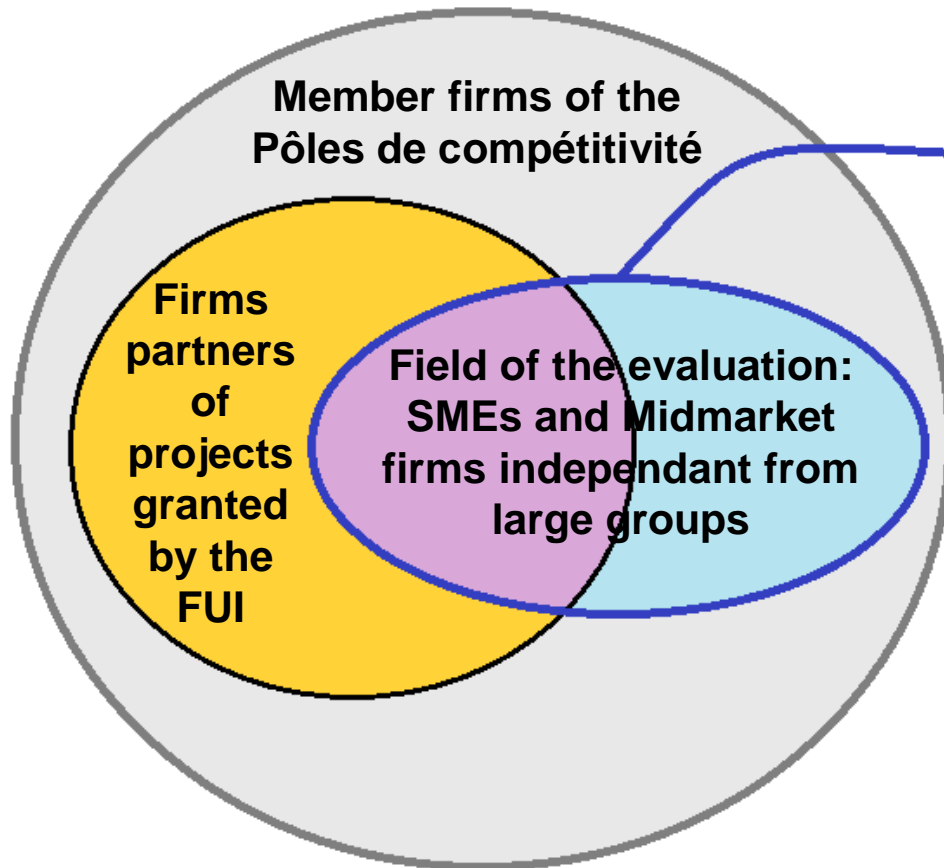


Results (accounting for the overlapping of direct and indirect public supports)

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- Decomposed between direct & indirect public support, and private investment (private = no direct & indirect public support)



Results: Alternative outcomes



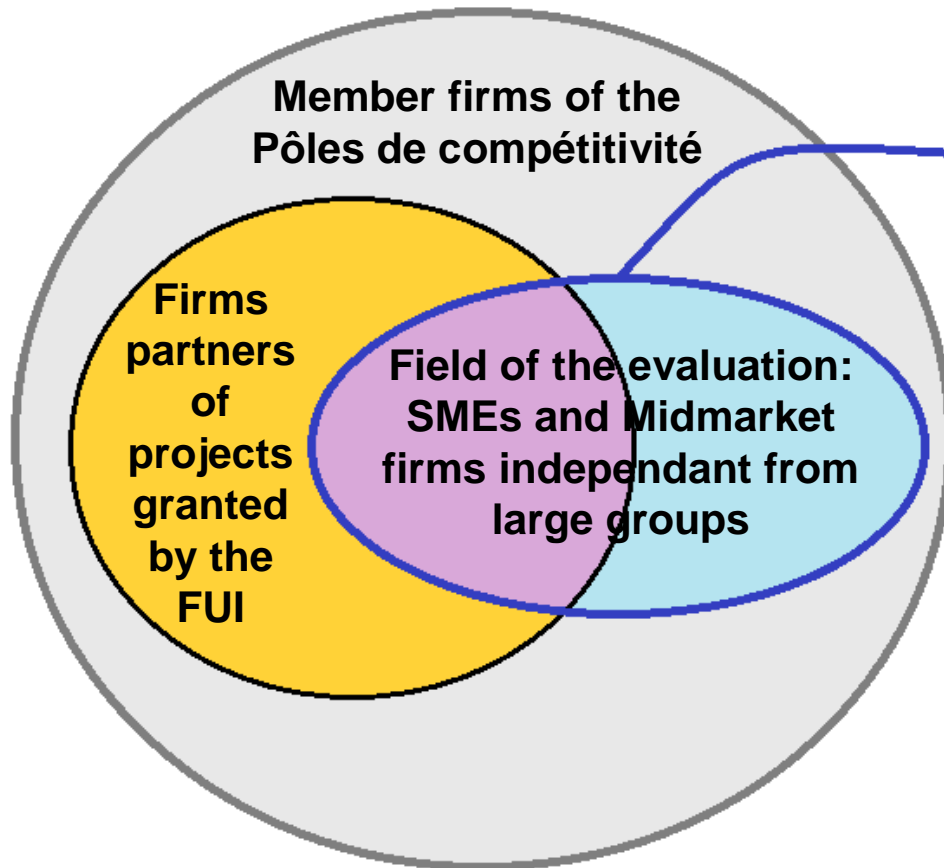
Average yearly effect from being a member of a cluster over 2006-2009⁽¹⁾:

- Total R&D expenditures (k€) : +76
- R&D direct public funding (k€): +30
- CIR (tax credit, in k€): +33
- CIR use (%): +11
- Empl. devoted to R&D: +0,7
- Revenue: +0
- Patent: +0

⁽¹⁾ Relative effect compared to similar non participants

➔ No crowding-out effect but, for now, no virtuous effect on private R&D expenditures

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Conclusion

Results:

- Subsidies to small and mid R&D investors add to their private investment: no crowding-out effect, no virtuous effect
- Effect due to the raise in direct and indirect public supports: firms benefit from different public supports

Limitation:

- Impossible to disentangle the effect of the cluster policy from the effect of the R&D tax credit reform

Extentions:

- Dortet Bernadet & Sicsic (2014) study the population of small firms more specifically and obtain that, pooled together, the various innovation subsidy programs might lead to crowding-out effects

The impact of a French cluster policy

Thanks for your attention !

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