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-Working Paper-

Industrial Clusters and Economic shocks: Do clusters perform better or worse than non-clustered industries during periods of regional slowdown and growth?

Julio Prado

j.prado1@lancs.ac.uk

Researcher at Lancaster University Management School (UK), and
Lecturer at IDE Business School (Ecuador).

Lancaster University Management School

IDE Business School

AGENDA

- Relevance and contribution
- Brief literature overview
- Methods and model
  - France
  - Comparison Germany vs France
- Results
- Conclusion

Relevance and contribution

- Cluster policy has become very popular.
- According to KETELS (2003), at least 250 specific initiatives to develop or strengthen clusters were launched worldwide up to 2003, but
- That number is outdated and underestimated: only in Europe there are **1235 official cluster associations** registered by the European Cluster Observatory (based in a review made in 2011)
- There is a **"cluster momentum"** that has been increased by the present world recession: some politicians, practitioners and academic see clusters as the "light at the end of the tunnel".
- For example, MURO *ET AL.* (2010, p. 4): *"(...) it [is] appropriate to revisit the cluster paradigm and consider its* ***special relevance at a moment of deep economic uncertainty****, fiscal crisis, (...)".*

Relevance and contribution

- What do we know about clusters and economic shocks? Some research is starting to emerge:
  - HILL *ET AL.* (Forthcoming 2012): Economic shocks and regional economic resilience (metropolitan areas US, no industry-specific measure).
  - KUKALIS (2010): Clusters and firm performance (ROA, ROE). One hypothesis investigates a shock-scenario. 2 high-tech sectors in USA
  - ASGEIR SKÅLHOLT *ET AL.* (WP 2012): Can clusters cope with crisis? Norway: 4 case studies (mainly qualitative).
  - Many other papers look at clusters and growth (national, regional or firm), but not at specific interaction with economic shocks.
  - RODRÍGUEZ-POSE *ET AL.* (2011): Analyze growth at regional level and clusters. 14 European countries using ECO database.

The model

$$RSN_{irt} = \alpha + \beta_1 Cluster_{irt} + \beta_2 Size_{irt} + \beta_3 Focus_{irt} + \beta_4 RD_{rt} + \beta_5 Employment_{rt} + \beta_6 Wealth_{rt} + \beta_7 XportReg_{rt} + \beta_8 EUAID_r + \beta_9 NSN_{it} + \varepsilon$$

$$RSP_{irt} = \alpha + \beta_1 Cluster_{irt} + \beta_2 Size_{irt} + \beta_3 Focus_{irt} + \beta_4 RD_{rt} + \beta_5 Employment_{rt} + \beta_6 Wealth_{rt} + \beta_7 XportReg_{rt} + \beta_8 EUAID_r + \beta_9 NSP_{it} + \varepsilon$$

Data and Method

Data from the ECO at industry level for France was chosen, which includes 40 sectors, 22 regions from 1996 to 2008 (after applying the *shock variable,* the data is constricted from 2000 to 2008). And Germany 33 regions and 40 industries from 2004 to 2007

For the control variables at the regional level, the information was obtained from Eurostat database

Table : Descriptive statistics France 2000-2008

Variable	Obs	Mean	Std. Dev.	Min	Max
Regional Shock Negative (RSN)	7920	0.421	0.494	0	1
Regional Shock Positive (RSP)	7920	0.368	0.482	0	1
Cluster	7920	0.338	0.473	0	1
Size	7920	0.591	1.004	0.000	15.890
Focus	7920	0.905	1.222	0.000	8.460
RD	7920	0.000	2.452	-3.854	8.197
Wealth	7920	0.000	1.222	-2.683	5.083
Employ	7920	0.000	2.147	-10.359	3.142
XportReg	7920	0.085	0.279	0	1
EUAID	7920	1.656	1.140	0.075	6.094
National Shock Negative (NSN)	7920	0.375	0.484	0	1
National Shock Positive (NSP)	7920	0.283	0.451	0	1
lag1NSN	7919	0.375	0.484	0	1
lag1NSP	7919	0.283	0.451	0	1

Data and Method

ESTIMATION METHOD FOR FRANCE 2000 to 2008

- Probit Panel using a population average model (variables not independent)
- With robust SE

Robusteness:
- Cluster_Index based on a different methodology (instead of a Cluster dummy).
- Shock_Trend (instead of Shock Dummy).

ESTIMATION METHOD FOR COMPARISON BETWEEN GERMANY AND FRANCE:
- Data only available from 2000 to 2007.
- After the applying the shock variable, the number of observations is reduced to 3520 for France and 5172 for Germany (from 2004 to 2007)
- A heteroskedastic Pooled-Probit is used instead of a Panel, when heteroskedasticity is detected.
- To control for fixed effects, dummy variables for time and industry are introduced.
- The same variables as before are tested

The Model

Shock variable (*RSN, RSP*):

The approach created by HAUSMANN *ET AL.* (2005) for measuring growth accelerations is used.

Which is also used to model economic shocks in HILL *ET AL.* (2010), EICHENGREEN *ET AL.* (2011) and XU (2011)

Using the number of employees per industry, **the last 4-year industry growth rate** is subtracted from the base year industry growth rate, if the difference is **higher than +2 percent a *positive shock (RSP)*** is inferred, if the difference is **lower than -2 percent a *negative shock (RSN)*** is inferred.

The 4-year industry growth rate is measured by the slope of the regression line from the natural logarithm of employment on a time trend for the previous four years (without including the base year).

HAUSMANN *ET AL.* (2005) used GDP and a 8-year growth rate. In this research employment is used following HILL *ET AL.* (2010), and a 4-year growth rate is used to avoid a loss of observations.

The Model

***Cluster* variable:**

There is disagreement on how to properly define a cluster. In this paper we will use Porter's (1998, p. 199), which will allow to use a location quotient (called Specialization Quotient by ECO) to define a cluster

'a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities'

Location quotients are widely used in the literature to detect clusters. From Ellison and Glaesser. (1994) it has recently been used by De Silva (2012), Delgado *and Porter*(2010), Kukalis (2010) and Wennberg *et al.* (2010).

The Model

***Cluster* variable:**

$$SQ_{irt} = (E_{irt} / E_{it}) / (E_{rt} / E_t)$$

SQirt = the specialization quotient for region *r* and industry i
Eirt = the number of employees for region *r* and industry i
Eit = the total number of employees in all regions for industry i
Ert = the total number of employees in all industries for region *r*
Et = the total number of employees in all regions and all sectors (in Europe)

***If SQirt* > 1 there is a cluster**

Table 1: Cluster Dummy tabulation France 2000-2008

d_cluster	Freq.	Percent	Cum.
0	5,244	66.21	66.21
1	2,676	33.79	100.00
Total	7,920	100.00	

The Model

Industry specific variables

- *Focus*

Is a measure of the level of diversification of the clusters in a region. Is a way to capture the presence of a Marshallian type of cluster versus (more focused) a Jacobian type (more dispersed).

$$Focus_{irt} = E_{irt} / E_{rt}$$

- Size

$$Size_{irt} = E_{irt} / E_{t}$$

- Regional control variables supported by a large number of papers reviewed

Transformed into 3 indexes using Principal Component Analysis:
RD, Employment and Wealth following RODRÍGUEZ-POSE *ET AL.* (2011)

The model

Export intensity variables

- Exports have been widely recognized to affect regional growth.
  But it is difficult determine the specific impact due to limited regional exports data.
- The most widely used method, involves estimating regional trade based on national trade patterns SCHAFFER *ET AL.* (1969)

- The method involves creating a Simple Location Quotient (SLQ) that is used as a trading coefficient (ROUND, 1978).

- the SLQ greater than 1 means that the area economy has more than enough employment in industry *i* to supply the region with its product. And a quotient less than 1 suggests that the area is deficient in industry *i* and must import its product if the area is to maintain normal consumption patterns.

$$\mathrm{SLQ}_{irt} = \frac{\mathrm{RE}i/\mathrm{TRE}}{NEi/TNE}$$

If SLQ > 1, industry *i* in region *r* is intensive in exports

The model

Export intensity variables

• But, even if the SLQ is the most widely used method it has been critized (HARRIS *ET AL.*, 1998). It is insufficient to account for cross regional trade (export-import between regions).
• In recent years FLEGG *ET AL.* (2000, 2011, 2012), created a variation of the SLQ that captures the "cross-hauling effects of trade", it is called the Flegg Location Quotient (FLQ)

$$FLQ_{ir} = SLQ_{ir} \times \lambda$$

Where

$$\lambda = [\log 2 (1 + TRE/TNE)]^{\alpha}$$

The FLQ is used as the ***XportReg*** variable, that accounts for export intensity in an industry at regional level.

Export intensity variables

An additional ***XportNac*** variable is created, using input-output matrix at national level to reflect the export ratio over the domestic consumption for every industry.

The model

Old Industrial Regions

According to the Evolutionary Economic Geography, some regions and clusters may be **affected by their history (path-dependancy theory)** and they might be unable to **escape from their structure (lock-in theory).**

To try to capture this effects, a variable is created to identify Old Industrial Regions using the method proposed by Birch et al. (2010).: Regions that were at their peak up until 1950's, but had industrial crisis during the 1970's and mid 1980's.

Germany: Dusseldorf, Munster, Arnsberg, Saarsland.
France: Picardie, Nord Pas de Calais, Lorraine

These regions are then transformed to a dummy, values of 1 if the region is an Old Industrial Region.

The model

European Regional Development Funds (ERDF)

In order to capture the effects of the European policy on French and German regions, a coefficient is constructed using the official data from the European Commission for the projects between 2000 to 2006 , using funds from EU objective 1 and 2

$$EUAID = (\text{Region aid} \quad / \text{Total aid} \quad)/(RegionalGDP/TotalGDP)$$

Results: FRANCE Negative Shock (only selected industries reported)

Table 3: France, probit panel estimation of Regional Negative Shock (RSN)

	(1)	(2)	(3)	(4)	(5)		(18)	(19)	(20)	(21)	(22)	(23)		(35)	(36)	(37)	(38)
	Aerospace	Agricultural	Apparel	Automotive	Biotech	...	IT	Jewellery an	Leather proc	Lighting and	Maritime	Media and	...	Telecom	Textiles	Tobacco	Tourism an
Cluster	0.0645	0.0120	0.152	-0.0434	-0.208**		0.0118	0.166	-0.0496	-0.0669	-0.111**	-0.00452		-0.207**	-0.228**	-0.157**	-0.111
	(0.0668)	*(0.182)*	*(0.157)*	*(0.0731)*	*(0.0840)*		*(0.118)*	*(0.107)*	*(0.0925)*	*(0.127)*	*(0.0446)*	*(0.0524)*		*(0.0843)*	*(0.0957)*	*(0.0732)*	*(0.159)*
Size	-0.000259	-0.0316	0.0611	0.0160	-0.0593***		0.0576*	-0.0830**	-0.0186	0.118	0.214*	0.0309		-0.234**	0.119*	0.227***	0.127***
	(0.0356)	*(0.135)*	*(0.0952)*	*(0.0503)*	*(0.0199)*		*(0.0323)*	*(0.0382)*	*(0.0476)*	*(0.0800)*	*(0.120)*	*(0.0592)*		*(0.0913)*	*(0.0662)*	*(0.0794)*	*(0.0493)*
Focus	-0.230*	0.258	-0.168	0.00139	2.501***		0.0782	-1.098	-0.162	0.0528	0.266***	-0.0731		0.324	-1.856	0.0203	0.0183
	(0.122)	*(0.260)*	*(0.279)*	*(0.0428)*	*(0.755)*		*(0.721)*	*(0.903)*	*(0.125)*	*(0.244)*	*(0.101)*	*(0.199)*		*(0.198)*	*(1.144)*	*(0.0407)*	*(0.0632)*
RD	-0.00161	-0.0587**	0.00791	0.0116	-0.0241		-0.00795	0.0235**	-0.0187	-0.0241*	-0.0133	-0.0107		0.00985	-0.0265**	-0.00708	-0.00771
	(0.0168)	*(0.0258)*	*(0.0192)*	*(0.0151)*	*(0.0165)*		*(0.0174)*	*(0.00984)*	*(0.0154)*	*(0.0144)*	*(0.0208)*	*(0.0145)*		*(0.0213)*	*(0.0114)*	*(0.0149)*	*(0.0234)*
Wealth	0.0152	0.163***	-0.0145	-0.0140	0.0523**		-0.0476*	0.00551	-0.0453	-0.0128	-0.0194	-0.0435		-0.0181	-0.0230	0.00605	-0.118**
	(0.0585)	*(0.0424)*	*(0.0367)*	*(0.0336)*	*(0.0261)*	...	*(0.0286)*	*(0.0329)*	*(0.0315)*	*(0.0288)*	*(0.0357)*	*(0.0284)*	...	*(0.0376)*	*(0.0340)*	*(0.0318)*	*(0.0481)*
Employment	0.00655	-0.00638	-0.00868	-0.0292	0.0113		-0.00300	-0.00808	-0.00808	0.0167	-0.0149	0.000901		-0.00501	0.000572	-0.00632	0.0155
	(0.0123)	*(0.0162)*	*(0.0180)*	*(0.0190)*	*(0.00786)*		*(0.0104)*	*(0.00979)*	*(0.0108)*	*(0.0152)*	*(0.0123)*	*'0.00883)*		*(0.0134)*	*(0.0118)*	*(0.0177)*	*(0.0230)*
XportReg	0.356***	-0.171	0.0684	-0.0936	0.268**		-0.0619	0.158	0.145	-0.183	-0.468***	-0.121		0.384***	0.208**	0.0295	
	(0.107)	*(0.116)*	*(0.188)*	*(0.201)*	*(0.114)*		*(0.0651)*	*(0.180)*	*(0.122)*	*(0.142)*	*(0.0282)*	*(0.0834)*		*(0.0795)*	*(0.106)*	*(0.105)*	
EUAID	-0.00518	-0.113*	-0.00262	0.0283***	-0.0207*		-0.0303	0.0554***	-0.0408***	-0.0222	-0.00126	0.0262		-0.0316	0.0375**	-0.0138	-0.00902
	(0.0142)	*(0.0674)*	*(0.0340)*	*(0.0108)*	*(0.0111)*		*(0.0316)*	*(0.0145)*	*(0.0138)*	*(0.0216)*	*'0.00916)*	*(0.0181)*		*(0.0223)*	*(0.0153)*	*'0.00976)*	*(0.0217)*
NSN	0.189*	0.849***	0.434***	0.222***	0.400***		0.286***	0.207***	0.352***	0.375***	0.503***	0.318***		0.324***	0.238***	0.571***	0.415***
	(0.101)	*(0.0506)*	*(0.111)*	*(0.0801)*	*(0.0861)*		*(0.0670)*	*(0.0676)*	*(0.114)*	*(0.0807)*	*(0.0960)*	*(0.0851)*		*(0.0676)*	*(0.0816)*	*(0.0509)*	*(0.0630)*
lag1NSN	-0.172*	0.264***	-0.0374	-0.148	-0.107		0.0711	0.124	-0.163*	-0.00302	-0.0364	0.332***		0.138	0.0335	0.0725	0.346***
	(0.0917)	*(0.0849)*	*(0.0652)*	*(0.114)*	*(0.0686)*	...	*(0.0770)*	*(0.0963)*	*(0.0865)*	*(0.107)*	*(0.0708)*	*(0.0740)*	...	*(0.127)*	*(0.116)*	*(0.0688)*	*(0.0586)*
N	197	198	198	198	198		198	198	198	198	198	198		198	198	198	198
chi2	82.29	222.5	74.92	71.00	39.13		62.10	128.1	56.34	94.69	709.7	282.8		44.93	50.64	180.1	85.92
p	1.78e-13	3.20e-42	4.93e-12	2.84e-11	0.0000241		1.45e-09	1.17e-22	1.77e-08	6.26e-16	5.09e-146	6.72e-55		0.0000027	0.0000002	2.28e-33	1.07e-14

Notes: Marginal effects are reported; Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

Only selected industries are reported due to space restrictions.

Data for 38 industries. Industries 7 and 14 are omitted due to non convergence

Results: Positive Shock (only selected industries reported)

Table 4: France, probit panel estimation of Regional Positive Shock (RSP)

	(1)	(2)	(3)	(4)	(5)	...	(18)	(19)	(20)	(21)	(22)	(23)	...	(35)	(36)	(37)	(38)
	Aerospace	Agricultura	Apparel	Automotive	Biotech	...	IT	Jewellery a	Leather pro	Lighting an	Maritime	Media and	...	Telecom	Textiles	Tobacco	Tourism an
Cluster	-0.0889	-0.127	-0.202	0.0638	0.0950		0.121	-0.162*	-0.00147	-0.118	0.0772	-0.209***		0.122	-0.00163	-0.0118	-0.0347
	(0.0758)	*(0.132)*	*(0.132)*	*(0.0699)*	*(0.0911)*		*(0.189)*	*(0.0888)*	*(0.0762)*	*(0.118)*	*(0.101)*	*(0.0678)*		*(0.101)*	*(0.101)*	*(0.0962)*	*(0.121)*
Size	-0.00590	0.175	0.00715	0.116**	0.0257		-0.184***	0.0273	-0.110***	-0.0294	-0.0830	-0.0718		0.0926	-0.0369	-0.112	-0.0645
	(0.0309)	*(0.120)*	*(0.0694)*	*(0.0564)*	*(0.0203)*		*(0.0566)*	*(0.0576)*	*(0.0365)*	*(0.0846)*	*(0.161)*	*(0.0688)*		*(0.106)*	*(0.0542)*	*(0.0831)*	*(0.156)*
Focus	0.111*	-0.213	-0.197	-0.105***	-1.203*		0.438	1.027	0.0771	0.306	-0.0737	1.519***		-0.228	0.882	0.00366	0.0740
	(0.0621)	*(0.216)*	*(0.173)*	*(0.0396)*	*(0.726)*		*(1.257)*	*(0.733)*	*(0.100)*	*(0.237)*	*(0.207)*	*(0.315)*		*(0.170)*	*(1.181)*	*(0.0308)*	*(0.0555)*
RD	0.0119	0.0392	-0.0261*	-0.00723	0.0341**		0.0246	-0.0399	0.0139	0.00310	0.00516	0.000545		-0.0410***	-0.00137	0.0365**	-0.0418
	(0.0176)	*(0.0247)*	*(0.0137)*	*(0.0201)*	*(0.0165)*		*(0.0218)*	*(0.0293)*	*'0.00870)*	*(0.0118)*	*(0.0190)*	*(0.0170)*		*(0.0157)*	*(0.0131)*	*(0.0148)*	*(0.0292)*
Wealth	0.0382	-0.214***	0.0418	-0.0525*	0.0258		0.0754*	-0.0519	0.00453	0.0139	0.000441	-0.00953		0.0504	-0.0495*	-0.00156	-0.110
	(0.0360)	*(0.0563)*	*(0.0293)*	*(0.0310)*	*(0.0356)*	...	*(0.0396)*	*(0.0572)*	*(0.0208)*	*(0.0219)*	*(0.0425)*	*(0.0388)*	...	*(0.0347)*	*(0.0300)*	*(0.0548)*	*(0.0888)*
Employment	-0.00565	0.00699	0.00546	0.00271	-0.0181**		-0.0115	0.00835	-0.00831	0.0121	-0.00657	-0.0306***		0.0119	-0.00759	-0.0353	0.0258
	(0.0128)	*(0.0178)*	*(0.0141)*	*(0.0211)*	*'0.00900)*		*(0.0186)*	*(0.0174)*	*(0.0104)*	*(0.0139)*	*(0.0180)*	*(0.0101)*		*(0.0143)*	*'0.00798)*	*(0.0277)*	*(0.0279)*
XportReg	-0.223***	0.282*	0.0714	0.0708	-0.370***		-0.0932	-0.208**	0.108	-0.168	0.293	-0.252***		-0.0206	-0.188***	-0.177**	
	(0.0781)	*(0.145)*	*(0.182)*	*(0.212)*	*(0.0539)*		*(0.172)*	*(0.0922)*	*(0.0990)*	*(0.131)*	*(0.543)*	*(0.0400)*		*(0.155)*	*(0.0567)*	*(0.0690)*	
EUAID	-0.0151	0.0240	0.00800	0.00996	0.0392**		0.0211	-0.0632**	0.0130	0.0233	0.0249*	-0.0266*		-0.0141	0.00502	-0.0466***	-0.104**
	(0.0137)	*(0.0519)*	*(0.0260)*	*(0.0106)*	*(0.0185)*		*(0.0322)*	*(0.0246)*	*(0.0188)*	*(0.0168)*	*(0.0150)*	*(0.0146)*		*(0.0183)*	*(0.0113)*	*(0.0111)*	*(0.0485)*
NSP	0.249***	0.901***	0.104	0.209	0.613***		0.189**	0.149	0.355***	0.459***	0.484***	0.620***		0.436***	0.431***	0.462***	0.922***
	(0.0932)	*(0.0557)*	*(0.112)*	*(0.136)*	*(0.0818)*		*(0.0934)*	*(0.123)*	*(0.0712)*	*(0.0728)*	*(0.0895)*	*(0.0904)*		*(0.136)*	*(0.127)*	*(0.0590)*	*(0.0248)*
lag1NSP	-0.308***	0.265***	-0.0133	0.285**	-0.0793		0.0271	0.157*	0.00933	-0.0765	0.0475	0.230***		-0.0949	-0.0429	0.0801	0.403***
	(0.0874)	*(0.0847)*	*(0.0630)*	*(0.135)*	*(0.103)*	...	*(0.0602)*	*(0.0948)*	*(0.101)*	*(0.0813)*	*(0.0715)*	*(0.0598)*	...	*(0.0934)*	*(0.172)*	*(0.0724)*	*(0.102)*
N	197	198	198	198	198		198	198	198	198	198	198		198	198	198	198
chi2	87.03	188.2	66.06	45.39	116.1		58.57	40.16	73.82	96.85	78.26	482.1		29.93	153.3	208.4	360.6
p	2.07e-14	4.61e-35	2.54e-10	0.0000018	3.06e-20		6.74e-09	0.000015	8.06e-12	2.32e-16	1.10e-12	2.92e-97		0.000881	7.84e-28	2.90e-39	3.47e-72

Notes: Marginal effects are reported; Standard errors in parentheses

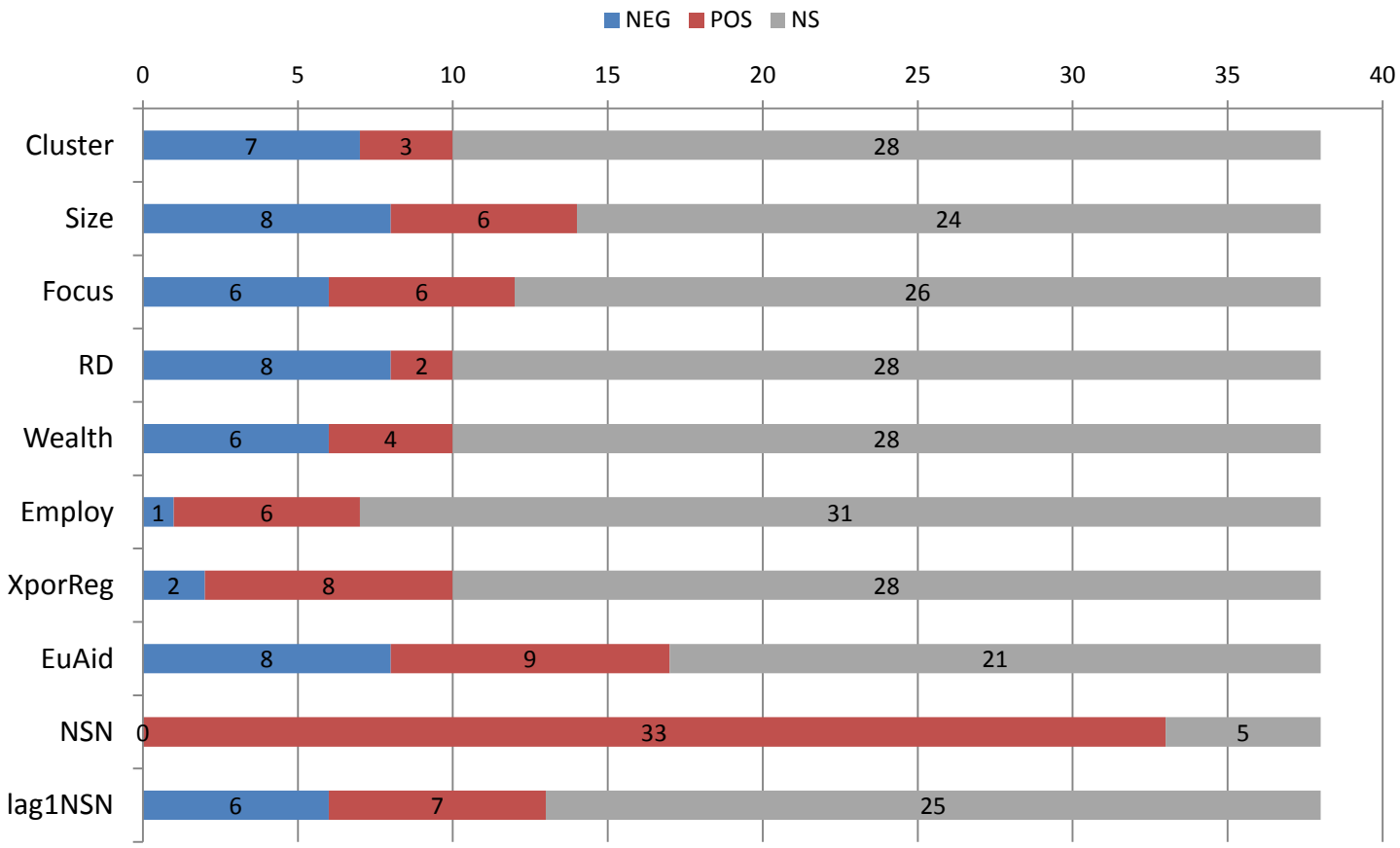
* p<0.10, ** p<0.05, *** p<0.01

Only selected industries are reported due to space restrictions.

Data for 38 industries. Industries 7 and 14 are omitted due to non convergence

Summary of the results for the 2 models for France 2000-2008

Number of significant industries and sign of the coefficient found in case of a Negative Regional Shock (RSN). France 2000-2008



Notes: Significance measured either at the 1%, 5% or 10%. Sign of the significant coefficients is reported, as either negative (NEG) or positive (POS). Data as reported in table 3, for the results of the estimation.

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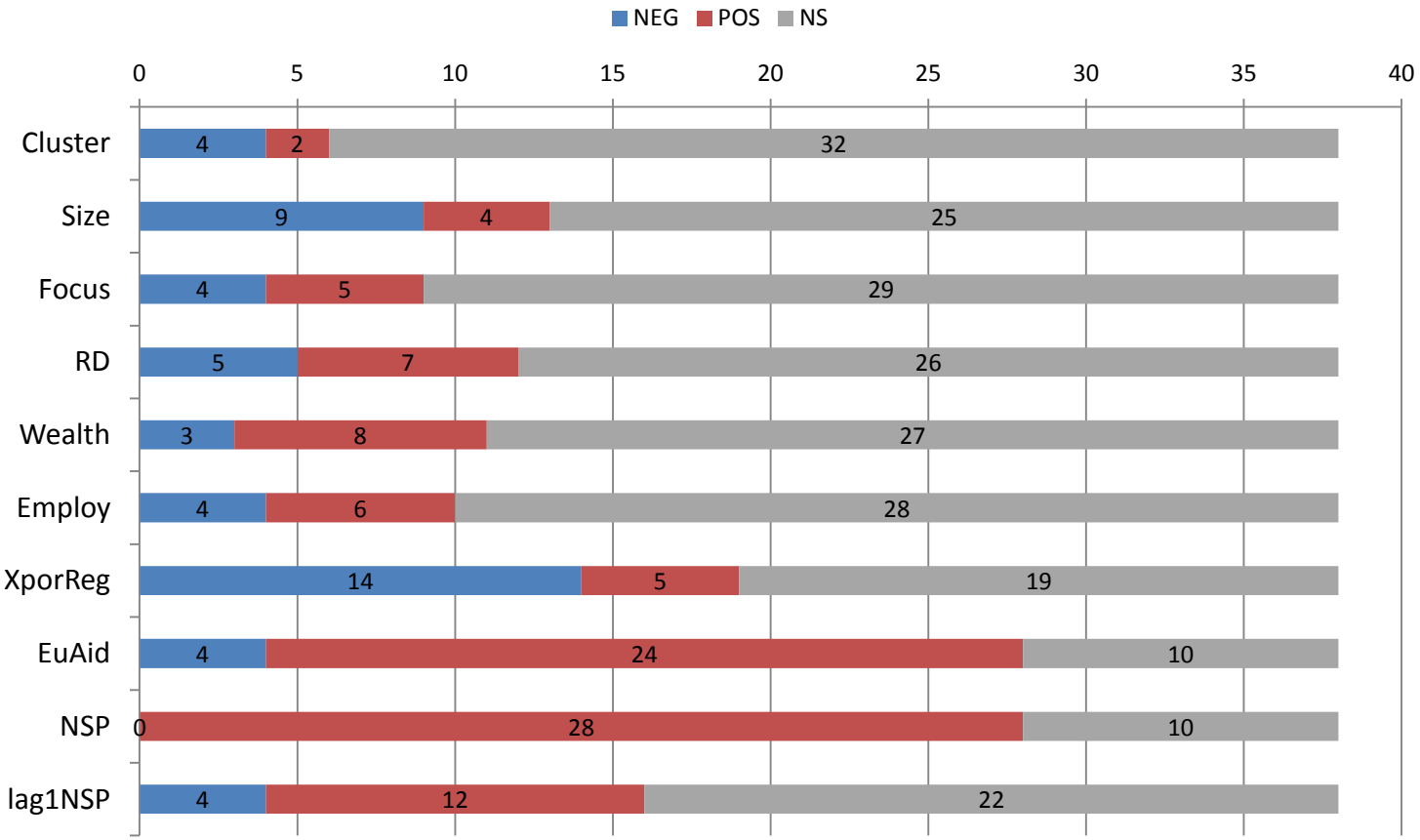

Notes: Significance measured either at the 1%, 5% or 10%. Sign of the significant coefficients is reported, as either negative (NEG) or positive (POS). Data as reported in table 3, for the results of the estimation.

Partial Conclusions after France estimation

The relationship between **clusters and economic shocks is insignificant for a large number of industries**

- The probability of a cluster protecting regions against a negative regional shock is slim but it is significantly large in 7 of the industries analyzed.
- Clusters are not significantly correlated with positive shocks.

Regional characteristics are significant only for a small number of industries. But they have the expect sign: RD and Wealth are **negatively correlated** with a **negative regional shock,** and **positively correlated** with a **positive shock**

Employment, has the expected sign (positively correlated with a positive shock), but the overall results are rather ambiguous.

The relationship between **shocks and regional exports** has ambiguous signs, thus no particular conclusions can be stated.

Sector characteristics (focus or size) have heterogeneous results depending on the industry.

National industrial shocks, are **highly significant** and increase the probability of a regional shock.

Results: Comparison France-Germany HC / Pooled-Probit 2004-2007

Table 5: Pooled probit France and Germany from 2004 to 2007

	FRANCE		GERMANY	
	Regional Shock Negative (RSN)	Regional Shock Positive (RSP)	Regional Shock Negative (RSN)	Regional Shock Positive (RSP)
Cluster	-0.0301	0.00558	0.0242	-0.0624*
	(0.0232)	*(0.0206)*	*(0.0320)*	*(0.0352)*
Size	0.0267**	-0.0390***	-0.00876	-0.00966
	(0.0118)	*(0.0135)*	*(0.0197)*	*(0.0251)*
Focus	-0.0314**	0.0348***	0.0290**	-0.0492***
	(0.0149)	*(0.0122)*	*(0.0142)*	*(0.0169)*
RD	-0.00942***	-0.00309	-0.0141**	0.0131
	(0.00335)	*(0.00406)*	*(0.00703)*	*(0.00824)*
Wealth	-0.00372	0.0165*	-0.00200	0.0182*
	(0.00808)	*(0.00842)*	*(0.00940)*	*(0.0109)*
Employment	-0.00555	0.00349	0.000683	-0.0122
	(0.00606)	*(0.00780)*	*(0.00721)*	*(0.00858)*
XportNac	-0.0901	-0.279***	-0.230**	0.272***
	(0.0857)	*(0.0996)*	*(0.108)*	*(0.101)*
XportReg	0.00259	-0.0239	-0.0302	0.118***
	(0.0316)	*(0.0404)*	*(0.0419)*	*(0.0395)*
OIR	-0.0151	0.00292	-0.0645**	0.0685**
	(0.0142)	*(0.0201)*	*(0.0290)*	*(0.0330)*
EUAID	-0.0105**	0.00805	0.440	-0.350
	(0.00441)	*(0.00607)*	*(0.426)*	*(0.721)*
NSN	0.365***		0.0397	
	(0.0298)		*(0.0279)*	
lag1NSN	0.0713***		-0.00922	
	(0.0275)		*(0.0244)*	
NSP		0.393***		0.144***
		(0.0269)		*(0.0206)*
lag1NSP		0.00911		0.0450**
		(0.0206)		*(0.0208)*
Year Dummy (3)	Yes	Yes	Yes	Yes
Industry Dummy (39)	Yes	Yes	Yes	Yes
Estim. Method	Probit	Het-Probit	Het-Probit	Probit
Pseudo R2	0.1566	n.a.	n.a.	0.1794
Wald test of lnsigma2=0:				
Chi2	n.a.	50.18	10.51	n.a.
P(Chi2)	n.a.	0.0000	0.0052	n.a.

Notes: Marginal effects are reported; Standard errors in parentheses

* p<0.10, ** p<0.05, *** p<0.01

2004 is the reference dummy year. Tourisms, is the reference for dummy industry

Data for 40 industries.

Conclusions after comparing France and Germany

1. At this aggregate level, the relationship between **clusters and economic shocks is insignificant** (the specific case of Germany is only relevant at the 10%).
2. **Focus**, had similar magnitudes in both countries but **exactly opposite sign**. Thus, the effects seem to be country-specific. **Size** has a negative impact and is significant for France but not for Germany.
3. **RD** is negatively correlated with a negative shock in both countries, but the magnitude is small.
4. Wealth and Employment, are not significant.
5. Regions and industries that are more **export oriented seem to cope better** with negative and positive shocks in Germany, but exports are insignificant in France (unexpected results for France).
6. National Shock is highly significant in both countries, but the magnitude is very different. **French regions are highly affected by national shocks. The impact of both negative and positive shocks in Germany are smaller.**