Tab.1: Population and sample distribution (%) by sector and size

Population distribution (%)	Size					
Sector	20-49	50-99	100-249	250+	*Total*	*Total (a.v.)*
FOOD	5,65	1,94	1,16	0,64	9,39	*382*
TEXTILE	6,17	1,47	0,71	0,37	8,73	*355*
WOOD, PAPER AND OTHER INDUSTRIES	7,79	1,67	0,79	0,42	10,67	*434*
CHEMICAL AND RUBBER	5,01	1,87	1,11	0,42	8,41	*342*
NON METALLIC MINERAL PRODUCTS	3,81	1,23	1,18	0,79	7,01	*285*
METALLURGY	16,99	3,29	1,18	0,25	21,71	*883*
MACHINERY	21,44	6,37	4,06	2,24	34,10	*1387*
Total	66,86	17,85	10,18	5,11	100,00	
Total (a.v.)	*2720*	*726*	*414*	*208*		*4068*
Sample distribution (%)	Size					
Sector	20-49	50-99	100-249	250+	*Total*	*Total (a.v.)*
FOOD	2,88	3,78	1,62	0,54	8,83	*49*
TEXTILE	2,70	1,44	1,62	0,54	6,31	*35*
WOOD, PAPER AND OTHER INDUSTRIES	3,60	2,88	1,08	0,90	8,47	*47*
CHEMICAL AND RUBBER	3,78	3,42	1,80	1,08	10,09	*56*
NON METALLIC MINERAL PRODUCTS	1,62	2,16	1,62	2,16	7,57	*42*
METALLURGY	8,83	5,77	2,16	0,18	16,94	*94*
MACHINERY	14,05	15,32	7,39	5,05	41,80	*232*
Total	37,48	34,77	17,30	10,45	100,00	
Total (a.v.)	*208*	*193*	*96*	*58*		*555*
Cochran Test *Margin of error* θ *						*Interviewed firms vs. Population*
$\theta = \sqrt{\frac{N}{(N-1)n} - \frac{1}{N-1}}$						**0.039**
Margin of error θ "usually" tolerated: 0.05. Restrictive test for small population: the smaller is N, the lesser the distance between N and *n* has to be in order to generate an acceptable θ.						

Tab.2- Number of firms covered by balance sheets data for each year of the period 2006-2008

Variable*	2006 (%)	2007 (%)	2008 (%)
VA/EMP	436 (78.5)	436 (78.5)	399 (71.9)
PROFIT/EMP	433 (78.0)	436 (78.5)	390 (70.3)
CASHFLOW/EMP	436 (78.5)	436 (78.5)	402 (72.4)

* See next section for a full description of the data

Tab.3: Construction and descriptive statistics of firm specific characteristics

	Construction	Mean	Min	Max
FIRM SPECIFIC CHARACTERISITCS (FIRM_SPEC)				
PAVITT SECTORS (d)	Dummies (5) identifying the sectors the firm belong to on the base of the OECD-Pavitt taxonomy	/	0	1
GEO (d)	Dummies of geographical location of the firm: NUTS 3 territorial units (9 provinces + extra regional) were grouped in 5 clusters.	/	0	1
SIZE (d)	Size dummies by employees: 20-49; 50-99; 100-249; > 249.	/	0	1

EXPORT	Percentage of turnover made on international markets	0.33	0	1
GROUP_INTERNAT (d)	Dummy: 1 firm is part of an international group; 0 otherwise	0.07	0	1
GROUP_NAT (d)	Dummy: 1 firm is part of a national group; 0 otherwise	0.23	0	1
SUPPLIER	Percentage of turnover made as supplier	0.28	0	1
SKILL_SHARE	Share of non-manual workers	0.85	0	5.1
PROACTIVE	Dummy variable: 1 if the firm is active in terms of strategic innovation behaviour (strongly active on the innovation activities before the crisis and willing to see policies supporting training, innovation and human capital accumulation or policies directly addressed to sustain the internal aggregate demand); 0 otherwise	0.40	0	1
DEFENSIVE	Dummy variable: 1 if the firm is defensive in terms of strategic behaviour (strategic difficulty in front of competitors, especially from BRIC countries and/or structural 'distress' for high labour, production and financial costs coupled with a willingness to see policies aimed to cut labour costs through a reduction of taxation); 0 otherwise	0.14	0	1
MIX	Dummy variable: 1 if the firm shows a mixed behaviour in terms of strategic innovation behaviour (share both PROACTIVE and DEFENSIVE characteristics); 0 otherwise	0.13	0	1
OTHER	Dummy variable: 1 if the firm shows neither PROACTIVE nor DEFENSIVE behaviours; 0 otherwise	0.33	0	1
WORK_COND_P	Trend in working conditions focused on positive aspects (workers effort; employees competencies; available information on the production process for the employees; employees autonomy and control on their tasks; economic and non economic incentives) measured on a 5 points scale going from -2 to +2 rescaled on the interval (0,1)	0.64	0	1
WORK_COND_N	Trend in working conditions focused on negative aspects (workload for single employees; job instability; rigidity of the working hours; diseases related to the job; work-related injuries) measured on a 5 points scale going from -2 to +2 rescaled on the interval (0,1)	0.56	0	1
INNO_SUB (d)	Dummy: 1 firm has been publicly funded to support an innovative program 2003-2006; 0 otherwise	0.23	0	1

Tab.4: Construction and descriptive statistics of innovation variable (period 2006-2008)

	Construction	**Mean**	**Min**	**Max**
INNO (2006-2008)				
Technological Innovation				
INNO_TECH..	Composite index of innovation intensity in the technological sphere. Values on	0.22	0	0.60

	the interval (0,1). Constructed on the basis of the following specific indexes:			
...OUTPUT_TECH	Index including innovation aspects belonging to the dimension of technological output	0.12	0	0.82
INPUT_TECH	Index including innovation aspects belonging to the dimension of technological input	0.32	0	0.65
Organisational Innovation				
INNO_ORG…	Composite index of innovation intensity in the organisational sphere. Values on the interval (0,1). Constructed on the basis of the following specific indexes:	0.26	0	0.75
...OUTSOURCING	Index of outsourcing activities	0.11	0	0.8
ORG_COLL	Index of collaboration activities to carry out organisational innovations	0.20	0	1
PROD_PRACTICES	Index as the average number of production organisation practices	0.48	0	1
LAB_PRACTICES	Index as the average number of labour organisation practices	0.25	0	1
Training				
TRAIN…	Composite index of intensity in training policies. Values on the interval (0,1). Constructed on the basis of the following specific indexes:	0.50	0	1
...TRAIN_TYPE	Index of training typologies	0.42	0	1
COV_PERM	Percentage of permanent workers involved in training programs. Interval (0,1)	0.38	0	1
COV_NONPERM	Percentage of fixed-term workers involved in training programs. Interval (0,1)	0.21	0	1
TRAIN_COMP	Index of training competencies covered by training programs (computing comp.; technical comp.; organisational/relational comp.; economic/legal comp.)	0.44	0	1
Environmental Innovations				
INNO_ENV…	Composite index of innovation intensity in the environmental sphere. Values on the interval (0,1). Constructed on the basis of the following specific indexes:	0.13	0	0.89
...ENV_BEN	Index of benefits due to environmental innovations (emission reduction, energy/material efficiency, CO2 reduction)	0.13	0	1
ENV_PROC	Index of environmental innovation procedures (EMAS, ISO14001)	0.06	0	1
ICT				
ICT…	Composite index of innovation intensity in information and communication technologies sphere. Values on the interval (0,1). Constructed on the basis of the following specific indexes:	0.59	0	1
...INSTR_ICT	Index of ICT instruments implemented	0.83	0	1
SYS_ICT	Index of ICT management systems implemented	0.29	0	1
ACT_ICT	Index of activities supported by ICT	0.69	0	1
ROLE_ICT	Index of types of role covered by ICT	0.55	0	1
Internationalisation				
INTERNAT...	Composite index of internationalization activities. Values on the interval (0,1).	0.08	0	0.59

	Constructed on the basis of the following specific indexes:			
...IDE (d)	Dummy variable: 1 if foreign direct investments are done; 0 otherwise	0.16	0	1
IDE_TYPE	Index of IDE typology	0.04	0	0.80
IMPORT	Dummy variable: 1 if the firm import intermediate goods from abroad; 0 otherwise	0.40	0	1
IMPORT_TYPE	Typology of firms providing intermediate goods	0.12	0	1
INT_PART	Index capturing different typologies of international participation	0.02	0	0.83
INDREL (2006-2008)				
UNION_INV...	Composite index capturing the degree of union involvements constructed as the average of the following three specific indexes of involvement:	0.28	0	1
...UNION_INF*	Index: as average of union information about changes in the 6 innovation spheres	0.55	0	1
UNION_CONS*	Index as average of union consultation about changes in the 6 innovation spheres	0.19	0	1
UNION_BARG*	Index as average of union bargaining about changes in the 6 innovation spheres	0.07	0	1
EMP_INV...	Composite index capturing the degree of employees involvements constructed as the average of the following two specific indexes of involvement:	0.50	0	1
...EMP_INF	Index as average of employees information about changes in the 6 innovation spheres	0.66	0	1
EMP_CONS	Index as average of employees consultation about changes in the 6 innovation spheres	0.17	0	1
EMPINV_ORG	Set of variables indicating the degree of employees involvement on each of the six innovations spheres: 0 no involvement; 1 informed; 2 consulted	1.06	0	2
EMPINV_TRAIN		1.06	0	2
EMPINV_TECH		1.07	0	2
EMPINV_ICT		1,01	0	2
EMPINV_ENV		0.92	0	2
EMPINV_INTERNAT		0.86	0	2
UNIONINV_ORG*	Set of variables indicating the degree of union representatives involvement on each of the six innovations spheres: 0 no involvement; 1 informed; 2 consulted; 3 bargained with	1.28	0	3
UNIONINV _TRAIN*		1.25	0	3
UNIONINV _TECH*		1.17	0	3
UNIONINV _ICT*		1.11	0	3
UNIONINV _ENV*		1.14	0	3
UNIONINV _INTERNAT*		1.05	0	3
PERF (2006-2008)				
GRVA/EMP	Ln of value added per capita. Rate of growth over 2006-2008	0.05	-2.71	2.03
GRPROFIT/EMP	Ln of profit per capita. Rate of growth over 2006-2008	-0.04	-2.51	3.25
GRCASHFLOW/EMP	Ln of cash-flow per capita. Rate of growth over 2006-2008	0.11	-3.93	4.45

* These variables are only computed when union representative are present: 402 firms

Tab.5: Pairwise correlations among the main covariates

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
(1) INNO_ORG	1													
(2) TRAIN	0.30	1												
(3) INNO_TECH	0.44	0.37	1											
(4) INNO_ENV	0.19	0.20	0.26	1										
(5) ICT	0.43	0.32	0.44	0.19	1									
(6) INTERNAT	0.37	0.20	0.35	0.10	0.28	1								
(7) UNION_INF	0.03	0.09	0.09	0.10	0.13	0.16	1							
(8) UNION_CONS	0.14	0.09	0.08	0.00	0.05	0.03	-0.33	1						
(9) UNION_BARG	0.16	0.08	0.09	0.10	0.11	0.06	-0.19	-0.09	1					
(10) EMP_INF	0.06	0.14	0.09	0.06	0.19	0.06	0.35	-0.01	-0.03	1				
(11) EMP_CONS	0.09	0.10	0.08	0.04	-0.01	0.03	-0.25	0.16	0.11	-0.67	1			
(12) GRVA/EMP	-0.05	-0.04	-0.03	-0.07	-0.11	0.00	-0.14	0.05	-0.02	-0.03	-0.02	1		
(13) GRCASHFLOW/EMP	-0.05	-0.07	-0.05	-0.06	-0.09	-0.02	-0.09	-0.08	-0.02	0.03	-0.05	0.52	1	
(14) GRPROFIT/EMP	0.01	-0.02	-0.04	-0.13	0.00	-0.03	-0.08	-0.03	0.00	0.03	-0.04	0.59	0.79	1

Tab.6: Innovative actions to react to the crisis

Innovations	**Construction**	**Mean**	**Min**	**Max**
Degree of the intervention intensity (Null=0; Very feeble=1; Feeble=2; Strong=3; Very strong=4)				
ACTION_TOT	Constructed as the average of the following three indexes:	0.63	0	1
ACTION_PROC (Underlying strategic behaviour: efficiency gains)	Index as sample average of the answers on five dimensions of process innovation: designing of product and service; efficiency/productivity/costs; flexibility in product variety; productive capacity; quality of productive process. Values normalised on the interval (0-1)	0.66	0	1
ACTION _PROD (Underlying strategic behaviour: high competitiveness and future rent exploitation)	Index as sample average of the answers on five dimensions of product innovation: new products and services; quality of product and service; access to new markets; marketing activities; logistics and distribution activities. Values normalised on the interval (0-1)	0.62	0	1
ACTION _ORG_HRM (Underlying strategic behaviour: skill base construction and efficiency gains)	Index as sample average of the answers on five dimensions of competitive factors: increased employees competencies; increased employees responsibility and satisfaction; increased security and decreased injuries; environmental impact reduction; adjustment to laws and quality standards. Values normalised on the interval (0-1)	0.62	0	1

Tab.7: Results to test HP1 and HP2

	2a				2b				2c			
	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM
	HP1				HP2a				HP2b			
FIRM_SPEC^	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PROD_PRACTICES	0.043**	0.054**	0.013	0.062**								
	(0.020)	(0.027)	(0.027)	(0.026)								
LAB_PRACTICES	0.109***	0.057	0.081	0.190***								
	(0.037)	(0.049)	(0.055)	(0.046)								
COV_PERM	0.035*	0.031	0.009	0.063***								
	(0.020)	(0.026)	(0.028)	(0.023)								
TRAIN_COMP	-0.056**	-0.080**	-0.047	-0.039								
	(0.027)	(0.035)	(0.036)	(0.030)								
INPUT_TECH	0.194***	0.177***	0.315***	0.088								
	(0.048)	(0.062)	(0.068)	(0.058)								
ACT_ICT	0.042	0.072**	0.046	0.011								
	(0.028)	(0.036)	(0.039)	(0.035)								
INNO_ORG§					0.166***	0.124*	0.107	0.263***	0.180***	0.133*	0.116	0.286***
					(0.049)	(0.065)	(0.068)	(0.066)	(0.052)	(0.068)	(0.072)	(0.067)
TRAINING§					0.025	-0.001	-0.011	0.089***	0.032	0.009	-0.003	0.090***
					(0.026)	(0.033)	(0.035)	(0.031)	(0.026)	(0.033)	(0.035)	(0.031)
INNO_TECH§					0.215***	0.211***	0.388***	0.041	0.216***	0.205**	0.407***	0.029
					(0.064)	(0.082)	(0.092)	(0.081)	(0.067)	(0.085)	(0.095)	(0.084)
INNOENV§					0.006	0.002	-0.039	0.054*	0.018	-0.014	-0.062	0.024
					(0.024)	(0.027)	(0.035)	(0.031)	(0.03)	(0.032)	(0.047)	(0.04)
ICT§					0.091**	0.083	0.154***	0.039	0.095**	0.097*	0.146**	0.044
					(0.044)	(0.058)	(0.058)	(0.054)	(0.042)	(0.056)	(0.057)	(0.051)
TRAINxENV§									0.212**	0.170*	0.192	0.253*
									(0.090)	(0.099)	(0.161)	(0.133)
TECHxENV§									-0.191	-0.144	-0.534*	0.122
									(0.184)	(0.235)	(0.282)	(0.284)
ORGxTECH§									-0.807*	-0.903	-0.579	-0.944
									(0.478)	(0.628)	(0.675)	(0.587)
TECHxICT§									0.335	-0.027	-0.267	1.241**

									(0.393)	(0.521)	(0.569)	(0.487)
Constant	0.300***	0.289***	0.298***	0.313***	0.336***	0.333***	0.332***	0.343***	0.497***	0.460***	0.529***	0.500***
	(0.072)	(0.091)	(0.095)	(0.084)	(0.067)	(0.088)	(0.088)	(0.077)	(0.063)	(0.083)	(0.084)	(0.072)
Observations	555	555	555	555	555	555	555	555	555	555	555	555
Adj. R2	0.213	0.118	0.189	0.139	0.204	0.114	0.195	0.120	0.200	0.107	0.190	0.120
F	5.474	3.261	4.840	3.362	7.274	4.370	6.957	3.675	6.037	3.525	5.244	3.561

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Robust to heteroskedasticity standard errors in parentheses; for space constraint only significant variables are reported; empty cells mean the variables are not included in the specification; the Variance Inflation Factor (VIF) does not show any relevant multicollinearity problem.

^ All firm specific characteristics are included and their main results are discussed at the beginning of Section 4, but we do not report them for space constraint.

§ In specifications 2c the variables are centred around their mean in order to reduce problems of multicollinearity in the specifications..

Tab.8: Results to test HP3

	3a				3b1				3b2			
	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM	ACTION_TOT	ACTION_PROC	ACTION_PROD	ACTION_ORG_HRM
	HP3a				HP3b				HP3b§			
FIRM_SPEC ^	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
COMPOSITE_INNO_INDEXES^	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
UNION_INV	0.026	0.048	0.019	0.009								
	(0.024)	(0.034)	(0.037)	(0.030)								
EMP_INV	0.006	-0.057	0.033	0.041								
	(0.031)	(0.042)	(0.043)	(0.041)								
UNION_BARG					0.059**	0.058*	0.066*	0.054*				
					(0.025)	(0.035)	(0.038)	(0.031)				
EMP_INF					0.046	0.027	0.078**	0.030				
					(0.028)	(0.035)	(0.038)	(0.033)				
EMPINV_ENV									0.049**	0.052**	0.052	0.047*
									(0.023)	(0.026)	(0.032)	(0.026)
EMPINV_INTERNAT									-0.016	-0.051**	0.024	-0.026
									(0.022)	(0.025)	(0.027)	(0.030)
UNIONINV_ENV									-0.018	-0.053**	0.027	-0.029
									(0.021)	(0.026)	(0.029)	(0.030)
UNIONINV_INTERNAT									-0.019	0.024	-0.048*	-0.030
									(0.025)	(0.029)	(0.028)	(0.038)
Constant	0.366***	0.373***	0.399***	0.325***	0.346***	0.358***	0.371***	0.308***	0.373***	0.395***	0.394***	0.329***
	(0.076)	(0.090)	(0.101)	(0.088)	(0.075)	(0.091)	(0.100)	(0.088)	(0.077)	(0.094)	(0.103)	(0.089)
Observations	402	402	402	402	402	402	402	402	402	402	402	402
Adj. R2	0.206	0.125	0.191	0.105	0.227	0.131	0.211	0.113	0.204	0.118	0.201	0.101
F	4.727	3.263	4.738	2.500	4.813	3.094	4.598	2.604	3.800	2.934	4.112	2.286

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Robust to heteroskedasticity standard errors in parentheses; for space constraint only significant variables are reported; empty cells mean the variables are not included in the specification; the Variance Inflation Factor (VIF) does not show any relevant multicollinearity problem, but in specifications 3c.

^ All firm specific characteristics are included and their main results are discussed at the beginning of Section 4, but we do not report them for space constraint; the composite innovation indexes included in order not to omit relevant variables show the same results as reported in tab.7.

§This set of specification slightly suffers from multicollinearity problems, however there is not a clear cut solution to multicollinearity (Kennedy, 2001). Dropping specific variables of interest could not be a good choice if we are interested on their results, so we decided to keep all the variables, with the caveat that the results may be affected by weak multicollinearity.

Tab.9: Results to test HP4

	ACTION_ TOT	ACTION_ PROC	ACTION_ PROD	ACTION_ORG_ HRM
			HP4	
FIRM_SPECIFIC_CHARACTERISTICS^	Yes	Yes	Yes	Yes
COMPOSITE_INNO_INDEXES^	Yes	Yes	Yes	Yes
INDREL_SPECIFIC_INDEXES^	Yes	Yes	Yes	Yes
"GR_VAEMP_0608"	-0.010	0.014	-0.028	-0.015
	(0.022)	(0.030)	(0.031)	(0.029)
"GR_CASHFLOWEMP_0608"	0.009	0.016	-0.011	0.020
	(0.024)	(0.034)	(0.034)	(0.026)
GR_PROFITEMP	-0.006	-0.022	0.016	-0.012
	(0.019)	(0.027)	(0.027)	(0.021)
Constant	0.304***	0.285***	0.317***	0.311***
	(0.070)	(0.092)	(0.093)	(0.082)
Observations	555	555	555	555
Adjusted R-squared§§	0.222	0.126	0.213	0.126
F	5.63	3.29	5.09	3.03

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$; Robust to heteroskedasticity standard errors in parentheses; for space constraint only significant variables are reported; empty cells mean the variables are not included in the specification; the Variance Inflation Factor (VIF) does not show any relevant multicollinearity problem.

^ All firm specific characteristics are included and their main results are discussed at the beginning of Section 4; the composite innovation indexes and the industrial relation specific indexes included in order not to omit relevant variables show the same results as reported in tab.7 and tab.8 but we do not report them for space constraint.

§ All the 'performance' variables are reported although they are not significant. The results are based on the Multiple Imputation strategy (Sata11 Manual, 2009) which has been used in order to overcome the problem given by missing values;

§§The adjusted R-squared has been obtained using the *mibeta* command (Stata Manual, 2009)

Tab.10: Summing up the empirical evidence

	Dependent variables			
	ACTION_TOT	**ACTION_PROC**	**ACTION_PROD**	**ACTION_ORG_HRM**
INNOVATION				
Hp1	++	++	++	++
Hp2a	++	++	++	++
Hp2b	+/-	+	-	+
INDUSTRIAL RELATIONS				
Hp3a	+	+	+	+
Hp3b	+/-	+/-	+/-	+/-
ECONOMIC PERFORMANCE				
Hp4	/	/	/	/

Note: ++ (--) means a strong support to (rejection of) Hp; + (-) means a weak support to (rejection of) Hp; +/- means mixed evidence; / means no evidence.