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Flexibility - new technology, product/market innovation and organisational change in two economic sectors

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Focus

This paper supplements the attached paper written jointly by the author and Allan Næs Gjerding: The flexible company. In both papers the data come from the DISKO survey covering 1900 Danish private firms in manufacturing and non-manufacturing.

The RL/ANG paper gives the background of the DISKO project and a preliminary discussion of flexibility and some major results regarding correlations with flexibility, so it's a good idea to start with that paper.

This paper pay attention to our two-dimensional model of flexibility i.e. internal organisational and external innovative flexibility. The questions are 1) to what extent organisational flexibility and innovation are correlated, 2) whether internal (workgroups etc) or external (products,markets,-technology) features of the firm have the strongest correlations with such other organisational traits as recruitment, work content, actors' attitudes and behaviour, learning performance, 3) similarities and differences between manufacturing and non-manufacturing with respect to the above mentioned topics.

The paper must be seen as a part of a continuous analysis process which is only in its initial phase.

Two-dimensional typology

The flexibility index (FI) in the RL/ANG paper is based upon 10 questions regarding internal organisational conditions of the firm and 4 questions characterising its innovative technological and product/market behaviour. From a two-dimensional point of view the following figure 1 can be presented which explains the connections between the 0-14 FI, the two dimensions i.e. INTERNAL ORGANISATION 0-10 and EXTERNAL INNOVATION 0-4. Furthermore two flexibility typologies GROUP 1-4 and GROUP 1'-8' are suggested.

Figure 1

E\I	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14

GROUP 1-4 can also be seen from figure A1 in the appendix, and a similar presentation can be given of GROUP 1'-8' where the following counts:

Group 1' INTERNAL	0-2	EXTERNAL	0-2
Group 2'	-	3-5	-
Group 3'	-	6-7	-
Group 4'	-	8-10	-
Group 5'	-	0-2	-
Group 6'	-	3-5	-
Group 7'	-	6-7	-
Group 8'	-	8-10	-

In table 1 the number of firms within the two typologies are given. The meaning of the GROUP model with regard to the defining characteristics is seen from table A1 in the appendix. Group 4 is characterized by firms which in most cases score higher than the others when taking all firms together. When dividing the firms in manufacturing and non-manufacturing it is seen from table A1 that group 4 only has the highest frequencies on such criteria as group work, quality circles, delegation of responsibility, long term educational planning and new technology whereas group 1 has the lowest frequencies on working groups, delegation of responsibility, integration of functions, moving people around between different work functions, continued vocational training, educational activities tailored to the firm's needs, long term educational planning, and new technology.

From table 1 is found an answer to our first question on correlation between organisation and innovation. The table 1 shows that relatively more innovative firms are found together with relatively more organisational flexible firms. The percentage of more innovative firms are 6.7, 21.1, 40.0, and 59.6 when moving from organisational flexibility 0-2, via 3-5, 6-7 to 8-10.

Table 1 The distribution of firms according to the static-dynamic typologies.

E\I	0-2	3-5	6-7	8-10	Total
0-2	Gr 1: 278	Gr 2: 502	GR.3: 293	Gr. 4:93	1266
	Gr.1: 780		Gr.2: 486		
3-4	Gr.5: 20	Gr.6: 134	Gr.7: 195	Gr.8: 285	634
	Gr.3: 154		Gr.4: 480		
Total	934		966		1900

In table 2 it is seen that the group 1 and 4 differ much with respect to organisational change during the period 1993-95. The polarisation is even larger when using the GROUP 1'-8' typology where group 8' has five times higher percentage change than group 1. On this background the flexibility typology shall also be called *the static-dynamic typology*. Table A 8 in the appendix

shows the major reasons given by management for organisational change. Effectiveness, co-operation and coordination, and adjustment to turbulent environments are the most important. In all cases the internal organisational dimension is stronger than the external when comparing the step from group 1 to group 2 with the step from group 1 to group 3. In the former cases more firms are expressing an importance to the mentioned factor. Only with regard to the objectives of developing new products/services and strengthening of knowledge are the external innovative dimension the stronger.

Table 2 Percentage of firms which experienced organisational change during the period 1993-95.

E\I	0-2	3-5	6-7	8-10
0-2	16.9	35.1	53.6	65.8
	28.6		58.4	
3-4	70.0	64.2	71.3	85.3
	64.9		79.6	

Recruitment and demand for qualifications

In the RL/ANG paper pg. 14 it is highlighted how the most flexible firms more often than less flexible ones have increased their demand for vocational qualifications, cooperation, ability for readjustment and responsibility and quality consciousness. From the appendix table A5 in the RL/ANG paper it can be seen that the ability for readjustment especially makes a difference. Turning to table A2 in this paper it is seen that manufacturing firms to a higher extent than non-manufacturing firms have demanded higher vocational and social qualifications during 1993-95, but in both cases social demands have changed more frequently than vocational demands.

An interesting difference between manufacturing and non-manufacturing turns up when looking upon the relative importance of moving from more static or less internal flexible firms (group 1) to more internal flexible ones (group 2), and from less external flexible firms (in group 1) to more external flexible ones (in group 3). It is seen that the internal transition is more important in the cases of manufacturing whereas the external dimension counts more among the non-manufacturing ones.

Work content

There seems to be an important difference between the developments of work content in manufacturing and non-manufacturing. In manufacturing more responsibility and less routine work is seen more often than in non-manufacturing, where specialisation has expanded more than in manufacturing, cf. table A3 in the appendix.

Contact with customers has increased more often in non-manufacturing than in manufacturing which mirrors the fact that service enterprises count much in non-manufacturing. Sub-contracting

is more important in manufacturing.

Co-operation has expanded more in manufacturing than in non-manufacturing.

Focussing upon the relative importance of the internal organisational (from group 1 to 2) and external innovative (from group 1 to 3) dimensions, it is seen that the internal dimensions are the more important regarding responsibility, vocational qualifications, decreases in routine work and cooperation. The external innovative dimension especially has an effect regarding sub-contractor relationships.

Among the factors which have contributed to these changes the need for more flexibility is the most often mentioned among the manufacturing firms whereas the non-manufacturing ones make the more astonishing answer and give priority to the introduction of new technology, cf. table A4 in the appendix.

In correspondence with these answers it is seen that changes in the internal organisational dimension is a stronger determining factor than external oriented changes among manufacturing firms which mention flexibility, and the external innovative dimension is the stronger among non-manufacturing firms which mention the introduction of new technology.

Both within manufacturing and non-manufacturing the organisational dimension is the stronger determinant when it comes to promoting factors such as flexibility, better possibilities for stimulating the development of the employees' qualifications, demands from the employees, and interestingly enough also regarding the need for better contact with customers.

The external innovative dimension is the stronger determinant with regard to sharper competition, the development of new products, and as already mentioned new technology, as reasons for changes of the work content. It is to be recognised that the last mentioned factors of products and technology are similar to the ones which are defining the external dimension and so a close relationship could be expected, but it may also show consistency between behaviour and attitudes.

Actors' attitudes and behaviours

Middle management's and employees' attitudes and qualifications are the most important facilitators, but also mentioned more often than other factors as obstacles, cf. table 9 in the appendix of RL/ANG paper. In general the promoting factors count more among non-manufacturing than manufacturing firms (opposite results were given in RL/ANG pg.20), but obstacles are more often mentioned among the manufacturing firms, cf. table A5 in this paper's appendix.

Regarding middle management as promotor of organisational change the external dimension counts more than the internal within manufacturing, whereas the opposite is true within non-manufacturing. Within both manufacturing and non-manufacturing the internal organisational dimension is the stronger regarding employees as promoters of change.

Co-operation committees and shop stewards are rather strong promoting factors within

manufacturing and mentioned by more than half of the most dynamic firms. Their roles within non-manufacturing are more modest, and not as important as knowledge from other firms or the consultants' qualifications.

Again the internal organisational dimension is the stronger determinant in comparison with the external innovative dimension. Yet it can be noticed that when it comes to public support as a promoting factor, this one is more often mentioned among non-manufacturing innovative firms in group 3 than the non-innovative in group 2.

Learning

A number of questions highlight the extent to which the employees and managers get more vocational and social qualified to do their job, and how these qualifications are valued by the management. As underlined in the RL/ANG paper the more flexible firms pay more attention to qualifications, but here it must be recognised that training is build into the flexibility index.

Manufacturing firms pay more attention to the employees' abilities as a competitive factor when going from a less to a more organisational flexible firm than when going to a more innovative set-up whereas non-manufacturing firms behave in the opposite way, cf. table 3. In all cases the non-manufacturing firms are more inclined to pay attention to the employees' abilities as a competitive factor. It must be remembered that there has been no control for size which may contaminate the results.

Table 3 Firms where it is of decisive importance for the competitiveness that the employees develop their abilities distributed by the static-dynamic typology and economic sectors.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
%	7.1	27.4	10.7	43.8	17.4	34.7	40.0	49.8

In line with this higher attention paid to development of abilities among non-manufacturing, it is also seen that these firms more often have their employees taking part in training and education, cf. table 4. Here the organisational dimension is the stronger in both economic sectors.

Table 4. Firms in which more than half of the employees have participated in courses etc. in 1995 or 1996 distributed along static-dynamic criteria and economic sectors.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
%	14.2	43.0	14.3	53.9	23.6	55.4	40.0	68.3

Regarding the issues of the training and education there is a difference of priority between

manufacturing and non-manufacturing, cf. table A6. Not to our surprise strategy, marketing and customer topics are more often mentioned by non-manufacturing firms, but it was not expected that new technology would be mentioned most often among non-manufacturing firms, but it corresponds with the above mentioned findings on the technology as the most important promoting factor with regard to changes of work content in non-manufacturing firms. It is quite surprising that the organisational dimension is more important than the innovative dimension both within the manufacturing and non-manufacturing sector with regard to the leadership, marketing and customer issues.

Quality control is more important in manufacturing except in group 3. In both sectors the organisational dimension is the more important.

Table 5. Top and middle management and employees with more than 5 days of training and education per year according to the static-dynamic typology and economic sector.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
Top management	16.8	27.4	24.3	40.0	24.2	41.1	39.0	49.5
Supervisor and middle management	19.8	38.6	25.7	46.0	22.9	45.6	40.7	53.3
Other employees	9.9	27.8	11.4	32.5	18.1	27.5	33.9	37.1

In most cases the internal dimension is the stronger regarding time for courses, but an exception is seen for employees in non-manufacturing.

Performance

Regarding economic performance measured by value added per employee, table 6 shows that performance is better among the more innovative firms in non-manufacturing than in manufacturing whereas the opposite is true for less innovative firms. So, it is interesting to see that the transition from less to more organisational flexibility has a strong effect upon manufacturing firms, whereas the transition from less to more innovative manufacturing firms show decreasing figures of VA per employee, cf. table 6. Within non-manufacturing both dimensions add to an increase in VA per employee, but here the innovative dimension is the stronger.

Table 6. Value added per employee in firms distributed according to static-dynamic typology and economic sectors 1993 - 94.

1000 Dkr	Manufacturing (1994)				Non-manufacturing (1993)			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
VA/em ploye	431	510	427	483	425	479	496	569

Conclusions

In this paper the analysis is a continuation of the results from the RL/ANG paper: The Flexible Company. The emphasis has been placed upon similarities and differences between manufacturing and non-manufacturing, and a comparison of the relative impact of the internal organisational dimension and the external innovative dimension. The results are limited by the fact that no control has been made for the size factor in this paper.

Three questions have been discussed.

Regarding the first about the extent of correlation between organisational flexibility and innovative flexibility it was shown that innovation increased to a high extent when moving from less to more organisational flexible firms.

The question about similarities and differences between manufacturing and non-manufacturing have focussed more on differences than similarities. Yet, among the similarities have been noticed the reasons given for organisational change and the role of middle management's and employees' attitudes and qualifications as important facilitators of change.

Manufacturing is different from non-manufacturing with regard to recruitment where the demands of the manufacturing firms are higher. Regarding work content it is less routine oriented and more co-operative than in non-manufacturing where the work content is more specialised. Changes in work content is to a high extent explained by new technology within non-manufacturing, but promoted more by the need for flexibility within manufacturing.

Co-operative committees and shop stewards are important facilitating actors within manufacturing, but not so within non-manufacturing.

Learning had a higher priority within non-manufacturing.

Performance with regard to value added per employee was higher among the more innovative firms in non-manufacturing than in manufacturing wheres the opposite was true for less innovative firms.

Much attention has been paid to the question about the relative importance of differences in organisational and innovative context. By a comparison of group 1 (the most static along both dimensions) with the answers of firms in the more internal flexible group 2 and with the more external flexible group 3 an impression has been extracted with regard to the mentioned relative importance. These comparisons are summarised in the following table 7.

The main impression from table 7 is that the internal organisational dimension is the stronger determinant of the firms' answers on most questions, but there are exceptions. Some of these were to be expected i.e. development of new products and new technology as more determined by the innovative dimension than by the organisational. Similarly the importance of the innovative dimension regarding more contact with sub-contractors as the content of changes in work content. On the other hand it is not quite clear why recruitment demands are determined more by the innovative dimension among non-manufacturing firms or why performance is also determined more by this dimension than the organisational one.

Table 7 Summary of comparisons between internal and external dimension

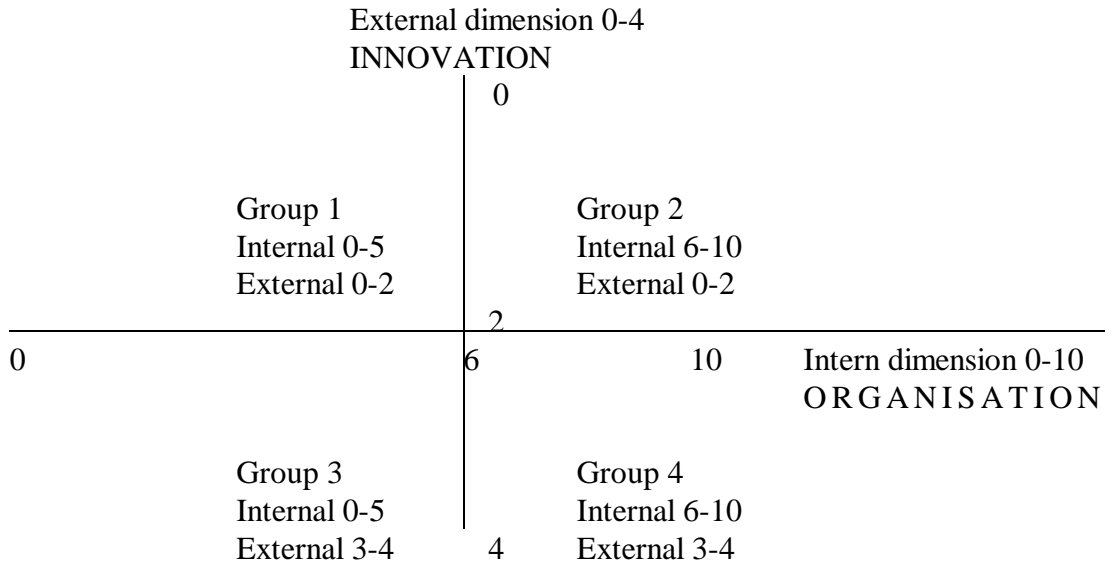
Economic sector	Manufacturing		Non-manufacturing	
Flexibility dimension	Internal Organisation	External Innovation	Internal Organisation	External Innovation

<i>Recruitment</i>	x			x
<i>Work content</i>				
Responsibility	x		x	
Vocational qualifications	x		x	
Decrease of routine	x		x	
Cooperation	x		x	
Sub-contracting		x		x
<i>Contributing factors regarding work content</i>				
Flexibility	x		x	
Employee development	x		x	
Employee demands	x		x	
Contact with customers	x		x	
Sharper competition		x		x
Development of new products		x		x
New technology		x		x
<i>Actors' attitudes and behaviours</i>				
Middle management's attitudes		x	x	
Middle management's qualific.		x	x	
Employees' attitudes	x		x	
Employees qualifications	x		x	
Co-operation committees	x		x	
Shop Stewards	x		x	
Public support	x			x

<i>Learning</i>				
Competitive factor	x			x
Course participation	x		x	
Courses on leadership, marketing, customers	x		x	
Courses on quality	x		x	
Top management	x		x	
Middle management	x		x	
Employees	x			x
<i>Performance</i>				
Value added per employee	x			x

Figure A1

APPENDIX FIGURE



APPENDIX TABLES

Table A1. Criteria of 4-group typology and their percentage distributions.

Quest.	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
5b Emplo yee alone	11.29	38.71	6.45	43.55	40.12	27.54	3.59	28.74
5c Emplo yee alone or super- visor	A15.22	A34.78	A4.35	A45.65	A53.03	A24.24	A3.03	A19.70
	B5.95	B29.76	B5.95	B58.33	B26.37	B38.46	B4.40	B30.77
	C22.13	C27.32	C13.93	C36.61	C38.64	C32.06	C7.22	C22.08
6a	29.16	82.26	30.95	89.22	14.95	64.67	25.72	80.56
6b	18.06	59.67	17.85	69.89	10.12	55.33	17.14	63.04
6e	65.97	95.69	80.95	97.40	70.81	98.00	81.43	98.58
6f	38.89	81.18	45.23	79.18	31.07	74.00	48.57	78.67
12c	43.26	75.27	47.61	74.35	26.68	58.67	35.72	65.87
12e	32.63	74.73	41.67	92.57	30.44	85.20	38.57	84.83
15g	20.87	74.46	23.37	82.87	29.68	83.56	34.85	79.05
15h	21.74	68.47	24.67	77.90	18.88	76.71	30.31	77.62
20	25.53	24.19	100.00	100.00	22.42	38.26	100.00	100.00
22b	38.89	20.00	85.71	80.67	6.57	4.39	38.57	55.45
23a	31.91	67.20	75.00	93.31	38.13	68.12	97.14	97.16
23b	29.79	44.09	78.57	85.13	17.02	26.51	88.57	74.88

Note: Re 5c: A means 'employee alone', B 'Employee and supervisor/middle manager' and C 'supervisor/middle manager alone'.

Table A2 Firms posing greater demands by recruitment of employees 1993-95 distributed according to static-dynamic typology and economic sector.

Group	Manufacturing				Non-manufacturing			
	Vocational qualifications	Co-operation ability and communication	Re-adjustment ability	Responsibility and quality consciousness	Vocational qualifications	Co-operation ability and communication	Re-adjustment ability	Responsibility and quality consciousness
1	34.0	36.9	39.0	48.9	34.5	32.7	30.8	44.4
2	56.5	69.4	72.0	79.0	49.3	50.7	52.0	63.0
3	40.5	47.6	61.9	70.2	52.9	54.3	52.9	65.7
4	59.5	77.7	79.6	81.4	55.5	64.5	65.4	74.4
Average	51.0	63.2	66.9	72.7	43.0	44.1	43.5	55.6

Table A3 Changes in employees' work content during the period 1993-95 distributed by static-dynamic typology and economic sector.

More weight on these tasks	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
Autonomy	35.0	72.0	67.9	82.9	33.8	58.7	51.4	73.9
Vocational qualifications	28.2	58.6	47.6	64.3	31.2	54.3	38.6	63.0
Specialisation	19.0	29.6	32.1	32.7	21.9	36.3	37.1	47.4
Routine content	4.9 (14.1)*	3.8 (45.7)*	11.9 (31.0)*	4.5 (55.8)*	7.2 (12.6)*	9.0 (29.3)*	5.7 (30.0)*	8.1 (37.9)*

Customer contact	17.6	48.4	41.7	52.8	27.0	47.7	52.9	61.6
Sub-contractor contact	14.8	33.3	41.7	50.2	15.0	22.0	27.1	36.0
Contact to other firms	13.4	24.2	26.2	33.5	9.6	17.0	17.1	30.8
Co-operation with colleagues	23.2	58.6	45.2	70.3	23.7	46.7	37.1	64.9
Co-operation with management	26.1	66.1	48.8	76.2	24.7	52.3	48.6	64.9

* Figures in () comprise percentage of firms with *less* content of routine.

Table A4. Factors which to a high extent have contributed to changes in the work content of the employees 1993-95 distributed by static-dynamic typology and economic sector.

	Manufacturing				Non-manufacturing			
	Gr.1	Gr.2	Gr.3	Gr.4	Gr.1	Gr.2	Gr.3	Gr. 4
Sharper competition	20.4	35.5	38.1	46.8	18.8	28.3	35.7	41.2

Improved possibilities for development of new products-/services	7.8	10.2	21.4	24.5	5.6	9.3	17.1	26.1
Introduction of new technology	11.4	29.0	29.8	46.8	12.4	31.3	41.4	50.2
Need for greater flexibility by employees	19.2	44.1	38.1	57.6	15.7	28.7	27.1	43.1
Need for better contacts to customers	13..5	25.8	17.9	30.5	14.1	29.3	28.6	39.3
Need for better contacts to subcontractors	7.8	9.1	9.5	20.5	4.3	9.7	7.1	14.7

Need for better possibilities for the stimulation of the development of the employees' qualifications	7.1	20.4	6.0	26.4	4.3	17.3	14.3	25.6
Demands and wishes from the employees	2.1	11.3	6.0	15.6	5.6	12.7	10.0	14.7

Table A5. Factors which have contributed to the promotion or hindrance of organisational development distributed by static-dynamic typology and economic sectors.

	Direction	Manufacturing				Non-manufacturing			
		Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
Middle management's attitudes	Promote	39.9	44.1	50.0	53.90	35.8	59.3	54.3	58.2
	Hindrance	16.1	35.0	23.81	30.9	6.0	15.0	8.6	14.7
Middle management's qualifications	P	37.8	33.9	39.3	43.1	31.5	50.3	45.7	60.2
	H	16.1	36.56	25.0	36.1	8.8	16.7	7.2	19.4

Empl-oyees' attitud-es	P	32.9	50.0	44.1	53.5	35.6	55.7	37.1	61.6
	H	12.6	22.6	21.4	24.2	10.9	18.0	17.2	19.0
Empl-oyees' quali-fica-tions	P	30.8	38.2	38.1	43.1	34.7	45.3	34.3	59.2
	H	8.4	22.0	14.3	23.1	7.8	12.7	14.3	13.8
Co-opera-tion commi-tees	P	25.2	45.7	38.1	53.2	10.6	22.7	15.7	24.2
	H	2.1	3.2	2.4	4.8	1.0	1.3	0.0	2.9
Shop ste-wards	P	20.3	42.5	41.7	54.6	11.3	17.0	7.1	15.6
	H	9.8	12.4	9.5	10.0	2.0	3.7	1.4	2.9
Consu-ltants' quali-fica-tions	P	15.4	29.6	19.0	37.9	11.4	24.7	22.9	33.7
	H	1.0	3.8	4.8	3.0	1.2	2.3	2.9	1.4
Public sup-port mea-sures	P	9.8	18.8	17.9	27.1	7.0	8.0	12.9	13.3
	H	1.0	2.7	1.2	1.5	1.5	2.7	0.0	1.0
Know-ledge from other firms	P	21.7	38.2	36.9	50.9	17.8	37.3	28.6	49.8
	H	1.0	1.6	1.2	2.6	1.6	1.7	1.4	1.0

Co-operation with educational institutions	P	16.8	41.4	33.3	49.8	18.6	26.7	18.6	37.9
	H	2.1	2.2	0.0	1.1	1.6	2.3	0.0	1.4

Table A6. Content of courses distributed by static-dynamic typology and economic sectors.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4
Strategy, markets and customers	31.7	59.1	44.3	74.3	40.5	72.5	64.4	80.0
New technology	54.5	71.0	67.1	88.3	55.4	79.4	79.7	89.1
Communication, co-operation etc.	32.7	59.7	47.1	75.1	30.1	61.0	54.2	73.3
Quality control	56.4	77.3	55.7	86.8	37.6	63.4	61.0	70.0
Work environment	45.5	56.8	61.4	73.6	30.8	41.8	37.3	47.6
Environmental demands	34.7	47.2	47.1	64.5	22.4	33.1	30.5	42.4

Management development	32.7	59.1	40.0	77.0	33.5	59.9	52.5	81.0
Custom tailored topics	34.7	55.4	32.9	72.5	44.3	64.5	50.9	72.9

Table A7. Firms which to a high/some extent have developed a closer co-operation with external parties 1993-95 distributed according to co-operation partner, static-dynamic typology and economic sector.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr.4
Customer	71.6	90.3	91.7	95.9	66.6	82.9	91.43	92.0
Sub-contractor	52.5	71.0	69.1	87.4	47.5	59.1	60.0	68.7
Consultants	19.9	26.9	16.7	33.8	10.0	25.8	22.9	37.9
Knowledge centres	12.1	19.9	20.2	39.0	3.9	12.1	14.3	24.7
Educational institutions	15.6	33.9	23.8	55.8	14.4	23.8	12.9	30.3
Public authorities	15.6	25.3	19.1	34.2	10.3	16.5	22.9	26.5

Table A8. The primary objective of the organisational changes distributed according to static-dynamic typology and economic sectors.

	Manufacturing				Non-manufacturing			
	Gr. 1	Gr. 2	Gr. 3	Gr. 4	Gr. 1	Gr. 2	Gr. 3	Gr. 4

Effectiveness	57.9	67.2	63.2	67.7	47.6	71.7	67.4	62.9
Co-operation and coordination	28.1	54.4	42.1	63.2	35.0	46.5	39.5	63.5
Adjustment to more turbulent environment	36.8	47.2	42.1	62.3	35.0	47.2	46.5	56.6
Development of more new products/services	19.3	17.6	38.6	41.7	14.2	25.8	34.9	35.9
Strengthening of knowledge	19.3	21.6	24.6	37.2	15.4	28.3	30.2	34.6