Table 1. Response rate by sector

Sector	Number of surveys sent	Number of surveys received	Response Rate (%)
Transportation Equipment	132	32	24.2
Computing, Electrical & Telecommunications	260	67	25.8
Machine Tool & Die	238	57	23.9
Health	130	34	26.2
Plastics	130	47	36.2
Entire sample	890	237	26.6

Table 2. R&D intensity over time

Level of R&D expenditures as a percentage of sales*	**1989**	**1992**	**1995**
		% of firms	
Low	46.7	43.1	38.5
Medium	17.0	17.0	23.0
High	36.3	39.9	38.5
Valid N	135	153	161

*The low, medium and high categories correspond to the OECD classifications for this ratio of less than 1% for low, 1 to 2.999% for medium and 3% or greater for high. See Anthony Arundel, Gert van de Paal and Luc Soete, *Pace Report: Innovation Strategies of Europe's Largest Industrial Firms* (MERIT: June 1995), p. 7.

Table 3. R&D intensity by industrial sector, 1995

Percentage distribution of establishments and change in percentage share from 1989

R&D Intensity Level	Transportation Equipment*		Computing, Telecom & Electrical		Health		Machine Tool & Die		Plastics		Row Total
	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%
Low	54.5	-10.5	25.5	-14.5	16.0	-12.6	46.2	+2.4	57.1	-6.5	38.5
Medium	22.7	+12.7	12.8	+5.3	36.0	+17.0	23.1	-1.9	28.6	+1.3	23.0
High	22.7	-2.3	61.7	+9.2	48.0	-4.4	30.8	-0.5	14.3	+5.2	38.5
Column total (%)	99.9		100.0		100.0		100.1		100.0		100.0

*The transportation equipment sector includes firms from the automotive and aerospace sectors

Note: R&D intensity is calculated in the same manner as in Table 2. Figures in the column total may not come to 100 due to rounding errors.

Table 4. R&D intensity by ownership, controlling for firm size. (1995).

R&D intensity	Ownership						Chi-Square (P)
	Canadian		Foreign		Row Total		
	N	(%)	N	(%)	N	(%)	
Small & medium sized enterprises (1-249 employees)							
Low	27	27.6	11	50.0	38	31.7	
Medium	23	23.5	6	27.3	29	24.2	
High	48	49.0	5	22.7	53	44.2	5.77 (0.056)
Column Total	98	100.0	22	100.0	120	100.0	
Large Enterprises (250 + employees)							
Low	6	42.9	6	54.5	12	48.0	
Medium	3	21.4	3	27.3	6	24.0	
High	5	35.7	2	18.2	7	28.0	0.939 (0.625)*
Column Total	14	100.0	11	100.0	25	100.0	

*In this case, more than 20 percent of the cells in the crosstabulation had expected frequencies less than five.

Note: R&D intensity is calculated in the same manner as in Table 2.

Table 5. Training intensity over time

Level of training expenditures as a percentage of sales*	**1989**	**1992**	**1995**
		% of firms	
Low	56.2	42.6	36.2
Medium	21.5	27.0	31.6
High	22.3	30.5	32.2
Valid N	130	141	152

* The distribution of training intensity for 1995 was divided into three equal segments to create the definitions for the low, medium and high categories for this table. The actual cut-off points were less than 0.2% for low, 0.2-0.6% for medium and greater than 0.6% for high.

Table 6. Training intensity by industrial sector, 1995

Percentage distribution of establishments and change in percentage share from 1989.

Training intensity level	Transportation Equipment		Computing, Telecom & Electrical		Health		Machine Tool & Die		Plastics		Row Total
	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%	change in % share from 1989	%
Low	30.0	-28.8	36.2	-25.3	34.8	-17.8	30.6	-13.5	50.0	-16.7	36.2
Medium	45.0	+21.5	27.7	+14.9	39.1	-3.0	38.9	+12.4	11.5	+2.0	31.6
High	25.0	+7.4	36.2	+10.6	26.1	+20.8	30.6	+1.2	38.5	+14.7	32.2
Column Total (%)	100.0		100.0		100.0		100.0		100.0		100.0

Note: Training intensity is calculated in the same manner as in Table 5.

Table 7. Training intensity incidence by establishment size, 1995

Level of training expenditures as a percentage of sales	Size category							
	Small (1-49 employees)		Medium (50-249 employees)		Large (250+ employees)		Row Total	
	N	%	N	%	N	%	N	%
Low	17	31.5	22	31.4	13	52.0	52	34.9
Medium	16	29.6	24	34.3	8	32.0	48	32.9
High	21	38.9	24	34.3	4	16.0	49	32.9
Column Total	54	100.0	70	100.0	25	100.0	149	100.0

Note: Training intensity is calculated in the same manner as in Table 5. Chi-Square=5.52, p=.24

Table 8. Training intensity incidence by ownership, controlling for firm size. (1995).

	Ownership						
Training Intensity	Canadian		Foreign		Row Total		Chi-Square (P)
	N	%	N	%	N	%	
Small and medium-sized enterprises (1-249 employees)							
Low	21	23.6	16	64.0	37	32.5	
Medium	32	36.0	5	20.0	37	32.5	
High	36	40.4	4	16.0	40	35.1	14.67 (0.00065)
Column total	89	100.0	25	100.0	114	100.0	
Large enterprises (250+ employees)							
Low	5	50.0	8	57.1	13	54.2	
Medium	2	20.0	5	35.7	7	29.2	
High	3	30.0	1	7.1	4	16.7	2.38 (0.300)*
Column total	10	100.0	14	100.0	24	100.0	

*In this case, more than 20 percent of the cells in the crosstabulation had expected frequencies less than five.

Note: Training intensity is calculated in the same manner as in Table 5.

Table 9. Incidence of advanced process technology (APT) usage by establishment size.

APT usage	Size category							
	Small (1-49 employees)		Medium (50-249 employees)		Large (250+ employees)		Row Total	
	N	%	N	%	N	%	N	%
Not used	16	26.2	6	7.6	0	0.0	22	13.3
Used	45	73.8	73	92.4	26	100.0	144	86.7
Column Total	61	100.0	79	100.0	26	100.0	166	100.0

Note: Chi-Square = 15.11, p=.00052

Table 10. Advanced process technology (APT) usage: mean scores

	Sector					
Type of APT*	Transportation Equipment	Computing, Telecom & Electrical	Health	Machine Tool & Die	Plastics	Entire sample
AI	1.0	1.1	1.2	1.0	1.2	1.1
AGVS	1.3	1.1	1.0	1.2	1.1	1.1
CAD	3.8	3.7	3.0	3.3	2.9	3.4
CAM	2.4	2.2	1.9	2.2	2.0	2.1
CIM	1.7	1.3	1.2	1.5	1.3	1.4
CNC Machines	3.1	2.1	1.6	2.9	2.0	2.4
Programmable Controller	3.3	2.4	2.1	2.6	3.0	2.7
FMC	2.2	1.5	1.5	1.4	1.6	1.6
Material Working Lasers	1.1	1.3	1.2	1.3	1.2	1.2
MRP	3.3	3.3	2.6	2.5	2.6	2.9
Robots	1.8	1.7	1.4	1.5	1.7	1.6
Technical Data Network	2.1	2.7	2.5	2.3	1.9	2.3

Table 10:...continued

*APT abbreviations:

AI=Artificial Intelligence
AGVS=Automoated Guided Vehicle Systems or Automated Storage and Retrieval Systems
CAD=Computer-Aided Design
CAM=Computer-Aided Manufacturing
CIM=Computer Integrated Manufacturing
CNC=Computer Numerically Controlled Machines
FMC=Flexible Manufacturing Cells or Flexible Manufacturing Systems
MRP=Materials Requirement Planning or Manufacturing Resource Planning
Robots=Robots, including Pick and Place Robots
TDN=Technical Data Network or Factory Network

Note: Extent of use was measured on a scale running from "1=not used" through "5=extensive usage in all product lines".

Table 11. Usage of workplace innovations by establishment size: mean scores, 1995

Type of workplace innovation	Size category			
	Small (1-49 employees)	Medium (50-249 employees)	Large (250+ employees)	Entire Sample
Involving shop-floor employees in production planning	2.9	2.6	3.3	2.9
Concurrent engineering	2.7	2.6	3.1	2.7
ISO 9000	2.0	3.2	3.7	2.9
Frequent job rotation	2.0	2.2	2.7	2.3
Labour-management committees	2.5	2.6	3.5	2.8
Profit-sharing	2.6	3.0	3.1	2.9
Self-directed work groups	2.5	2.3	3.0	2.5
Statistical process control	1.7	2.4	2.8	2.3
Total quality management	2.4	2.6	2.9	2.6

Note: Extent of use was measured on a scale running from "1=not used" to "5=used in all departments or divisions."

Table 12. Usage of workplace innovations by industrial sector: mean scores, 1995

Type of workplace innovation	Sector					
	Transportation Equipment	Computing, Telecom & Electrical	Health	Machine Tool & Die	Plastics	Entire sample
Involving shop-floor employees in production planning	2.7	2.6	2.7	3.1	3.0	2.9
Concurrent engineering	2.6	2.8	2.4	2.9	2.5	2.7
ISO 9000	3.3	3.2	2.2	2.7	3.1	2.9
Frequent job rotation	2.3	2.2	2.1	2.1	2.5	2.2
Labour-management committees	2.7	2.9	2.7	2.4	3.1	2.8
Profit-sharing	2.4	3.1	2.5	2.9	3.1	2.9
Self-directed work groups	2.3	2.9	3.0	2.1	2.5	2.5
Statistical process control	2.4	2.3	2.0	2.1	2.5	2.3
Total quality management	3.0	2.5	2.3	2.5	2.6	2.6

Note: Extent of use was measured on a scale running from "1=not used" through "5=used in all departments or divisions".

Table 13. Relationship between employment growth and selected indicators of innovative internal practice.

A. Employment growth (1989-95) by R&D intensity (1989)

	R&D intensity							
Employment growth *	Low		Medium		High		Row Total	
	N	%	N	%	N	%	N	%
Low	23	37.7	7	31.8	14	28.6	44	33.3
Medium	27	44.3	7	31.8	11	22.4	45	34.1
High	11	18.0	8	36.4	24	49.0	43	32.6
Column Total	61	100.0	22	100.0	49	100.0	132	100.0

Note: Chi-Square = 12.64, *p*= .01320.

B. Employment growth (1989-95) by training intensity (1989)

	Training intensity							
Employment growth *	Low		Medium		High		Row Total	
	N	%	N	%	N	%	N	%
Low	19	34.5	9	34.6	11	23.9	39	30.7
Medium	21	38.2	15	57.7	10	21.7	46	36.2
High	15	27.3	2	7.7	25	54.3	42	33.1
Column Total	55	100.0	26	100.0	46	100.0	127	100.0

*Categories for employment growth and training intensity were created by dividing establishments into three equal segments. R&D intensity is calculated in the same manner as in Table 2.

Note: Chi-Square = 19.04, *p*= .00077.

Table 14. Interfirm relations by establishment size: mean scores.

Interfirm activity	Sector: Small (1-49 employees)	Medium (50-249 employees)	Large (250+employees)	Entire Sample
A. Relations with customers				
Joint production	2.0	1.8	2.3	1.9
Joint production scheduling	2.9	2.8	2.9	2.9
Joint marketing/ export promotion	2.0	2.2	2.4	2.1
Process or product design	3.6	3.2	3.7	3.4
Product development	3.7	3.6	3.9	3.7
Research	3.4	3.1	3.4	3.3
B. Relations with suppliers				
Joint production	1.8	2.1	2.7	2.1
Joint production scheduling	2.3	2.8	3.1	2.7
Joint marketing/ export promotion	1.7	1.9	1.8	1.8
Process or product design	2.9	3.1	3.3	3.1
Product development	2.8	3.3	3.2	3.1
Research	2.5	2.8	2.8	2.7

Table 14...continued

Interfirm activity	Small (1-49 employees)	Medium (50-249 employees)	Large (250+employees)	Entire Sample
C. Relations with other firms in the industry				
Joint production	1.3	1.4	1.5	1.4
Joint production scheduling	1.2	1.3	1.5	1.3
Joint marketing/ export promotion	1.5	1.6	1.5	1.5
Process or product design	1.7	1.7	2.0	1.7
Product development	1.7	1.8	2.0	1.8
Research	1.7	1.8	1.9	1.8

Note: The strength of interfirm relationships was measured on a scale ranging from "1=no relationship through to "5=close collaborative interaction".

Table 15. Interfirm relations by industrial sector: mean scores.

Interfirm activity	Sector					
	Transportation Equipment	Computing, Telecommunications & Electrical	Health	Machine Tool & Die	Plastics	Entire Sample
A. Relations with customers						
Joint production	2.5	1.8	1.2	2.1	2.0	1.9
Joint production scheduling	3.3	2.7	2.2	3.1	3.1	2.9
Joint marketing/ export promotion	2.5	2.3	1.9	2.0	2.1	2.2
Process or product design	3.4	3.4	3.3	3.6	3.3	3.4
Product development	3.6	3.9	3.5	3.6	3.9	3.7
Research	3.0	3.4	3.3	3.3	3.3	3.3
B. Relations with suppliers						
Joint production	2.7	2.1	1.8	2.1	1.9	2.1
Joint production scheduling	3.0	2.8	2.6	2.6	2.3	2.7
Joint marketing/ export promotion	1.9	1.6	2.0	1.8	1.8	1.8
Process or product design	2.9	3.1	3.1	3.0	3.4	3.1
Product development	3.2	3.0	3.1	2.8	3.5	3.1
Research	2.3	2.5	2.8	2.8	3.2	2.7

Table 15...continued

Interfirm activity	Transportation Equipment	Computing, Telecommunications & Electrical	Health	Machine Tool & Die	Plastics	Entire Sample
C. Relations with other firms in the industry						
Joint production	1.6	1.4	1.3	1.2	1.3	1.4
Joint production scheduling	1.5	1.5	1.3	1.1	1.2	1.3
Joint marketing/ export promotion	1.6	1.6	1.8	1.4	1.3	1.5
Process or product design	1.5	2.0	2.0	1.7	1.5	1.7
Product development	1.6	2.0	2.2	1.7	1.6	1.8
Research	1.7	1.9	2.0	1.7	1.6	1.8

Note: The strength of interfirm relationships was measured on a scale ranging from "1=no relationship through to "5=close collaborative interaction".

Table 16. Usage of interfirm practices by establishment size: mean score (1995)

Interfirm practice	Size category			
	Small (1-49 employees)	Medium (50-249 employees)	Large (250+ employees)	Entire Sample
Outsourcing R&D	2.8	2.2	2.1	2.3
Outsourcing production of parts	3.6	2.9	3.0	3.2
Outsourcing production of complete product	3.0	2.1	2.7	2.5
Strategic alliance or joint venture	2.9	2.9	3.1	3.0
Just-in-Time with customers	3.6	3.5	3.4	3.5
Just-in-time with suppliers	3.5	3.3	3.3	3.3
Electronic data interchange	2.5	3.0	3.2	2.9

Note: Extent of use was measured on a scale running from "1=limited" to "5=extensive".

Table 17. Relationship between employment growth and selected indicators of innovative inter-firm practice.

A. Employment growth (1989-95) by research relationships with customers

	Strength of relationship							
Employment growth *	No relationship		Limited relationship		Close relationship		Row Total	
	N	%	N	%	N	%	N	%
Low	4	23.5	30	35.7	27	31.4	61	32.6
Medium	10	58.8	29	34.5	25	29.1	64	34.2
High	3	17.6	25	29.8	34	39.5	62	33.2
Column Total	17	100.0	84	100.0	86	100.0	187	100.0

Note: Chi-Square = 6.97, *p*= .13732.

B. Employment growth (1989-95) by just-in-time with customers

	Extent of use (column percentages in parentheses)							
Employment growth *	Limited use		Moderate use		Extensive use		Row Total	
	N	%	N	%	N	%	N	%
Low	13	54.2	7	26.9	14	25.0	34	32.1
Medium	6	25.0	12	46.2	15	26.8	33	31.1
High	5	20.8	7	26.9	27	48.2	39	36.8
Column Total	24	100.0	26	100.0	56	100.0	106	100.0

*Categories for employment growth were created by dividing establishments into three equal segments.

Note: Chi-Square = 11.59, *p*= .02067