Innovation Cluster Research

Linkages in the New Brunswick ICT Innovation Cluster: Where are the Corners of the Diamond?

Table 1: The New Brunswick ICT sector at a glance, ca. early 2002

- Number of firms: 247 (see note i below).
- Number of firms participating in survey: 189
- Gross Revenues, estimate 1: $755.4M (note ii)
- Gross Revenues, estimate 2: $600.3M (note iii)
- Gross Revenues from IT: $478.4 M (note iv)
- Mean revenues per firm: $3.7M
- Total number of employees: 4550 (note v)
- Mean number of employees: 24
- number of IT employees: 3862 (note vi)
- Percentage of firms employing fifteen or fewer employees: 75%
- Percentage of responding companies indicate that they had created a new pr
  process in the preceding three year: 91%
- Percentage of responding firms generating revenues outside of New Brunswick: 72%
- Percentage of aggregate IT revenues generated outside of Atlantic Canada: 63%
- Average age of firm: 8 years
- Average growth rate in IT revenues in the three years period 1999-2001: 177%
- Percent independent (i.e. owned and operated by individuals residing in New Brunswick): 84%

About as big as tourism sector

Most are small, young, locally-owned firms

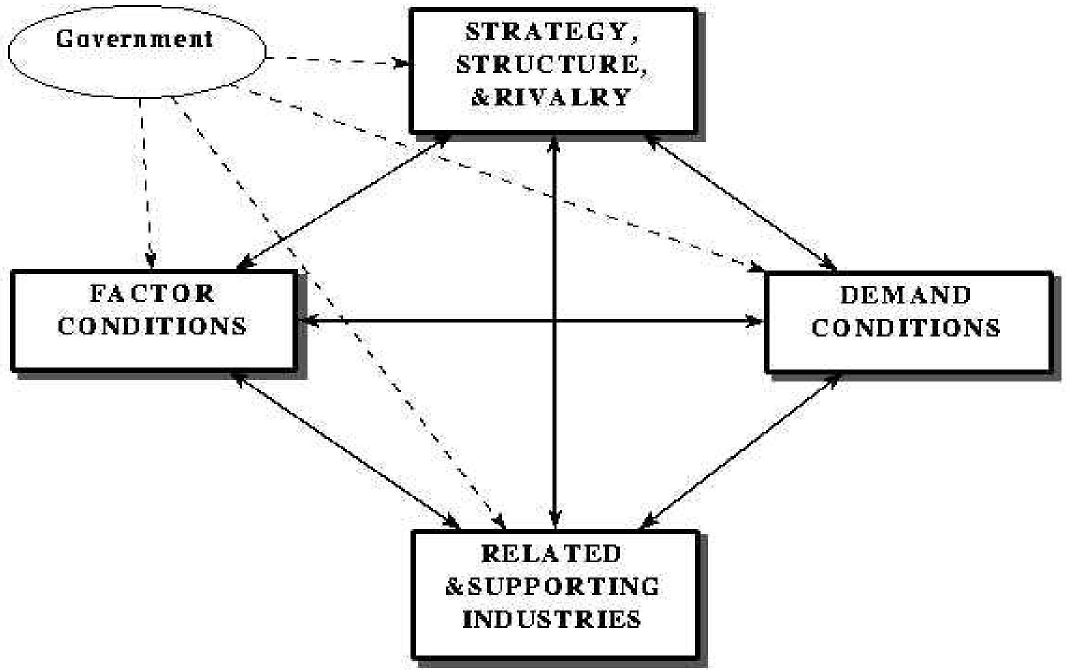
Export-oriented

Very high growth rate

Davis and Schaefer, 2003

Definitions of “cluster” require specification of the nature and scope of local inter-firm traded and untraded interdependencies, which may result from co-location of related firms, co-located segments of a value chain, or inter-firm networks (Gordon and McCann, 2000).

Porter’s “Diamond”



A Porter Cluster? - Goals

- Evaluate New Brunswick IT industry in terms of Porter’s model
- Determine degree and perceived significance of co-location of factors as perceived by the interviewees

A Porter Cluster? - Methodology

- Questionnaire
  - Open and Closed ended questions
  - 30 pages in length
  - Minimum 1 hour to complete
- Sample size 44
- Selection Criteria

Customers

Innovative Customers

Innovative Customers

	Frequency	Percent
Yes	38	86.4
No	5	11.4
No Response	1	2.3
Total	44	100.0

Location of Innovative Customers

	# of Respondents Indicating Innovative Customers in the Region	# of Innovative Customers
New Brunswick	**14**	**27 (14.7%)**
Atlantic Canada Except New Brunswick	**4**	**10 (5.4%)**
Rest of Canada	**13**	**20 (10.8%)**
USA Only	**21**	**98 (53.3%)**
International Except USA	**13**	**29 (15.8%)**
Total		**184**

Co-location and Competitive Disadvantage

Competitive Disadvantage - Customer Distance

	Frequency	Percent
Yes	21	47.7
No	19	43.2
Not Applicable	2	4.5
No Response	2	4.5
Total	44	100.0

Competitors

Location of Major Competitors

Location of Major Competitors

	Frequency
New Brunswick	10
Atlantic Canada Excluding New Brunswick	1
Canada Excluding Atlantic Canada	12
USA	34
International Excluding USA	13
Total	70

Importance of Monitoring Competitors

Importance of Monitoring Competitors

	Frequency	Percent
1.0	1	2.3
3.0	10	22.7
4.0	14	31.8
4.5	2	4.5
5.0	14	31.8
No Response	3	6.8
Total	44	100.0

Difficulty in Monitoring Competitors

Difficulty in Monitoring Competitors

	Frequency	Percent
Not Applicable	9	20.5
1	7	15.9
2	8	18.2
3	4	9.1
4	10	22.7
5	1	2.3
No Response	5	11.4
Total	44	100.0

Competitor Distance

Competitive Disadvantage - Competitor Distance

	Frequency	Percent
Yes	7	15.9
No	25	56.8
Not Applicable	6	13.6
No Response	6	13.6
Total	44	100.0

Suppliers

Critical Suppliers

Critical Suppliers

	Frequency	Percent
Yes	16	36.4
No	27	61.4
No Response	1	2.3
Total	44	100.0

Location of Critical Suppliers

Location of Critical Suppliers

	Frequency	Percent
New Brunswick	5	17.2
Atlantic Canada Excluding New Brunsw	1	3.5
Canada Excluding Atlantic Canada	7	24.1
USA	10	34.5
International Excluding USA	6	20.7
Total	29	100.0

Co-Location and Competitive Disadvantage

Competitive Disadvantage - Supplier Distance

	Frequency	Percent
Yes	4	25.0
No	12	75.0
Total	16	100.0

Research Institutes

Research Partners

Collaboration with R&D Institutions Other Than NRC

	Frequency	Percent
Yes	13	29.5
No	23	52.3
No Response	8	18.2
Total	44	100.0

Location of Research Institutes

Location of Research Institutes Used (Excluding NRC)

	Frequency
New Brunswick	9
Atlantic Canada Excluding New Brunswick	3
Canada Excluding Atlantic Canada	7
USA	3
International Excluding USA	1
Total	23

Competitive Disadvantage of Not Co-Locating

Does Geographic Distance Negatively Affect Your Relationships With Outside Research Institutes?

	Frequency	Percent
Yes	13	29.5
No	16	36.4
No Response	15	34.1
Total	44	100.0

Benefits of Moving

Would Your Company Gain A Competitive Advantage by Moving to a Metropolitan Area?

	Frequency	Percent
Yes	15	34.1
No	26	59.1
Not Sure	1	2.3
No Response	2	4.5
Total	44	100.0

Research Issues

- Significant differences were found among company responses in relation to :
  - Importance of co-location of customers
  - Importance of co-location of competitors
- Can the difference in importance give guidance where co-location is necessary, desirable, critical?

Market linkages, firm performance, and innovation

Figure 2: Establishment of Firms by Date and Industry Subsector in New Brunswick

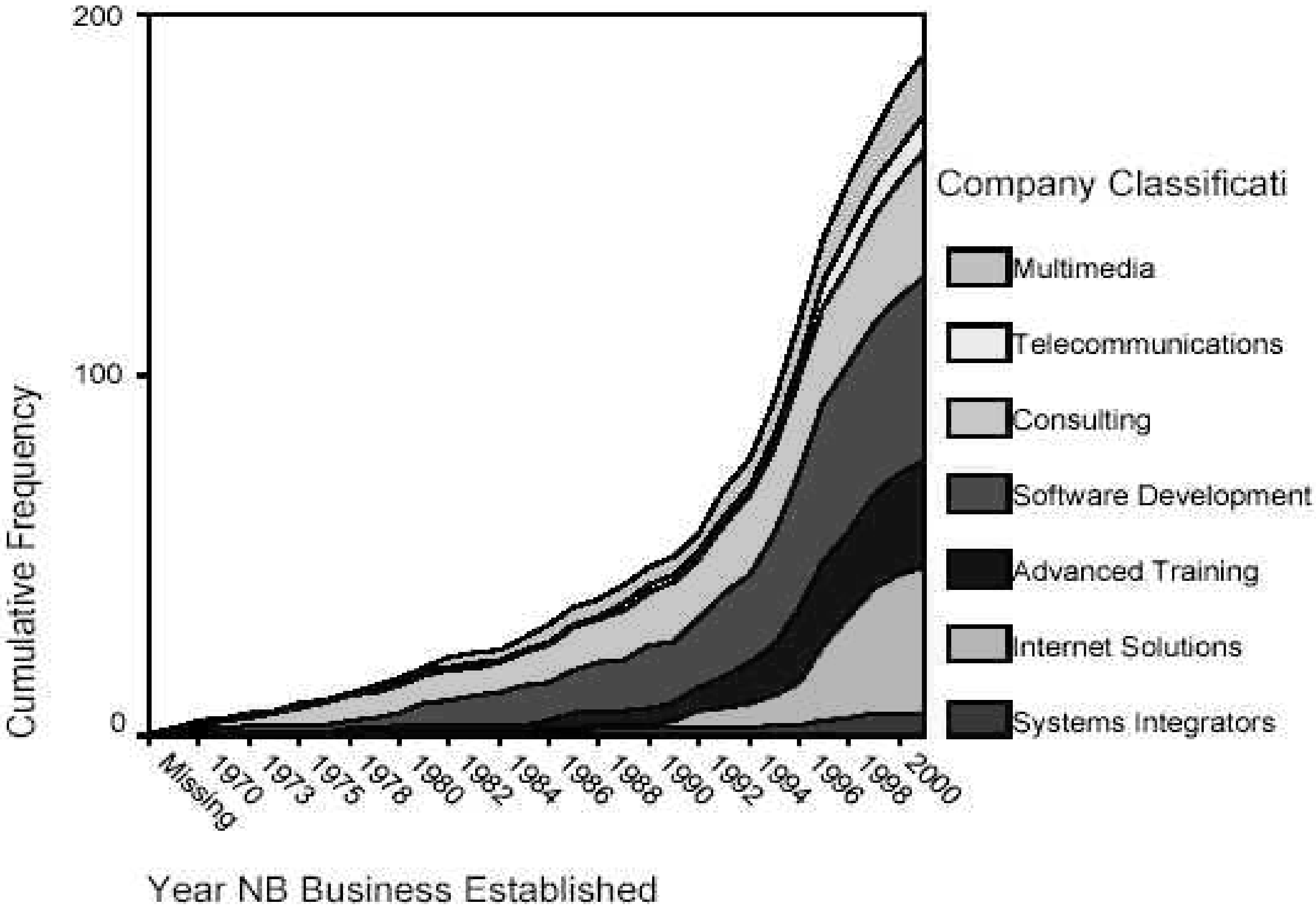


Figure 3: 2001 IT Revenues by Subsector and Geographical Location of Market

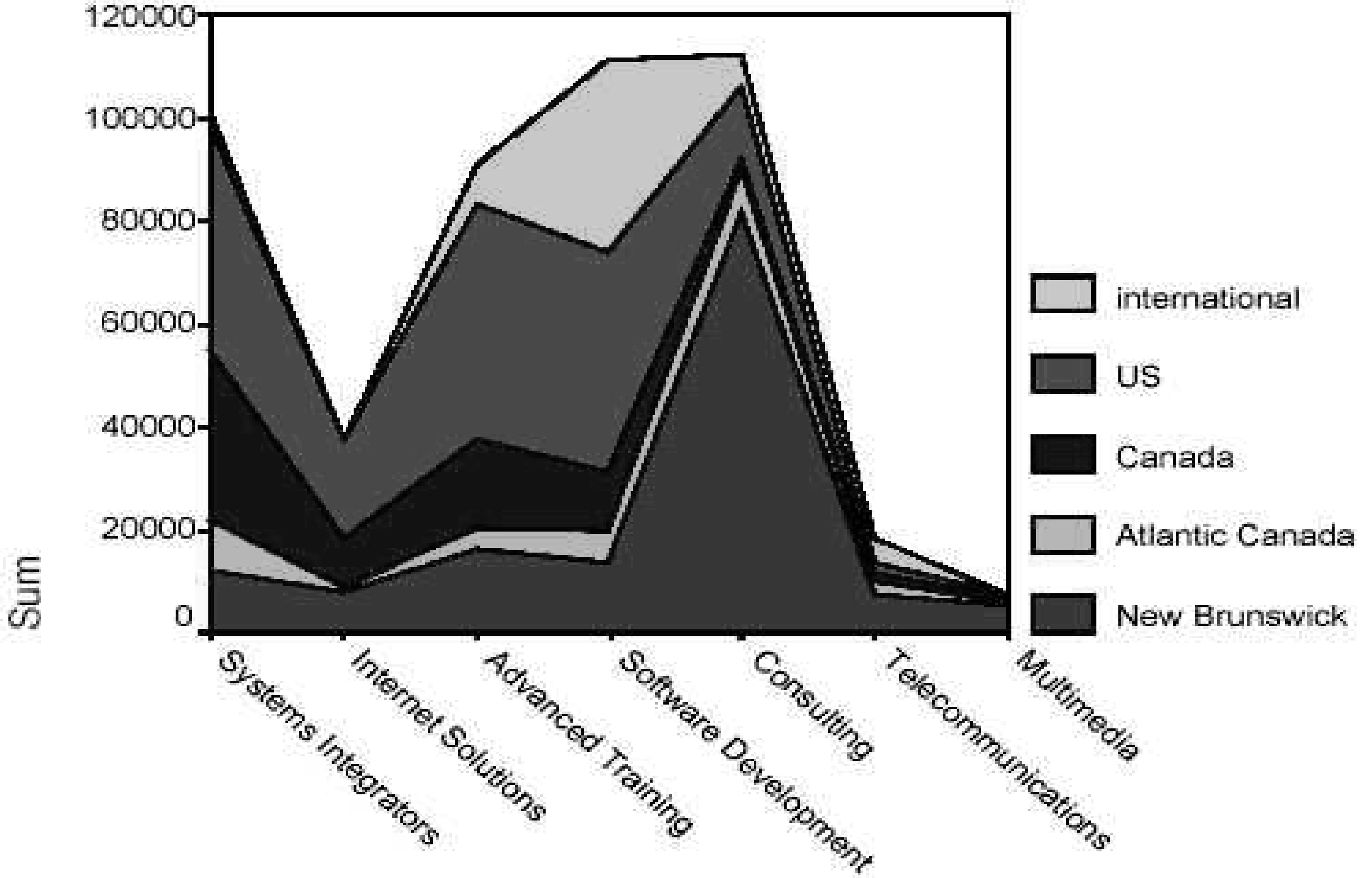
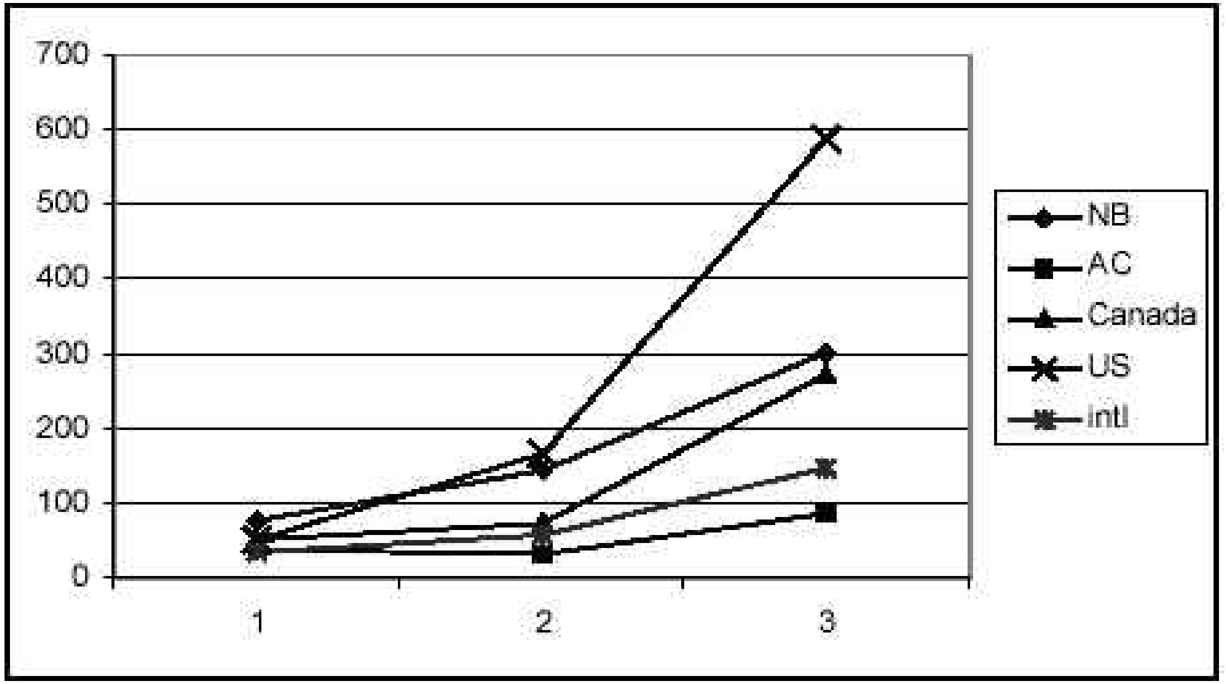
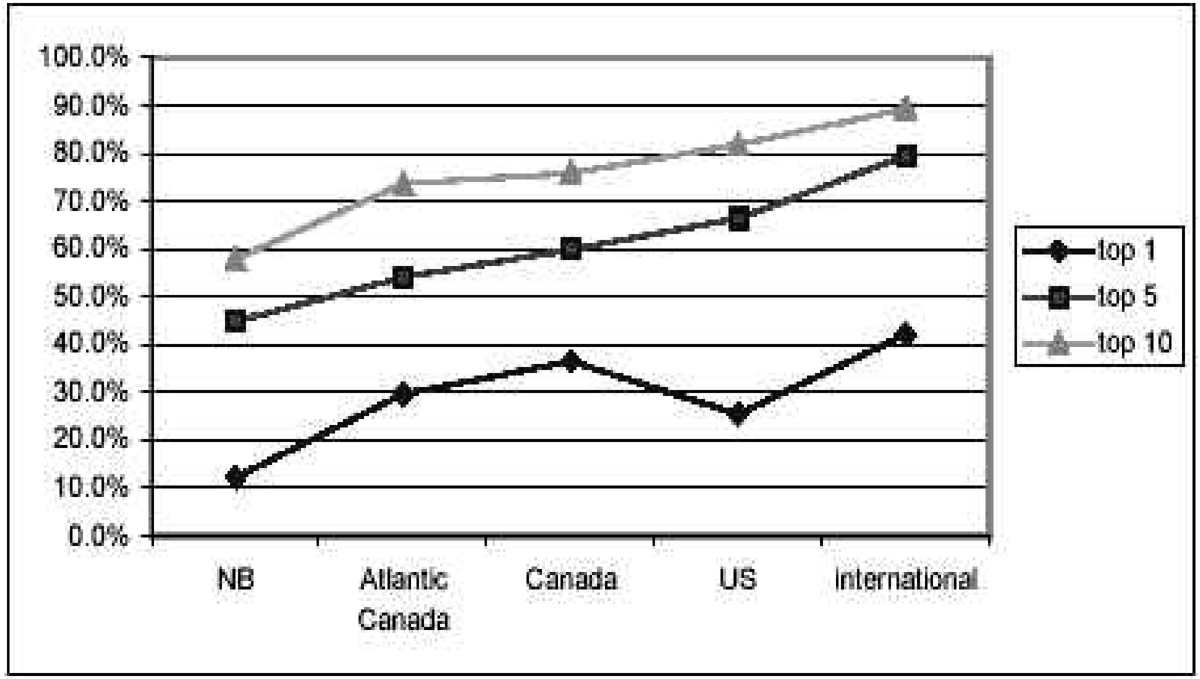


Figure 4: estimated and forecast growth of New Brunswick ICT firms' IT revenues, 1999-2004



The vertical axis represents millions of dollars. The horizontal axis represent estimates for 1999, 2001, and 2004 respectively. Size of IT markets in 1999 and 2004 was calculated using respondents' estimates of revenue growth in 1999-2001 and their revenue growth projects for 2002-2004. Only IT revenues are included. Data refer only to firms active in early 2002.

Figure 7: Concentration of IT Earnings Among ICT Firms in New Brunswick, by Market



Note: figures for Atlantic Canada exclude New Brunswick; figures for Canada do not include Atlantic Canada or New Brunswick; figures for international revenues do not include the United States

Quadrant 1: independent exporters (65 firms)	Quadrant 2: branches and subsidiaries that export (11 firms)
Quadrant 4: independent firms that export little or not at all (84 firms)	Quadrant 3: branches and subsidiaries that export little or not at all (19 firms)

	quadrant			
	1.00	2.00	3.00	4.00
% change in Reven past 3 years	340.79	138.33	111.88	59.41

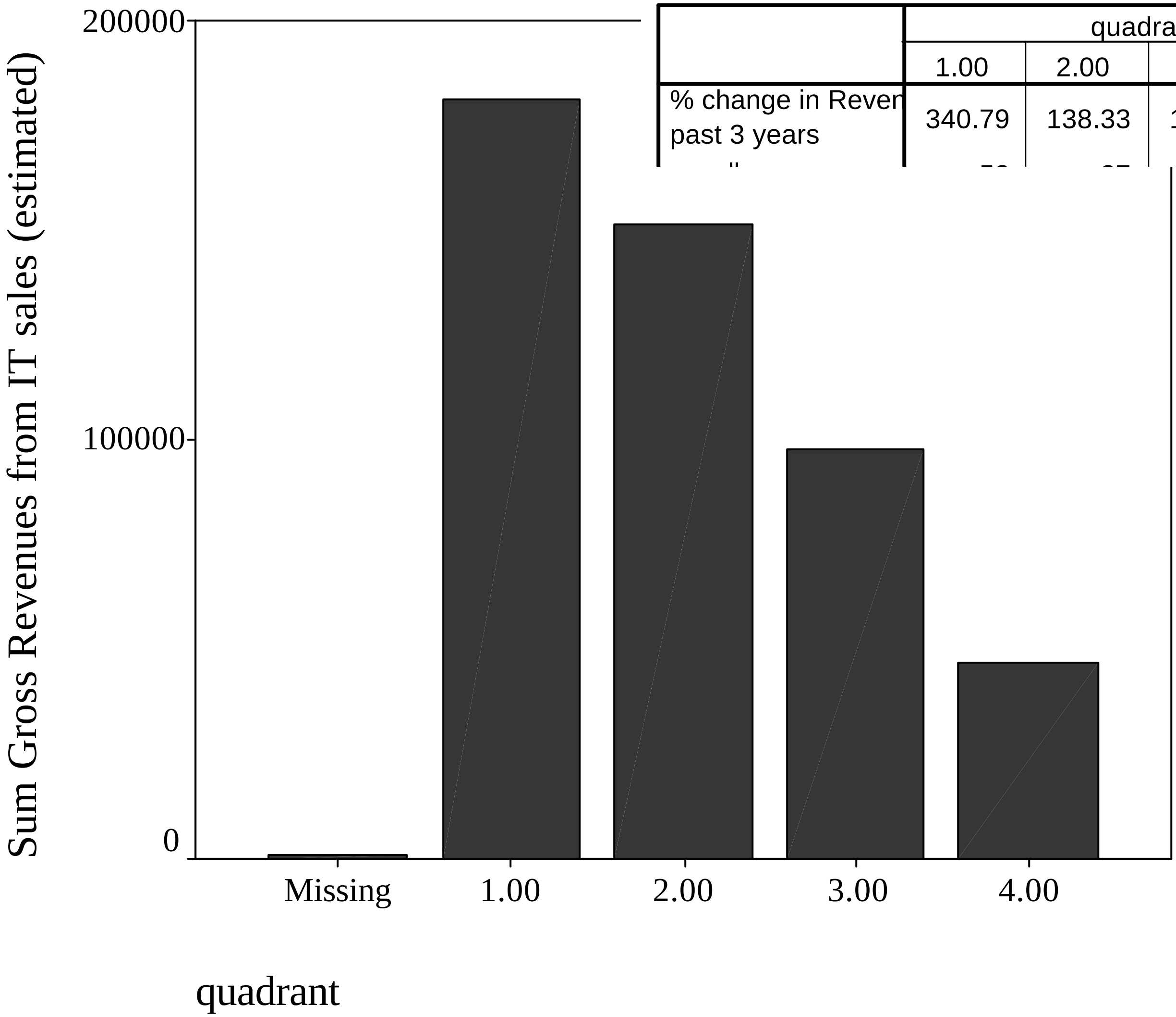


Figure 5: New Brunswick ICT Firms' Degree of Innovation by Industry Subsector and Quadrant

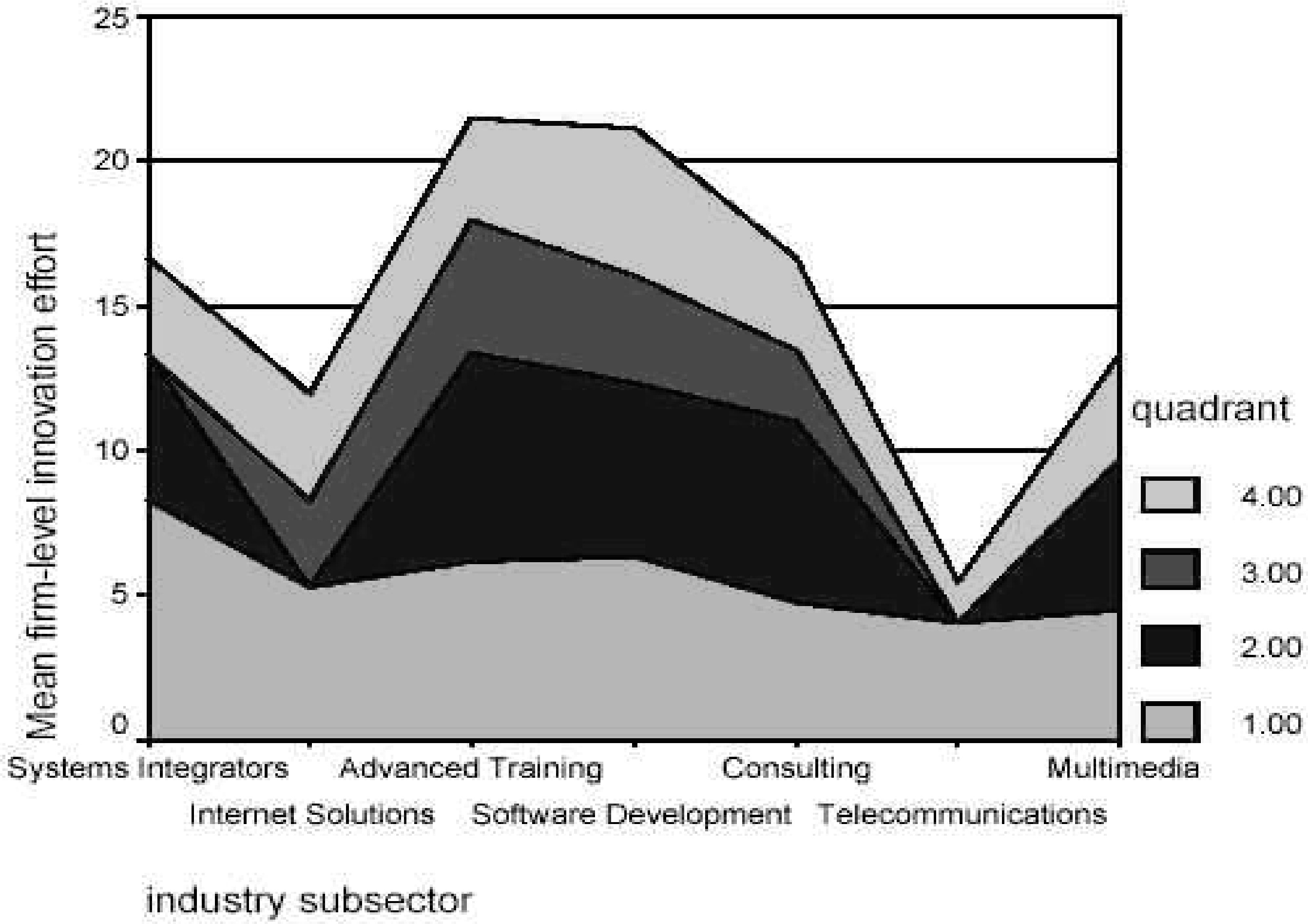
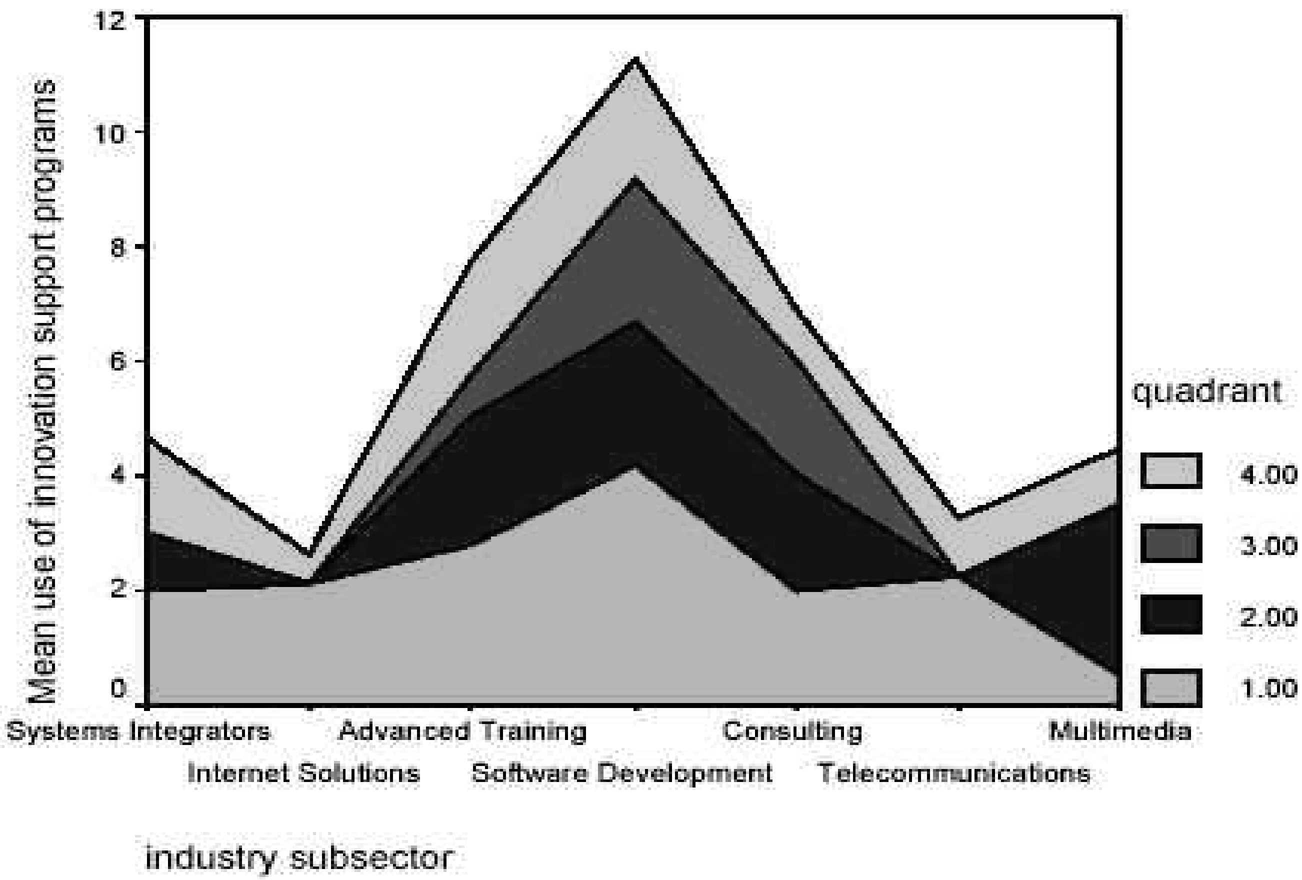


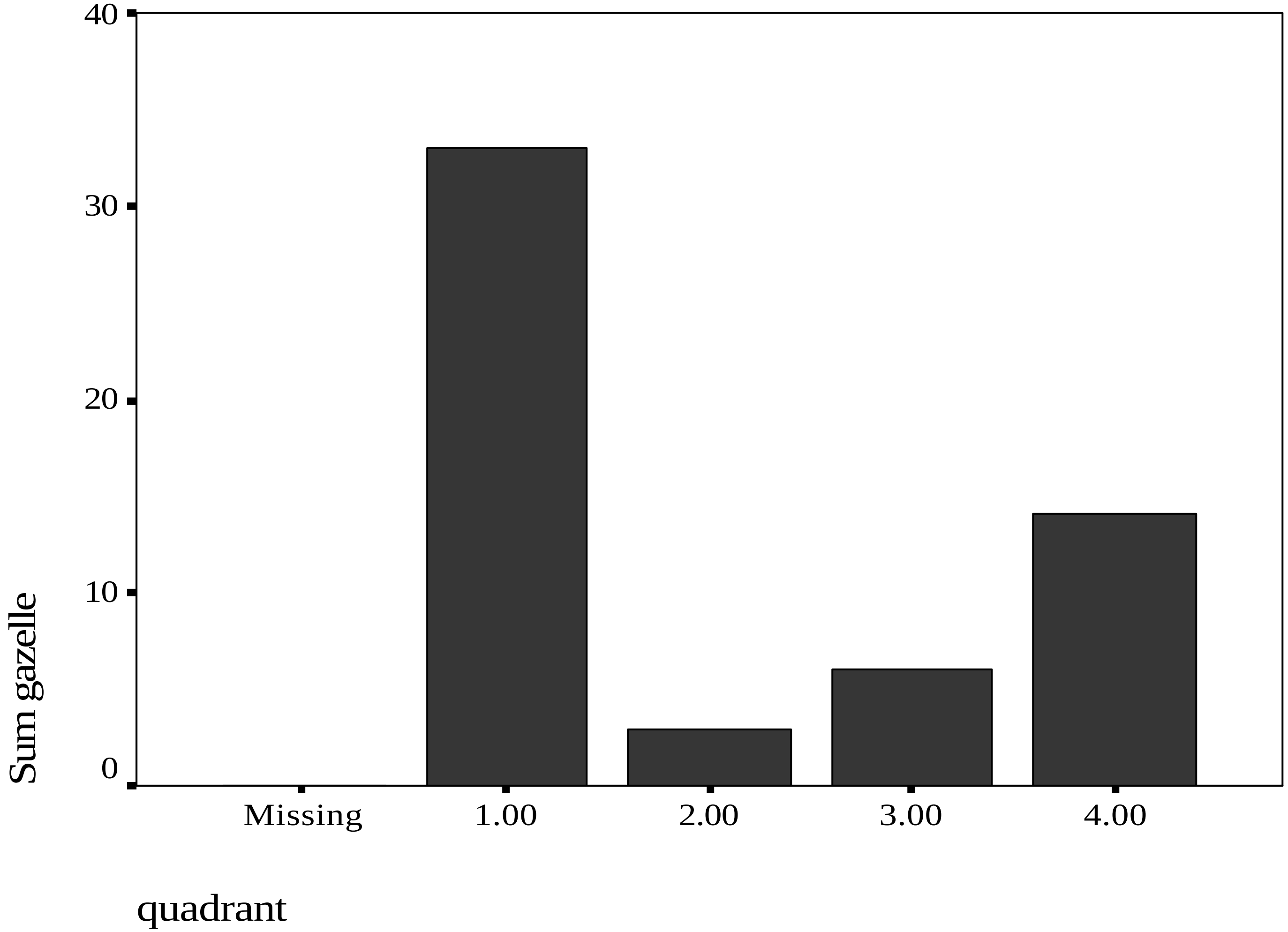
Figure 6: New Brunswick ICT Firms' Use of Public Innovation Support Programs and Services by Industry Subsector and Quadrant



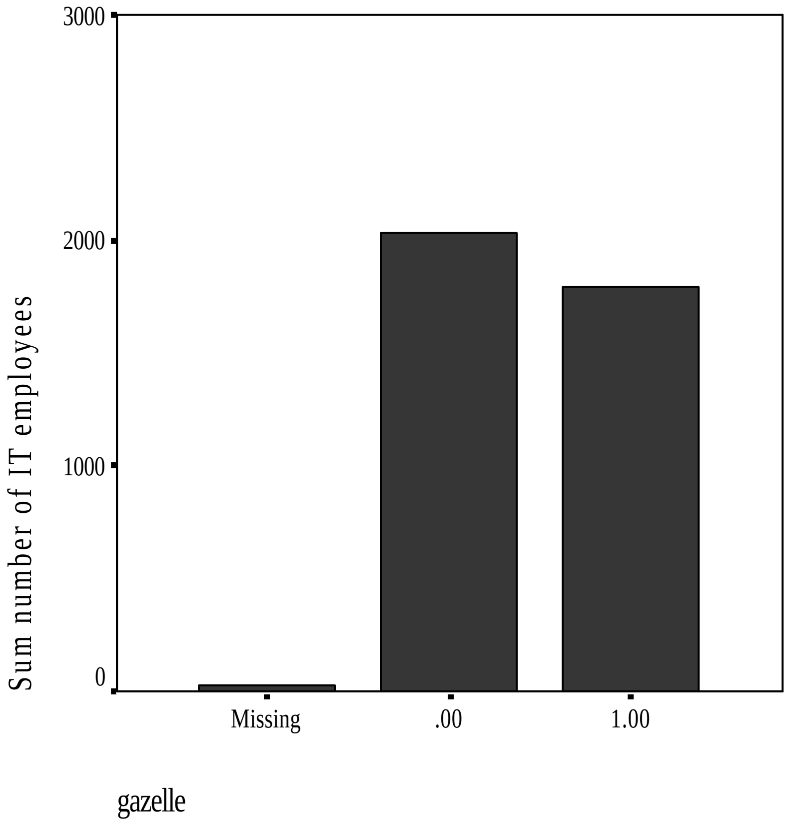
Quadrant 1: independent exporters. Quadrant 2: externally controlled exporters. Quadrant 3: externally controlled non-exporters. Quadrant 4: independent non-exporters. For further explanation of the quadrant construct, see Table 8.

“gazelles”

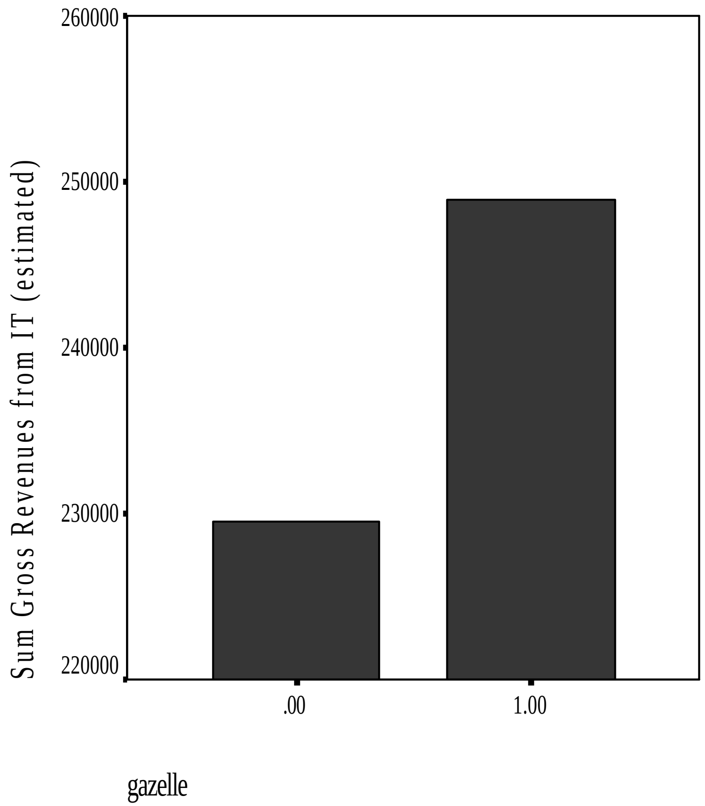
- Firms that experience much higher than average growth rates
- In this study, gazelles are firms that have grown more than 73% in the three years between 1999 and 2001 and have revenue of at least $100K
- By these criteria, 56 NB IT firms are gazelles



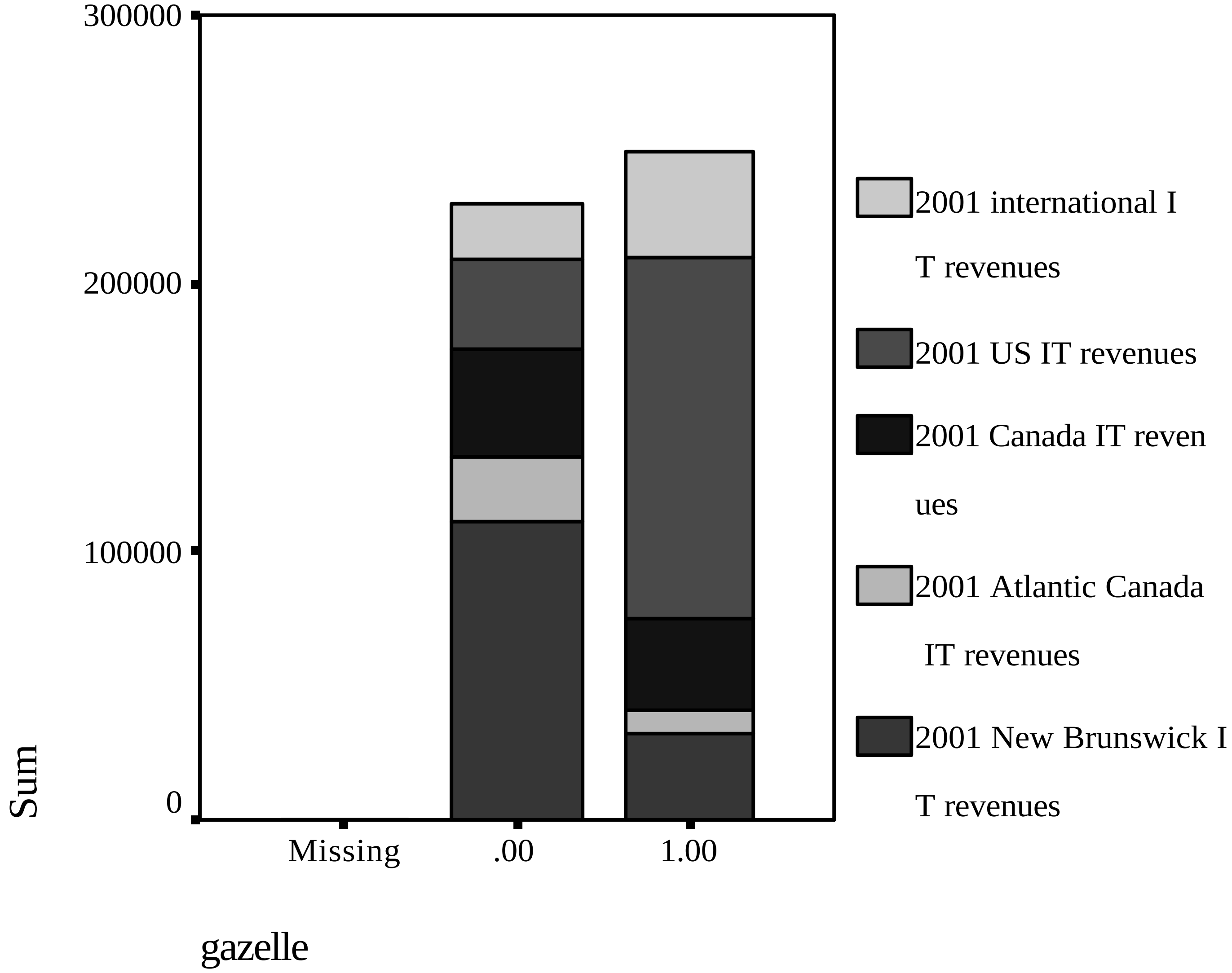
40
30
20
10
0
Sum gazelle
Missing
1.00
2.00
3.00
4.00
quadrant



Sum number of IT employees
3000
2000
1000
0
Missing
.00
1.00
gazelle



Sum Gross Revenues from IT (estimated)
260000
250000
240000
230000
220000
.00
1.00
gazelle


300000
200000
100000
0
Sum
Missing
.00
1.00
gazelle
2001 international IT revenues
2001 US IT revenues
2001 Canada IT revenues
2001 Atlantic Canada IT revenues
2001 New Brunswick IT revenues