Patenting
Waterloo Region

The number of patents per calendar year generated by inventors in the Waterloo Region increased by nearly a factor of 10 between 1975 and 1997 from roughly 20 patents per year to nearly 200 patents per year (see Figure 1). Most of this growth occurred in the last decade and after the dot-com bust.

The industrial mix of patents also changed significantly between 1975 and 2007. While there is a high level of diversity within the Waterloo Region, the combination of computers (17.9%) and telecommunications (21.2%) accounted for 2 out of every 5 patents between 1998 and 2007. This is twice the proportion of the previous two decades.

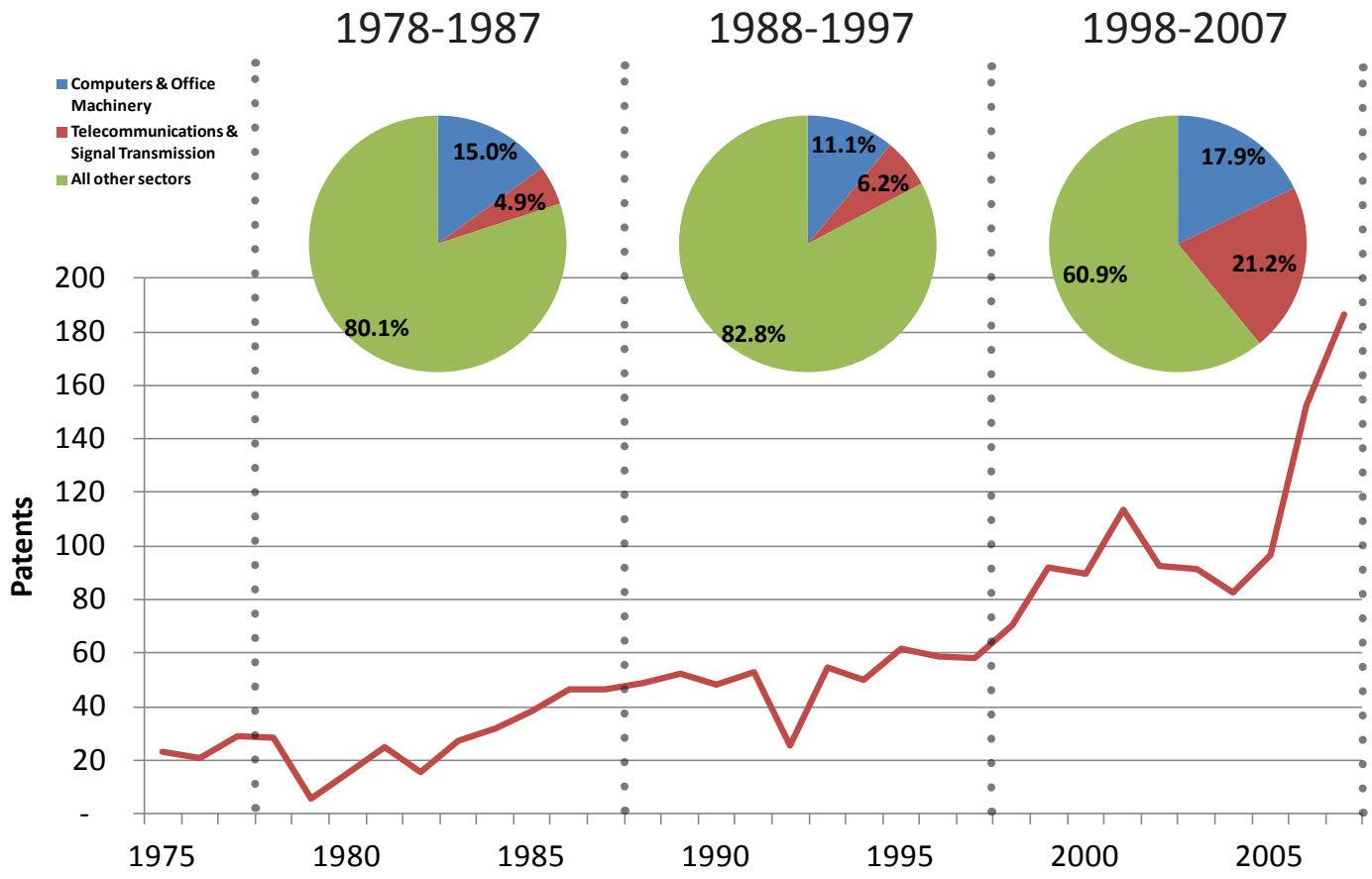
Both the high number and high growth in patents in computers and telecommunications in the Waterloo Region are reflected in the top patenting enterprises (see Table 1). Research in Motion is the most prolific generator of patents by a wide margin with 211 patents between 1998 and 2007. It is also important to highlight that the University of Waterloo produced the 7th most patents in the region over the same time period. This gives credence to the view that it is an important player in the local technology ecosystem.

Table 1 - Top 10 Patenting Enterprises 1998-2007

Enterprise	Patents
Research In Motion Limited	211
NCR Corporation	55
Com Dev Limited	38
Maxtech Manufacturing Inc	27
Dalsa Inc	27
Certicom Corporation	26
University Of Waterloo	25
Senesco Inc	15
Babcock Wilcox Canada Limited	13
Intelligent Mechatronic Systems Inc	13

Data notes:
- Source: USPTO
- All data has been cleaned and geocoded by Prof. Dieter Kogler University College Dublin
- Patents counts are proportional to number of inventors

Figure 1 - Number of patents by year and key industries



Inventor Connections

Waterloo Region

An analysis of patents that involved collaboration between inventors based in the Waterloo Region and inventors elsewhere show that the majority of these relationships exist within Ontario. Specifically, connections to Toronto (see Figure 2) are by far the most common with 652 instances of a Toronto-based inventor collaborating with an inventor in the Waterloo Region. Connections with Guelph (162) and Hamilton (119) are also quite strong and provide evidence of the formation of a 'tech-triangle' to the west of the GTA.

Most instances of international collaboration occur with US-based inventors. The top five US states (see Figure 3) are Connecticut (67), New York (54), Michigan (48), California (46), and New Jersey (30).

Beyond the United States (447) the top countries for inventor collaboration with the Waterloo Region are Germany (30), Great Britain (22), France (19), and Japan (7) (see Figure 4).

Figure 2 - Top ten Canadian city-regions by number of co-inventors, 1975-2007

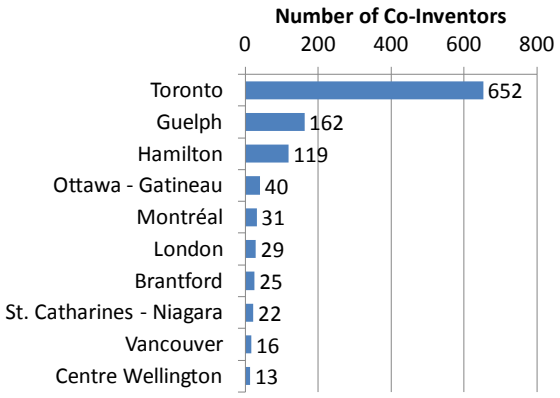


Figure 3 - Top five US states by number of co-inventors, 1975-2007

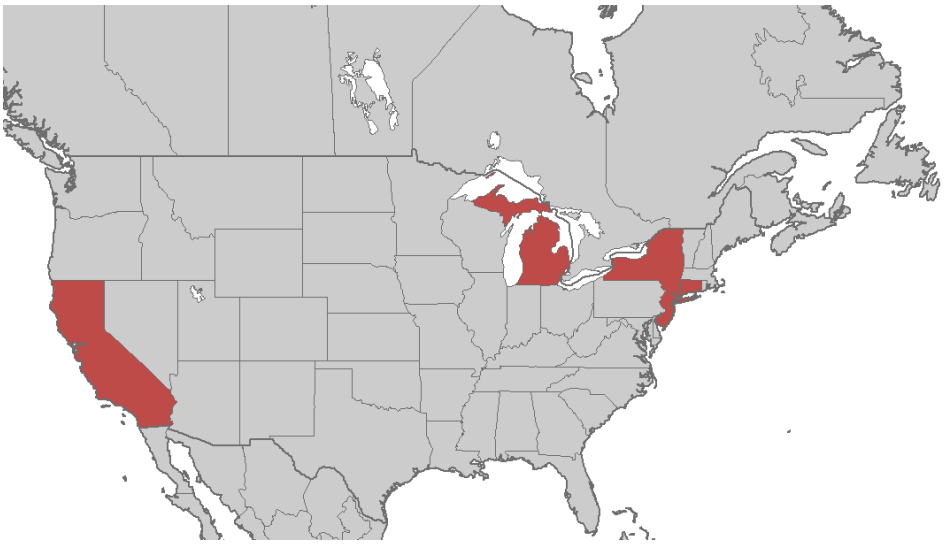
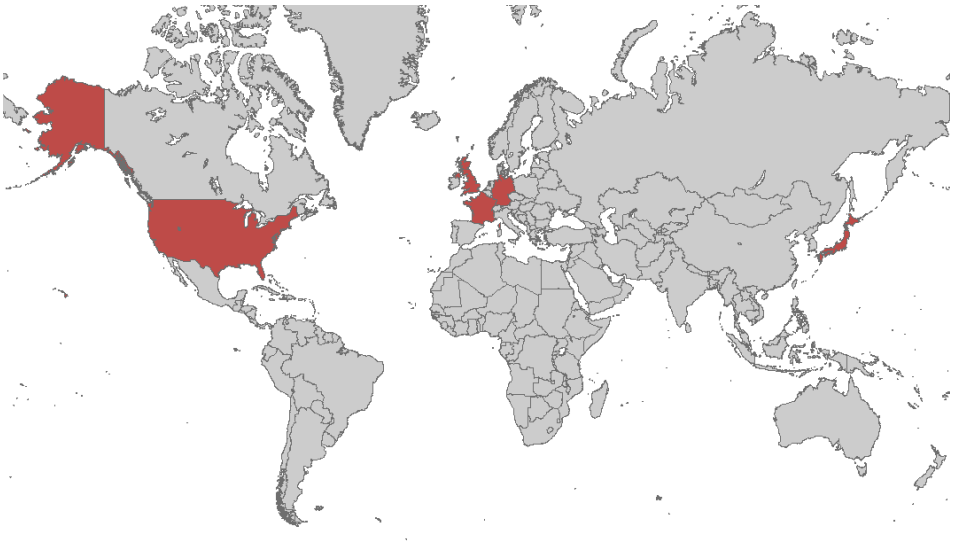


Figure 4 - Top five countries by number of co-inventors, 1975-2007



Data notes:
- Source: USPTO
- All data has been cleaned and geocoded by Prof. Dieter Kogler University College Dublin
- Each co-inventor counts as one and is not dependent on the total number of co-inventors on each patent

Business Expenditure on R&D

Waterloo Region

Business spending on R&D in the Waterloo Region more than doubled between 2005 and 2009 from just over $300 million to just over $800 million (see Figure 5). Expenditures per R&D employee increased from roughly $90,000 to nearly $140,000 over the same time period.

There were almost 400 business in the Waterloo Region reporting significant R&D activity in 2008 (see Figure 6). This was up by nearly 100 firms over a four year period. R&D spending per firm also showed strong growth from just over $1 million in 2005 to roughly $1.3 million in 2008.

Figure 5 - Business enterprise R&D (BERD) 2005-2009 (constant dollars)

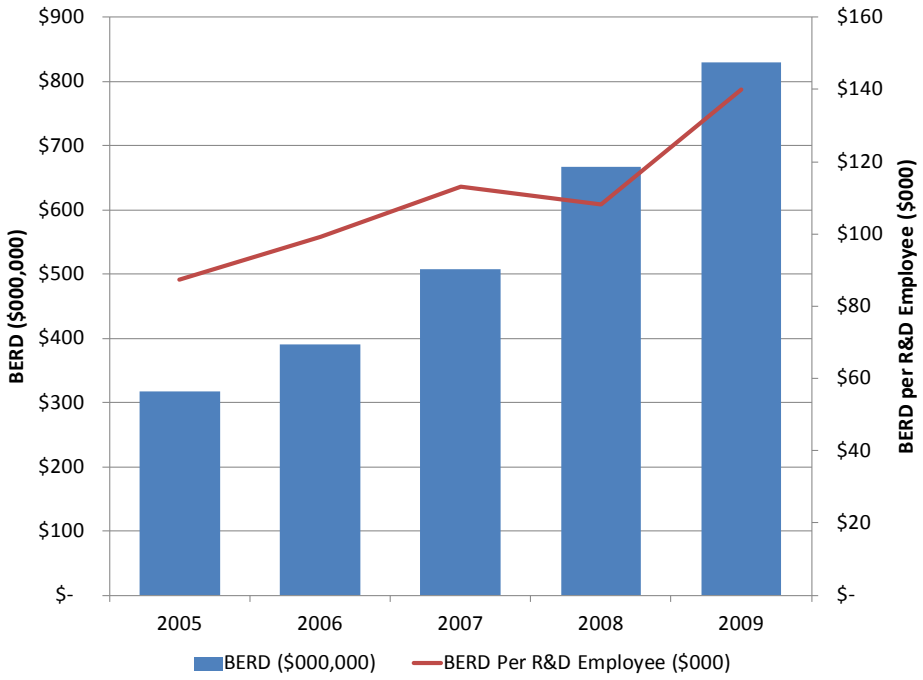
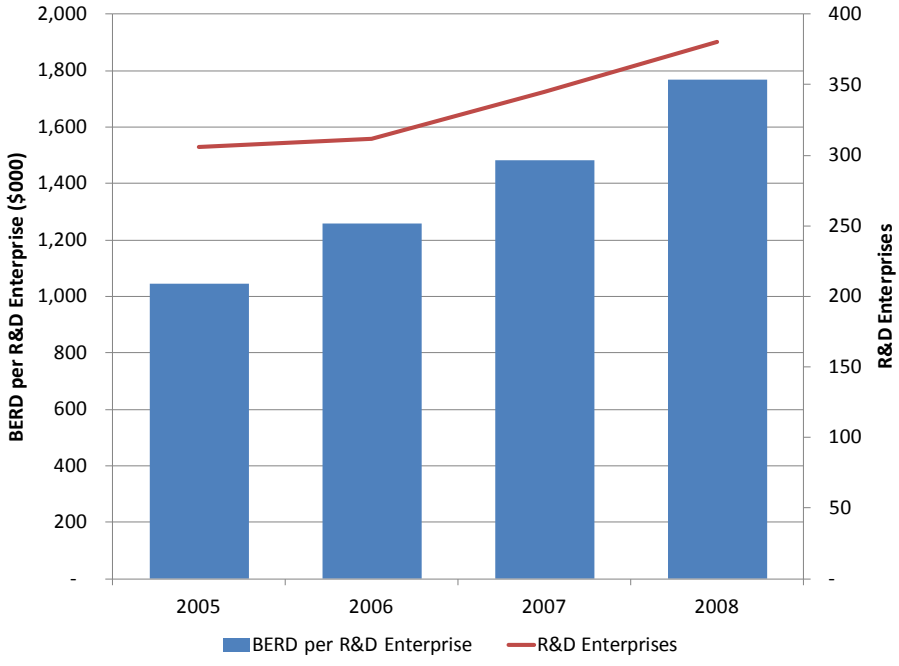


Figure 6 - BERD per R&D enterprise 2005-2008 (constant dollars)



Data notes:
- Source: Statistics Canada via The Impact Group
- Exact figures cannot be disclosed for proprietary reasons
- Dollar amounts have been standardized to constant 2008 or 2009 dollars by Local IDEAs
- The figures represent the most recent data available

Post-Secondary Research Funding
Waterloo Region

Research funding to public institutions such as universities and research hospitals increased steadily from 1999 through 2005 in the Waterloo Region before levelling off somewhat around $160 million per year to 2008. 2007 was the most bountiful year for public research funding with nearly $200 million in spending.

The Natural Sciences and Engineering Research Council (NSERC) was the largest single source of research funding in 2008 accounting for just over a quarter (25.6%) of the total for the Waterloo Region. The Canadian Foundation for Innovation (17.7%) and the Social Sciences and Humanities Research Council (8.4%) were the next two largest sources of research funding.

Figure 7 - Public research funding 1999-2008 (constant dollars)

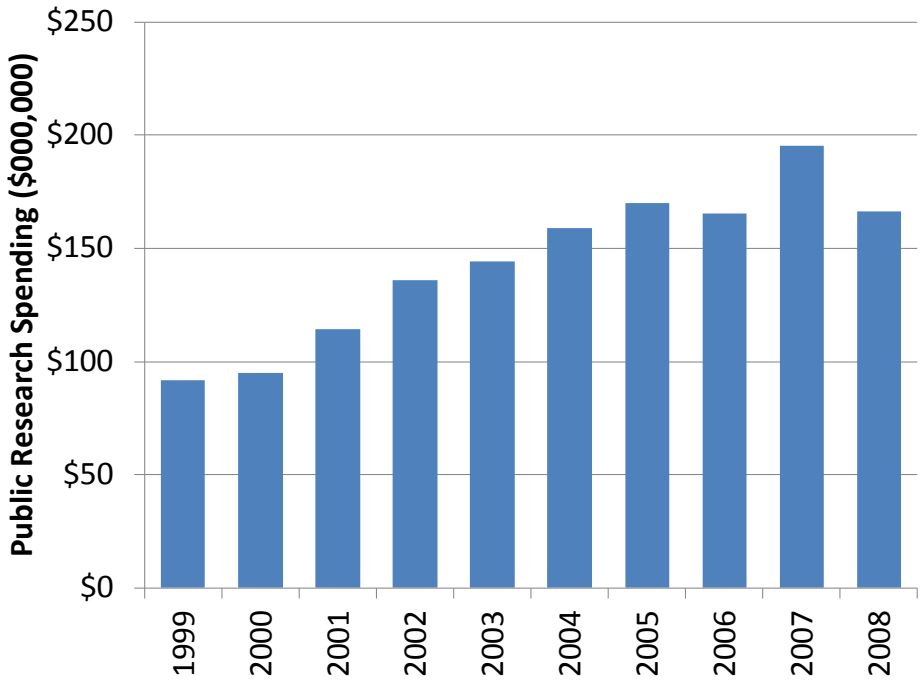
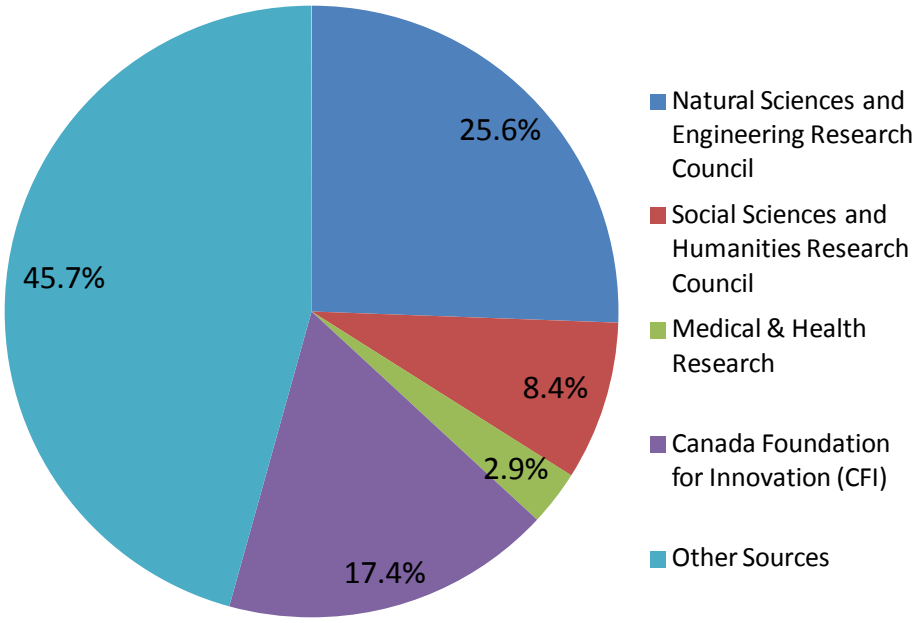


Figure 8 - Share of public research funding by major sources (2008)



Data notes:
- Source: Canadian Association of University Business Officers (CAUBO)
- Dollar amounts have been standardized to constant 2008 dollars by Local IDEAs

Venture Capital
Waterloo Region

Venture capital activity in the Waterloo Region had its strongest years between 1997 and 2001 when the dot-com boom was at its peak (see Figure 9). The strongest years were 1997 and 2001 in which there was over $40 million in VC in each. The number of VC deals were at there highest in 2000 when 16 were reported. Since the dot-com bust in 2001 the number of VC deals per year in the Waterloo Region has ranged between five and nine which the estimated total value of those deals has been between $9-13 million per year.

Software ($69 million) and computer manufacturing ($55.1) have been the specific industries that have received the highest estimated total amounts of venture capital funding over the period of 1996-2011 (see Figure 10). Other ICT related sectors were also large recipients of VC in the Waterloo Region.

Figure 9 - Venture capital deals and estimated total value (constant $)

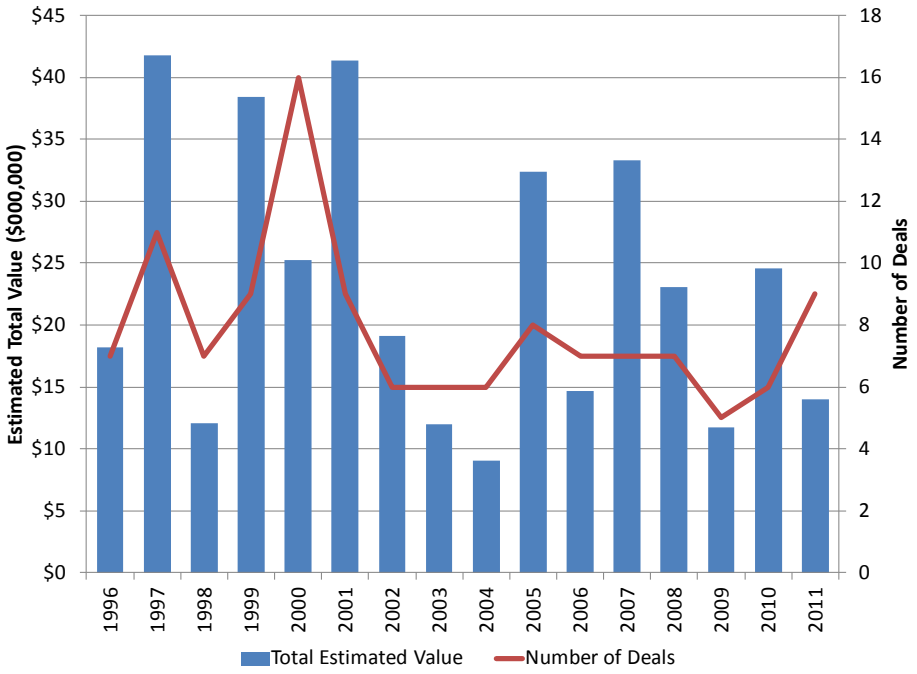
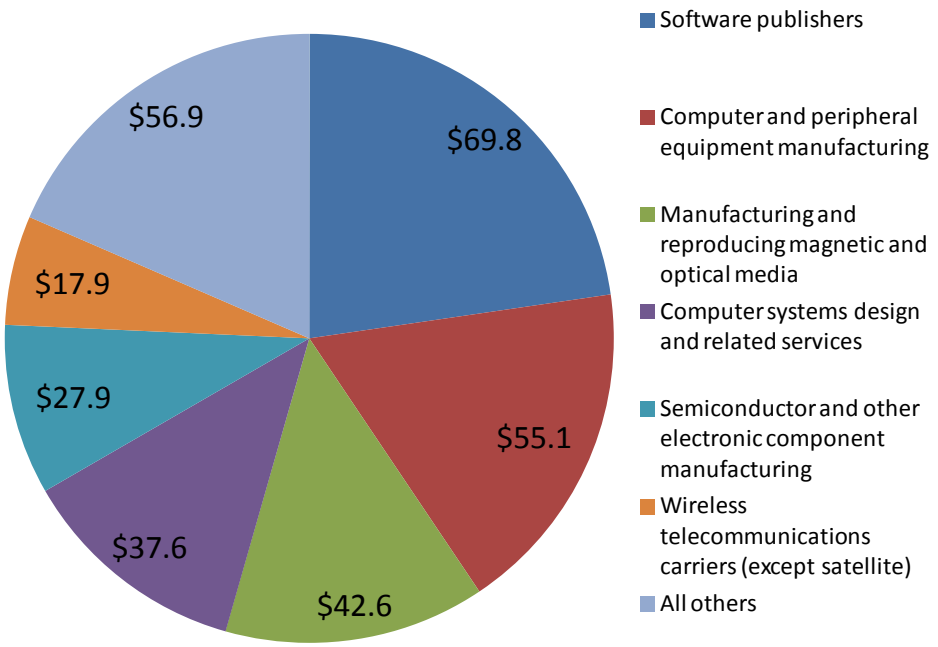


Figure 10 - Value of venture capital by industry, 1996-2011 (estimated)



Data notes:
- Source: Thomson-Reuters
- Annual values are estimated due to undisclosed values on certain deals (annual averages are applied)
- Dollar amounts have been standardized to constant 2011 dollars by Local IDEAs

University Spin-Offs
Waterloo Region

The Waterloo Region and specifically the University of Waterloo have a strong reputation for industries linkages and generating spin-offs. Since 1970 there have been 47 companies spun started by either local university professors or based on technology produced at a local university. Of these companies 19 have been high growth firms 14 of which remained in the Waterloo Region with 5 others decamping to other locations (see Figure 11). Roughly half of these were in either software (19) or ICT (10) industries.

There have also been a number (34) of firms started by university students from the Waterloo Region since 1995. Six of the university student spin-offs have achieved high growth status with four of them remaining in the Waterloo Region and two of them leaving (see Figure 13). Software (7) and ICT (9) firms have accounted for nearly half of all student spin-offs (see Figure 14).

Figure 11 - University spin-off firms by growth and location

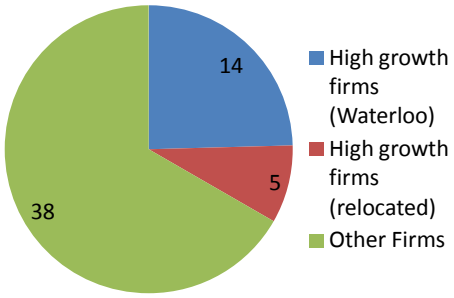


Figure 12 - University spin-off firms by industry

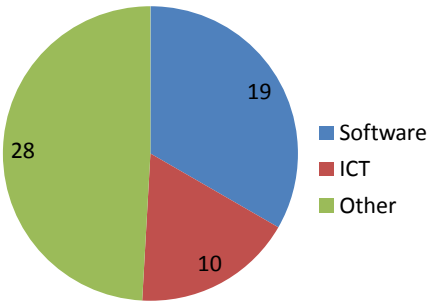


Figure 13 - University student spin-off firms by growth and location

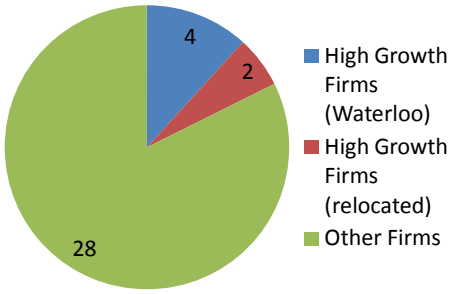
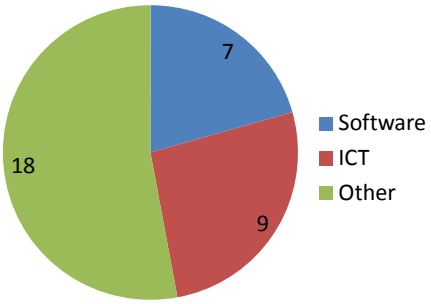


Figure 14 - University student spin-off firms by industry



Data notes:
- Source: Denys Cooper USO/USSO database
- Individual firms cannot be disclosed due for reasons of confidentiality
- High growth firms defined as doubling of employees within five years to at least 20 employees or doubling in sales within five years to at least $10 million