Patenting
Vancouver

The number of patents per calendar year generated by inventors in Vancouver increased by nearly a factor of 5 between 1975 and 1997 from roughly 100 patents per year to nearly 500 patents per year (see Figure 1). Most of this growth occurred in the second half of this time period.

The industrial mix of patents also changed significantly between 1975 and 2007. While there is a high level of diversity within the Vancouver economy, the combination of computers (19.9%), telecommunications (9.0%), and pharmaceuticals (7.9%) accounted over one third of patents between 1998 and 2007. This is more than twice the proportion of the previous two decades.

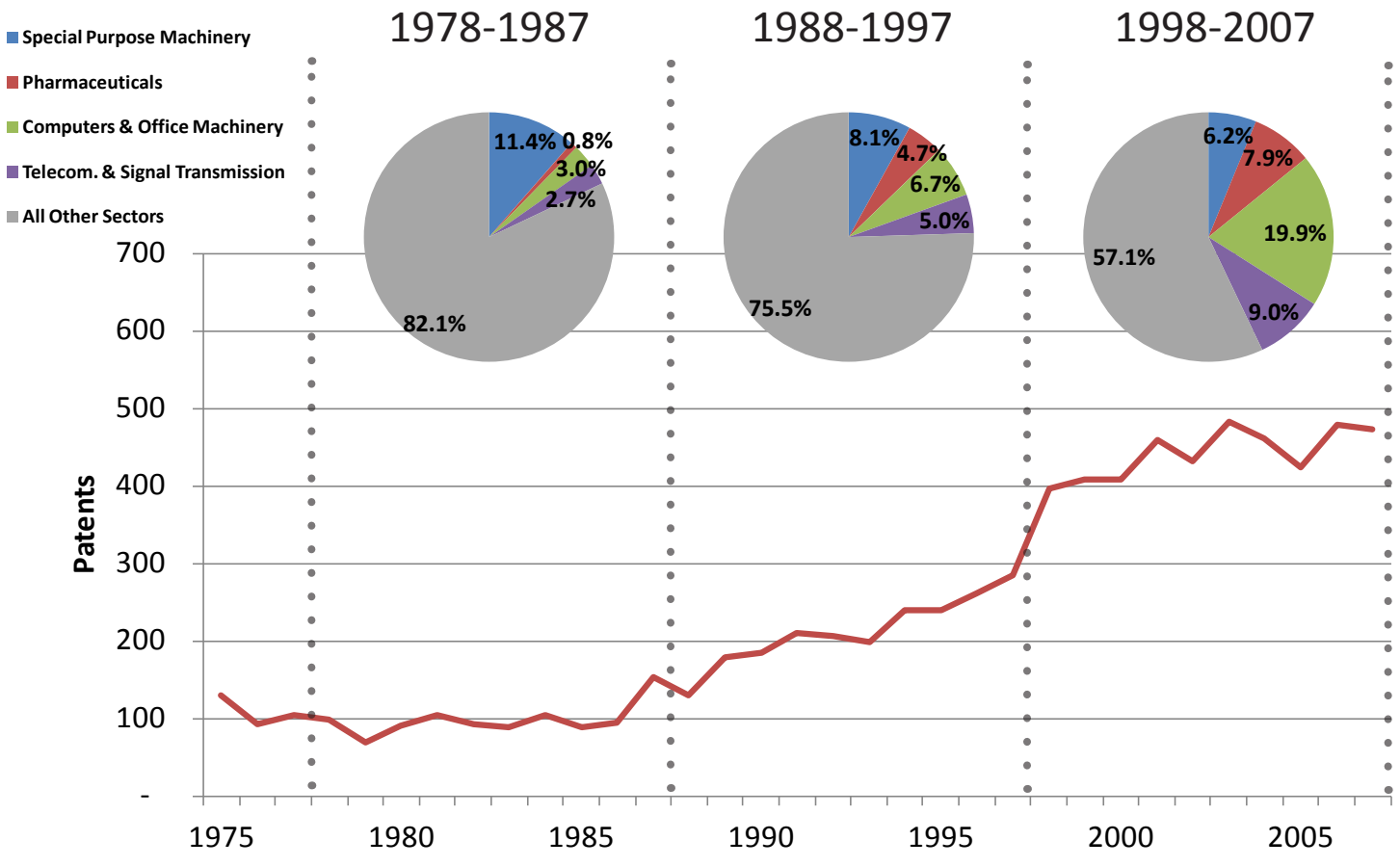
The wide range of industries in Vancouver are reflected in the top patenting enterprises (see Table 1). Hewlett-Packard is the most prolific generator of patents with 392 patents between 1998 and 2007 followed closely by Sharp Laboratories with 367. The University of British Columbia was also a major contributor to new science and technology with 186 patents.

Table 1 - Top 10 Patenting Enterprises 1998-2007

Enterprise	Patents
Hewlett-Packard	392
Sharp Laboratories	367
University of British Columbia	186
Ballard Power Systems	143
PMC-Sierra	133
Creo	96
SEH America	81
Seiko Epson	44
Simon Fraser University	33
Broadcom	32

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

Vancouver

An analysis of patents that involved collaboration between inventors based in Vancouver and inventors elsewhere show that the majority of these relationships exist with other large cities in Canada. Specifically, connections to Toronto (see Figure 2) are the most common with 158 instances of a Toronto-based inventor collaborating with an inventor in Vancouver. Connections with Ottawa-Gatineau (98) and Montreal (97) are also quite strong.

Most instances of international collaboration occur with US-based inventors. The top five US states (see Figure 3) are Oregon (1,550), Washington (1,347), California (816), Texas (115), and Illinois (112).

Beyond the United States (4,914) the top countries for inventor collaboration with Vancouver are Japan (154), Great Britain (98), Germany (77), and the Netherlands (42) (see Figure 4).

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

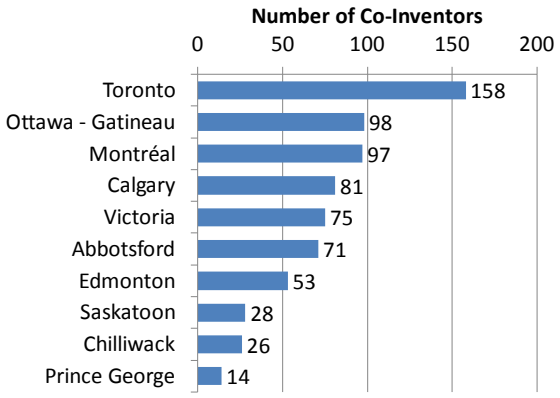


Figure 3 - Top five US states by number of co-inventors, 1975-2007

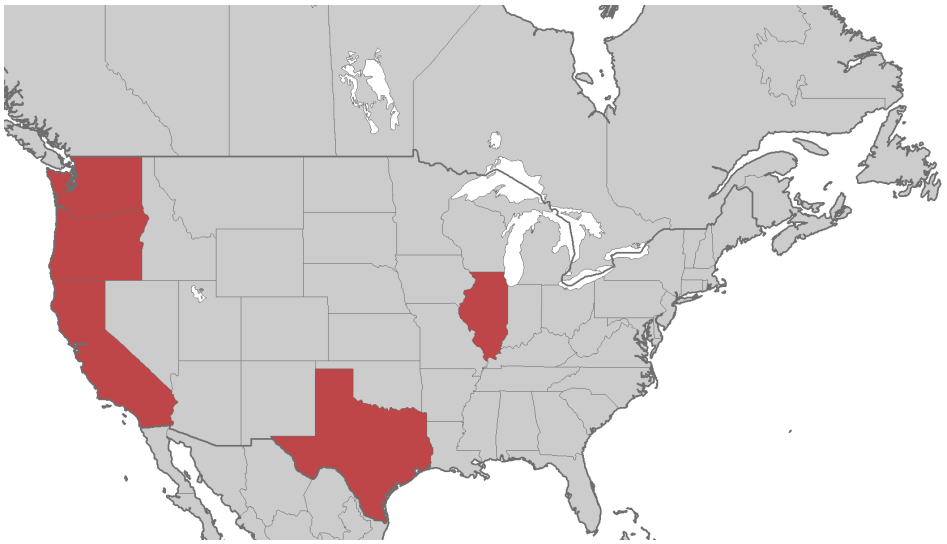
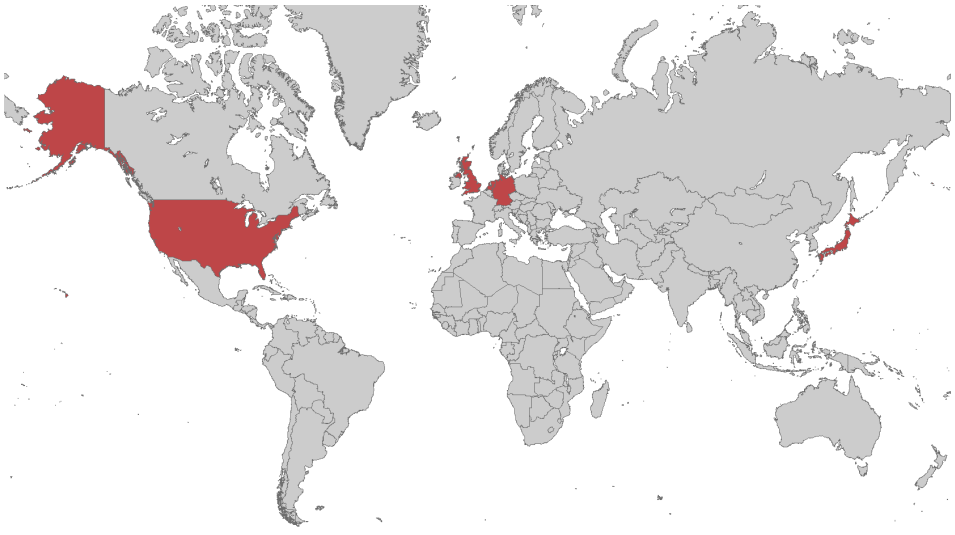


Figure 4 - Top five countries by number of co-inventors, 1975-2007



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

Vancouver

Business spending on R&D in Vancouver declined somewhat between 2005 and 2009 from over $1.3 billion to just less than $1 billion (see Figure 5). Expenditures per R&D employee remained around $70,000 over the same time period.

There were over 1,800 business in Vancouver reporting significant R&D activity in 2008 (see Figure 6). This was up by nearly 600 firms over a four year period. R&D spending per firm showed a decline however from just over $1.1 billion in 2005 to $600 million in 2008.

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

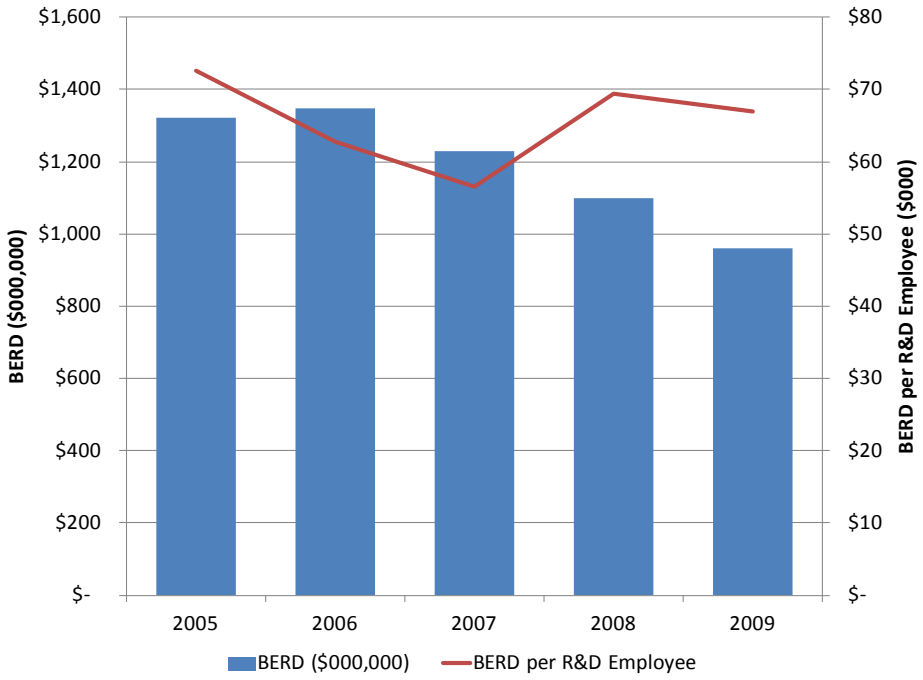
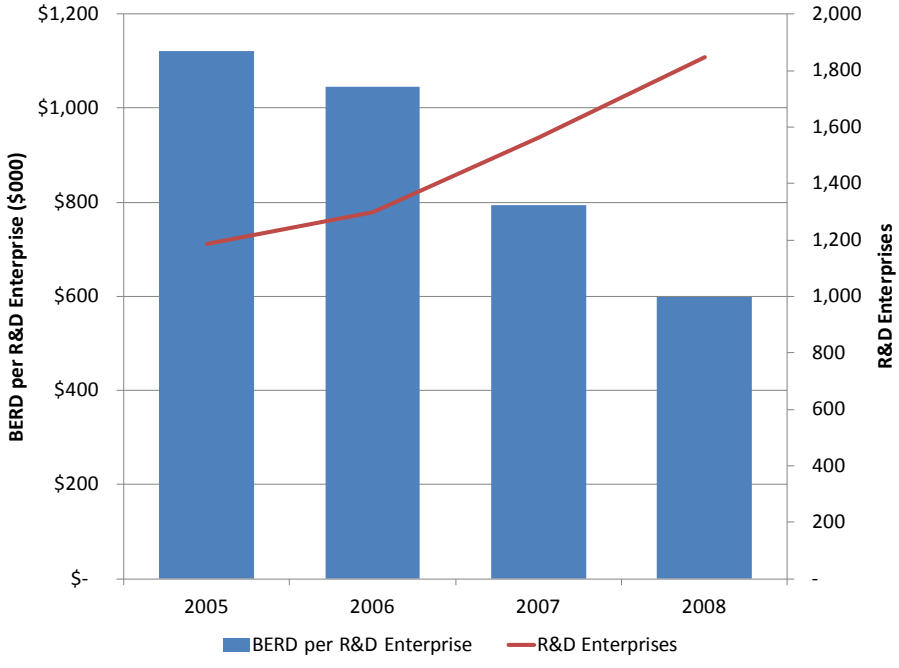


Figure 6 - BERD per R&D enterprise 2005-2008 (constant dollars)



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
Vancouver

Research funding to public institutions such as universities and research hospitals increased steadily from 1999 through 2008 in Vancouver from roughly $250 million to over $600 million (see Figure 7).

Medical and health research received the most funding of any specific category in 2008 (see Figure 8). The Natural Sciences and Engineering Research Council was the second largest provider (13.6%) to Vancouver institutions followed by the Canadian Foundation for Innovation (6.6%).

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

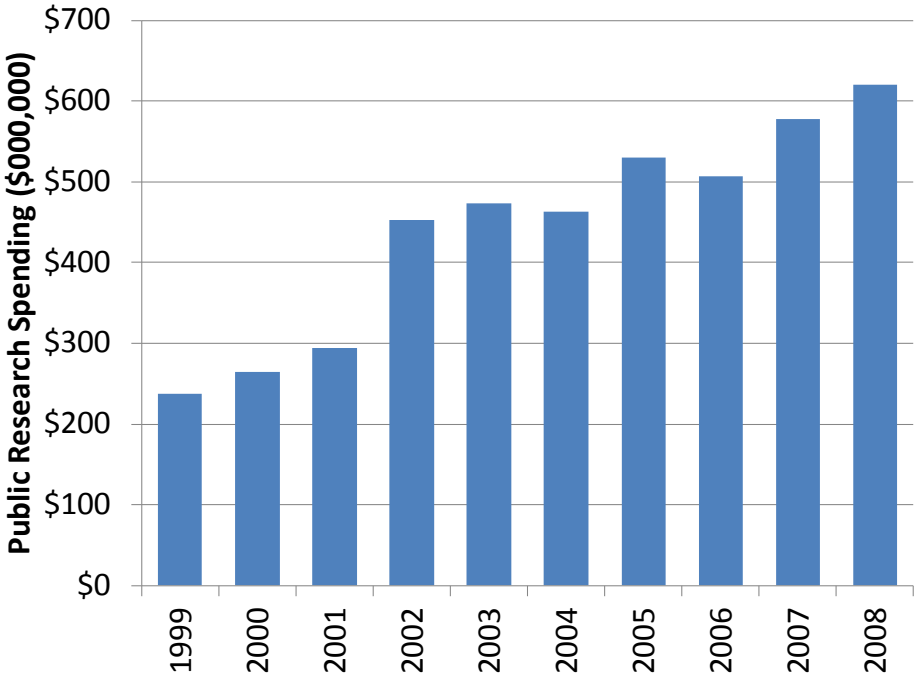
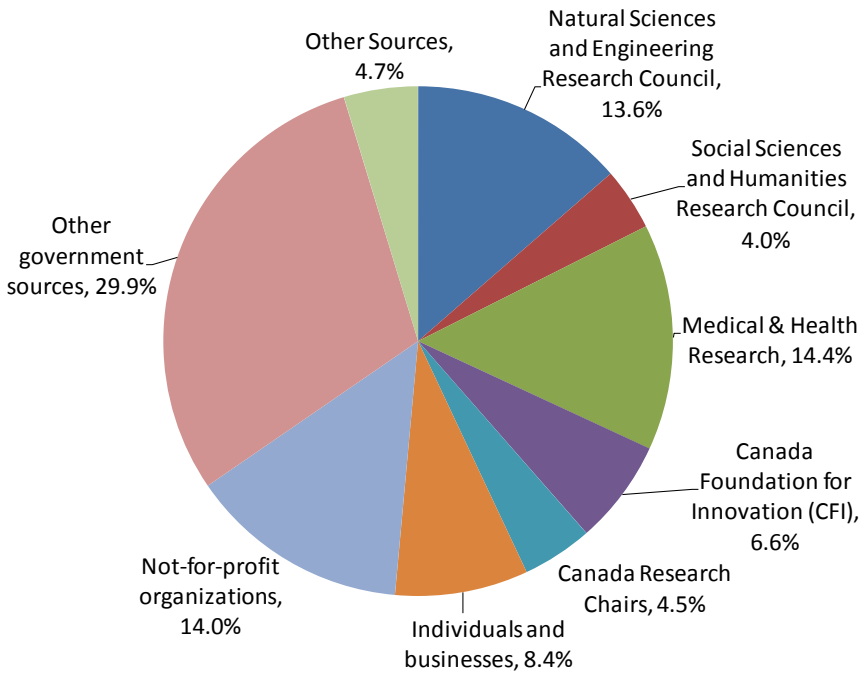


Figure 8 - Share of public research funding by major sources (2008)



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

Venture Capital
Vancouver

Venture capital activity in Vancouver had its strongest year in 2000 when the dot-com boom was at its peak (see Figure 9). There were nearly 100 VC deals worth and estimated $650 million. Since the dot-com bust VC activity has levelled-off to on average 40 deals per year worth $200 million.

Software and ICT services accounted for 43.2% of all venture capital deals between 1996 and 2011 (see Figure 10). Bio-pharma (14.9%) and ICT manufacturing (10.5%) were other major recipients of VC in Vancouver over the same time period.

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

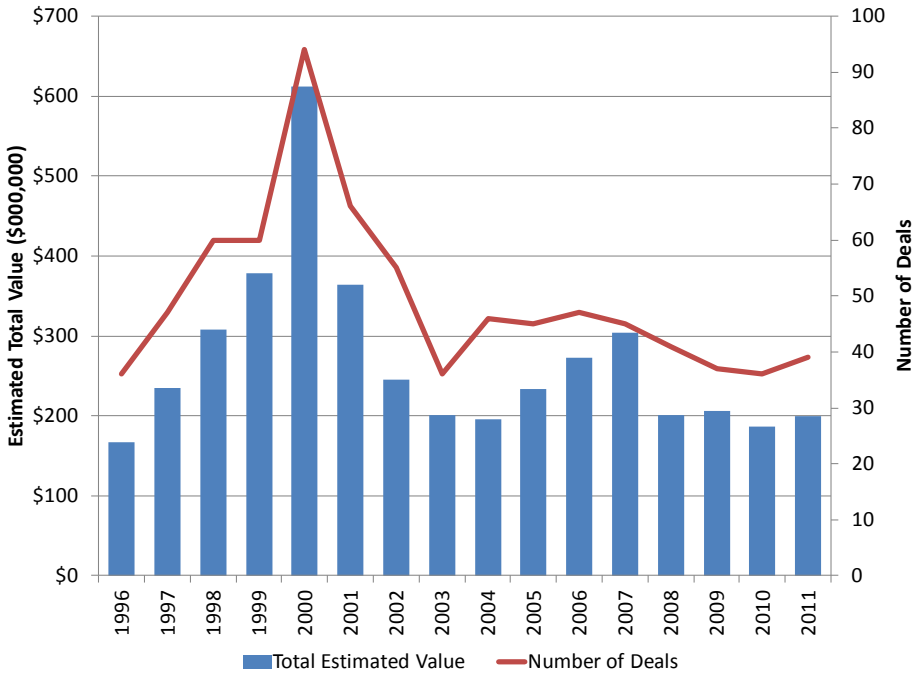
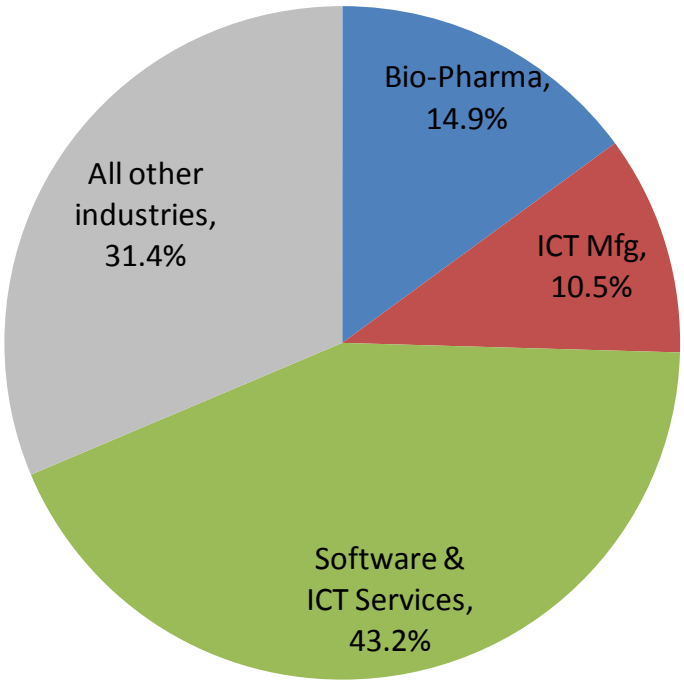


Figure 10 - Share of venture capital deals by industry, 1996-2011



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
Vancouver

Since 1970 there have been 265 companies spun started by either local university professors or based on technology produced at a local university. Of these companies 56 have been high growth firms 51 of which remained in Vancouver with 5 others decamping to other locations (see Figure 11). Nearly half of all spin-offs (109) were in biomedical & pharmaceutical industries (see Figure 12).

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

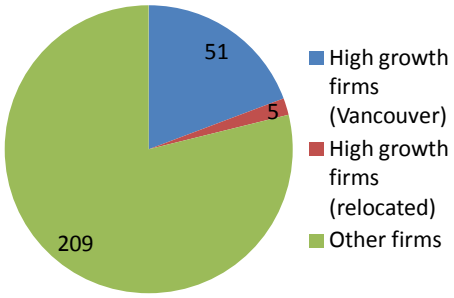
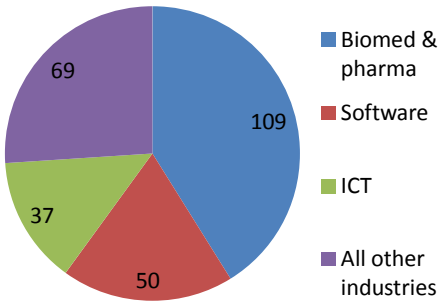


Figure 12 - University spin-off firms by industry



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