Patenting
Toronto

The number of patents per calendar year generated by inventors in Toronto more than doubled between 1975 and 1997 from roughly 300 patents per year to over 700 patents per year (see Figure 1). Most of this growth occurred in the 1990s and has since levelled-off.

The industrial mix of patents also changed significantly between 1975 and 2007. While there is a high level of diversity within the Toronto economy, the combination of computers (16.0%%), pharmaceuticals (9.8%%), and rubber & plastics (8.1%) accounted for one third of all patents between 1998 and 2007. This is twice the proportion of the previous two decades.

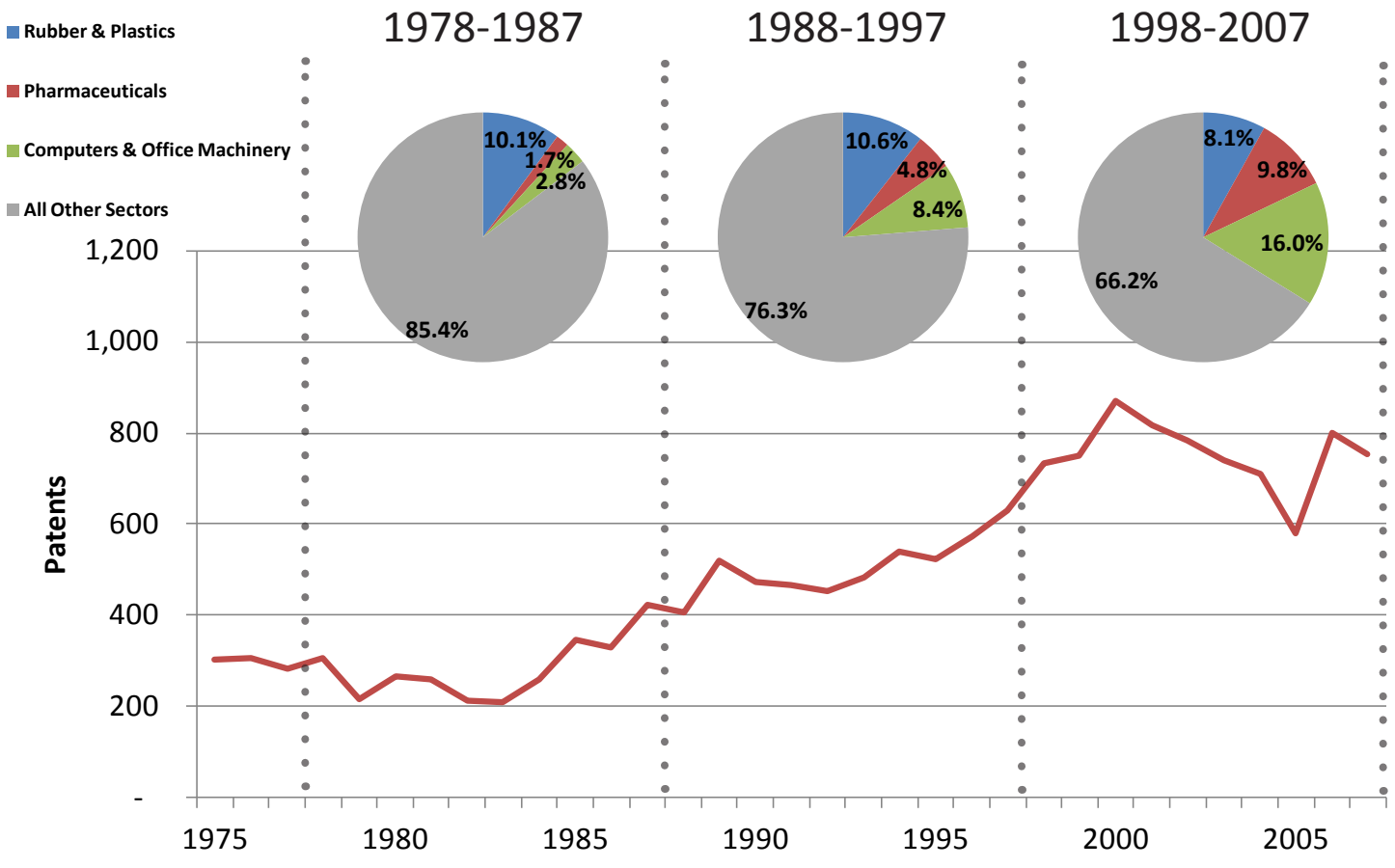
The industrial mix of patenting firms in Toronto are reflected in the top patenting enterprises (see Table 1). Xerox is the most prolific generator of patents with 493 between 1998 and 2007. ATI Technologies (321), IBM (276), and Husky Injection Molding (140) were other companies that produced a significant number of patents.

Table 1 - Top 10 Patenting Enterprises 1998-2007

Enterprise	Patents
Xerox	493
ATI Technologies	321
IBM	276
Husky Injection Molding	140
Pratt and Whitney	115
Mold-Masters	114
Connaught Laboratories	77
Aventis Pasteur	60
MDS	46
Honeywell	46

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
Toronto

An analysis of patents that involved collaboration between inventors based in Toronto and inventors elsewhere show that the majority of these relationships exist within Ontario. Specifically, connections to Hamilton (see Figure 2) are by far the most common with 1,087 instances of a Hamilton-based inventor collaborating with an inventor in Toronto. Connections with Kitchener-Waterloo (467) and Ottawa-Gatineau (393) are also quite strong.

Most instances of international collaboration occur with US-based inventors. The top five US states (see Figure 3) are California (1,394), New York (1,040), Michigan (355), Ohio (292), and Massachusetts (278).

Beyond the United States (5,793) the top countries for inventor collaboration with Toronto are Great Britain (211), Germany (183), Japan (119), and France (101) (see Figure 4).

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

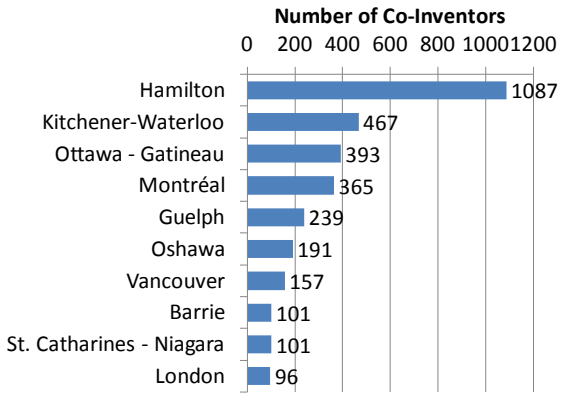


Figure 3 - Top five US states by number of co-inventors, 1975-2007

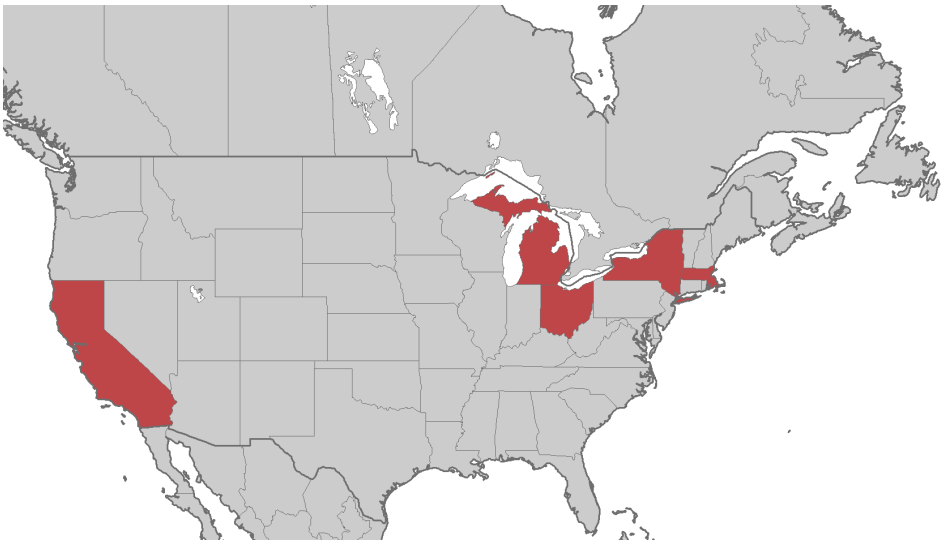
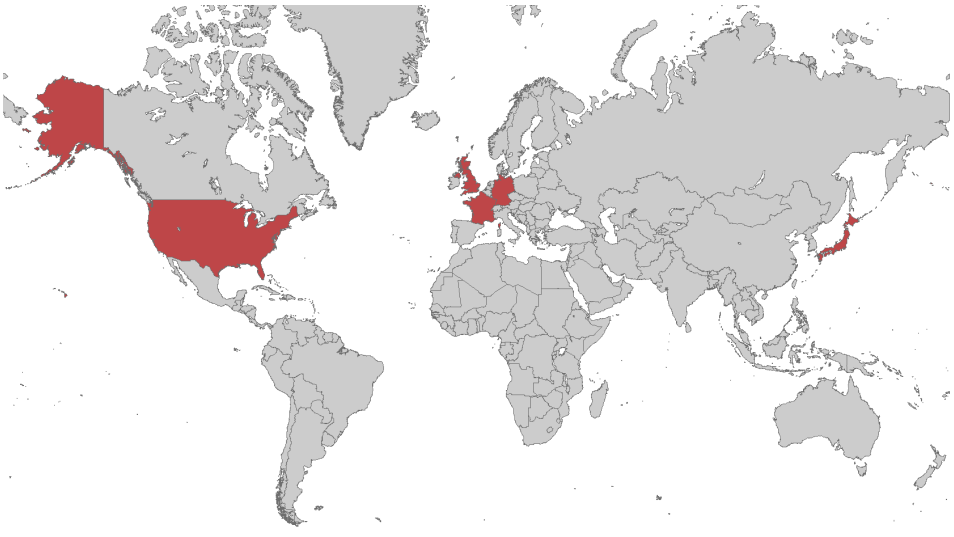


Figure 4 - Top five countries by number of co-inventors, 1975-2007



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
Toronto

Business spending on R&D in Toronto decreased steadily between 2005 and 2009 from just over $4.5 billion to under $3.5 billion (see Figure 5). Similarly, expenditures per R&D employee decreased from roughly $120,000 to $80,000 over the same time period.

There were nearly 5,500 business in Toronto reporting significant R&D activity in 2008 (see Figure 6). This was up by nearly 1,500 firms over a four year period. R&D spending per firm showed a decline however from just under $1.2 million in 2005 to $700,000 in 2008.

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

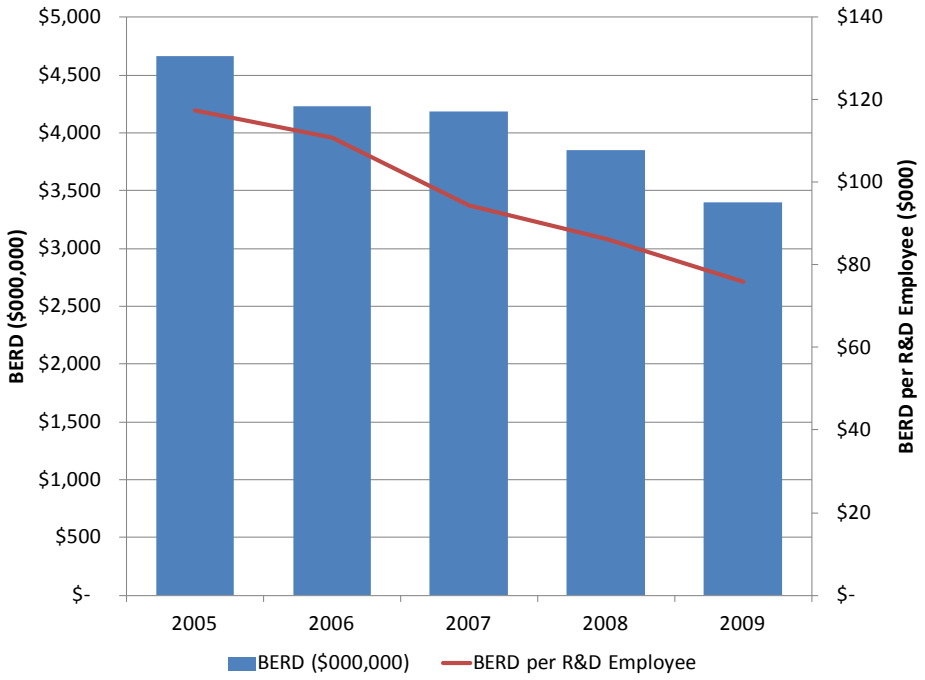
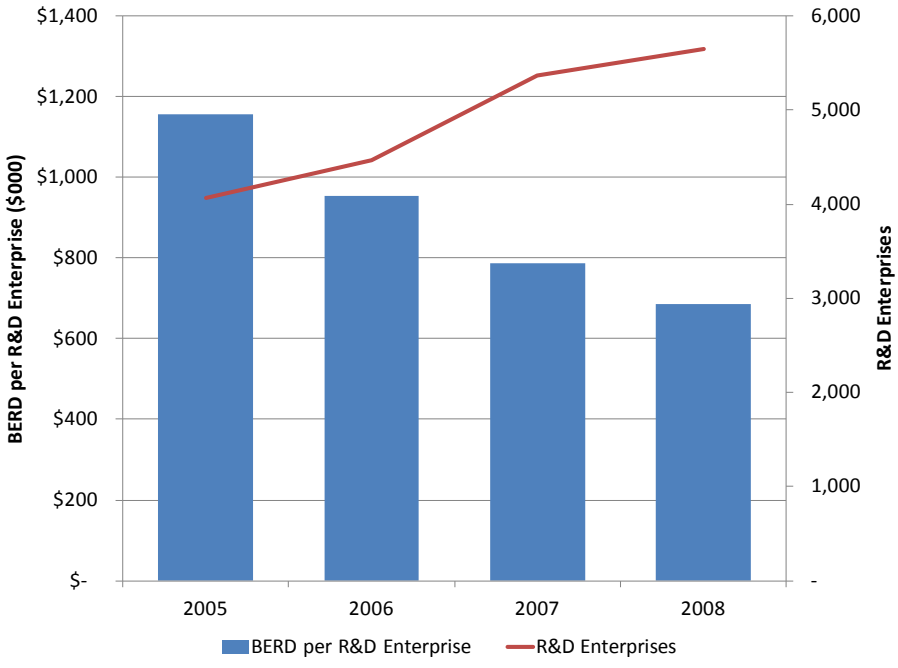


Figure 6 - BERD per R&D enterprise 2005-2008 (constant dollars)



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
Toronto

Research funding to public institutions such as universities and research hospitals increased steadily from 1999 through 2006 in Toronto before levelling off just shy of $1 billion per year to 2008. 2006 was the most bountiful year for public research funding.

Not-for-profit organizations (23.8%) barely eclipsed general government sources (23.3%) in 2008 (see Figure 8). Medical and health related research (18.1%) was the largest specific government funding area.

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

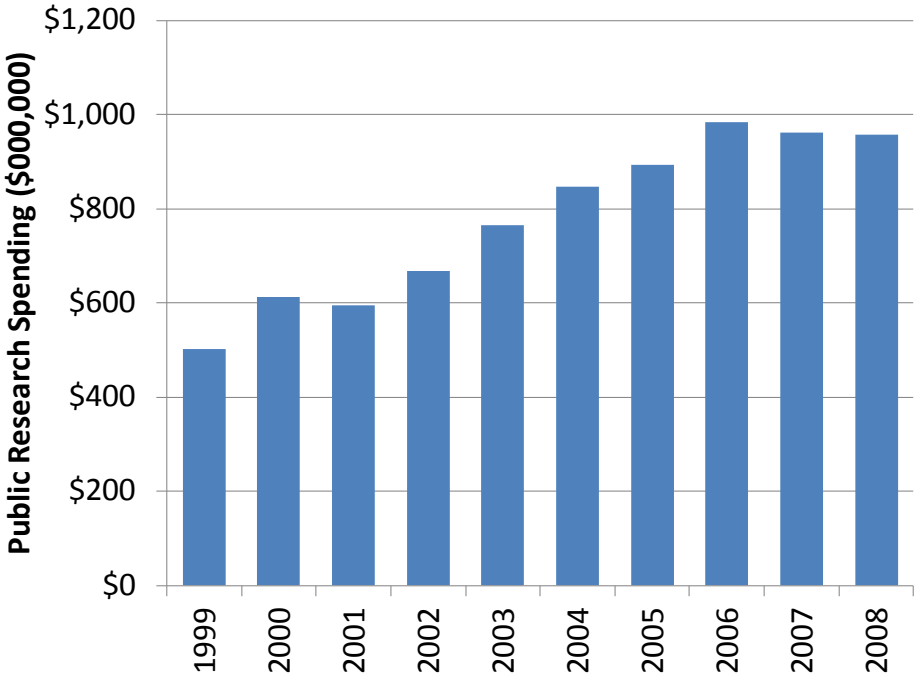
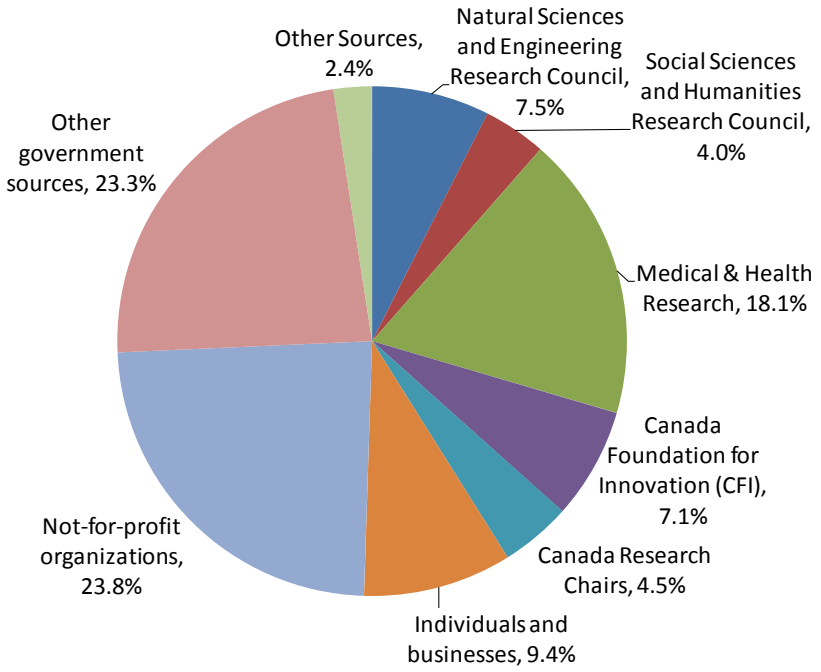


Figure 8 - Share of public research funding by major sources (2008)



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

Venture Capital
Toronto

Venture capital activity in Toronto had its strongest year in 2000 when the dot-com boom was at its peak (see Figure 9). There were over 180 VC deals worth an estimated $2.3 billion. Since the dot-com bust venture capital activity has fallen off dramatically to an average of 60 deals per year worth less than $500 million.

Software and ICT services accounted for 42.2% of all VC deals between 1996 and 2011 (see Figure 10). ICT manufacturing (14.7%) and bio-pharma (8.4%) were other notable recipients of venture capital in Toronto over the same time period.

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

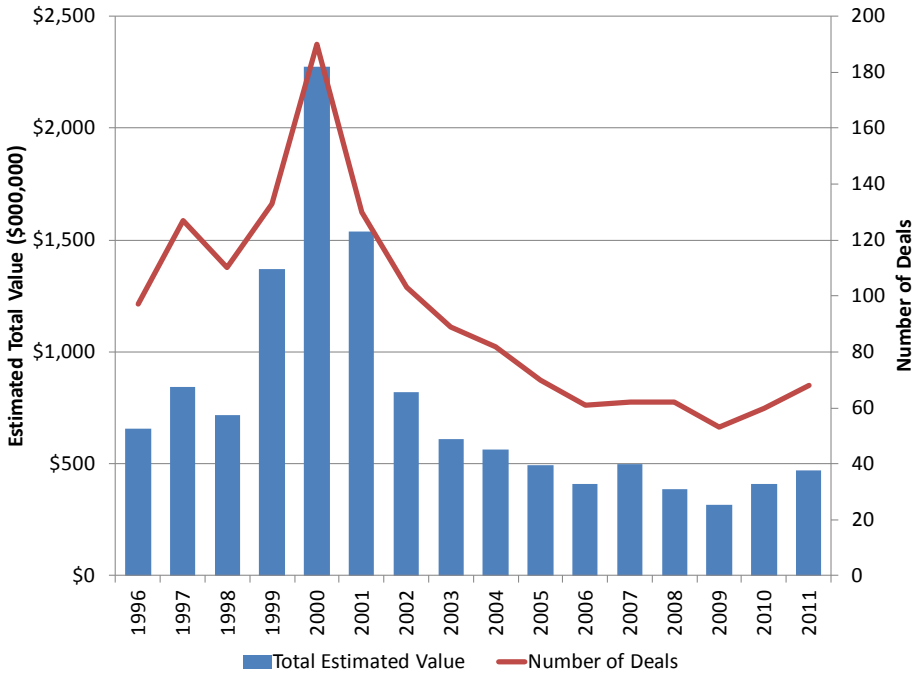
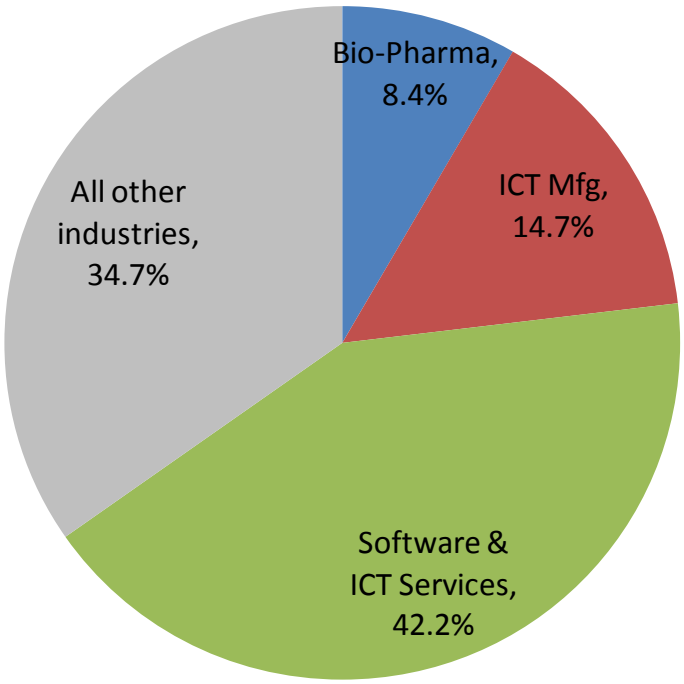


Figure 10 - Share of venture capital deals by industry, 1996-2011



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
Toronto

Since 1970 there have been 203 companies started by either local university professors or based on technology produced at a local university. Of these companies 32 have been high growth firms 30 of which remained in Toronto with 2 others decamping to other locations (see Figure 11). Two thirds of these were in either biomedical/ pharma (77), software (24), or ICT (32) industries.

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

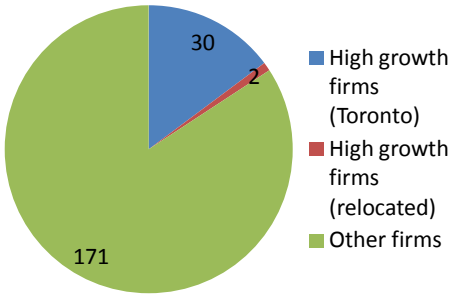
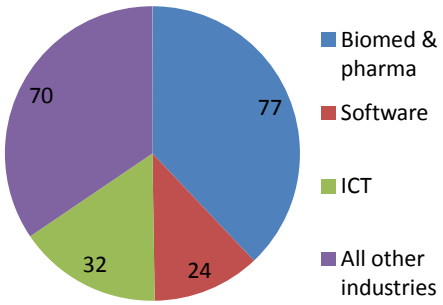


Figure 12 - University spin-off firms by industry



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