Patenting
Calgary

The number of patents per calendar year generated by inventors in the Calgary region increased by roughly quadrupled between 1975 and 1997 from around 40 patents per year to typically 150 patents per year (see Figure 1). Most of this growth occurred during the 1990s and has levelled-off since the peak years of the early 2000s.

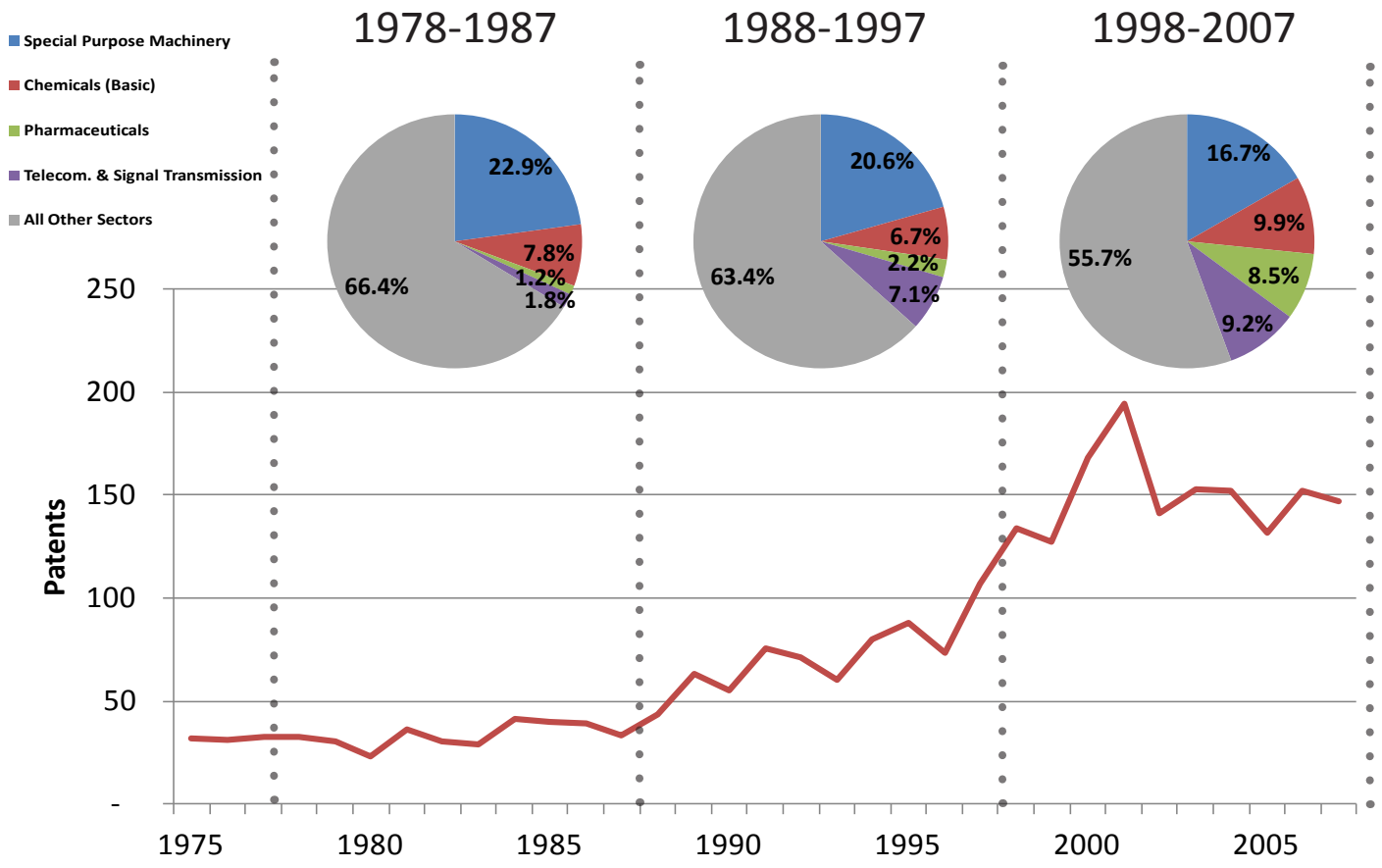
The industrial mix of patents also changed significantly between 1975 and 2007. While there is a high level of diversity within Calgary economy, the combination of special purpose machinery (16.7%), basic chemicals (9.9%), pharmaceuticals (8.5%), and telecoms (9.2%) accounted for nearly half of all patents between 1998 and 2007. Growth in the last two categories has been especially pronounced over the past three decades. Both the high number and high growth in patents in pharmaceuticals and telecoms in Calgary are reflected in the top patenting enterprises (see Table 1). University Technologies International is the most prolific generator of patents with 70 patents between 1998 and 2007. This is followed closely by Nova Chemicals (69) and Nortel Networks (67), although the former is certainly no longer a major player in the Calgary economy.

Table 1 - Top 10 Patenting Enterprises 1998-2007

Enterprise	Patents
University Technologies International	70
Nova Chemicals AG	69
Nortel Networks	67
Novatel	24
Oncolytics Biotech	23
Smart Technologies	21
BJ Services Company	20
Sembiosys Genetics	18
Telecom. Research Laboratories	18
Tesco Corporation	14

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

Calgary

An analysis of patents that involved collaboration between inventors based in Calgary and inventors elsewhere show that the majority of these relationships exist within the largest Canadian cities as well as smaller cities in Alberta and Saskatchewan. Specifically, connections to Edmonton (see Figure 2) are the most common with 245 instances of an Edmonton-based inventor collaborating with an inventor in the Calgary. Connections with Toronto (145) and Ottawa-Gatineau (140) are also quite strong but may be largely due to relationships within the former Nortel corporate structure.

Most instances of international collaboration occur with US-based inventors. The top five US states (see Figure 3) are California (194), Texas (188), Oklahoma (60), Washington (52), and Illinois (41). Relationships between Calgary inventors and those in Texas and Oklahoma are largely due to activity within the oil and gas sector.

Beyond the United States (854) the top countries for inventor collaboration with Calgary-based inventors are Great Britain (43), Germany (41), Japan (30), and South Korea (21) (see Figure 4).

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

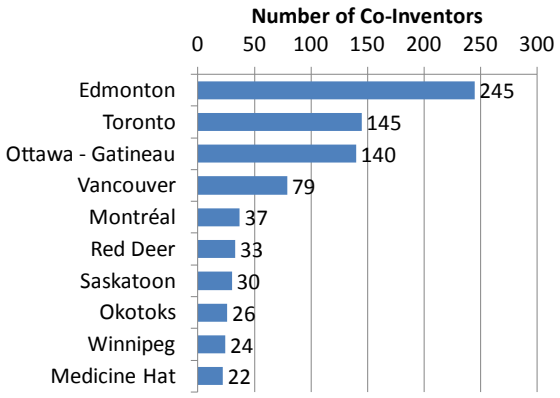


Figure 3 - Top five US states by number of co-inventors, 1975-2007

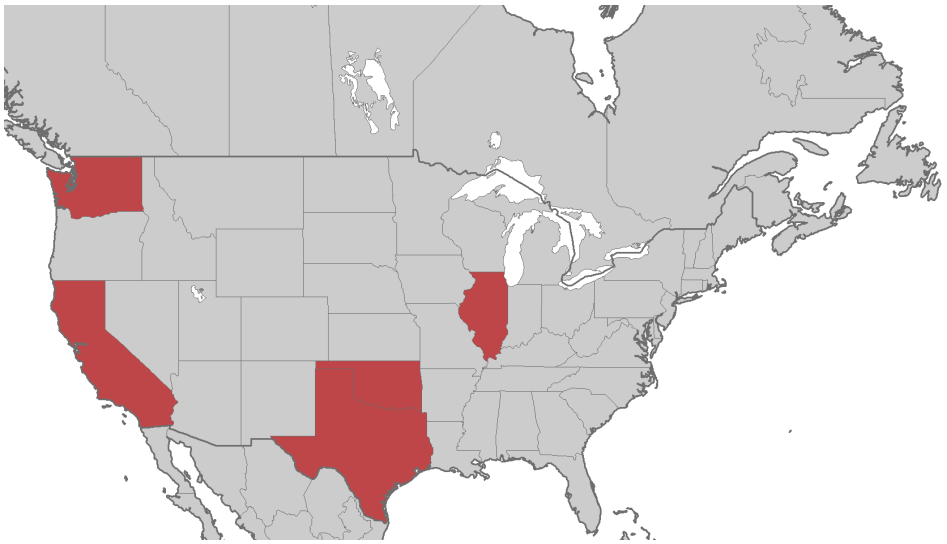
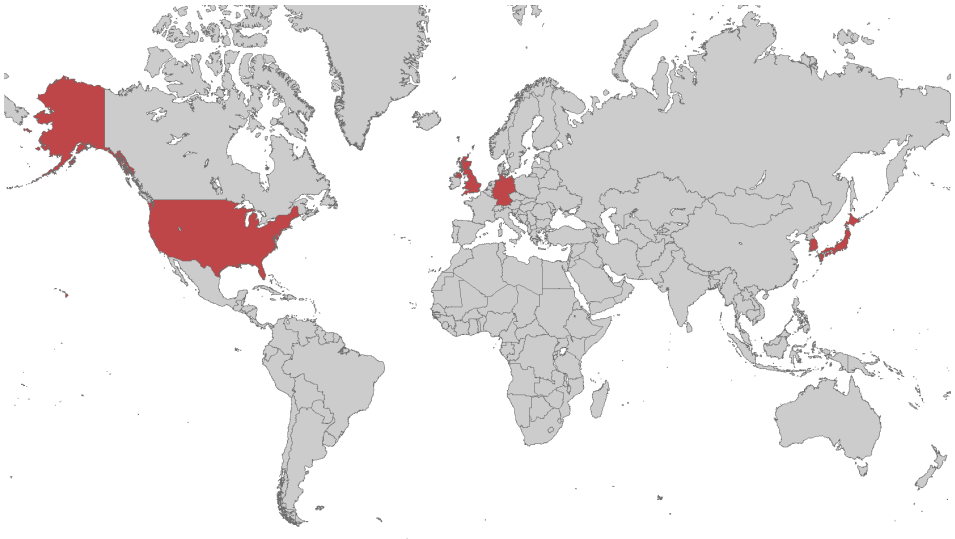


Figure 4 - Top five countries by number of co-inventors, 1975-2007



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
Calgary

Business spending on R&D in Calgary grew by roughly 40% between 2005 and 2009 from just over $1 billion to just over $1.4 billion (see Figure 5). Expenditures per R&D employee increased modestly from approximately $250,000 to nearly $300,000 over the same time period.

There were just over 600 business in Calgary reporting significant R&D activity in 2008 (see Figure 6). This was up by roughly 50 firms over a four year period. R&D spending per firm also showed consistent growth from slightly under $2 million in 2005 to roughly $2.25 million in 2008.

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

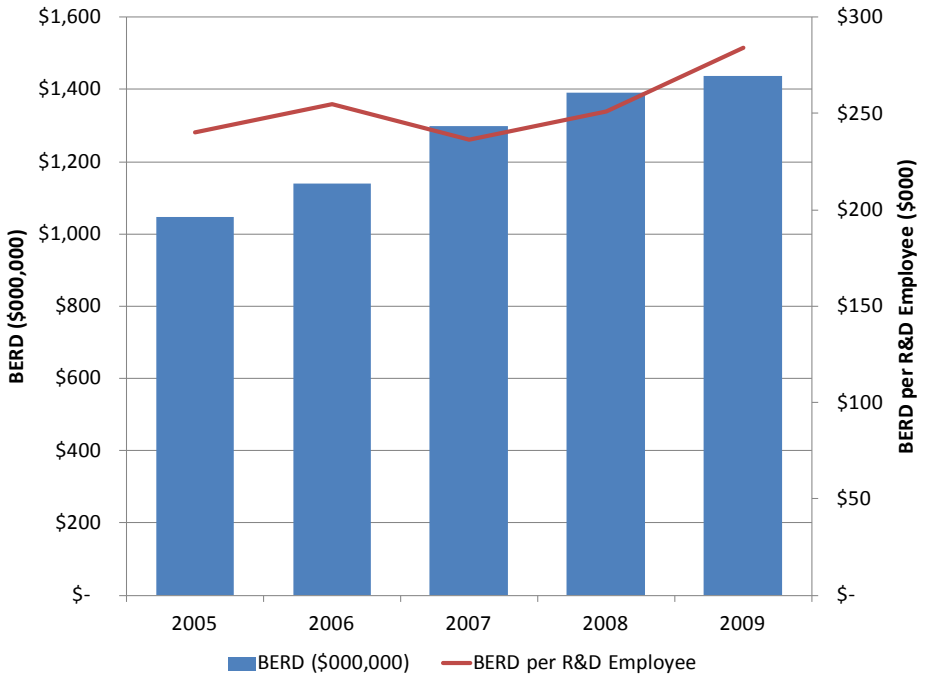
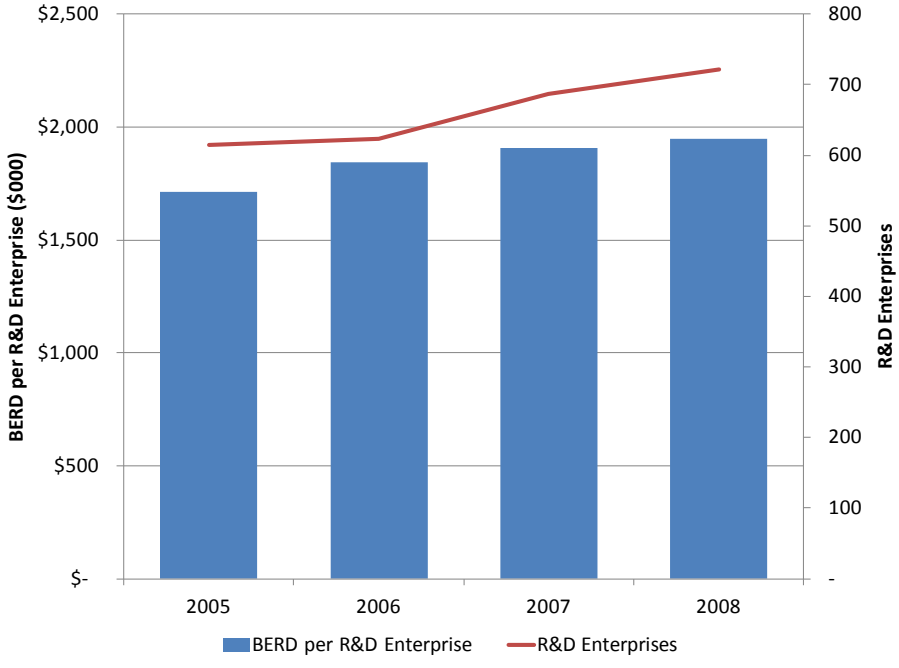


Figure 6 - BERD per R&D enterprise 2005-2008 (constant dollars)



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
Calgary

Research funding to public institutions such as universities and research hospitals in Calgary remained fairly consistent from 2003 to 2008 ranging between $250-300 million per year. This followed a significant increase from the period of 199-2002 when annual funding was typically $200 million.

The Natural Sciences and Engineering Research Council (NSERC) was the largest single source of research funding in 2008 accounting for (13,0%) of the total for Calgary. Medical and health related research funding (12.5%), private businesses and individuals (12.3%), and not-for-profit organizations were the next specific sources of funding. Non-specific government sources from all three levels accounted for 42.2% of research support.

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

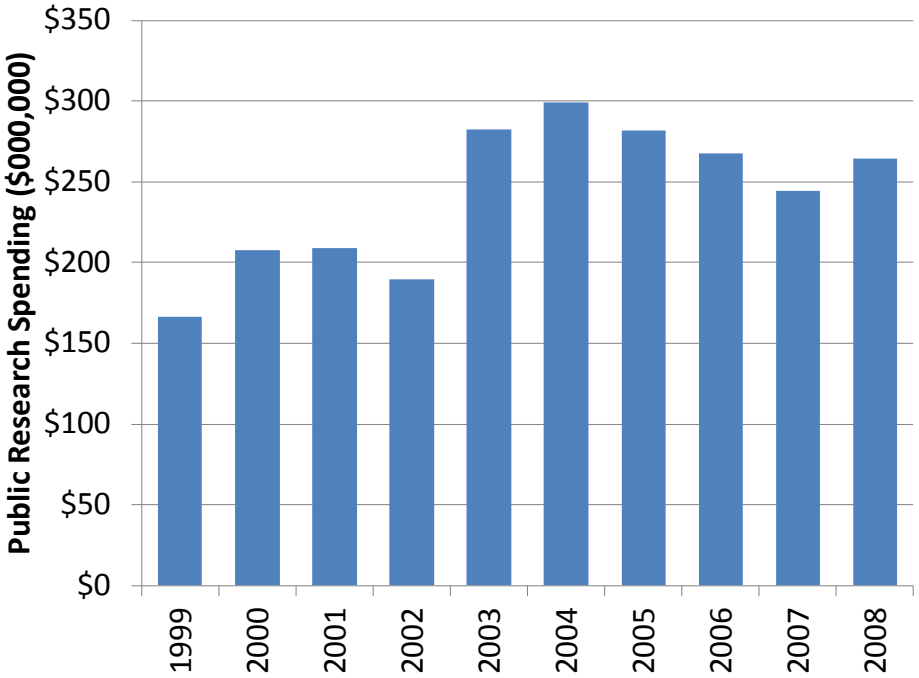
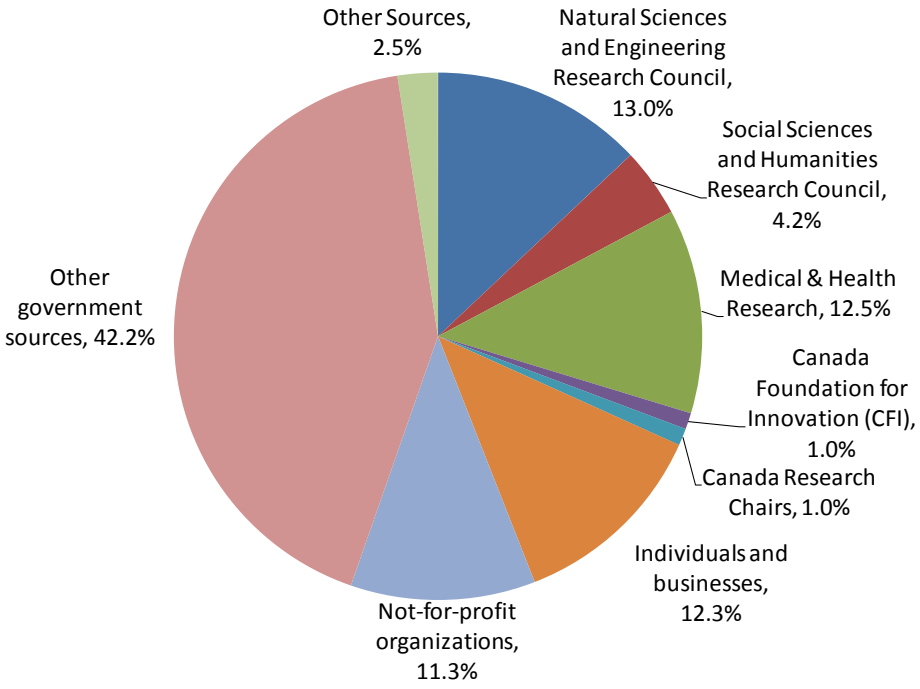


Figure 8 - Share of public research funding by major sources (2008)



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

Venture Capital
Calgary

Venture capital activity in the Calgary had its strongest years between 1997 and 2000 when the dot-com boom was at its peak (see Figure 9). The strongest years were 1997, 1999, and 2000 in which there was over $200 million in VC in each. The number of VC deals were at there highest in 2000 when 41 were registered. Since the dot-com bust in 2001 the number of VC deals per year in Calgary has ranged between 8 and 19 which the estimated total value of those deals has been between $20-190 million per year.

Software (26.6) has accounted for the largest number of deals between 1996 and 2011 (see Figure 10). Oil & gas (15.2) and ICT services (14.4%) are the next most significant industries.

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

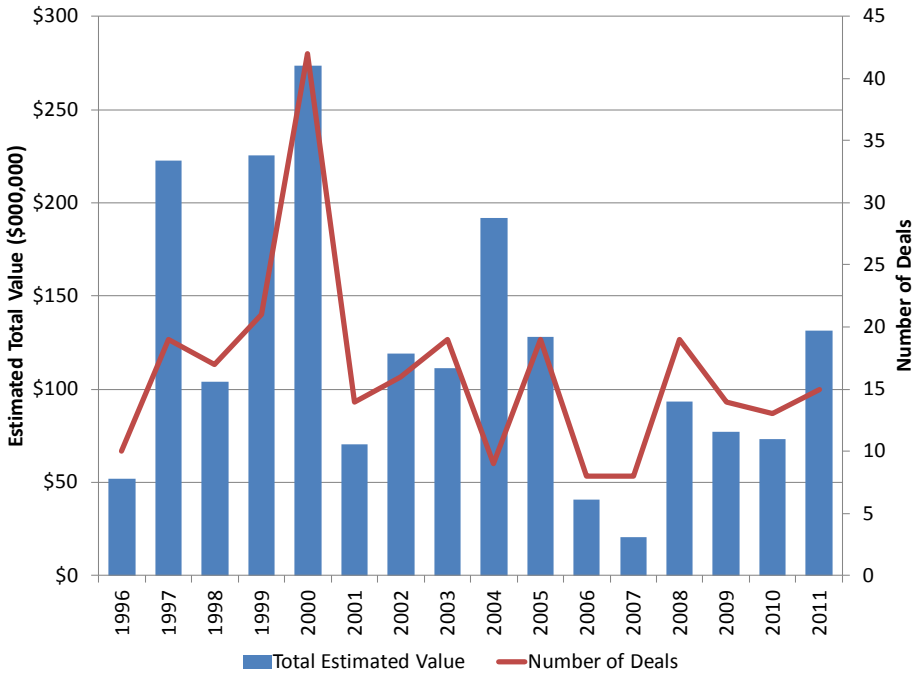
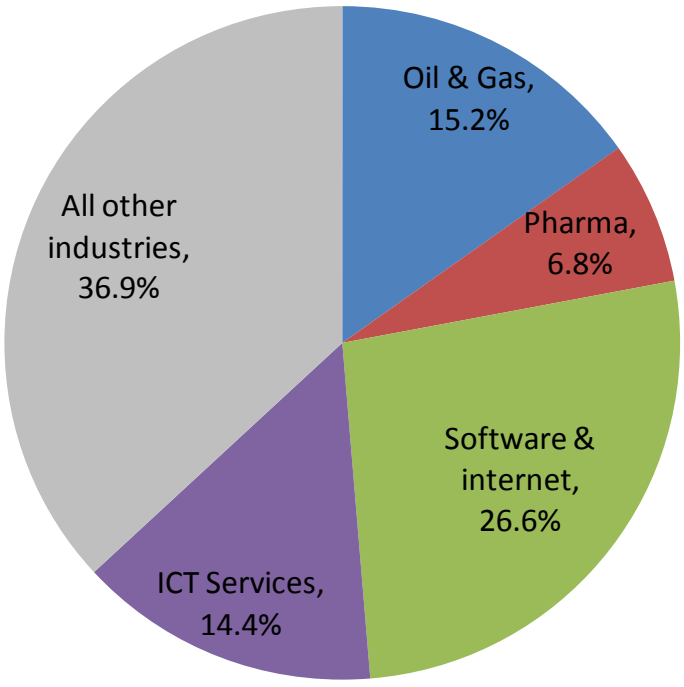


Figure 10 - Share of venture capital deals by industry, 1996-2011



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
Calgary

Since 1970 there have been 48 companies spun-out of the University of Calgary. These have been started by either local university professors or based on technology produced at a local university. Of these companies 18 have been high growth firms, all of which remained have remained based in Calgary (see Figure 11). Roughly half of these were in biomedical & pharma (23), while there were 9 software firms and 6 information and communications technologies (ICT) companies.

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

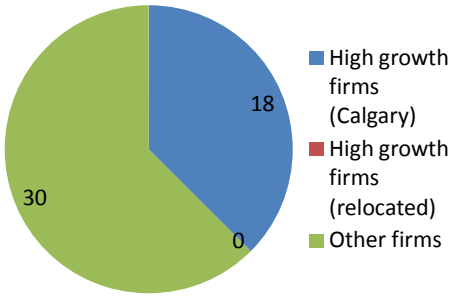
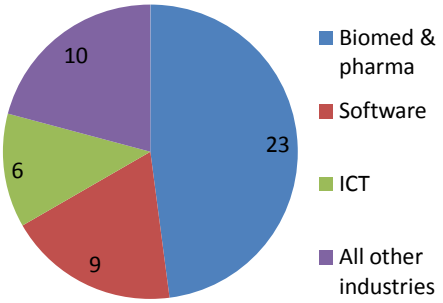


Figure 12 - University spin-off firms by industry



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