

Growth of University Spin Offs – USOs.

Input / Output Metrics & Benefits

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Purpose of Review

1. To present wrap up of 22 year study of University Spin Off Firms [USOs] in Canada and their position internationally.
2. To highlight strengths of Canadian USOs in terms of socio-economic benefits.
3. To highlight High Growth Firms - **Gazelles** and **Lag Time** shifts for decisions - so need faster management decisions.

Data Sources

Multi-year Data collected over 30 Years from wide range of inputs.

1. Names of USOs - UILO reports, press releases, grants.
2. Financial and Jobs: USO web pages, SEDAR for public firms, Strategis, **Manta**, Zoominfo, sector reports, & news clips.
3. Note: **NO** company surveys or interviews done.

ACKNOWLEDGEMENTS:

1. To NSERC for financial support 2011 /12 & 2014. To NRC-IRAP.
2. USO list exchange with B. Laciak, NSERC but new names not used unless independently verified as a USO.

Definitions of University Spin OFF Firms - USO and USSO

1. **USO SPIN OFF Firm:** created to COMMERCIALIZE
INTELLECTUAL PROPERTY that is:

UNIVERSITY OWNED * & / or
UNIVERSITY RESEARCHER OWNED

2. **USSO Univ Student Spin Off Firm:** created by a STUDENT or Recent
GRADUATE with some links to the university – thesis, services,
equipment etc, but NO University linked I.P.

3. **NRC-IRAP Assisted University Spin Off Firm**
received >\$15,000 of NRC - IRAP Funding & advice **
within First 5 Years after Start Up - 34% of cases

* Includes some Hospitals

** 43 NRC - ITAs on Univ & Coll campus.

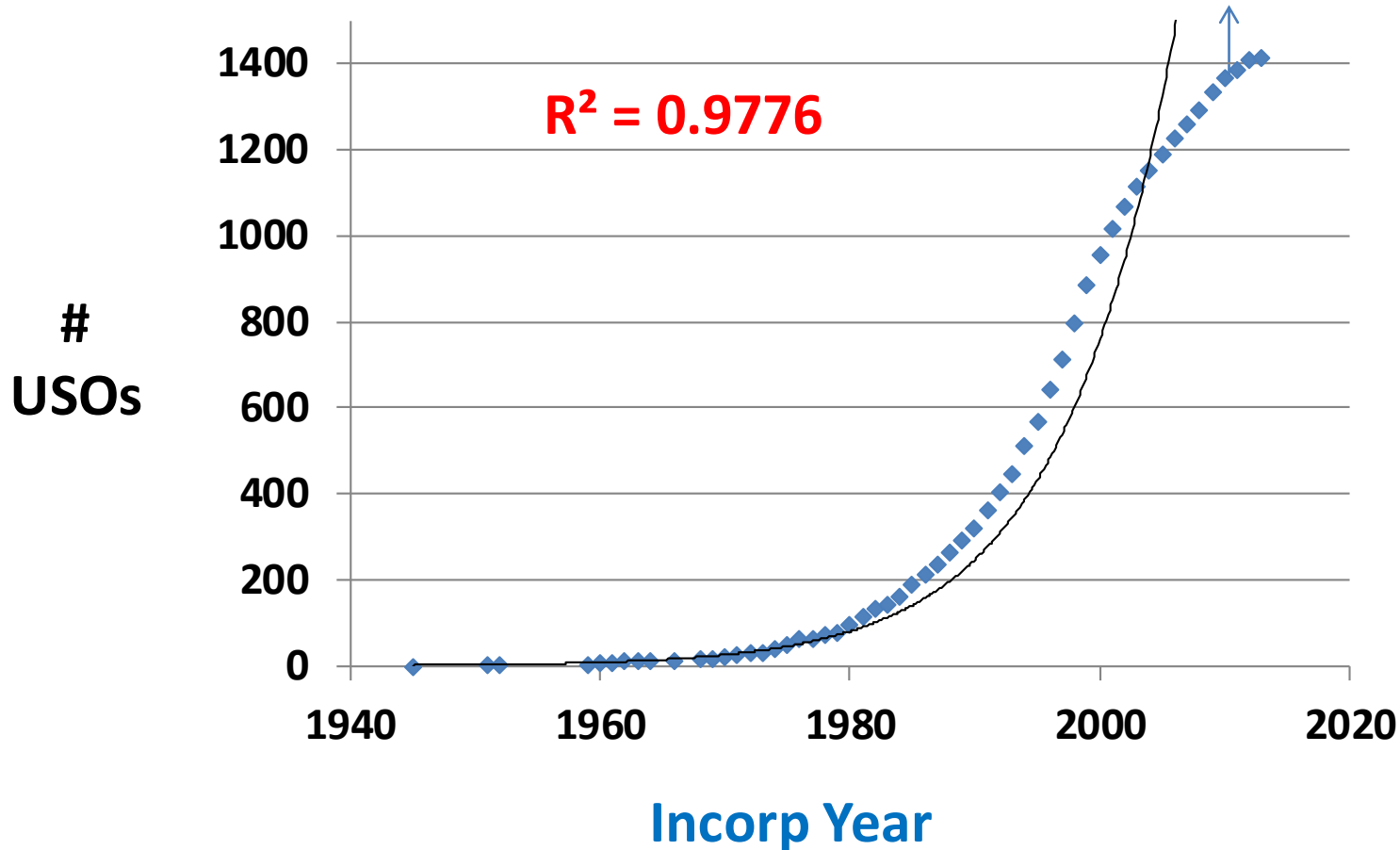
Lead Studies in Canada

- Jerome Doutriaux - Ottawa U: 1980s
- David Strangway, UBC, 301 USOs: 1995 - 2001
- AUTM for US and Canadian Univs: <1990 - 2012
- NSERC: Res. Means Business: 3 Rpts 121 USOs
- Stats Can: 4 surveys - 1,242 USOs - 1999 - 2008
- Benefits reports UILOs: UBC, SK / Man 2009 -2013
- Jorge Niosi, UQAM, Montreal 1990 - 2013
- Denys Cooper: 1,394 USOs 1989 – 2014+



Cumulative 1,394 USOs: 1945 - 2014 in Canada

High R^2 value until drop in 2001



USA : also exponential curve and drop off line but recovers post 2005,
Similar curves for **Japan, Korea, Italy.**

Socio - Economic Contributions by Universities

Orders of Magnitude:

- 1. Training** of Students → Graduates → higher Salaries *
- → Better Jobs for the economy and Taxes.
- 2. Contracts** from industry **/ **Licence** of Univ technology to established firms -
→ products & services → Jobs, sales and taxes.
- 3. Staff as Consultants** to industry → Products and services
- → Jobs, sales and taxes.
- 4. University Spin Off firms** → Products and services
- → Jobs, Sales and Taxes.
#4 is the one **most studied** for their socio-economic contributions.
- 5. Environment / Social** Issues.

* Stats Can 2014: \$742 K salary > for univ grad over H. Sch. over 20 years.

** \$938 M in 2011 / 12, Stats Can: Licence revenue \$58 M in 2008 - if 2% → \$3B sales
- <http://www.statcan.gc.ca/daily-quotidien/130708/t130708b001-eng.htm>₇



Found 24,000 USOs in 29 Countries

<u>Country</u>	<u># USOs</u>	<u>Years</u>	<u>Country</u>	<u># USOs</u>	<u>Years</u>
USA	9,116	<1990 - 2013	China	2,900	2010<
Canada	1,394	1945 - 2013 *	Japan	1,500	2000 - 2010
Italy	1,071	1979 - 2012	S. Korea	1,185	1998 - 2010
UK	976	to 2007			
Netherlands	600	to 2009	Spain	496	1993 - 2006
Germany	3,369	to 2006	France	387	<1984 - 1998
Belgium	250	to 2010	Australia	314	2001 - 2010
Israel	150	to 2010	Switz - ETH	130	1998 - 2007
Norway	120	1986 - 2006	Sweden	150	1960 - 1991

DC Est. to 2013 28,000 USOs Worldwide

Detailed **23 page** international literature review.

* Excludes 250 Student led USSOs.



<u>Latest USO Status</u>	<u># of USOs</u>	<u>%</u>
S = Ongoing	614	44%
X = Still on Stock Exchange	43	3%
T = Taken Over / Ongoing	<u>249</u> <u>[906]</u>	<u>18%</u>
C = Closed	437	31%
U = Uncertain	<u>51</u>	<u>4%</u>
Total	1,394	100%

High net **Survival Rate 65%** for **average of 15.6 years** so far.
In general, SME start ups: only 50% survive for 5+ years.

Start up USO

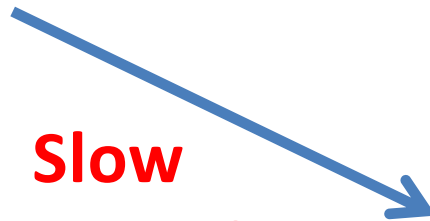


**USO
Success**



Acclaim Images.com

**Keep 1 Toe in Univ
/ Adjunct Prof Role,
9 Toes in USO**



**Slow
Growth
USO**



Acclaim Images.com

**Keep 9 Toes in Univ,
1 Toe for USO
consulting & royalties.**

<u>Sector</u>	<u># USOs</u>	<u>%</u>	<u>Sub-Sector</u>
---------------	---------------	----------	-------------------

Life Sciences	620	44%:	- Bio, pharma, Medical
I.C.T. / Elect	387	28%	- Comm., electr, software
Manuf	170	12%	- Mach, mech, materials
Resources	76	6%	- Energy, enviro,
Other	<u>139</u>	<u>10%</u>	- Construction, transport
Total	1,394	100%	.



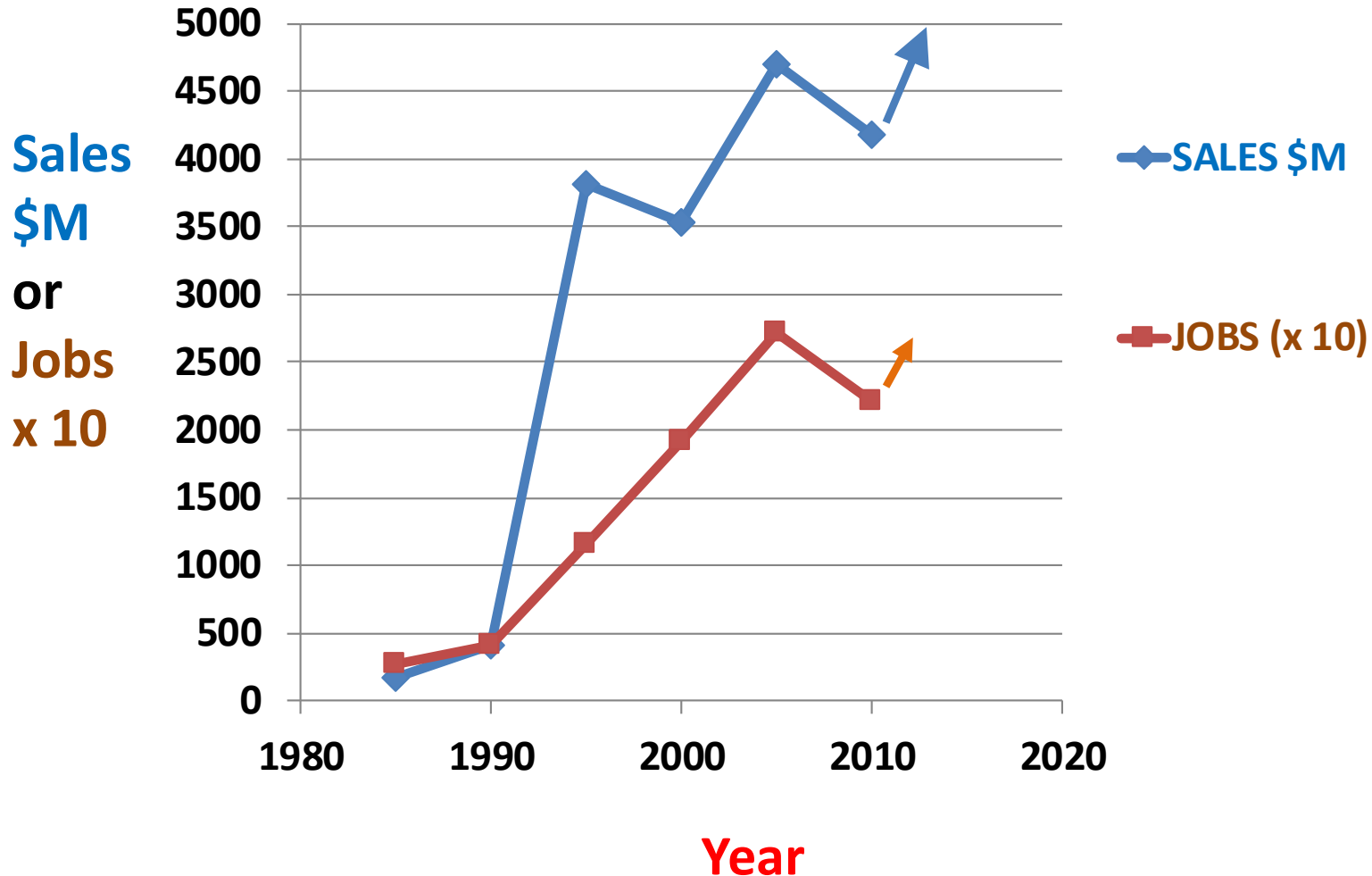
<u>Region</u>	<u># of Can USOs</u>	<u>USO %</u>	<u>185 Female Led %</u>
BC	320	23%	49 for 15%
Prairies	244	18%	25 for 10%
ONT	506	36%	62 for 12%
QC	256	18%	38 for 15%
ATL	<u>68</u>	<u>5%</u>	<u>11 for 16%</u>
Total	1,394	100%	185 for 13.3%

24 Slides unique / special data marked with





USO: Growth of Known Jobs and Sales



Revised 2012 Nov – Charts #5



Sizable Jobs and Sales - Annual & Accumulated

	<u>Latest Year 2012 -14</u>	<u>Accumulated</u>
Jobs	25,200 in 410 USOs	307,000+ ** job years
Sales	\$9.2 B on 410 USOs	\$62+ B **

2013: 10 firms 9,800 jobs & \$7.5 B sales.

Accumulated Data:

*** First national estimate.** Cohen showed 280 K USO **USA** jobs 1980 - 99

**** A.** My figures should be larger because of data gaps.

B. Little data for ongoing USOs once taken over, but if use latest year 2010+ could represent **30,000** more job-yrs & **\$5 B** sales.

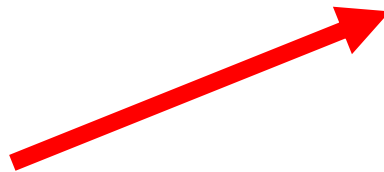
High Growth Firms - Definition of Gazelles

1. Employment:

- **Double** employment within a **5 year** period and
- Have at least **20** employees within a 5 year period
- Definition adopted in Statistics Canada / IRAP study

2. Sales:

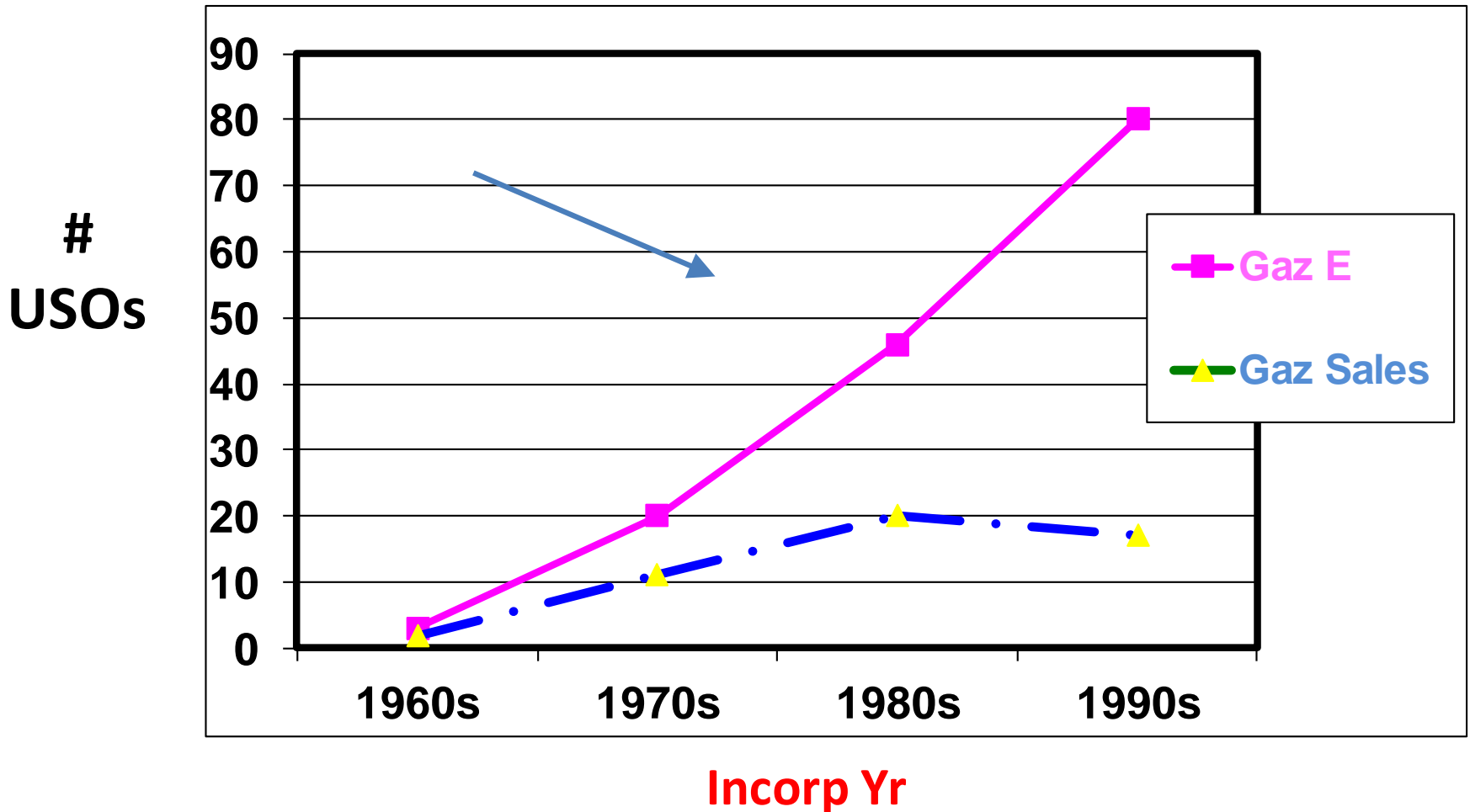
- **Double** sales within a **5 year** period and
- Have at least **\$10 M** sales within a 5 year period





259 Gazelles for University Spin Off Firms

USOs by Decades, for Gazelles by
Employment [GE] and Sales [GS] to 2011

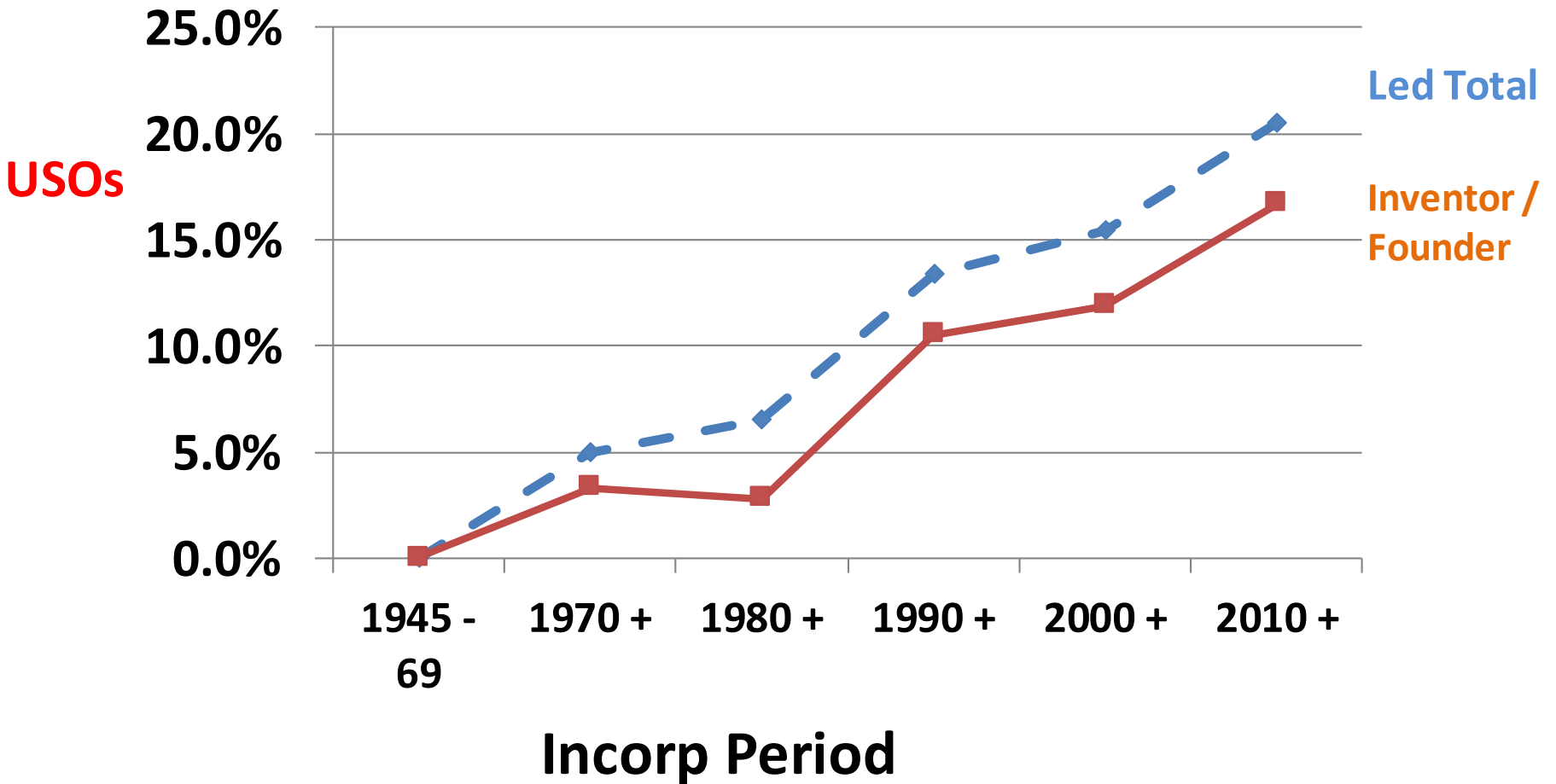


Gazelles: Presence Varies by Sector

Sector	259 USOs for % as Gaz	185 Female Led USOs and # for % as Gaz -34
ICT / Elect	94 for 26%	7 for 7%
Life Sci: Bio / Pharma / Med	118 for 61%	23 for 19%
Manuf Energy / Enviro	14 for 8% 15 for 20%	3 for 21% 0 for 0%
Other	18 for 13%	1 for 6%
Net Total	19%	34 for 13.3%.

Gazelles based on Employment levels. Lower % for Sales levels.

First Study of Female Led USOs [185] and Female Inventor / Founder USOs [123]



Gazelles Important for Job Creation in 2012 -14

	# GE USOs	# Jobs	% Firms	% Jobs	Ave # Jobs / Firm
Gazelles	91	21,240	24%	95%	233
Non Gaz	295	3,205	76%	5%	11
Total	386	22,445	100%	100%	58
Excludes	75	USO Gaz	with no	recent	Sales Data

Jobs for latest year for 2012 – 2014

Sales Gazelles had \$4.3 B from 87 USOs for 94% of sales



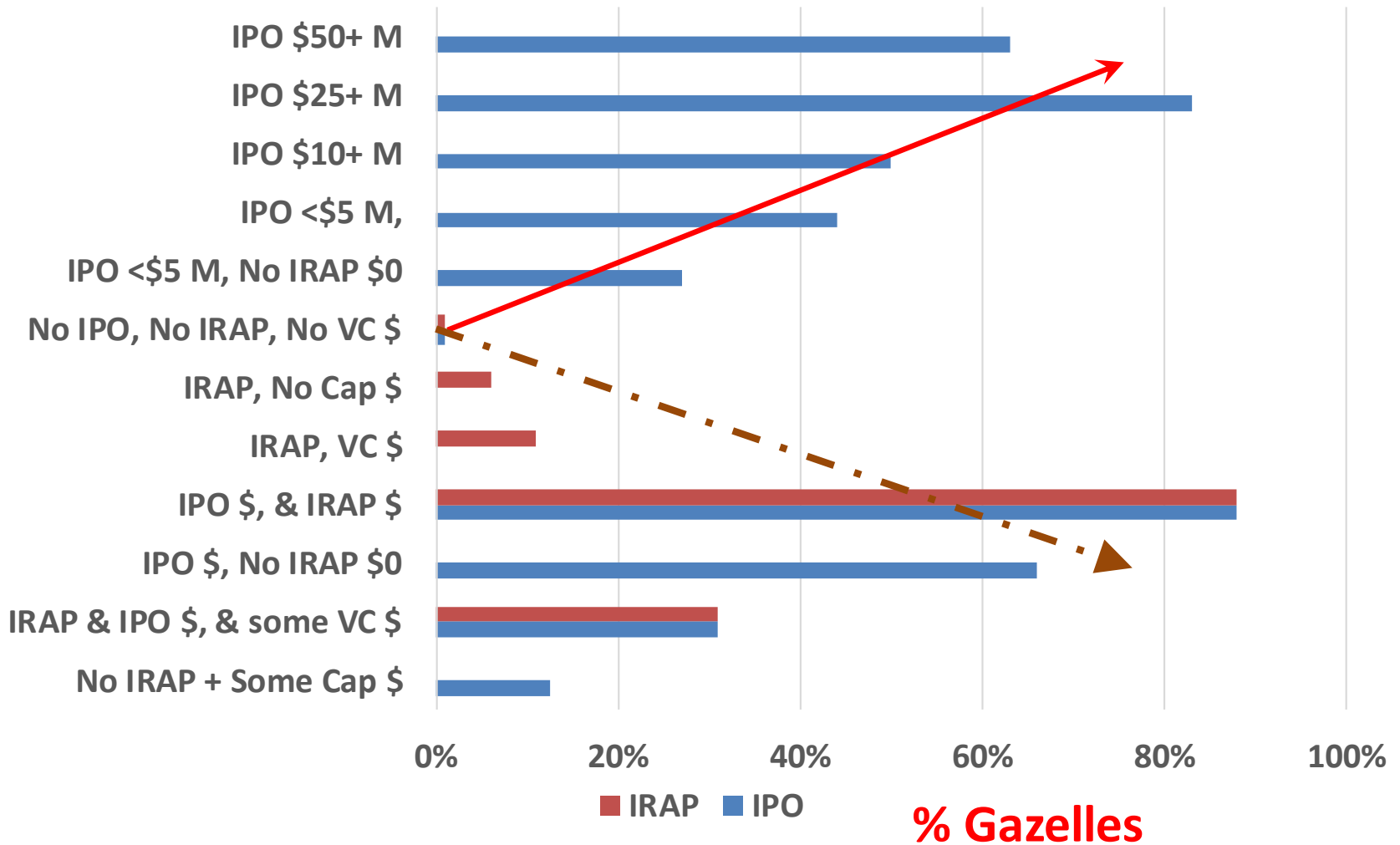
USO Gazelles higher with VC Funding than base 4%* for all Firms

		Gazelles	
# Firms		#	%
2,434 **	Total \$18 B VC	429	17.6%
1,586 **	Technology Firms with VC	284	18%
200	Univ USOs with VC - 2014	40	20%
136	NRC - IRAP & VC - 2014	37	27%

- 4%: First seen by Prof Birch, MIT in 1970s, & Stats Can / NRC 1995.
- ** Industry Canada Study - 2008 Y. Errounda, and D. Cooper



Funding of 1394 USOs incl 259 IPO USOs



RTOs % Gaz: No IRAP, No VC = **20%**, With IRAP & VC = **52%**

Analysis of Gazelles in University Spin Offs

1 of 2

- 1. University Spin Off firms have a higher % of Gazelles**
 - **19%** vs 1 - 4% for Canadian industry as a whole, & US [Birch]
 - Davidsson in Sweden found **14%** for all sectors.
- 2. High Tech sector shows higher growth rates, in Canada**
 - Key growth sectors - ICT and Bio / Pharma.
 - Manufacturing sector shows **lower** levels of Gazelles
 - US, Holland and Finland show higher levels in Non-Tech areas.
- 3. Still get some Gazelles for larger firms**
- 4. Average time to Takeover unrelated to:**
 - Gazelle or if firm received IRAP support.

Analysis of Gazelles in University Spin Offs

2 of 2

6. Closure rates - **53 Gazelles [20%]** vs **31+%** for all USOs
 - Normally 50% of all start up firms disappear within 5 years.
7. Gazelles targeted? 329 USOs **T/Os at 25%** vs **38%** for Gazelles.
8. There is considerable turbulence in employment levels
 - especially in 2003/4 and in 2008/12 where Gazelle jobs grew then dropped back [GEDp] but NOT to original levels.
9. Sizeable lag time to get Sales, but R&D jobs grow - e.g. in Bio.
10. USO growth as gazelles NOT seen in EU study 2012.
11. Few GS Sales Gazelles in NCE USOs - still too early [2008 study].

85 Serial Entrepreneurs - 7 Female

UBC Annual report first covered them in 2005 for 2+ USOs

1. Net total of 192 firms. 21 profs had 3 to 6 USOs - 64 USOs.
2. U. of T. has 22 serial entrepreneurs with 50 USOs [28%].
 - Financial Models: \$500 M sales and 480 PYs in 2006 then T/O for \$170 M.
3. UBC has 16 serial entrepreneurs with 43 USOs [22%].
4. 71% of all Gazelles are formed by Serial Entrepreneurs but few USOs exceed \$25 M in annual sales.
5. **Lorne Whitehead**, UBC is the most prolific with 6 USOs
 - TIR Systems - Light Pipe had \$15 M sales when T/O by Phillips in 2006 for \$75 M.

185 Female Inventor / Founder Led USOs

1. Increasing level of female led and inventor / founder USOs by decade - up from 5% in 1970s to 11% in 1990s & 17% in 2010+. Level now similar to NSERC funded female researchers - 2004 Annual report.
2. Gazelles slightly **lower** at 13% vs 19% for all USOs,
 - Only **4** USOs have sales over \$20 M / yr
 - at **2.2%**, still higher than 1.8% for all USOs.
3. The average **IPO** funding for Women Led USOs at **\$11.5 M** vs \$29 M for all USOs is **40% lower** than for all USOs, but higher **# %** of RTOs, so overall funding is even lower to get on the stock exchange.
3. The leader, QLT of UBC - J. Levy's macular eye treatment [cumm revs \$1.5 B, raised \$454 M]. Even if one discounts this, female firms had **16% lower** ave VC and post IPO capital placements at **\$21 M / USO**.

250 Student Formed / Led USSOs



1. Largest national study so far. Prelim from 45 Univ & Colleges.
2. Exponential growth in numbers of USSOs - a high **R² of 0.91**.
3. ICT / Elect highest sector [49%], and Life Sciences [20%].
4. 60% USSOs formed by students in courses, 27% by recent grads
5. 11 firms gone public. 130 USSOs in ON [52%] which also received 72% of VC and post IPO funding.
6. Only 19% USSOs had IRAP \$ within 5 years of start up.
7. Higher survival rates at 81% vs 65% for USOs - maybe due to more being newer firms.
8. Gazelles - 14% - below that for USOs. **11%** Female Led.
9. Largest USSOs are: **RIM / Blackberry** [cumm sales of **\$59 B** and 113,000 job-years to 2014], **Angiotech** [closed]. **Faro, & Spin Master** in TV games - both in US.



Lag Time Studies

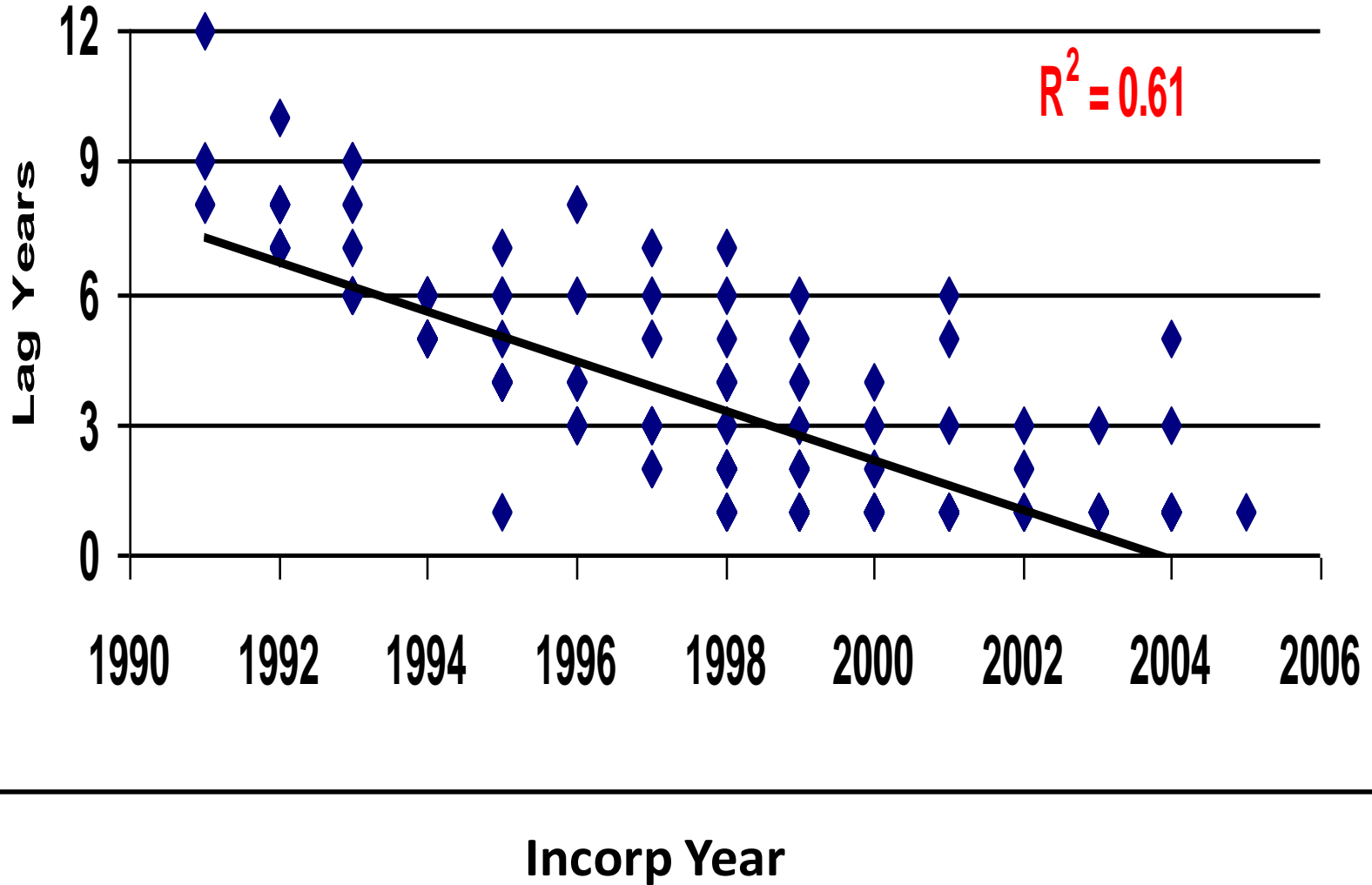
Shows **decreasing Lag Times** from date of Incorporation to:

- First VC Funding
- IPO
- Takeover
- Closure
- First Profit and Elimination of Deficits
- Job Creation Levels – 50 and 100 PYs

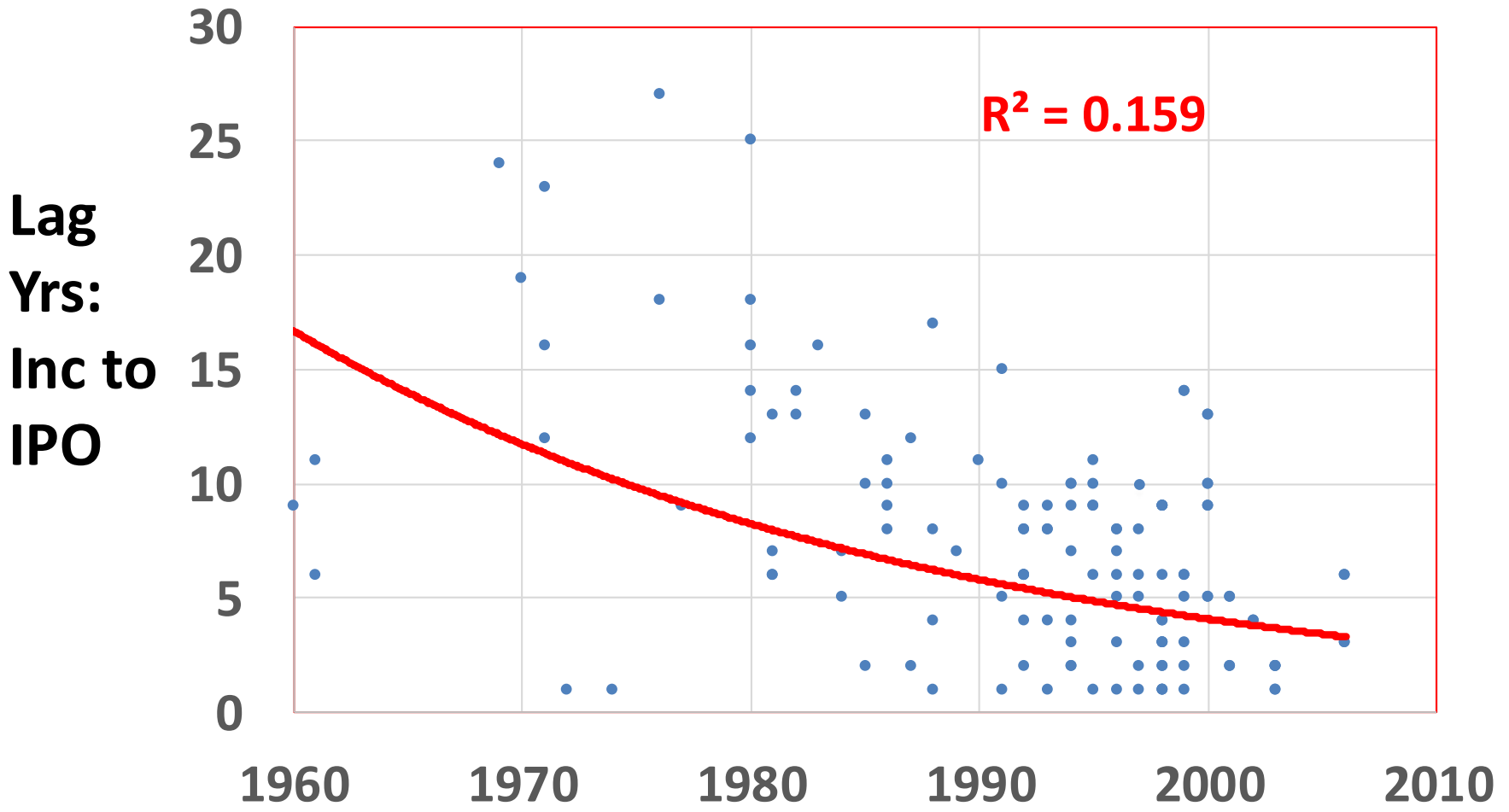
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Lag Time Yrs from Inc to VC for 203 Spin Offs



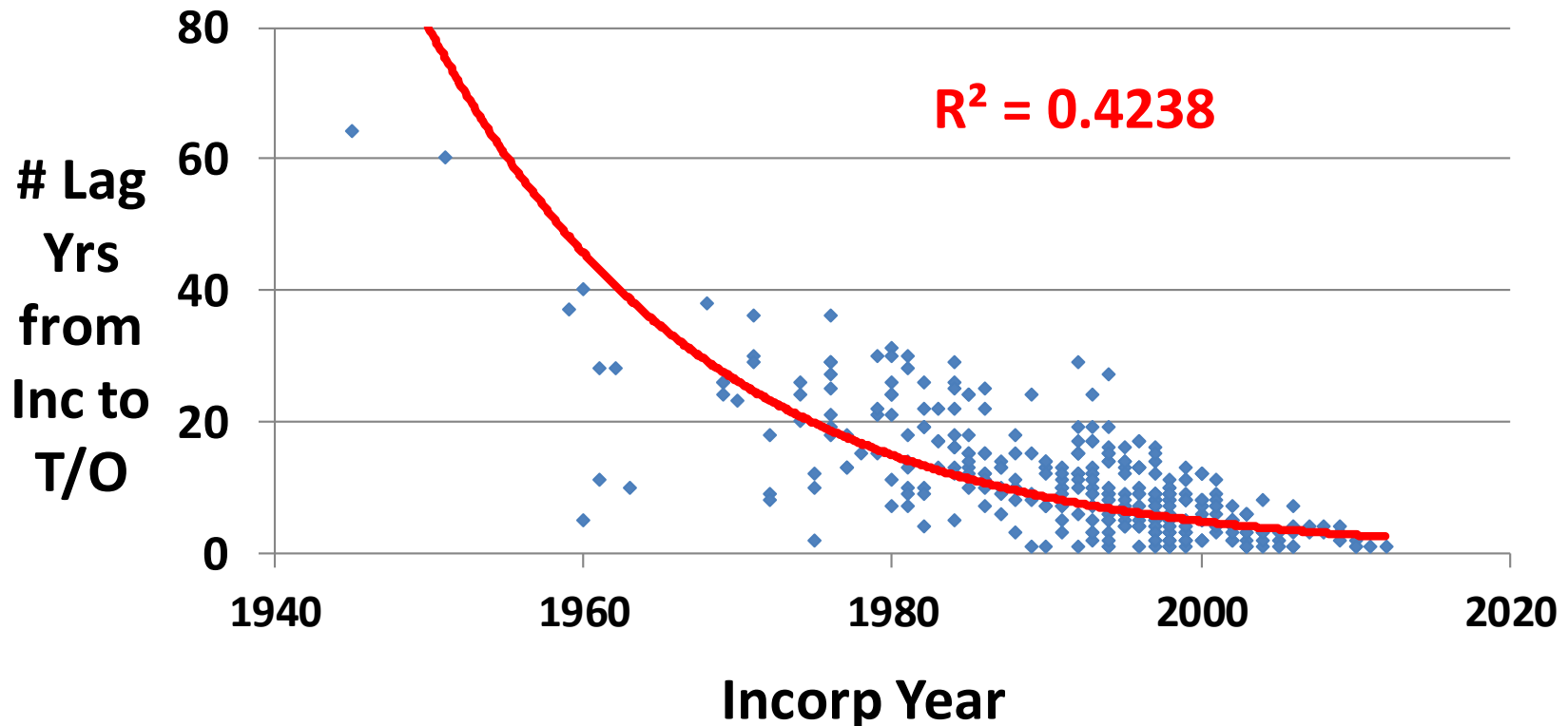
134 IPOs - Lag Yrs from Inc



Excludes RTOs, Cap Stocks and SPEQs



T/O Lag Yrs from Incorp for 366 of 387 Taken over USOs



1. T/Os occur at all sizes of USOs, rising to 50% for firms with 50 - 99 PYs, then % drops off.
2. Includes **19** USOs which transferred Head Office to US.

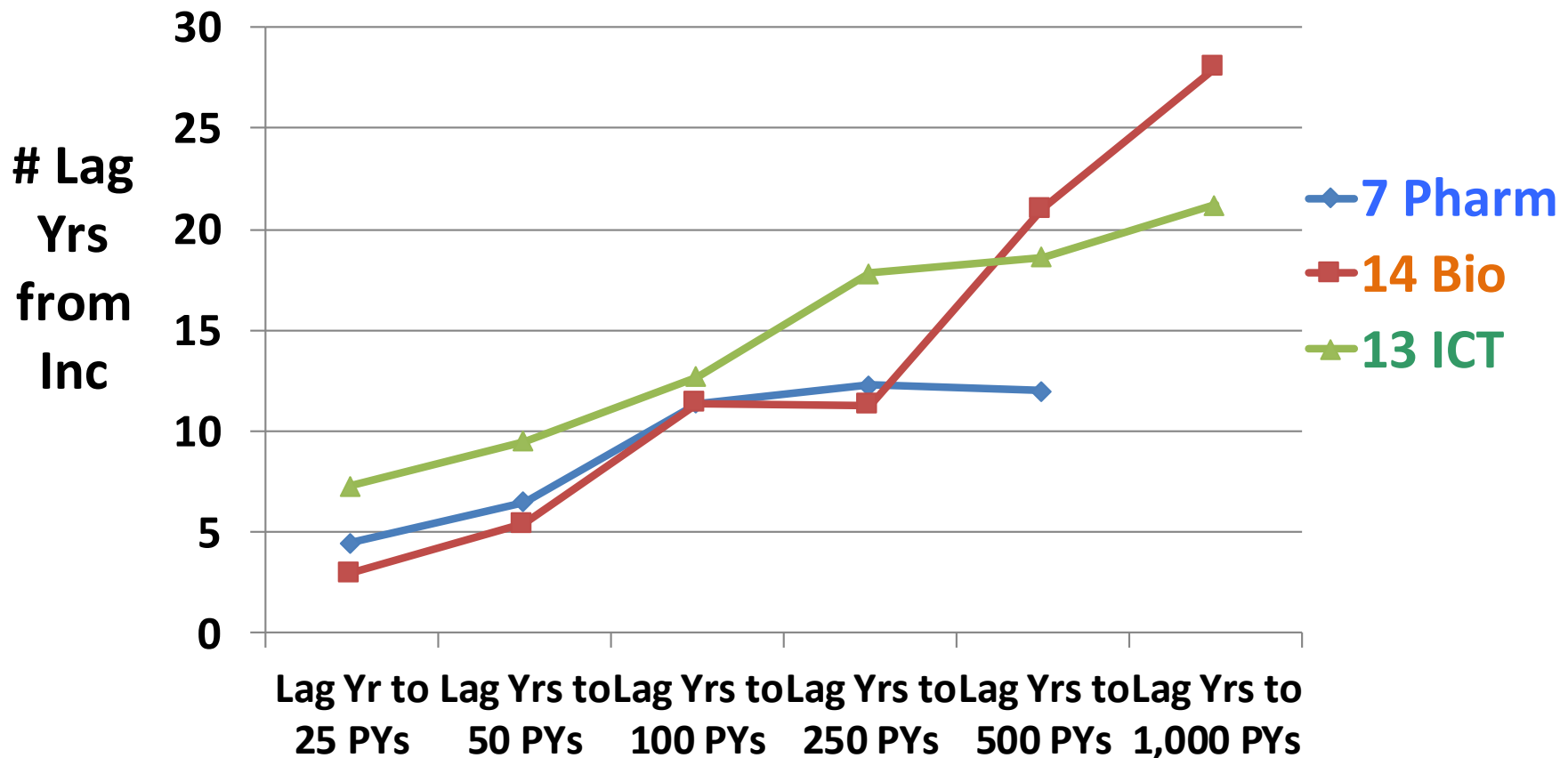
**Of 387 USOs Taken Over, 122 had known
Valuations of \$11.5 B**

Sector	122 T/Os	\$ M	Ave \$ M	Median \$ M
Life Science	71	\$6,700	\$95	\$30
ICT / Elect	34	\$2,739	\$83	\$33
Manuf	5	\$541	\$108	\$8
Energy / Enviro	5	\$813	\$163	\$19
Other	7	\$713	\$102	\$75
Total	122	\$11,506	\$94	\$23

BC: ID BioMedical at **\$1.2 B**, CREO at **\$980 M** [Spencer +].
ON: Rimon / Enobia at **\$1.4 B**, Zenon Enviro, at **\$760 M**.

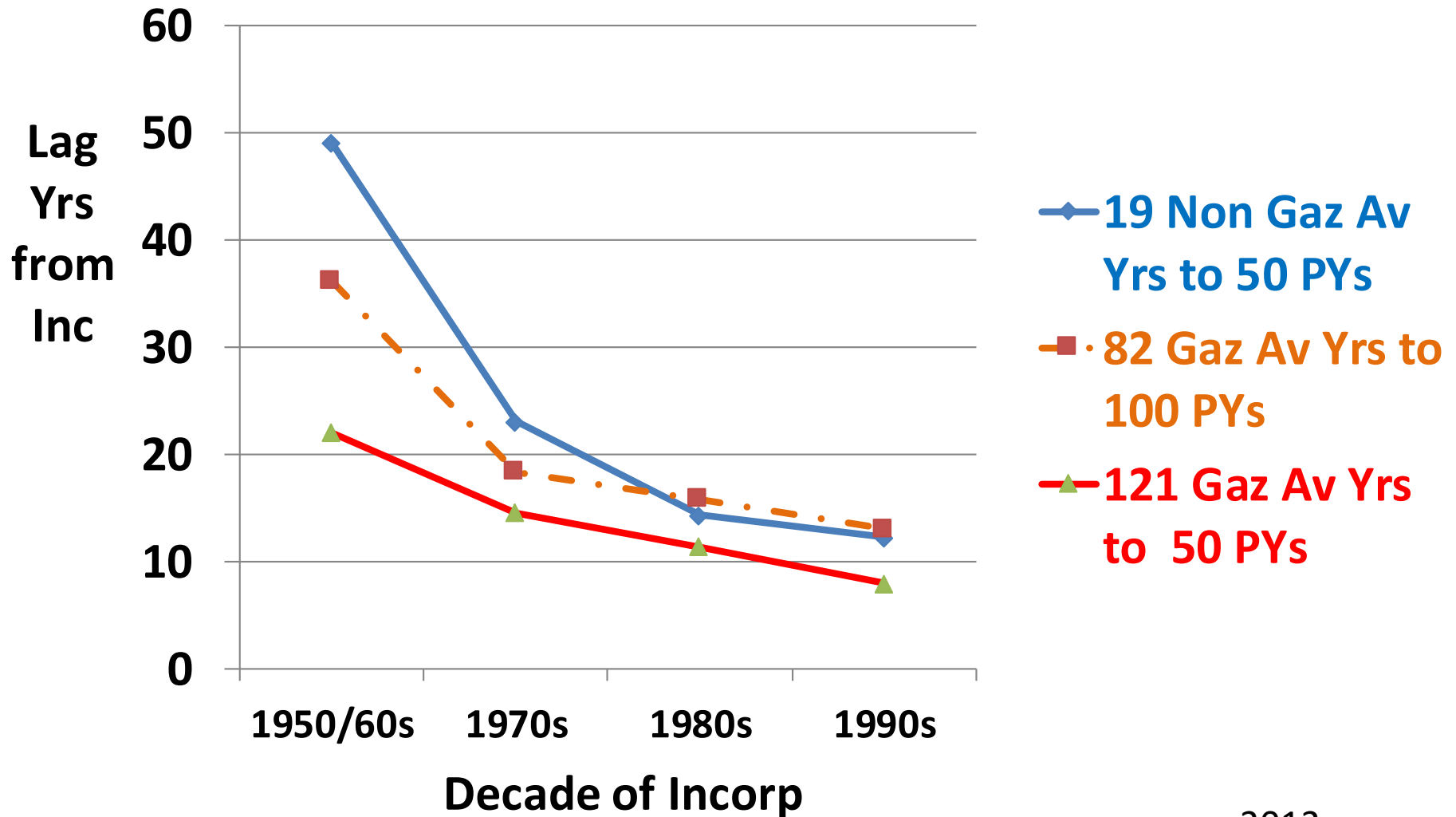


Average Employment Lag Times for 3 Sectors to Reach 50, 100, 500 and 1,000 Employees



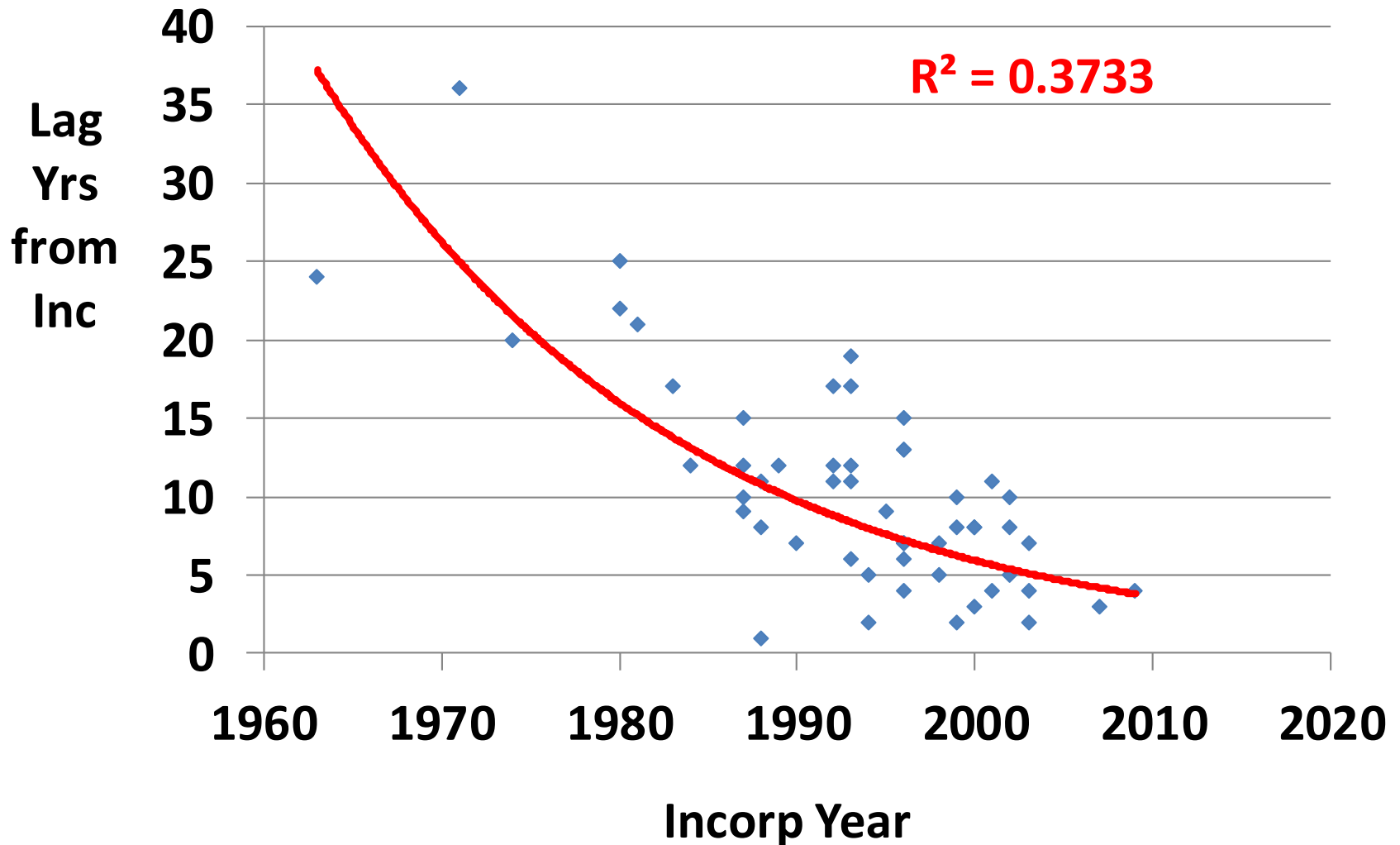
1. Similar curves for **sales**, but with longer lag times.
2. Lag times **reduced by 50% for gazelles**.

Drop in Lag Times for Gazelles vs Non-Gazelles ★ to Reach 50 and 100 Employees





Closure Lag Time Yrs from Incorp - 356 USOs



Does Canada Need a Bayh-Dole Act ? **NO**

University IP Ownership Policy



	Prof	Univ	Prof : Univ
IP Owned for 1257 USOs	699	558	56% : 44%
USOs Ongoing	473	280	Prof
- %	74%	50%	Prof
USOs Closed	20%	31%	Prof
GE Gaz #	17%	21%	Univ
# USOs with 100+ Employees	13	4	Prof
Ave Employees / USO	61	57	Similar
Ave Sales / USO 2012/13	\$15 M	\$16 M	Similar
IPO \$s / USO	\$18 M	\$33 M	Univ
VC & Private Placement	\$25M	\$33 M	Univ
T/Overs as % of USOs	26%	29%	Similar
% T/Overs by Can	53%	41%	Prof
% T/Overs by USA Coy	29%	38%	Prof

1980 Act: US Congress Start Up Act 2.0 of **2012** July may permit researchers to select their own commercialization agent. Weakens Bayh Dole Act?

Are USOs being Spun off Too Early?



2008 - 2011 VC Study shows:

- Status of Firms: Similar ratio of Ongoing firms : Closures
- Gazelles: USOs > Tech Firms
- Jobs: Similar for 2 size groups
- Sales: Similar for 2 size groups

Conclusion: Neutral - Generally USOs **NOT** being spun off too early.

- See next slide.

NSERC – i2i: Lower performances - special case.

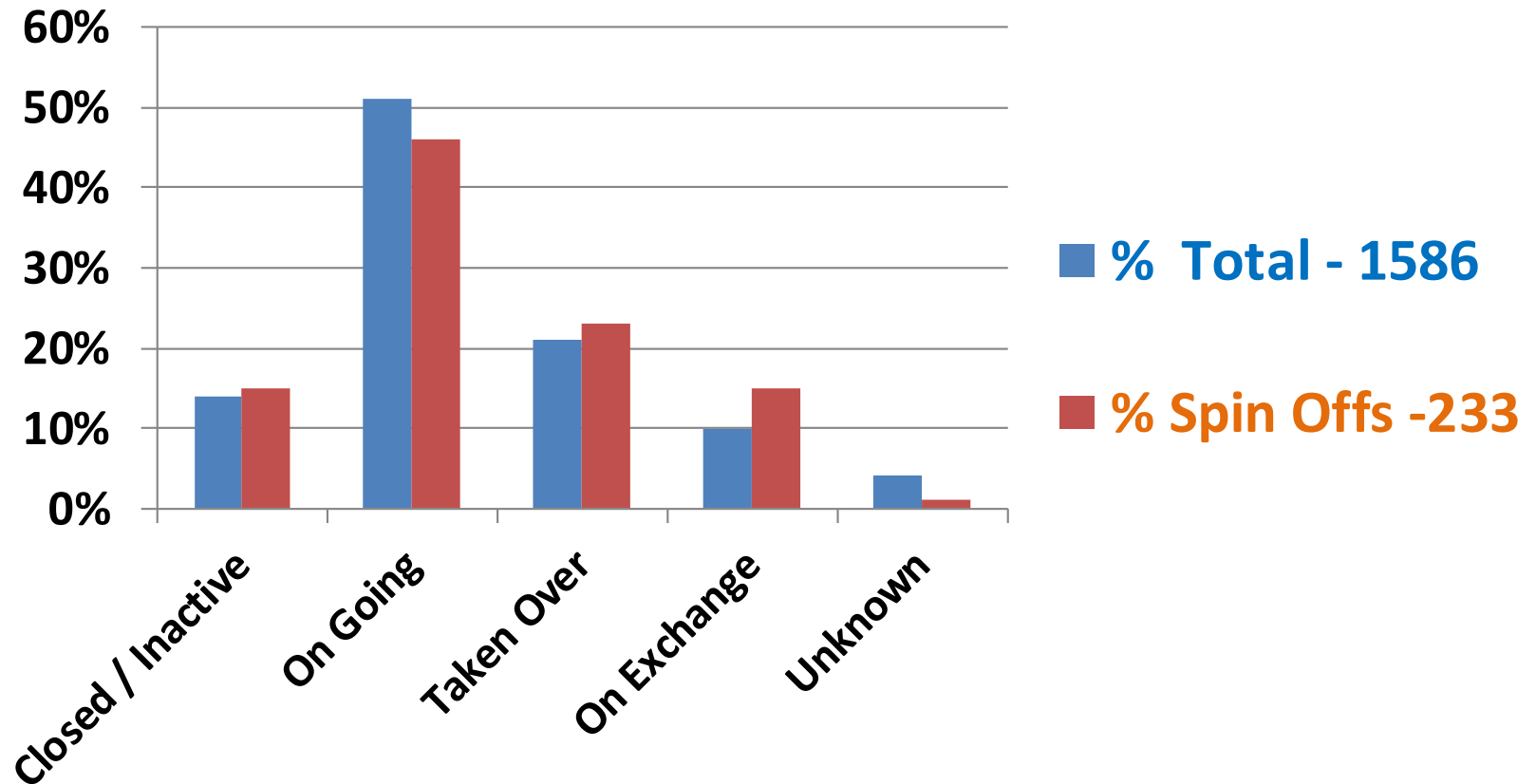


Are USOs Going Public Too Soon via RTO?: **YES**

- Short term gain for quicker / easier access to stock exchange listing via RTO / Cap Stock. Major difference from USA.
- RTOs raise lower initial \$s and lower TOTAL capital \$s.
 - Better to be patient for full IPO if one can afford to wait.



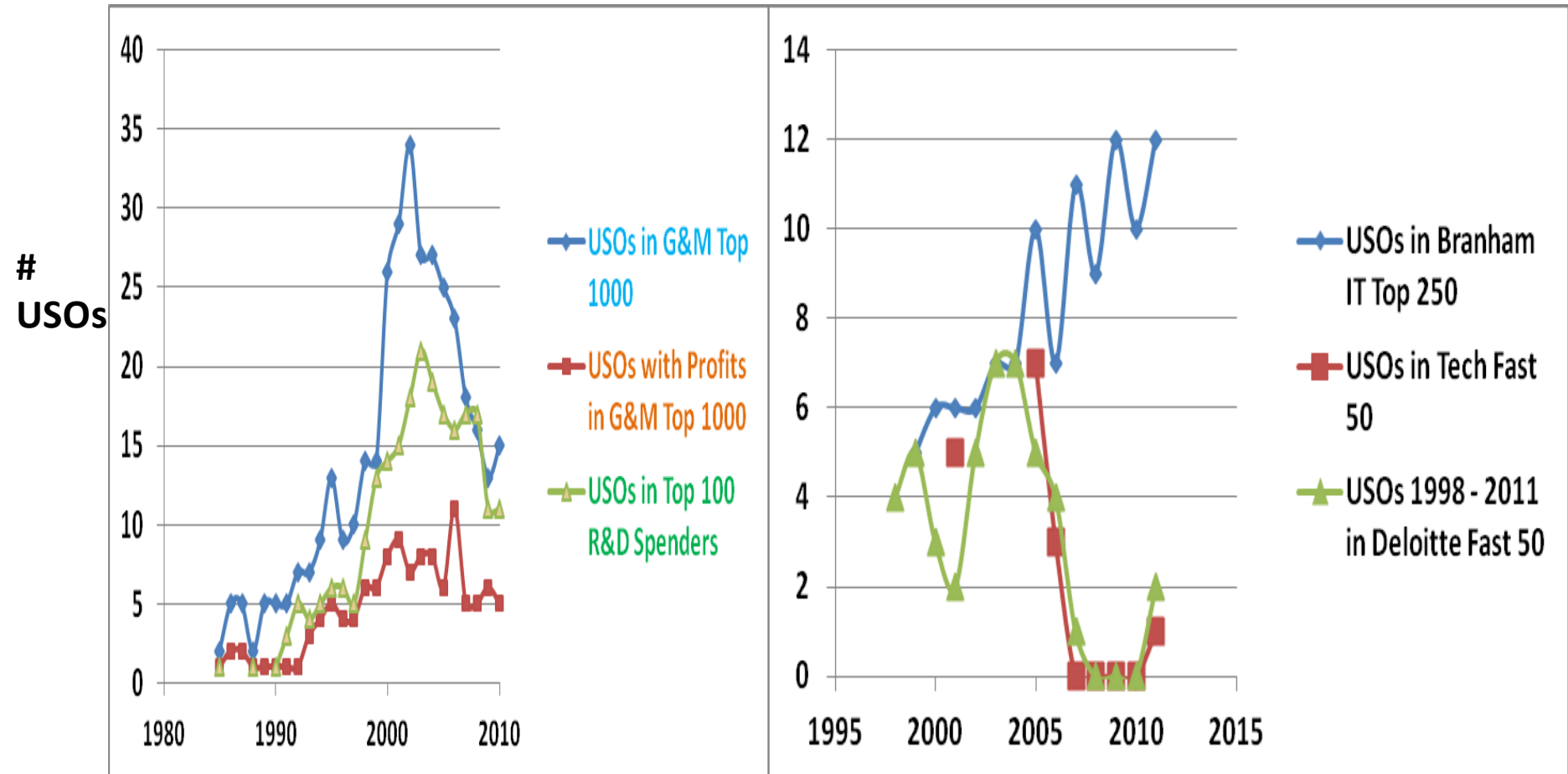
Are 233 USOs being Spun off Too Early?



There is **NO significant difference in status** of **USOs** vs **1,586 Technology firms** in the VC 2008 - 2011 Ind. Can. study.



Awards: Increased # of USOs, but then hit by Dotcom Bubble Burst. Exception is IT - Branham



Listing

Year

Conclusions


1. Canada has **more USOs than expected** - due to lower industry receptor capacity for Univ IP, compared to the US. Universities with larger research budgets create more USOs: UBC & SFU above trend line.
2. Canadian USOs have **high survival rates**. Results not strong in Europe - 2012.
3. USOs have a **major economic impact** - jobs & sales. Annual / Cumulative.
4. **Gazelles** make multiple jumps; contribute most jobs & sales. % Rise with VC \$s.
5. **High takeover rate** of USOs. Reasons: market [positive] & financial [negative].
6. **First detailed studies** of **women** led USOs, **student** led USSOs, **profits**, and **serial entrepreneurs**. Founders involved for many years of key USOs.
7. Some USOs have raised **large** amounts of **capital** - \$14.4 B. **Concern**: funds have **dropped** significantly over the past 3 years for VC \$s - no recent IPOs in USOs.
8. The **lag times** from incorporation year to IPO, T/O or Closure have dropped significantly over the past 20 years; so, now USO founders & officers must manage major corporate changes within 5 years of start-up or close.
9. Based on company status and gazelles, **USOs are NOT spun off too early**.

Dissemination Steps - Provided core data

1. To Prof David Wolfe U of T for Innovation modelling.
2. To Ron Freedman, Impact Group for Innovation Atlas.
3. To collaborate with Haibo LIN of Hong Kong Polytechnique for Ph.D. Thesis - first comparative international study of USOs which have gone **public**
 - from UK, USA [**200+ USOs**] and Canada [**151** USOs].

Next: To extend current benefits review of 600 American USOs, to over 3,500 of their 9,100 USOs.

Questions?

Supplementary data - 15 more slides & 12 

Top 5 Universities as Sources of USOs

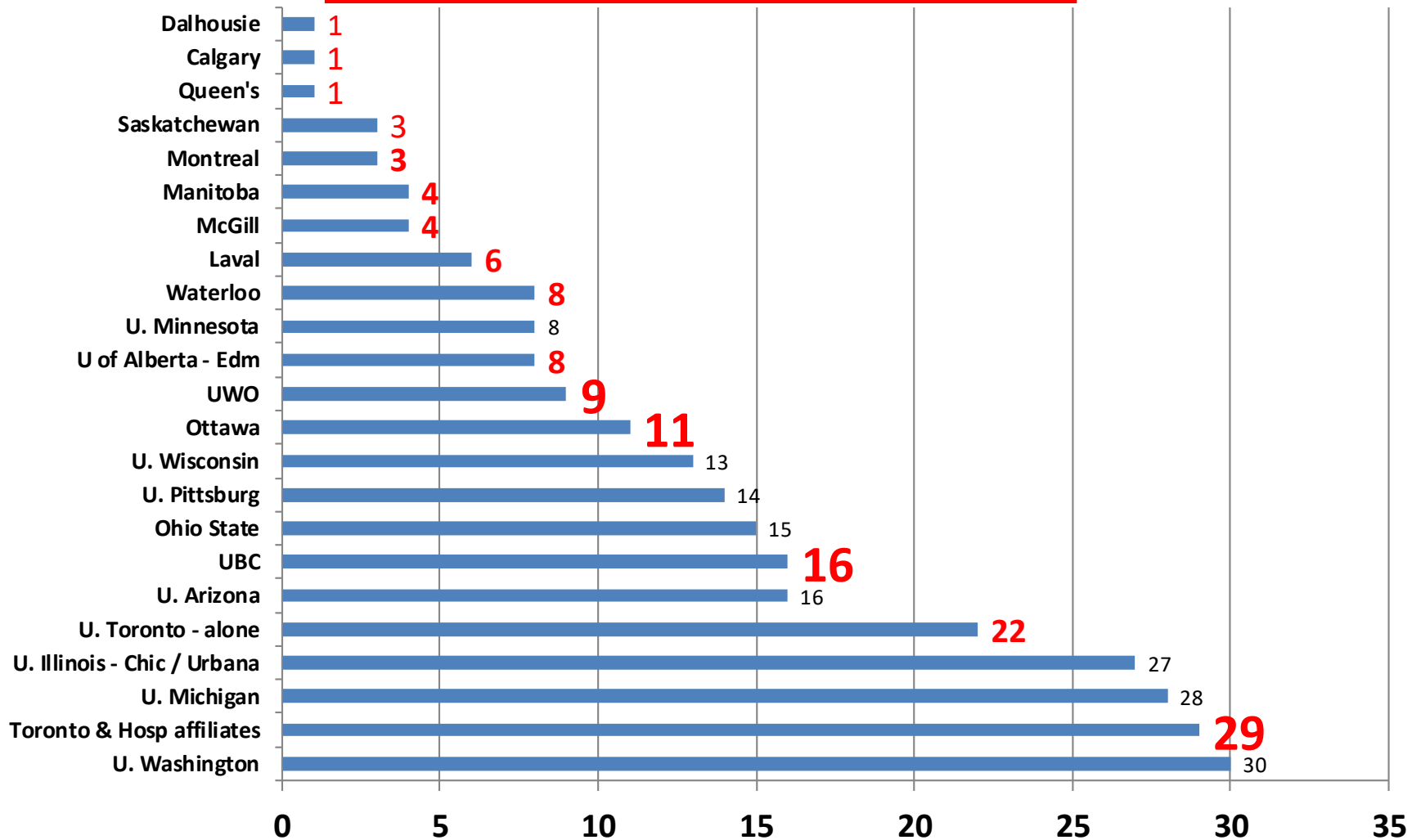
<u>University</u>	<u>USOs</u>			
• Toronto	189			includes co-centres
• UBC	174 *	“	“	“
• Edmonton	104			
• SFU	89			
• McGill	70			

Sub-Total	636			

Top 5 of total **103 centres** have 46% of USOs.

* Higher than UBC UILO www site - with 158 - here includes joint spin offs with others, e.g. BC Cancer Inst. & Van Gen Hosp.

USOs for 2006, 2007 & 2008



Source AUTM 3 years compiled by U of Toronto Annual Performance Rpt 2011 [**14+1 Can**, 8 US]

http://www.utoronto.ca/__shared/assets/09a_Commercialization_visual4432.pdf

18 USOs with over \$100 M in Sales in one or more Years - Key Leader



•McGill	Biochem Pharma	- F. Bellini
•McMaster	Linear / Genum	- D. Barber,
	Zenon Envirotech	- A. Benedecte
•Montreal	Algorithmics	
•Saskatchewan	Inverpower / Satcon Power,	
	Vecima / Watcom	- S. Kumar
•SFU	CREO Products	- K. Spencer & D. Gelbart
•Toronto	Innova Technologies	- M. Kehoe,
	Sciex	- J. B. French
•UBC	MDAssoc	- J. MacDonald,
	QLT	- J. Levy,
	Westport Innov	- P. Hill
•Victoria	UWI, & Aspreva	- ? - B. Glickman
•Waterloo	Dalsa	- S. Chamberlain,
	Open Text	- T. Jenkins,
	Watcom / Sybase	- G.Trevor & D. Cowan.



Male : Female NSERC Funded Cases to 2012

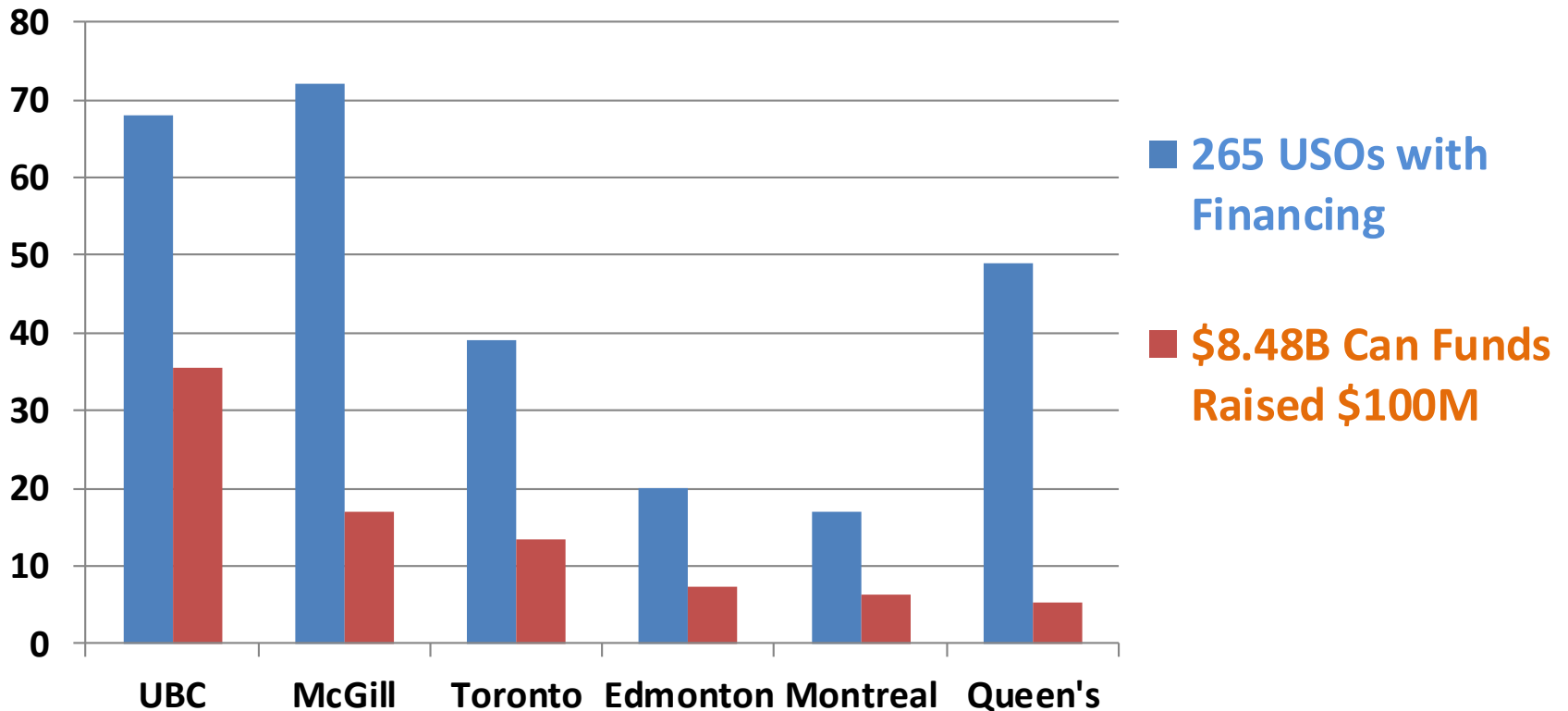
Type	NSERC Funded Cases		
	% Male	% Female Inventors / Founders	Total Female Led
USOs to 1995 Inc Yr	89%	11%	45
USOs 1996+ Inc Yr	83%	17%	42
Total USOs Prof funded	89%	11%	87
All USOs + /- NSERC \$	93%	7.2%	101
Total USSOs to 2013	90%	10%	10
NSERC Grantees 2012			
Professors	82.3%	17.7%	12,000
U-Grads and Grads	60.6%	39.4%	30,000



- **Total # of NSERC funded USOs and USSOs is likely under stated**



\$8.48 B in Capital Raised by 265 USOs - Top 6 Universities in Canada to 2012



Of 1,394 USOs and 250 USSOs in Canada to 2014, **486 had raised \$14.4 B** from VCs, IPOs, RTOs, and follow-on financing – aver \$30 M each. **DC 2015**

Jan

\$9.9 B Capital Raised by 134 of 151 Public USOs

IPO / RTO	#	\$	Ave / USO	VC & Pplcmnt	Total	Ave / USO
IPO	83	\$2,159 M	\$26.6 M	\$5,326 M	\$7,485 M	\$92.4 M
RTO /Cap Stock	51	\$145 M	\$3.7 M	\$2,146 M	\$2,327 M	\$47.5 M
Sub-total	134	\$2,304 M		\$7,634 M	\$9,938 M	\$74.2 M

IPO / RTO	85	No info	-	\$2,871 M	\$2,871 M	\$33.8 M
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1. USOs with **IPOs** raise much more capital than USOs with **RTOs / Cap Stocks**.
2. RTO provides quicker / easier access to public market but in long term provide lower benefits.
3. Surprising to find that IPO valuations for Gazelles only 4% higher.
4. 2008 - 2011 VC study showed technical firms raise **50% more than USOs**.



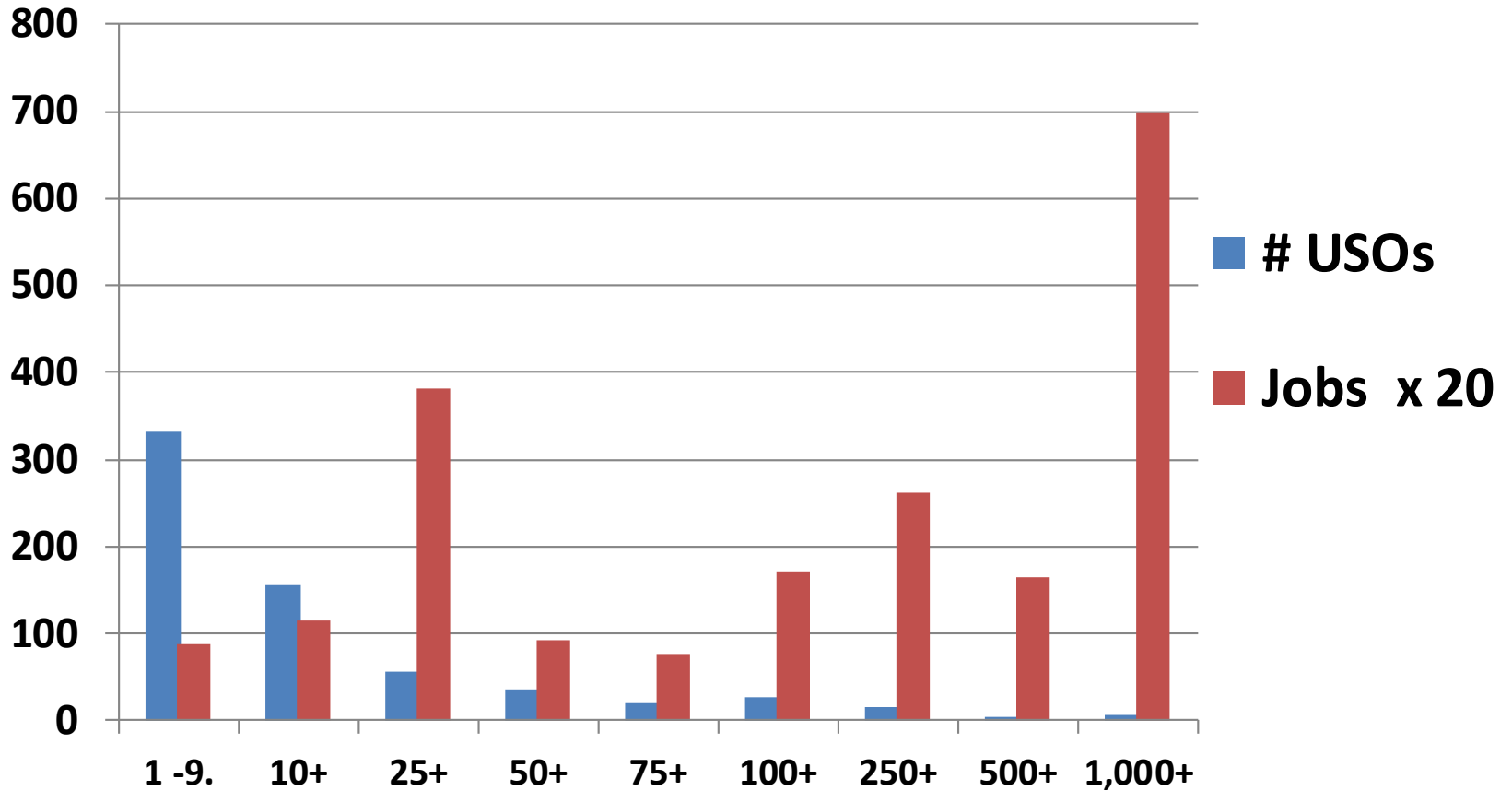
9 USOs have High Levels of Exports

Year	USO	Sector	Total \$M Sales	% Can Exports
2011	Computer Modeling	ICT	82.4	42%
2011	MDA, BC	ICT	761	68%
2008	NTI Newmerical	ICT	756	96%
2011	Open Text, ON	ICT	1,033	92%
2011	QLT, BC	Pharma	42.4	99%
2010	Hydrogenics, BC	Energy	20.9	99%
2004	Zenon Enviro, ON	Enviro	238	82%
2010	International Road Dynamics, MN	Eng	44.5	82%
2008	Virtek, ON	Eng	25	92%
	Subtotal - 9 USOs		3,003	85%

1. % Exports here cannot be extrapolated to all USOs.
2. High exports do not link to increased profits !
3. Few SEDAR reports cover Exports.



11 USOs Produce 50% of Jobs in Latest Year to 2009 - 2013



USO – Size by # PYs

Lag Years to 1st Profit / Eliminate Accumulated Deficits



Sector	USOs	Avg Yrs to 1 st Profit	USOs	Avg Yrs to No Deficit
Bio / Pharma	6	10	2	5 - 27
ICT	7	12	6	17
Total	22	11 av	16	16

Public company USOs only



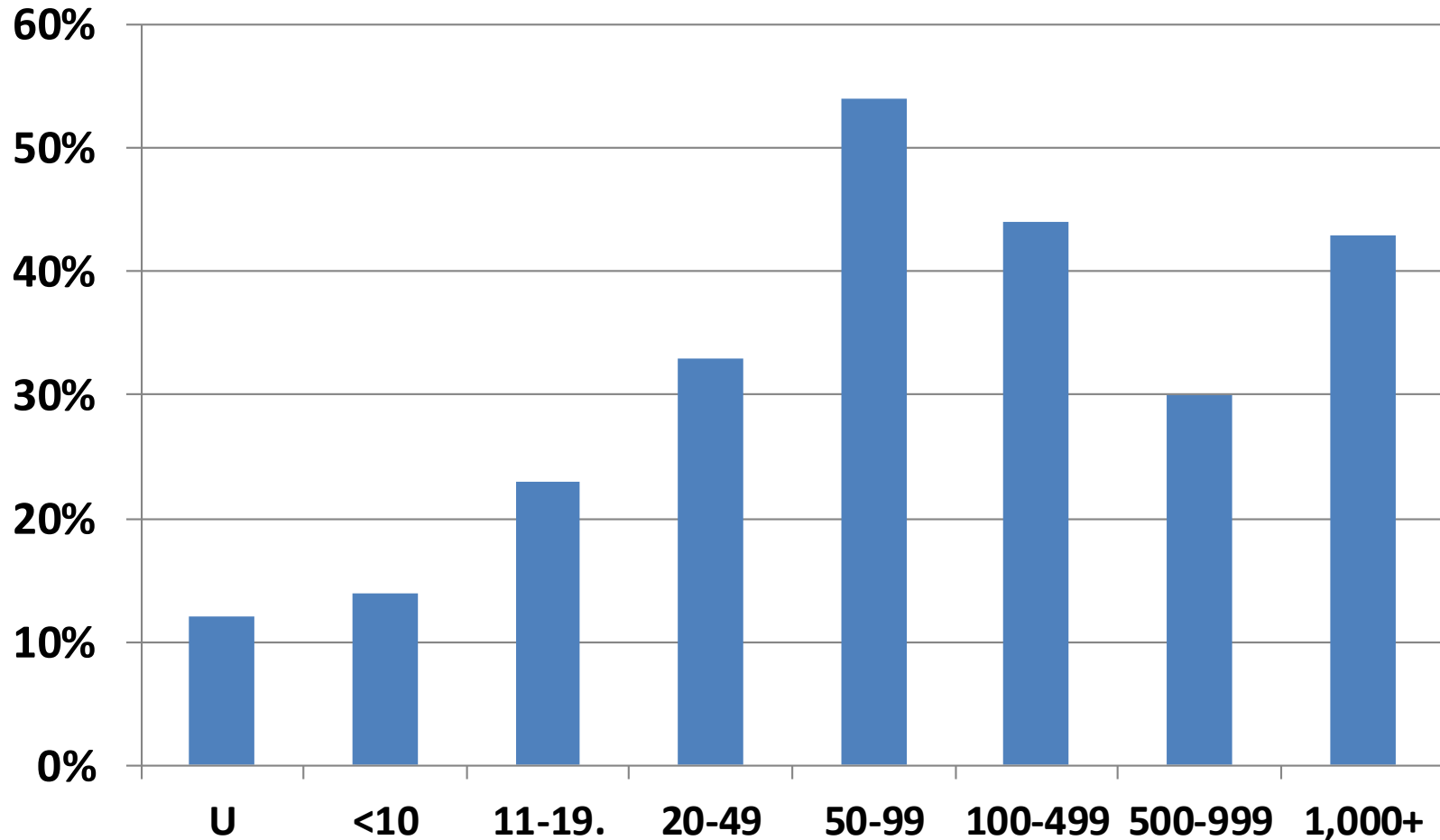
Lag Times for Gazelles vs Non-Gazelles to Reach \$10 M and \$100 M Sales to 2011

# USOs	62 Gazelles	32 Non Gazelles	9 Gazelles
Inc Period	Avrg Yrs to Reach \$10 M Sales	Avrg Yrs to Reach \$10 M Sales	Avrg Yrs to Reach \$100 M Sales
1960s	29	17	28
1970s	20	31.5	
1980s	15.4	17.1	17.4
1990s	8.5	15	16
2000s	6	8	

Connaught, MDA
Dalsa, Vecima, QLT
Innova, Open Text, Algorithmics



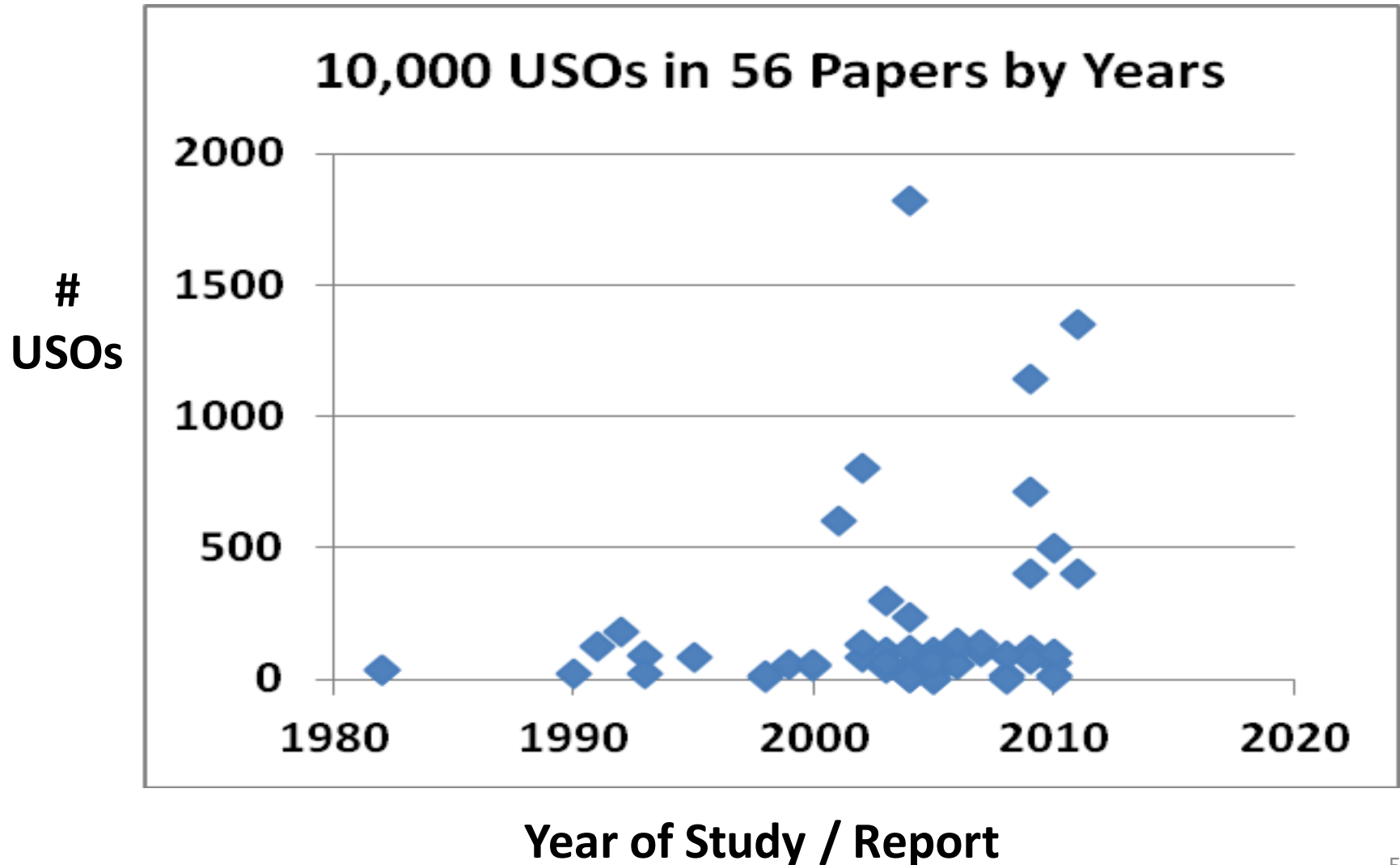
% of 281 Takeovers by USO Size to 2011



USO Size in PYs at Time of T/O

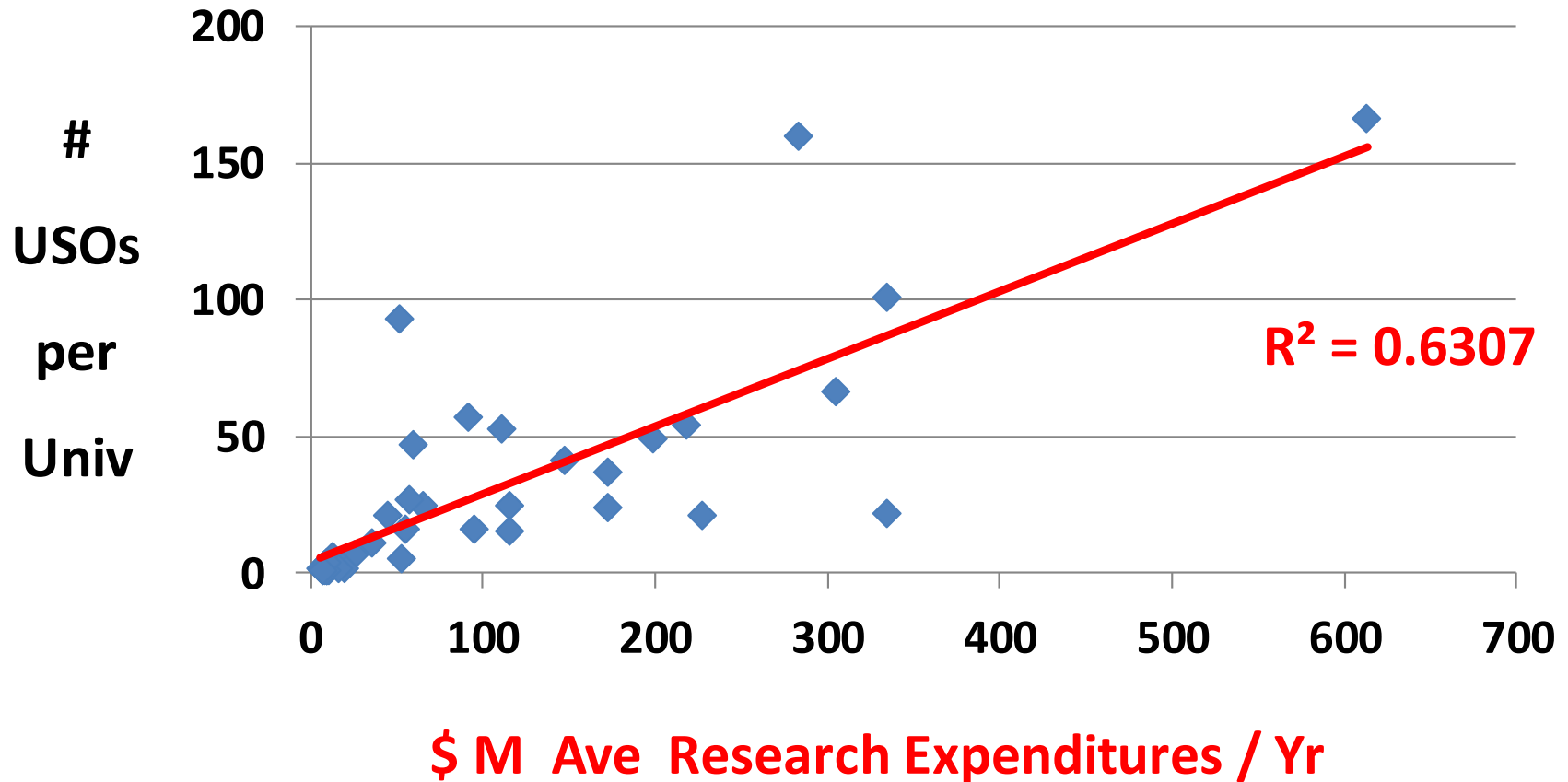


Increasing Sample Size of USOs in Impact Studies





Average Research Factor for 2000 & 2007 vs # USOs [1,193] from 40 Universities



- **Res. Factor** = Avrg R&D Expenditure 2000 & 2007 - Source ReSearch Money.
- **2 Universities well above trend line: UBC and SFU.**

Sales by 5 Groups of USOs for 2012



Size Group : Sales	\$ M Sales	USOs	Aver \$ / USO
\$1 B+	\$1,200 *	1	\$1,200 M
\$100 M+	\$1,611	7	\$230 M
\$50 M+	\$740	11	\$67 M
\$10 M+	\$1,035	38	\$27 M
<\$10 M	\$338	273	\$1.2 M
Total	\$4,924	330	\$15 M

5% of USOs provide 72% of Sales for year 2012.

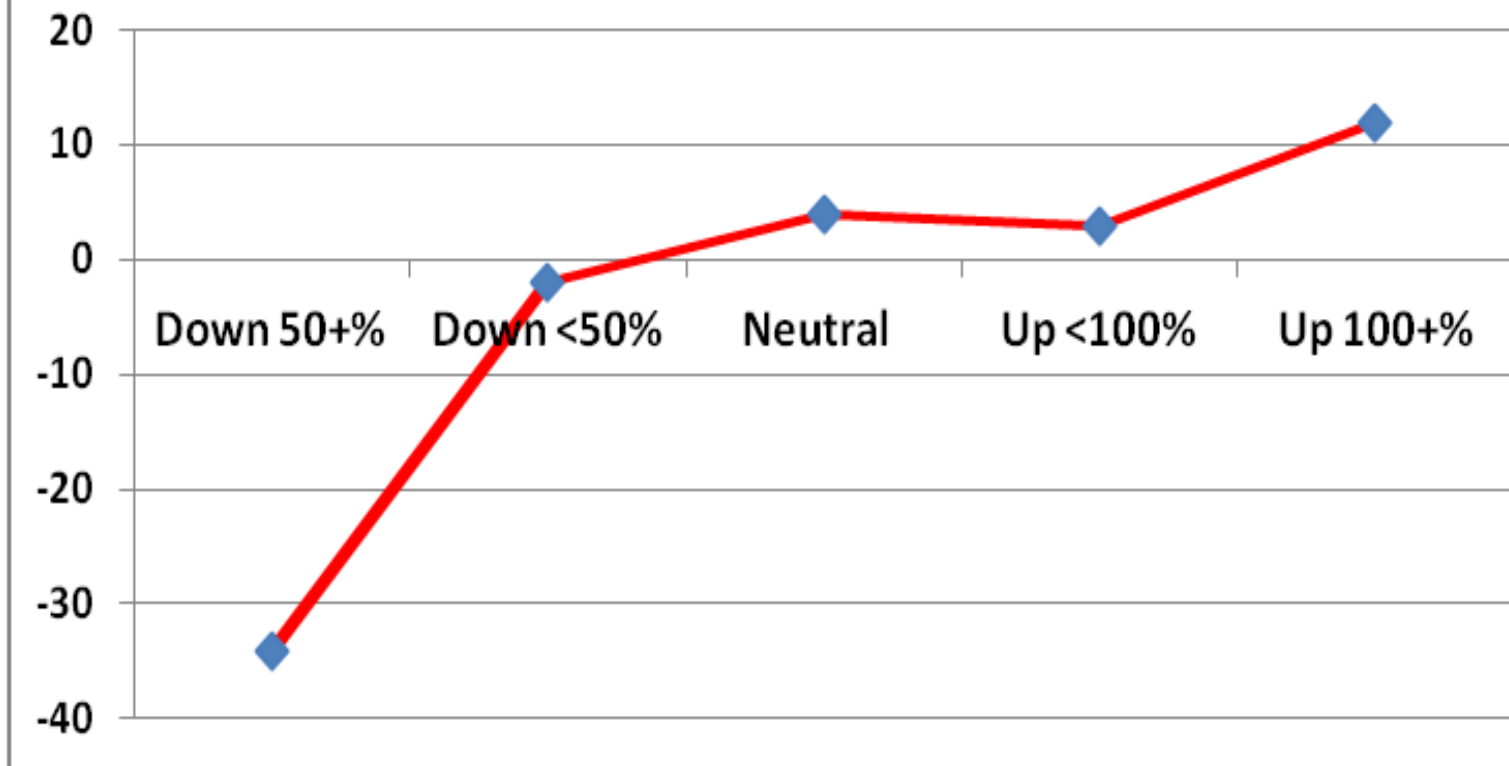
*** Open Text, accumulated sales \$10.8 B.**

MDA dropped to \$892 M in 2012 - accumulated sales of \$11.4 B.



Market Cap Change for 56 USOs 2007 - 2011

USOs
Up or
Down

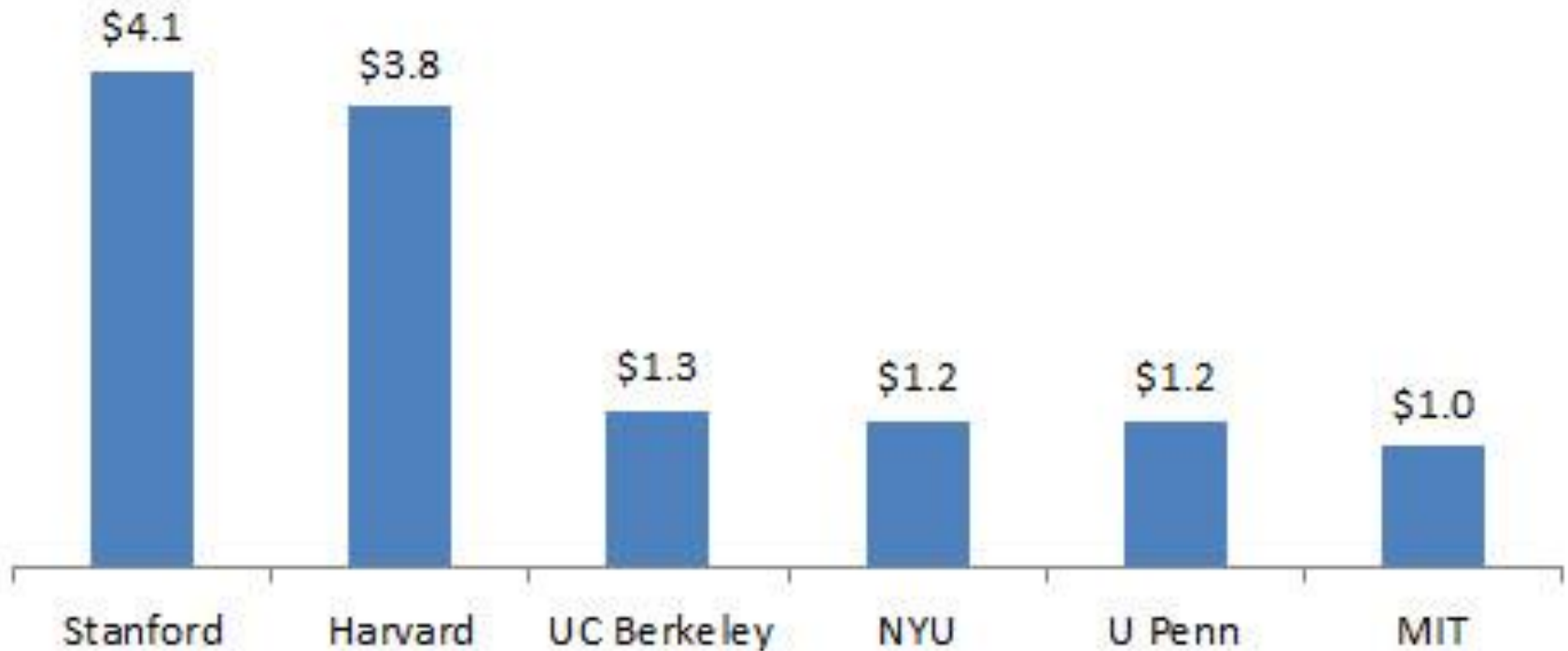


Public Firms only. QLT dropped from peak of \$115 / shr in 2000 to \$4 / share in 2014 Dec.

Similar curve for 119 bio / pharma firms.

VC and Angel Funding by University

(\$ of Billion of Investment from 2007-2011)



<http://www.cbinsights.com/blog/venture-capital/university-entrepreneurship-report>

2012 Oct

Total \$12.6 B US for an average of \$21 M US / firm.