

Canada-United States Law Journal

Volume 32 | Issue 1 Article 20

January 2006

Financing Innovation: Investment in Development and Marketing of New Technology, Venture Capital, and Other Aspects of Innovation

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Recommended Citation

Mark Romoff, Financing Innovation: Investment in Development and Marketing of New Technology, Venture Capital, and Other Aspects of Innovation, 32 Can.-U.S. L.J. 100 (2006)

Available at: https://scholarlycommons.law.case.edu/cuslj/vol32/iss1/20

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able decisions. In essence, I think there is a great tendency really just to back away from the issue and say it can't be managed. We need to move on.

DR. JANKOWSKI: Yeah. And in closing, I would say Ted quickly showed the CTSA grant. By the way, that was a March 2006 grant. The Government needs to actually build that interface and that conflict if people want to call it that, even more. The population is aging. We need more drugs. We need more devices, and we need them faster.

And the only way to do it is to have the academic world even come closer to the patient and to the company. As Ted said, well, then what's that going to do? That's going to put more emphasis on the legal and political world to accept in and make sure that that machine, which is needed, is running okay.

CANADIAN SPEAKER

Mark Romoff*

Well, I am thinking back to Dr. Rosen's presentation when he slipped in that one line about innovation being a contact sport, and it is very much that, and the remarks I am going to make really turn on my organization and where it applies, which is right at that level of contact between all the players that make a difference on the innovation agenda.

Just to situate things a little bit, I am obviously in the province of Ontario, and the Ontario Centers of Excellence is at the heart of the innovation agenda, and there are a couple of things that, obviously, are the context for my organization and why the Government, in part, funds it.

Clearly, it is driven by that growing concern about economic impact of global competition. It is easy to say. I think everybody understands that. In the case of Ontario, that's a significant issue right now because major industries that are critical to the economy of Ontario have already been considerably downsized.²² The obvious ones are the textiles industry, electronics, and

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²² See generally Peter James, Abitibi Boss Expected More Mill Closures, DAILY MINER

there are others, which have been historically so critical to economic prosperity in the province, which are really now under serious duress and the fourth, products and automotive sectors are maybe the ones that so quickly come to mind.²³

And as a consequence, the job losses in Ontario are reaching very significant levels.²⁴ And it is more than that. Of course, I think it really turns on productivity and Ontario's productivity relative to other comparable jurisdictions around North America. Some of you may know about the work being done by Roger Martin, the Dean of the Rothman School of Business at the University of Toronto.

And the work he has done has demonstrated that of 16 jurisdictions around North-America, Ontario ranks 14th in terms of productivity, only ahead of Quebec and Florida.²⁵ That's a very worrying outcome. And the other factors, which are also well known in the Ontario context, is that for a long time competitiveness in Ontario was driven by some such things as a pretty favorable exchange rate between the Canadian dollar and the American dollar and, of course, a Canada-United States border that was flowing pretty smoothly.²⁶

And those two are assumptions that are in different stages of atrophy at the moment. So the scenario has changed, and that really puts emphasis on the need to focus in on innovation. And I think if we are really serious about Canada and for that matter Ontario winning in the global economy, then innovation really has to become the natural resource for Canada and for the province.

Ontario itself needs to establish a culture of innovation. I know you will hear tomorrow from Doug Barber, who I am sure will talk about this issue, and may put it in somewhat different terms, but the issue here is that there is an absence of culture of innovation in Ontario, and to do that, two things have to be done extremely well: First and foremost, Ontario's innovators

AND NEWS (ONTARIO), Feb. 2, 2006, at A7 (discussing the general downsizing of Abitibi, a paper mill company in Ontario and its effects).

²³ See generally Tony Van Alphen, GM Cuts Spark Fear in Ontario, THE TORONTO STAR, Jun. 8, 2005, at D01 (discussing the general downsizing of GM as part of the automotive industry in Ontario).

²⁴ See generally Deirdre Healey, Linamar Eyes GM Cuts as an Opportunity, GUELPH MERCURY (ONTARIO), Nov. 23, 2005, at A1 (discussing that GM's downsizing will eliminate 3,600 jobs in Ontario).

²⁵ See generally Ontarians are Urged to Invest More for Future Prosperity, CANADA NEWSWIRE, Nov. 25, 2005, at DN (the Roger Martin's Task Force reports that Ontario's prosperity ranks 15th among 16 other North American jurisdictions).

See generally Steven Theobald, Export Volume Forecast to Grow, THE TORONTO STAR, Apr. 26, 2005, at C01, (discussing how the strong currency flow will allow Canada to enhance long term competitiveness).

must really be generating new ideas, and then Ontario's companies have to get out and bring these ideas successfully to the marketplace.

It is, in fact, that particular space where OCE [Ontario Centers of Excellence] places. In the last little while, I think the premier has got the message in Ontario and created a new ministry for research and innovation.²⁷ And, interestingly enough, he has made himself the minister responsible for the ministry; that is good and bad.²⁸

It is great because it sends a very strong message to Ontarians and a very strong message to his cabinet. It is also difficult for a premier to also try to manage a minister on a day-to-day basis, but he is working at it.

The other reality is that Ontario universities can be very much on the cutting edge in terms of world class research, but everyone would say that we are less effective in actually extracting value from the research and from the investment that governments at all levels have made in that research. Again, there is no coincidence that the areas with the most robust economic growth always center-around universities with leading edge research and development capabilities.

In terms of OCE specifically, the program, around for quite sometime, was created by the Government of Ontario, initially, to extract value from researchers around Ontario, in order to assure that research that was being undertaken had commercial value.²⁹

Over the years, a number of centers have been created, have been amalgamated and then brought together under one not-for-profit corporation. About a year-and-a-half ago, that happened, and they went out and hired a hell of a CEO, and now the mandate is, in fact, to get the value out of the money that the Government of Ontario has put into the agenda.³⁰

We focus really in three specific areas: I mentioned here directed research. What I mean here is, this is an organization that is in the business of market driven research. So it is, first and foremost, what it is that industry needs in order to maintain its global competitiveness or to become globally competitive.

So, first and foremost, it is a matter of identifying industry need and then identifying the cutting edge problem solvers who can bring the technologies

See generally Ontario Budget: Research and Innovation Matters, CANADA NEWSWIRE,
Mar. 23, 2006, (discussing the creation of the Ministry of Research and Innovation).

²⁹ ONTARIO NEXT STEP COMMERCIALIZATION PROGRAM: AN ACTION PLAN TO GENERATE GREATER ECONOMIC BENEFITS FROM ONTARIO RESEARCH, ONTARIO NEXT STEP COMMERCIALIZATION COMMITTEE, Mar. 2004, available at http://www.torontoalliance.ca/tcsa_initiatives/research_alliance/comm_appendix2.pdf, at 15.

³⁰ Press Release, *OCE Inc. Announces New Board of Directors*, OCE, Oct. 28, 2004, available at http://www.cito.ca/pages/media/mediareleases/OCE-Release_Oct28_FINAL.pdf, at 3 (announcing "Mark Romoff joins OCE Inc. as its new President and CEO").

and innovations to the table to enable those companies to solve their problems and continue to grow. That is about the commercialization of technology. So taking those great innovations and turning them into commercial benefit is the goal.

Equally important along the way is the need to ensure you are focusing in on developing that next generation of talent in Ontario, so it is partly, certainly, about the technology, but it is also about the innovators and talented people who are going to enable those technologies to be commercialized. So OCE is right in the space of systematically managing the connections between companies and university researchers in order to drag those technologies out and, as I say, to assure the successful transfer of innovation, science, and technology into the business community.

I have tried to show in this particular chart where we play. What is interesting, I think, is that most organizations that are either funded or have themselves as their mandate to advance the innovational agenda tend to really play at the point of invention at the middle of that chart.

The OCE engages right at the bottom, so the team of people that make up my organization play as much below the line at the point of invention as above, and that is what distinguishes an organization like ours.

This is not a big corporation that I run, but the business development team – and that is how we define the folks in my organization – are very much embedded in both the business community and research community around Ontario in order to foment the notions of innovation, to guide companies in identifying their requirements, and to work with researchers to get them to be thinking about the commercialization of the ideas that they are working on in the lab.

And for most of you, this is not a surprising chart. This talks about maybe the gap, and Rich was talking about this a bit earlier, too. The solid line in this chart represents research funding that is available from governments and other agencies, and as you can see, it is high on the research end.

And then as you get closer and closer to actual product development, this funding tends to dry up. The dotted line is more a reflection of angel and capital funding. Again, as you can see as products get closer and closer to product, venture capitalists are willing to step up to the plate, but the reality is there is that gap, and this is exactly where OCE plays. And that gap is where Government funding stops and venture capital funding has not kicked in yet.

So the organization I lead is focused on critical sectors to the economy of Ontario; they are ones that you would not find very surprising. I have centers that focus on the areas of communication and information technology, earth and environmental technologies. The recently created Center for Energy, which, as you can appreciate, is a high priority for the province of Ontario, is

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a center for advanced materials and manufacturing and another one that focuses in on the area of photonics.³¹

That looks pretty straight forward, but the reality is, in fact, the rationale behind the merger of these centers a little while ago was that innovation and technology needs do not fall neatly into silos such as they are here.

So, in fact, the merger was intended to enable us to develop a significant enough cluster of talent of individuals to actually make a difference in the innovation agenda and furthermore to enable the cross fertilization of ideas and the more effective allocation of resources in order to tackle challenges.

And most of the things that come to the table of the OCE, in fact, straddle three or four of these sectors at the same time. As I mentioned earlier, we are a small organization, about 70 people, so not large, but the makeup is interesting because we have recruited people from certainly the world of business, scientists, entrepreneurs, some of the better Government officials who are doing a little bit of leading edge thinking and bringing them altogether into an interest mix in the organization, and their client base, of course, is the business community, the research community, and Government.

This is not an easy geography to manage because, more often than not, no two of those components can talk effectively to one another. So I would like to talk about the folks in the OCE as being trilingual because they can actually navigate that territory and speak the language of all three and find the equation that is going to enable them to work together, that is going to make a difference on the bottom line, and the key to all this is the network.

We are at the heart of the research agenda, but the OCE does no research. So it is the research lab at universities and colleges and hospital research centers and research institutes around Ontario that are the OCE's labs.

And what differentiates our organization from any others, what I would call our secret sauce, are a couple of things. One, we have an unparalleled network. I referred earlier to our folks being embedded in the research and business communities; a small number of people, but they are sales people in a sense. They are out there walking the beat everyday, talking to the business community, talking to researchers, finding out what it is that is on the mind of business or in many instances putting something on the mind of business because they don't often know what it is they need, in fact, to make the kinds

³¹ See Press Release, Ontario Government Announces Centre of Excellence for Energy, Ontario Ministry of Economic Development & Trade, Oct. 1, 2005, available at http://www.ontario-canada.com/ontcan/page.do?page=5897 (last accessed Nov. 1, 2006); See generally Centre for Energy, OCE, http://www.oce-ontario.org/pages/aboutenergy.php (last visited Nov. 1, 2006); See also Centre for Materials and Manufacturing, OCE, http://www.oce-ontario.org/pages/aboutmmo.php (last visited Nov. 1, 2006); Centre for Photonics, OCE, http://www.oce-ontario.org/pages/aboutmpo.php (last visited Nov. 1, 2006).

of changes to grow, or it is working with researchers to find out what they are working on because there may be commercial opportunity there.

Again, keep in mind that the funding that I have is directed at research and its commercialization potential. So we are not in the business of funding fundamental research or basic research. It is all about that research, which is far enough along or is in an area, a space that has commercial potential.

The other element of our equation is we are a trusted advisor. We are not Government, and we are not industry, and we are not the academic community; we have no vested interest.

In fact, for all of the research that we underwrite through our funding, we take no piece of the action.³² So, intellectual property, a critical issue, is not our concern. We will establish research collaboration agreements between the business community and researchers. We will work out the issue of who owns the intellectual property.

We will work out the agenda for how that technology development will be commercialized, but we take no piece of the action, and that allows us to play a very different role when it is all said and done. As I mentioned earlier, we are proactive in our search for innovation. It is an interesting situation in the case of Ontario because not surprising – I think you know this – most of our industry is made up of small and medium sized companies, and these are companies that essentially have no R & D capacity.

They have, in some cases, no factually based knowledge of what they need to get them beyond where they are at the moment. They certainly do not have the time to develop their agenda and often do not have the money. So, the folks in OCE spend an enormous amount of time on a daily basis working with companies, identifying for them, in fact, where their problems are, and how we might help through our own cost sharing of funding to identify the solutions that will make a difference for them.

That is very much the space that we work in, and we get engaged in four areas of activity: First and foremost, as I mentioned earlier, we are working with industry to identify the technological challenges they have and then identifying cutting edge researchers who can respond to that.

Second, we are working with researchers on campuses, colleges, and universities around Ontario to identify the kinds of activities they are working on that have commercial application, and if they are unable to find a company that can take up that technology, we will help them do that.

So again, we are forging the connection between the two ends of the equation. Otherwise, we engage with researchers who are, in fact, doing

³² Press Release, *OCE Inc. Announces New Board of Directors*, OCE, Oct. 28, 2004, available at http://www.cito.ca/pages/media/mediareleases/OCE-Release_Oct28_FINAL.pdf at 3 (stating "OCE Inc. is a not-for-profit corporation supported through the Ontario Ministry of Economic Development and Trade's (MEDT) Ontario Centres of Excellence program").

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really interesting research in a disruptive area. At that point, we will step in using the programs we have to provide the funding to enable that idea to get to the point where it will lead to a startup company; we will then step in with pre-seed capital to enable that idea to surface.

But the other reality is that a great researcher does not necessarily make a great CEO. So, the OCE also plays a role in helping researchers structure the company, identify a senior management team, recruit a CEO and other key people for the corporation, help them write a business plan, and then work with them to find venture capital or funding to enable them to get legs and take off.³³

That is very unique and in a sense quite invasive play on the innovation agenda, however, that is what separates us from the competition, and that is what enables us to be successful.³⁴ So we have a variety of programs. I listed a couple here.

When I talk about directive research, collaborative or enabling, these are programs where we put funding on the table to collaborate or to create collaboration between companies and researchers. In some cases, where companies or startups do not have any business yet but have a great technology, we will step in with additional money to help them develop that technology to the point where they can be commercially successful.

MR. HERMAN: How much money do you have? I might have missed that.

MR. ROMOFF: I never said.

MR. HERMAN: It makes a difference if you have a million or a billion.

MR. ROMOFF: You are right. I have \$34.3 million dollars from the Government of Ontario, and through the collaborative arrangements that I have with other Government entities at the federal level, the provincial level, partnerships with industry, I am able to take that up to about \$75 million dollars a year.³⁵

Would that fall into sort of zero or the billion range?

MR. HERMAN: But now I would like you to tell us what your budget is.

MS. LUSSENBURG: Can we hold the questions until -

MR. ROMOFF: These are lawyers. You can't control them.

Randy Ray, Ontario Centres of Excellence help early stage companies from start-up to venture capital, Ottawa Citizen, Mar. 7, 2006, available at http://www.cito.ca/pages/media/pressroom/OCE%20Profile%20Mar%207.pdf.

³⁴ See Press Release, New Centre For Energy: The Latest Pillar In Ontario's Long-Term Energy Strategy, OCE, Jan. 10, 2005, available at http://www.cito.ca/pages/media/mediare-leases/Centre_for_Energy.pdf at 1-2 (describing "OCE's unique model of economic development.... For nearly 20 years, OCE's model has succeeded").

³⁵ See generally OCE ANNUAL REPORT 2005-2006, OCE, available at http://www.oce-ontario.org/pages/media/mediareleases/Annual%20Report%202005_2006.pdf.

MS. LUSSENBURG: It is my opportunity to control. We are almost done, and then we will get to the discussion.

MR. ROMOFF: And furthermore, he is a known quantity.

MS. LUSSENBURG: Well, he is a known quantity.

MR. ROMOFF: Sorry.

MR. ROMOFF: Let me move along so we can save some time for Larry.

All right. Here is what you want to know, what you are getting for the money, Larry, because part of this is some of the money, well, you are not paying your taxes, you know, he is not paying his taxes, but if you were paying your taxes, your money would be going for something like this.

Of that \$34 million dollars a year, about \$20 million of it goes right into the research agenda I talked about earlier. Again, what happens here, identify a project with a company, maybe the cost is a hundred thousand dollars. We determine what the capacity is to contribute to that project, either in cash or in kind, and we will bring the rest to the table.

So let us say for the sake of argument it is 50-50, the company puts in \$50,000, we put in \$50,000, and that money is then moved to the researcher who has a hundred thousand dollars and an agenda to deliver a product on a particular time frame with a commercial or transferable technology to accompany it.

The other piece of this equation is we mandate that those researchers employ their best and brightest students.³⁷ So, again, it is all about at the same time you are doing the research training that next generation of talent, and that, in part, means that we engage those students, teach them the research skills for sure but also get them exposed to the challenges that companies are facing.

Kinds of metrics over the past year, we have worked with 2,600 researchers around Ontario, 850 companies on specific projects along the lines I described.³⁸ We took our \$20 in research and were able to turn it into \$41 million dollars through leveraging and partnerships with others.³⁹

³⁶ See OCE ANNUAL REPORT 2004-2005, OCE, available at http://www.crestech.ca/pages/media/mediareleases/OCE_AR_04_05.pdf, at 5 (stating "we invested over \$21 million in research in Ontario's academic research institutions").

³⁷ See generally ONTARIO CENTRES OF EXCELLENCE 2002/2004 SUMMARY, OCE, available at http://www.oce-ontario.org/pages/media/mediareleases/OCE%202002_04%20English.pdf (stating "[b]y investing time, money and expertise in the research of Ontario's best and brightest, OCE Inc. can enable the work within the academic and research realms to continue, in order to bring it to the point of commercialization").

³⁸ See ONTARIO CENTRES OF EXCELLENCE R&D MATCHMAKERS, http://www.2ontario.com/software/brochures/RD2pager.asp (last visited Nov. 1, 2006) (stating "[d]uring 2004/2005, OCE worked with more than 850 Ontario companies."); See OCE ANNUAL REPORT 2004-2005, OCE, available at http://www.crestech.ca/pages/media/mediareleases/OCE_AR_04_05.pdf at 8 (stating "This year OCE supported a network of over 2,600 researchers, undergraduate and graduate students and post-doctoral fellows through its re-

That resulted in the transfer of 900 graduating students into high paying good jobs in industry, and we also spun off twelve companies last year, which makes for a total of 41 spin-offs coming out of OCE over the past couple of years and about 450 jobs created as a result.⁴⁰

Let me finish off, these are just some success stories. Let me pick one, a company like Fox-Tek. Here is a company that began with a researcher at the University of Toronto, who was playing around in the field of photonics, sensor technology, and began to develop algorithms and technologies, which would allow him to get a better handle on the integrity of large infrastructure.

So to put that into English, he developed photonics applications, which allowed him to, in fact, develop a technology for application in the oil and gas sector. He has got his photonics system being wrapped around oil pipelines, actually in Saudi Arabia at the moment and through this technology, you can identify the state of integrity of a gas pipeline.

So rather than shut down the system on a regular basis for routine maintenance with the system, he has in place now, he can identify problems in the pipeline, corrosion, whatever, and, therefore, get much more responsive to address the issue at that point of the problem.

That same company now through support of OCE is working with NASA to be able to identify when there are problems external to the shuttle, for instance, where there are penetrations to the shuttle, and you can all appreciate the value of something like that.⁴¹

Let me finish off by saying that there is real opportunity here for an organization like the Ontario Centers of Excellence to collaborate across the border. I take the point about the needs to establish sort of policies and harmonized thinking, but frankly, it is a matter of getting past the talk and on with the action.

The OCE is courted by a number of countries because of the model we have and how it operates, and there is real opportunity here for us to identify

search investments with a number of programs designed specifically to enhance the pool of highly qualified people in Ontario").

³⁹ See OCE ANNUAL REPORT 2004-2005, OCE, available at http://www.crestech.ca/pages/media/mediareleases/OCE_AR_04_05.pdf at 3 (stating "we invested over \$21 million in research in Ontario's academic research institutions. This in turn leveraged over \$20 million in additional funding and in-kind support from our partners in industry and other levels of government").

⁴⁰ *Id.* at 2, 7 (stating "OCE-supported research resulted in 12 new companies in 2004-2005; there are now 41 companies in business as a result of OCE-supported research employing 443 people").

⁴¹ See Press Release, FOX-TEK Announces Smart Material Tests at NASA Successful, Fiber Optic Systems Technology Inc., Apr. 22, 2005, available at http://www.fox-tek.com/new_developments/pdf/NASA_Press_Release_April_2005.pdf; See generally Success Stories Centre for Energy, OCE, available at http://www.oce-ontario.org/pages/success/energystories.php (last visited Nov. 1, 2006).

counterpart entities in the United States and get on with the kinds of partnerships that can really advance the Canada-United States agenda on the innovation front.

Thanks for listening.

DISCUSSION FOLLOWING THE REMARKS OF THEODORE C. THEOFRASTOUS, DR. JOSEPH J. JANKOWSKI, AND MARK ROMOFF

MS. LUSSENBURG: Questions, I guess. Henry, do you have a question? DR. KING: Okay. I wanted to ask Ted a question. You handle commercialization of technology for the Cleveland Clinic. I believe I am right on that. There are a lot of competitors forgetting that innovation that was developed by the doctor there.

What are the standards by which you determine who gets what and have the standards worked out, in other words, in terms of your ultimate result?

MR. THEOFRASTOUS: Well, internally, the standard for distribution is a function of institutional policy, and that is actually the same at Case as well. At The Cleveland Clinic, the individual investigator receives 40 percent of the net proceeds, and it is only net really of patent expenses from the commercial application side.

In terms of the industry participants vying for the technology, it is really – you would think it is a lot easier than it is, frankly, to get folks interested, to get industry interested at an early stage, at least somewhat validated technology. That is where, frankly, I can see a real benefit for something like the OCE.

But it boils down to the best deal and what's going to be the best upside for the institution. It becomes a very corporate type decision. What is going to yield the best income? Which of the potential candidates is really going to take this to market and put the highest level of investment into it?

Does that answer your question?

DR. KING: Yes. Has it worked?

MR. THEOFRASTOUS: I think so. You know, the problem with success is creating our – and when we talk about conflicts of interest, we are kind of dealing with the fact that it has been successful. And the genesis of those Wall Street Journal articles was a very successful device that, you know, in the interest of moving the innovation forward, you have people that ultimately became very senior at this institution involved in and having a stake in the commercialization. They consult. They help.

They really – you know, they believe in it. They think it is a great device and God forbid it makes billions of dollars, and all of a sudden they are rich. It makes people very uncomfortable that the white tower has people in it that are really making a lot of money, but, in fact, our sort of proposition is that's the way it was structured. The system was supposed to do that.