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The Demand for Innovation in Canada

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There is widespread consensus that Canada has an "innovation gap". In 2000, Canada stood 14th in the world on a key measure of innovation activity – the percentage of GDP spent on research and development.[1] The federal government has made a clear and public goal to increase innovation so as to rank in the top 5 in the world in R&D spending by 2010.[2] The federal government, the Ontario provincial government, the Conference Board and other organizations each have parallel and supporting "innovation agendas" as key policy priorities. Arguably, there is no meaningful challenge in placing innovation at the top of the policy agenda – it is there already.

However there is a major problem in the current conceptualization of the innovation problem. The innovation problem in Canada is seen broadly as a **supply** problem. This paper argues, on the contrary, that supply is not the problem and thus all the efforts oriented toward 'fixing' the supply problem just won't work. Instead I will argue that the innovation gap is the manifestation of a **demand** problem. This demand problem will require different actions to overcome than have been taken thus far.

Innovation as a Supply Problem

Innovation generally is seen and treated, whether explicitly or implicitly, as a supply problem. The logic starts with the way of defining innovation.

Innovation is implicitly and reflexively defined as arising from or coincident with scientific or technical activity. Research In Motion is seen as an innovation success because the RIM Blackberry is seen and classified as a scientific innovation. JDS-Uniphase is seen as an innovation success because its optical transmission components are seen and classified as scientific innovation. Dell Computer is not seen as an innovation success, even though it is by far and away the most innovative and successful personal computer, workstation and server company of the past decade, because its innovations are in business processes, not scientific advances.

As a consequence, many of the innovations most cherished in the business world – from Ford Motor Company and its assembly line, to Federal Express and its Memphis hub, to Walmart and its Everyday Low Pricing approach, to Dell Computer and its direct-to-the-customer model are not considered innovations because they are business innovations not scientific innovations.

With innovation implicitly defined as scientific/technical advances applied to economic activity, the logic then turns to the easily-identifiable sources of such scientific/technical innovations. The first and most obvious is scientific and technical personnel. The question immediately posed is: Do we have enough of such persons to produce the scientific/technical innovations we need? The reflexive answer is: No, if we did, we wouldn't have the huge gap in innovation demonstrated by 1.84% of GDP spent on R&D in 2000, ranking 14th in the world. In comparison, the U.S. spends 2.70% of GDP on R&D, ranked 4th in the world.[3]

The second and next most obvious focus is on the places where scientific and technical personnel tend to congregate: scientific and technical departments of universities, non-university laboratories, and scientific research centres. Again the question posed is: Do we have enough of such institutions to produce the scientific/technical innovations we need? Again, the reflexive answer is no, for if we did, we would not have the huge gap in innovation.

So in a couple of quick logical steps a clear answer to the problem emerges: Canada has too little innovation because Canada produces too few scientists and technical personnel and because Canada has too few and/or too small and/or too meagerly funded scientific and technical departments of universities, non-university laboratories, and research centres.

Therefore, follows the logic, the innovation gap is unambiguously a supply problem. Increase the supply of scientists, technicians and their environments for working and the problem will be solved.
This conceptualization of a supply problem has informed Canada's innovation policy over the past decade or more. As policy interest in innovation has heightened, the supply side explanation has accelerated the investment in supply of scientists, technicians and their environments.

Canadian governments have used four principle tools for increasing the supply of innovation under this logic: funding to increase enrollments in scientific and technical disciplines in Canadian universities; increased funding of research in scientific and technical disciplines in Canadian universities; creation of 'centres of excellence' to engage in research and development outside the confines of universities; and providing R&D tax credits to lower the cost of R&D to corporations.

1) *Funding to Increase Enrollments in Scientific and Technical Disciplines*

In an attempt to increase the enrollments in various scientific and technical disciplines, various Canadian governments have provided specific funding for the enlargement of programs. In Ontario, Access to Opportunities Program (ATOP) was introduced in 1998 with the intent to double the number of engineering students graduating each year in Ontario within three years.[4] In total, Ontario will spend $150 million over three years to increase the supply of engineers in this fashion.[5] In addition, Ontario committed in 2001 to open a new university, the Ontario Institute of Technology to specialize, like MIT, CalTech or Georgia Tech, in the scientific and technical disciplines. The first year budget outlay for the OIT was $60 million. [6]

2) *Increased Funding of Research in Scientific and Technical Disciplines*

In an attempt to spur university research in the scientific and technical disciplines, the government has dramatically ramped up the funding and support of research over the past five years. Of the three federal research granting agencies, two –NSERC and CIHR– cover the scientific and technical disciplines, while the third –SSHRC– covers the remainder. Over the past five years, average annual funding for NSERC has increased by 8.7% or $39.6 million per year, while CIHR (and its predecessor, MRC) has increased by 16.7% or $45.1 million per year.[7] Of the total increase in federal granting council funding, NSERC and CIHR have captured 85% of the increases.[8]

In addition, in 1997 the federal government created the Canada Foundation for Innovation to provide the infrastructure necessary for research-based innovation.[9] Though not specifically limited to scientific and technical infrastructure, the vast majority – 87.2% - of the funding has gone to scientific and technical infrastructure.[10] Because the provinces have generally created vehicles to match or enhance the awards to universities in their jurisdictions –such as the Ontario Innovation Trust– the emphasis on scientific and technical infrastructure is reinforced.

Finally, in 2000, the federal government announced the Canada Research Chairs (CRC) program. This program earmarked $900 million to create 2000 new CRC over five years in Canadian universities.[11] The formula for awarding the chairs to universities is on the basis of the proportion of research council grants over the past five years. Given that CIHR and NSERC dwarf SSHRC in size, this means that approximately 1760 chairs will be awarded in the scientific and technical disciplines.[12]

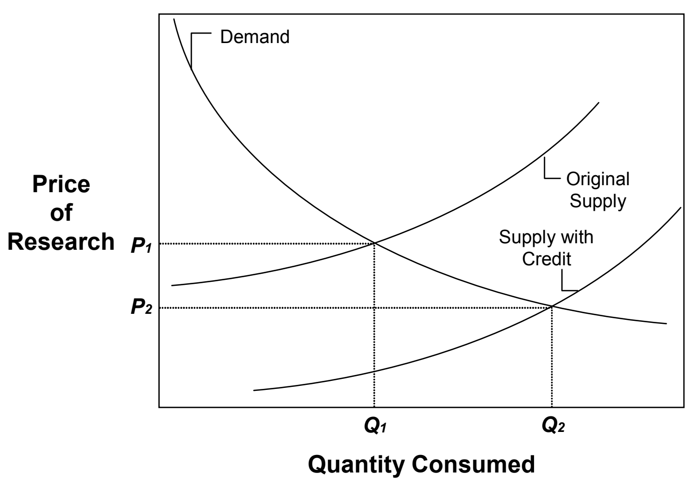
3) *Creation of Centres of Excellence*

Over the past ten years the federal government and the provinces have invested heavily in opening and supporting various centres of excellence to carry out and promote research outside the walls of universities.[13] The federal centres of excellence encompass four disciplines[14] and cost about $77.4 million per year to support.[15] In Ontario, there are four centres of excellence[16] costing about $50 million per year to support.[17] In addition, the federal government supports a series of National Research Council laboratories that focus primarily on the scientific and technical disciplines. The NRC funding has an average increase of 1.2% over the past 5 years and has averaged $133 million over the past five years.[18]

4) R&D Tax Credits for Corporations

The fourth way the federal government attempts to increase the supply of innovation is to subsidize its cost to corporations by way of tax credits for R&D that are among the most generous in the world. In essence the R&D tax credit moves the supply curve out to the right because it is substantially less costly to supply one unit of R&D to the corporation than without the tax credit as shown graphically below:

R&D Tax Credit and Impact on Supply



The result should be greater consumption with the same demand curve of the corporation.

The federal government invests $1.5 billion per year in tax expenditures that fund the R&D tax credit in Canada.[19]

Overall Investment in Supply Side Solutions to the Innovation Problem

By my estimates, the federal government invests at an annual rate of over $4.0 billion in the above four methods of supply side enhancement of innovation.[20] Provincial programs are somewhat harder to compile, but my estimate for the Province of Ontario is approximately $0.5 billion per year currently.[21] Over the past five years, I estimate that the federal investment in supply side measures has been on the order of $17 billion[22] and in Ontario $2 billion.[23]

Is the investment warranted? It has a chance of being warranted if enhancing the supply of scientists and technical personnel and their research support is the solution to the problem of innovation in Canada.

To address that question, I have performed an analysis of one of the four tools above – funding to increase enrollments in scientific and technical disciplines. We should step back and ask, what has been the manifestation of the problem we are attempting to solve with increased enrollments in scientific and technical disciplines? The answer would be a less prosperous economy than other countries who have invested more heavily in producing scientists and technically-trained personnel.

If we look at the data for the year 2000, Canada was the eighth most prosperous economy in the world, measured in GDP/capita (using Purchasing Power Parity to adjust for measurements in different currencies).[24] However, two of the countries –Luxembourg and Iceland– are smaller than the City of Hamilton and are therefore irrelevant comparators. Four others are about half the size of Ontario or smaller –Norway, Switzerland, Denmark and Ireland– so it hardly makes sense to draw conclusions about R&D and prosperity for these countries against Canada. If we compare each of the four against Ontario (which is probably still unfair to Ontario which is dramatically larger than all of them and in possession of chronically lower income rural territories), they all fall short of Ontario in prosperity, so none of them serve as useful benchmarks of prosperity.

The one country that is substantially ahead of Canada (by 21.3%) and Ontario (by 13.2%) in prosperity is the USA.[25] If we indeed have an innovation supply problem and a problem in enrollments in scientific and technical disciplines, the problem should show up dramatically when comparing Canada to the USA. Canada should show dramatically lower production of graduates from scientific and technical disciplines, relative to our size, than the USA – and hence Canada lags the USA dramatically in prosperity.

I have analyzed the best available numbers which are generally from 1998 of production of Bachelors, Masters and Doctoral graduates in the four classifications that most cover "scientific and technical" disciplines: agriculture and biological sciences, engineering and applied sciences, health professions, and math and physical sciences. I have compared the outputs in two ways. First I compared the simple totals, which treats a Bachelor the same as a Master or a Doctor. Clearly this is less than accurate, so I weighted the three categories using the Ontario provincial funding designation as a rough proxy. The Ontario government assigns 1.5 Basic Income Units (BIU) per year to most Bachelors students (for a total of 6 BIU), a maximum of 8 BIU to most Masters students (for their entire program) and maximum of 27 BIU less Master's weight (for their entire program) to most PhD students.[26]

Using the simple method, USA produced 10.3 times as many scientific and technical graduates as Canada in 1998. Since the USA is now exactly 10 times as populous as Canada, we would have expected 10 times as many, so the USA annual production is only 3% greater proportionately. Using the weighted method, USA produced 10.6 times as many or only 6% more than would be expected. Overall, on a weighted basis, USA produced 15% more graduates in all disciplines combined than Canada, indicating that Canada's proportionate investment in scientific and technical education is greater than that of the USA. That is, Canada invests 30% of its efforts in producing graduates to the scientific and technical fields while USA invests 28% of its total efforts.

I argue that a 6% advantage in production of scientific and technical personnel is a trivial advantage and largely irrelevant in producing any kind of innovation gap. As a result, it is fair to say that Canadian governments are – with respect to the enrollment enhancement plank of the supply strategy – pursuing an expensive strategy that has little or no data-based rationale. It might be a good idea to ramp up scientific and technical enrollments beyond the rough parity with the world's most prosperous economy, but nothing suggests that it particularly is.

The other three planks require similar analyses to either support or refute and that is outside the scope of this paper. However, studies on the effectiveness of the R&D tax credit regime appear to indicate that it is having little demonstrable impact on the R&D gap in Canada.[27]

The disconfirming data on the enrollment plank and the problematic performance of the R&D tax credit indeed begs the question whether the conceptualization of the problem as a supply problem is fundamentally in error. I believe that it is.

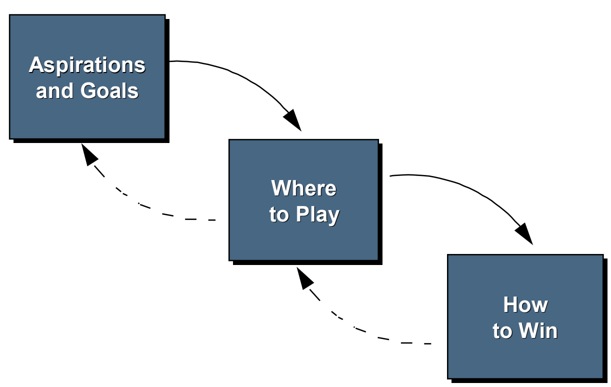
Innovation as a Demand Problem

An alternative and I believe more useful conceptualization is of the innovation gap in Canada is as a demand problem rather than a supply problem. In this conceptualization, there is sufficient supply in Canada of the building blocks of innovation supply –scientists and technical personnel, laboratories, research centres, etc.– but insufficient demand for innovation from corporate leaders who must demand innovation for it to be used in real economic activity.

Innovation activity will be demanded by firms only to the extent that it serves the strategy of the firm in question. If the strategy does not call for innovation, then innovation will not be sought, regardless of whether there is available –if not abundant– supply of innovation capacity and largely regardless of the price of innovation capacity.

The strategy of a firm can be thought of as an integrated cascade of choices concerning what it seeks to accomplish –i.e. its Aspirations and Goals– in what places in the market it seeks to compete –i.e. Where to Play– and how, in those places it seeks to prevail competitively against competition –i.e. How to Win.

Firm Strategy: An Integrated Cascade of Choices



The individual choices are closely linked with one another. The choice of Aspirations (the broad hopes and purposes of the firm) and Goals (the measurable targets of the firm) set the context for and constrain the choice of Where to Play. For example, if Four Seasons Hotels and Resorts seeks to become the world's leading luxury hotel chain, it will attempt to play in geographies around the world and it will operate high-end hotels not budget or discount hotels. If Investors Group aspires to be the biggest mutual fund company in Canada, then it will compete primarily if not exclusively in Canada.

Likewise, the choice of Where to Play sets the context for and constrains the choice of How to Win. If Four Seasons chooses to play globally in the luxury hotel segment, then it needs to find a way to win against the global competitors, such as Ritz Carleton and Peninsula Group, in this segment. In its case, Four Seasons chose exemplary customer service powered by unique human resources practices as the heart of its How to Win choices. For Investors, its historical How to Win choice was to have by far and away the largest and most qualified direct selling force of mutual funds in the Canadian industry.

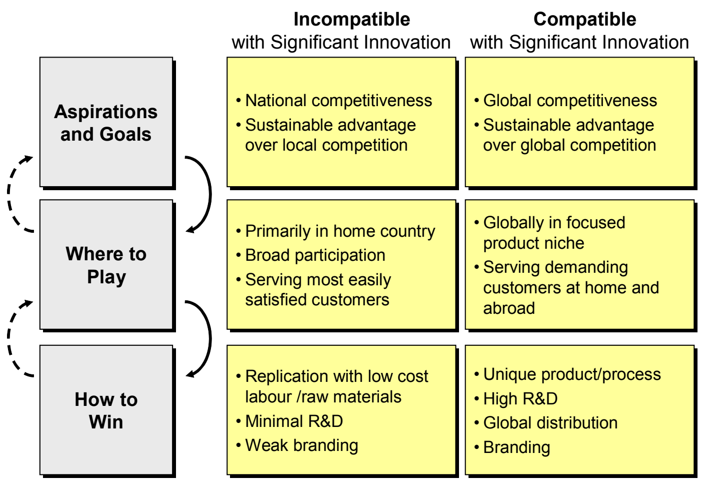
The choices down the cascade constrain the choices up the cascade as well. It may not be feasible for an organization to find a way to win to match its Aspirations and Goals and/or Where to Play choice. So a firm such as Nissan may wish to be a leading global player in the world automotive industry, but may be unequipped to take on Toyota, GM, Ford and Daimler-Chrysler. In this way, the arrows flow both down and up. Aspirations and Goals may need to be revisited in order to find a Where to Play and a How to Win that fits. In the end, the quality of a strategy is evidenced by the degree to which the parts of its choice cascade fit with and reinforce each other.

That having been said, there is a high level of 'path dependence' produced by the initial choice of Aspirations & Goals. If Aspirations & Goals are set low, then the Where to Play and How to Win choices will be set accordingly. The firm may succeed easily in achieving its modest goals and ramp up aspirations accordingly, but that will not necessarily take place because the firm may well be perfectly satisfied with achieving its initial low aspirations. If Aspirations and Goals are set too high, the feedback loop has immediate impact. The firm in question will fail and will have to revisit its Aspirations and Goals and perhaps its overall strategy, or go out of business.

In the modern globalizing business environment, there are almost an infinite variety of strategic choices that are open to firms. However, it is possible to characterize two main Aspirations & Goals choices that firms make and their ramifications for innovation. The first is to choose to aspire to national competitiveness – to try to win in the home market only. The second is to choose to aspire to global competitiveness – to try to win in all important markets globally. Globalization of the world economy has gathered momentum on the basis of increasing numbers of firms choosing the latter aspiration.

These fundamental aspirational choices drive fundamentally different approaches to the demand for innovation as shown in the following chart:

Strategy Choices and Innovation



The Aspiration of national competitiveness tends to result in Where to Play choices of broad participation in the home market, serving the most easily satisfied customers and How to Win choices that tend to focus on replication of successful strategies observed in other markets, which
require little R&D or investment in branding. Such How to Win choices follow most easily from the initial choice of national competitiveness. A firm could still choose to attempt innovation, but the cost associated with R&D and other innovation activities can be spread only over the home market and therefore make less strategic sense. It is easier and cheaper to replicate in the home market success models innovated elsewhere by other pioneers.

On the other hand, the initial aspiration of achieving global competitiveness leads to a fundamentally different set of Where to Play and How to Win choices. To achieve global competitiveness, the firm must choose to compete globally, serving the most demanding and sophisticated customers at home and abroad. If it doesn't do so, its global competitors will serve these demanding and sophisticated customers and in doing so will learn how to be still more innovative. Going up against the best competitors the world has to offer necessitates competing on the basis of unique products and/or processes, which requires high levels of innovation activity, such as R&D spending. Fortunately, since the firm in question is serving a global market, the R&D spending can be amortized over a much larger market and is therefore more affordable. In the same way, it is more likely to engage in branding activity, which can also be amortized over a greater volume of international business.

Hence innovation is a choice driven by the strategy of the firm. The firm can choose a strategy for which innovation is a critical component. Or alternatively, it can choose a strategy for which innovation is unimportant or even completely inconsistent. This fundamental strategic choice forms the basis of the demand for innovation. The CEO (on behalf of the board of directors and shareholders of the firm in question) determines the demand for innovation, which can be measured as the proportion of the firm's total spending that is dedicated to innovation activities – that is activities associated with creating and selling a unique product/service and/or creating a uniquely valuable process for delivering an existing product/service. I would place Intel in the former camp with its stream of uniquely powerful microprocessors or Pfizer with its stream of blockbuster drugs. I would place Southwest Airlines, Federal Express or Dell Computer in the latter camp as using unique and superior processes for creating products not dissimilar to those of competitors.

If CEOs across a given economy, in general, choose strategies requiring innovation, they will demand high volumes of innovation and the economy will be seen as highly innovative. And if its supply of innovation is lower than the amount demanded, there will be private market pressure for greater supply of innovative capacity.

If instead, CEOs across a given economy, in general, choose strategies not requiring innovation, they will demand modest volumes of innovation and the economy will be seen as not innovative. In such an environment there will not be meaningful private market pressure for greater supply of innovative capacity. And if there exists a high innovation capacity as a result of public sector spending on innovation, then much of that innovative capacity will be exported – by way of scientific and technically-trained individuals leaving to find jobs outside the country and intellectual property (e.g. patents) being exploited outside rather than inside the country.

Clearly there is interplay between the supply of innovation and the demand for innovation. If a jurisdiction is very weak in the supply of innovative capacity – i.e. scientists and technically trained workers, research universities, research laboratories – then when considering their strategies, CEOs may correctly and wisely conclude that a strategy not dependent on innovation is wisest and set their Aspirations & Goals/Where to Play/How to Win choices accordingly.

Alternatively, Michael Porter's work suggests that the local presence of research universities and a substantial pool of scientific and technical personnel encourage local firms to pursue innovation and upgrading of their sources of competitive advantage.

Demand for Innovation in Canada

We have already established that Canada is a highly prosperous economy, second only to the USA among economies of any substantial size and invests to produce supply of scientific and technical personnel that is not markedly lower than that of the world's leading economy. However, when compared in terms of indicators of the demand for innovation, Canada trails the USA and many other industrialized countries by a wide margin.

Each year the World Economic Forum produces a Global Competitiveness Report.[28] Part of the report is a "Current Competitiveness Index" that measures both the quality of the microeconomic environment and the sophistication of company operations and strategy in 58 countries (including the entire OECD). Included in the index are measures of the four most typical attributes of the How to Win choices of innovative, globally-competitive firms: Investment in Unique Products or Processes, Investment in R&D, Control of International Distribution, and Extent of Branding. While the index is survey-based, the results can be corroborated by quantitative data such actual corporate spending on R&D.

Canada ranks poorly relative to its current prosperity on the Index of Sophistication of Company Operations and Strategy. While sixth in the world in GDP/capita (excluding Luxembourg and Iceland), Canada ranks 14th in the world in Sophistication of Company Operations and Strategy. On the questions related most directly to demand for innovation, Canada scores considerably worse still as shown below:

Key Features of Company Operations and Strategy

Unique Products or Processes	Company Investment in R&D	Control of Int'l Distribution	Extent of Branding
1. Switzerland	1. Switzerland	1. Japan	1. Switzerland
2. Germany	2. Japan	2. Netherlands	2. Japan
3. United States	3. United States	3. United States	3. Germany
4. Israel	4. Germany	4. Finland	4. Finland
5. Japan	5. Finland	5. Iceland	5. United States
6. Denmark	6. Sweden	6. Germany	6. France
7. Finland	7. Israel	7. United Kingdom	7. United Kingdom
8. Austria	8. Netherlands	8. Sweden	8. Italy
9. Netherlands	9. Belgium	9. Denmark	9. Sweden
10. Belgium	10. Singapore	10. Switzerland	10. Netherlands
11. France	11. United Kingdom	11. Austria	11. Denmark
12. Sweden	12. Denmark	12. Italy	12. Austria
13. United Kingdom	13. Ireland	13. Canada	13. Iceland
14. Italy	14. Canada	14. Hong Kong	14. Jamaica
15. Singapore	15. Austria	15. France	15. Spain
16. Taiwan	16. Iceland	16. Trinidad & Tobago	16. Ireland
17. Hong Kong	17. France	17. Korea	17. Israel
18. Norway	18. Korea	18. Taiwan	18. New Zealand
19. Spain	19. Italy	19. New Zealand	19. Norway
20. Ireland	20. Taiwan	20. Slovenia	20. Belgium
21. Iceland	21. Norway	21. Singapore	21. Canada
22. Costa Rica	22. South Africa	22. Ireland	22. Korea
23. Korea	23. Spain	23. Belgium	23. Singapore
24. Panama	24. Slovenia	24. Israel	24. Russia
25. Australia	25. Hungary	25. South Africa	25. Australia
26. Uruguay	26. Taiwan	26. Norway	26. China
27. Canada	27. South Africa	27. Jamaica	27. South Africa

SOURCE: MICHAEL PORTER, GLOBAL COMPETITIVENESS REPORT, WORLD ECONOMIC FORUM, 2001

Canada ranks an abysmal 27th in the world on propensity to compete on the basis of unique products or processes rather than low cost labour or raw materials. The ranking on company investment in R&D is 14th. Control of international distribution, an important aspect of a global strategy is 13th. Extent of branding, which is related to the propensity to compete on the basis of unique products, is ranked 21st.

The picture is of a country that on the basis of the strategies of its firms exhibits a low demand for innovation, despite the relatively high supply of innovative capacity.

Roadblocks to the Demand for Innovation in Canada

The critically important policy question for Canada, therefore, is what has created a low-demand environment for innovation in a relatively prosperous country that is relatively well-endowed with innovation capacity. The answer is far from clear, but I have two hypotheses to put forward along with some initial data.

1) The Deleterious Effect of the Protectionist Policies on Aspirations

Since Aspirations play such an important role at the top of the choice cascade, setting the context for all choices below, one must ask: What influences the setting of aspirations either expansively or modestly. Clearly protectionist policies have an effect on Aspirations. Protection of an industry signals to its managers that the relevant government thinks that superior competitors exist outside the border of the country and that without protection; domestic firms will be crushed by foreign competitors. Domestic firms cannot help but take this view into consideration as they set their aspirations. Who could blame them for setting their aspirations low with respect to global competition and uniqueness? This is especially the case given that the protectionist policy ensures a lower level of competitiveness within the domestic market making innovation and upgrading less necessary. In addition, the protectionism makes it less likely that innovative firms from abroad will bring their innovations –e.g. unique products and processes– to the domestic market, thus making replication of strategies followed elsewhere a more viable strategy.

Of course, Canada's manufacturing and services sectors existed under significantly protected state during the majority of their existence, from the inception of the National Policy in 1879[29] to the Free Trade Agreement of 1989.[30] This conditioned these broad and important sectors to aspire to relatively low levels of innovation and global competitiveness. In addition, broad sectors still operate under stringent protection. Large portions of the Canadian finance, telecommunications services, transportation services, media and publishing industries are highly protected to this day. While such protection may ensure that we have Canadian ownership in these industries, it will also ensure a lower level of global competitiveness and less demand for innovation than without protection.

In this respect, we should see an increase in demand for innovation as more Canadian firms operate for longer periods of time under more open competition. In particular, I would expect to see greater demand for innovation as Canadian firms are run by CEOs whose careers are based more on the post-FTA/NAFTA era that the pre-FTA/NAFTA era.

2) The Dramatic Underinvestment in Business Education

The second hypothesis is that we have underinvested in formal business education in Canada and have a business leadership cadre that is not as capable as it should be in setting strategies that will enable their firms to compete as effectively as they could. In particular, Canadian CEOs are less well-trained and as a consequence are inclined to set their aspirations lower and be less inclined to pursue global strategies featuring uniqueness and innovation.

There exists both quantitative and anecdotal data to support this hypothesis. If again we compare Canada to the USA, its only large country superior economic performer, in formal business education, the difference –in contrast to the situation in scientific and technical education– is stark.

If again we consider the output of Canada versus the USA of degree-holders and weight the output using the same formula as with the scientific and technical degrees, we find the difference in investment in business education to be stark indeed. Recall, the USA produces 15% more graduates overall than Canada in proportion to its population, but only 6% more in the scientific and technical fields. In business education, the largest single field in post secondary education in USA by far, USA out-produces Canada by almost double –by 87%- on a weighted basis. It is the only field in which USA out-produces Canada by a wide margin. The USA educational strategy clearly prioritizes business education to a far greater degree. Business education accounts for 20% of the total weighted degrees in USA while only 12% in Canada. In USA, for every scientific and technical graduate, there is 0.7 of a business graduate, while in Canada there is 0.4 of a business graduate. The advantage for USA over Canada is by far most dramatic in the production of the highest-level non-academic stream business degree, the Masters in Business Administration, where USA produces 2.63 times as many graduates, proportionately, as Canada.

While the entire rest of the USA economy has about 5% more degree holders, the business sector of the USA economy has roughly double the proportion of degree holders in business. This represents a dramatic difference in the educational background of executives in the USA economy compared to the Canadian economy.

While it is clear that many business men and women succeed without formal business education, it is quite hard to argue that America's business success, which drives the prosperity of its economy, has nothing to do with a two times greater investment in training those businesspeople. Perhaps the added spending is wasted, but it is rather hard to argue against the consistent year over year rise in the demand for business education in the USA education system.

In addition, it is hard to understand the lack of investment in the Canadian business education area. It is not for lack of demand by students. Undergraduate and MBA business programs face among the longest waiting lists and the lowest percentage acceptance rates in all of Canadian higher education. If more spots were available, many, many more students would line up to fill them.

That notwithstanding, the investment in business education in Canada over the memorable past has rounded to zero. There has been no investment by governments in capacity increase. There have been no investments in new programs. Under the Canada Research Chairs program, given the small proportion of chairs to the SSHRC disciplines (approximately 240 chairs) and the small fraction of business research funding by SSHRC, there will be less than 10 of the 2000 Canada Research Chairs dedicated to business scholars in Canada. If Canada invested in business education like USA, we would expect to see 400 chairs awarded to business scholars. The only identifiable investment in all of Canada to business education of any sort has been the Initiative on the New Economy. Of the $100 million to be dedicated to funding research (not additional capacity) over five years beginning in 2001, $25 million is earmarked for scholars in business schools. So between the CRC and INE funding, there may be an investment of $30 million in business education in Canada in the next five years.

So Canada has over a long period of time invested in business education at intensity half of the level of USA. In addition, while Canadian governments have spent billions of dollars upgrading scientific and technical education –which produces graduates in rough proportion to USA– they have invested virtually nothing in upgrading or expanding business education.

The result? We have less educated business executives in Canada, less capable of making superior strategic decisions for the Canadian firms they direct, unless USA is making a terrible mistake and all that business education is simply wasted.

The anecdotal data on this issue comes from executive search firms hired to search for CEOs of Canadian firms. Their advice, universally, is to search for an American executive and increasingly often the successful candidate is American. Obviously, there are reasons other than better formal education. They typically come from a bigger market with more fierce competition. However, whether they have a greater level of education or not, they typically operated in a business environment characterized by double the level of business education and that provided them, arguably, better honing and training.

Summary

We need to think much more carefully about the innovation question in Canada. Despite lack of supporting logic or data, we have characterized it implicitly as a supply problem. As a result, we are attacking it as a supply problem. Canadian governments have invested at least $20 billion over the past five years in increasing the innovation supply in Canada. While having a robust supply of innovation capacity is clearly an asset for a country, the data on the innovation gap, while preliminary and incomplete, is much more consistent with the definition of a demand problem. However, since the passing of FTA and NAFTA, we have done nothing to address the demand problem – spending on increasing demand for innovation has been $0 – and in addition have only miniscule investments on the horizon. As long as we continue to treat the innovation shortfall as exclusively a supply problem, we will not either solve it or even make meaningful progress on it.

In fact, I predict on the current path, the problem will worsen. Dedicating 100% of resources to the supply problem will simply produce a dramatic over-supply of innovation capacity in Canada that will be noticed by other countries, especially the demand-driven USA. We will become an important source of supply of increasingly mobile scientific and technical personnel for the US economy, just as India, with a similar supply-demand imbalance, has become an important supplier to the world of scientific and technical personnel. While this makes India popular in the world, in a similar fashion to someone who stands on a street corner and hands out $20 bills, it does little for the development of their own economy.

The task at hand is to study the demand problem with equal vigor as the supply problem and work on an integrated solution that is likely to necessitate a significant ramp up in business education in Canada to at least begin to close the gap.

Endnotes

[1] The OECD Observer, 2002.
[2] Speech from the Throne (January 30, 2001):p.5. http://www.sft-ddt.gc.ca/sft-ddt/sft-ddt2001_e.pdf.
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I have used the following weighting system. I credited each undergraduate degree with 6 BIU, each Masters degree with 8 BIU and each PhD degree with 19 BIU. This probably overstates the undergraduate degree weight because there would be some three year degrees which would be weighted at 4.5 BIU, but there is no reason to believe that the proportion of three year degrees in the US is higher or lower than in Canada. I also used the maximum number of Masters BUI credits, which may overstate the proportion, but again it doesn't affect Canada or US disproportionately. Finally, to be compatible with the maximum credit at the Masters level of 8 BIU, I subtracted that from the PhD allocation, assuming that each PhD had been previously credited with 8 Masters BIU. I ran several scenarios using lower BIU credits for Masters in Business (4) and Other (6) and the overall statistics did not change materially.

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