Canadian Competitiveness: A Decade after the Crossroads[1]

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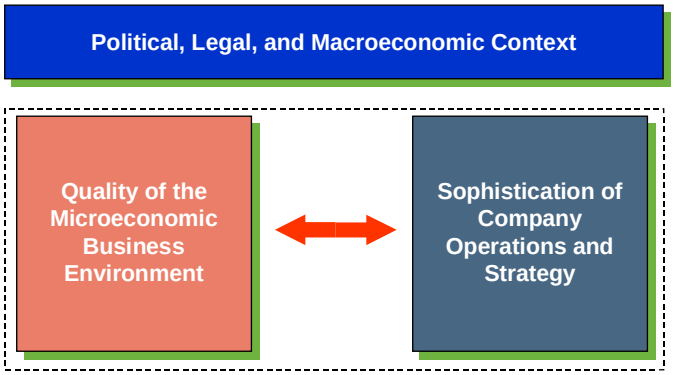
I. CANADA AT THE CROSSROADS: 1991

In 1990, Monitor Company and Professor Michael Porter undertook a study of Canadian competitiveness co-sponsored by the Government of Canada and the Business Council on National Issues. The study culminated in a report, *Canada at the Crossroads*, which was issued in October 1991[2].

The study was based on a model of competitiveness developed by Professor Porter[3]. It posits that the standard of living of a nation depends on the productivity with which it uses its human, capital and natural resources, manifested in the way in which its firms compete. In turn, productivity is determined by of the interplay of three broad influences: a nation's Political, Legal and Macroeconomic Context; the Quality of the Microeconomic Business Environment; and the Sophistication of Company Operations and Strategy. Together they determine the capacity of a nation to produce internationally competitive goods and services and support rising prosperity.

Determinants of Competitiveness



The study examined Canada's strengths and weakness in these areas both overall and in a number of important Canadian industries, including newsprint, central office telecommunications switches, life insurance, and environmental consulting.

Findings

Overall, we found that while the Canadian economy certainly had performed well historically, a number of factors suggested that its standard of living relative to other leading economies was likely to be challenged. There were significant macroeconomic impediments holding back needed public investments as well as firm level upgrading. Central among these was the budget deficit, which stood at 6.6% of GDP, over twice that in any G-7 country except Italy. The deficit put upward pressure on real interest rates and created an unfavorable environment for investment

[2] Michael E. Porter and Monitor Company, "Canada at the Crossroads", Business Council on National Issues, 1991
[3] Michael E. Porter, "The Competitive Advantage of Nations", Free Press, 1990

and capital formation. High personal and corporate taxation rates further discouraged investment and effort. Finally, a highly developed social safety net was designed in a way that created disincentives for work and personal skill upgrading.

Perhaps more importantly, the study revealed a number of weaknesses in the microeconomic business environment that afflicted much of the economy.[4] The absence of intense local rivalry combined with customers who were not demanding produced weak pressures for firm productivity and upgrading. Canadian related and supporting industries were often either shallow or weak, slowing down productivity improvement and the rate of innovation. In addition, factor conditions, especially with respect to specialized human capital and R&D infrastructure, constrained the movement to more sophisticated ways of competing.

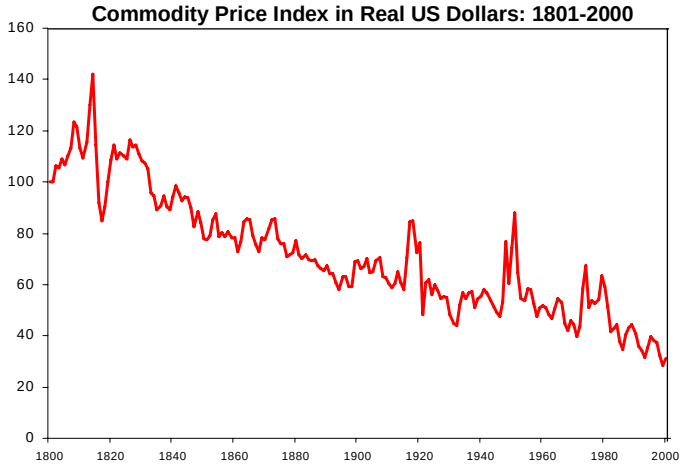
Finally, research uncovered key weaknesses in the sophistication of company operations and strategy. We found many firms content to compete in Canada, with little orientation toward global competition. Those firms that did compete internationally tended to focus on the U.S. and pursue strategies that depended on natural resource advantages or lower labor costs than other G-7 competitors instead of sophisticated products and processes. Rather than seek out the most demanding customers both at home and abroad, Canadian firms were inclined to serve the less demanding segments. Also, Canadian firms failed to invest in upgrading the business environment at home through supporting specialized education or cluster development initiatives. The prevailing orientation, instead, was to believe such investments were the responsibility of government.

Overall, due to Canada's rich endowment of natural resources, a 19th century decision to protect the Canadian economy with high tariff barriers, and the presence of a dominant neighbour to the south, Canadian institutions have been more inclined to replicate practices and strategies elsewhere rather than innovate to be uniquely positioned in global terms.

Yet Canada's rich endowment of natural resources has eroded in value. Because competitiveness in commodities derives largely from finding lower-cost sources of raw materials and/or using lower cost labor to exploit the raw materials, competitive advantage is fleeting. Firms around the world, especially in the developing countries, have been entering markets with lower-cost raw materials or labor. In the main, they have been successful. In forest products, for example, firms have learned how to utilize low-cost southern-hemisphere eucalyptus hardwood to make pulp and paper that is more competitive than higher-cost northern-hemisphere softwood. Since the price-setting mechanism is the marginal cost of production of the highest cost producer in the market, the result has been long-term downward pressure on pulp and paper prices. This phenomenon of downward price pressure has been clearly evident across commodities overall. Since 1800, commodity prices have moved downward in real US$ at a rate of approximately 0.6% per year as shown below.

[4] See Box 1 (page 5) on the Microeconomic Business Environment and the Role of Clusters for further discussion of theory.

Long-Term Trends in Commodity Prices



Note: Index of 1801 = 100
Source: Nesbitt Burns Economic Research

Relatively high tariff barriers from 1878 to 1989 protected Canadian firms outside natural resource firms and encouraged them to imitate products and processes developed elsewhere. In addition, the tariff barriers encouraged foreign-owned firms to set up in Canada to replicate in Canada their operations elsewhere in order to gain access to the Canadian market.

Original Conclusion and Recommendations

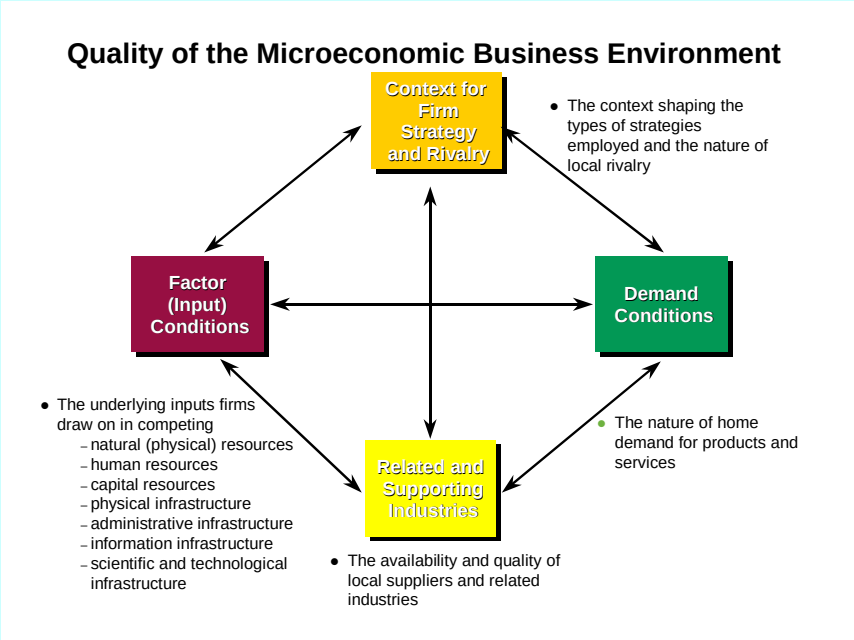
We found Canada to be at a critical crossroads as of 1991. Due to Canada's impressive endowment of natural resources, its well-educated population, and its proximity to the US, the nation had enjoyed economic prosperity and a high standard of living. However, we concluded that this favorable situation was likely to erode and produce a decline in standard of living unless Canada and its firms chose a distinctly different path.

We outlined an alternative path that could retain and enhance the nation's competitiveness. We recommended that governments move aggressively to restore a favorable macroeconomic context for Canadian business by tackling the budget deficit and reducing personal and corporate tax rates. We also recommended that governments eliminate the barriers to inter-provincial trade and investment that relaxed competitive pressures and fractured an already small economy.

With respect to the microeconomic business environment, we offered recommendations in each of the four areas. With respect to *Context for Firm Strategy and Rivalry*, we recommended that governments pursue policies to enhance the intensity of domestic competition rather than try to produce national champions shielded from competition in the home market. In *Demand Conditions*, we recommended that governments adopt more stringent and forward-looking regulatory standards and restructure government procurement to make the government a more sophisticated and demanding customer. With respect to *Factor Conditions*, we encouraged governments to invest more heavily in education and specialized skills development and to step up the pace of deregulation in infrastructure sectors. In addition, we encouraged technology development policies more connected to industry clusters and mechanisms for faster adoption of new technology.

BOX 1 - The Microeconomic Environment and the Role of Clusters

A favourable **Microeconomic Business Environment** is one that creates pressure for firms continuously to upgrade the source and sophistication of their advantage and at the same time supports the upgrading process with the appropriate factor inputs and supporting institutions. The combination of pressure and support is created by the interaction of four features as shown below:



Pressure for upgrading is supplied by *demand conditions* featuring sophisticated and demanding customers, whose demands spur local firms to innovate in order to upgrade their product/service offerings. Particularly valuable is customer pressure that anticipates the nature of demand elsewhere in the world. Beneficial pressure is also supplied by a *context for firm strategy and rivalry* that causes local competitors to feel the need to continuously seek unique and better ways to meet the needs of customers. Such a context typically requires active rivalry among firms competing in the same jurisdiction.

Support for upgrading is provided by the abundant supply of *factor (input) conditions*, including basic factors such as natural resources and capital resources, as well as advanced and specialized factors such as scientific infrastructure and pools of specialized labour. As countries become more advanced the quality of their microeconomic business environments is increasingly determined by advanced and specialized factors (e.g. research universities) rather than basic factors (e.g. raw material supply) because the basic factors can be readily purchased from abroad. Finally, support for upgrading is enhanced by the presence of high quality *related and supporting industries*. Clusters of such industries can help competing firms innovate and create more unique ways of meeting customer needs without needing to make all the investments themselves.

The four features work together in a self-reinforcing dynamic to drive the clustering of industries. The presence of demanding and sophisticated customers encourages the formation of multiple local rivals. The presence of a number of local rivals encourages the local establishment and growth of supplier industries and other related industries. The presence of local rivals and supplier industries spurs the creation of specialized local infrastructure and educational institutions. These in turn help the local rivals innovate and upgrade their capacity to serve the local customers even better, spurring even more sophisticated demand.

This self-reinforcing dynamic results in the tight clustering of many globally competitive industries in one confined geographic area (Porter, *The Competitive Advantage of Nations*, 1990). From movie production in southern California to ski boots in northern Italy, to fax machines in Japan, to golf club design in Carlsbad, California, there is a powerful tendency toward tight geographical clustering of globally competitive firms in the global economy.

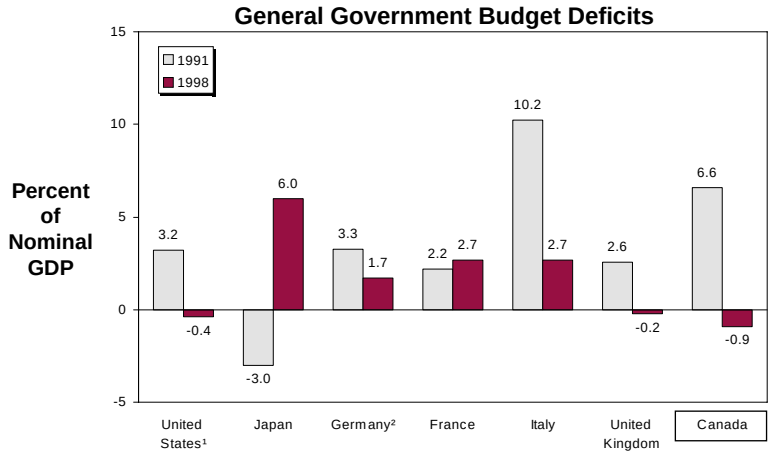
In *Related and Supporting Industries*, we recommended that governments ensure that programs in all policy areas are consistent with the development of clusters rather than spreading similar firms across many parts of the country, as has been the case too often in Canada through its historical policies of regional development.

We also outlined a new trajectory for Canadian firms. The central challenge was to move to innovation-driven modes of competing –i.e. sophisticated processes and products- rather than competing on raw materials or labour cost advantages. To do so, it would be necessary to rationalize product lines, reduce levels of diversification and dedicate more attention and resources on upgrading the Canadian home diamond. Firms needed to develop the capacity to sell in important markets globally and tap into leading-edge research excellence in specialized technologies.

II. CANADIAN COMPETITIVENESS: PROGRESS SINCE 1991

On one hand, Canada has enjoyed a spectacular macroeconomic turnaround since 1991. Between 1991 and 1999, the Canadian government managed to bring the federal budget deficit down from a second worst among G-7 countries level of 6.6% of GDP to the best, with a surplus of 0.9%.

Elimination of the Federal Budget Deficit



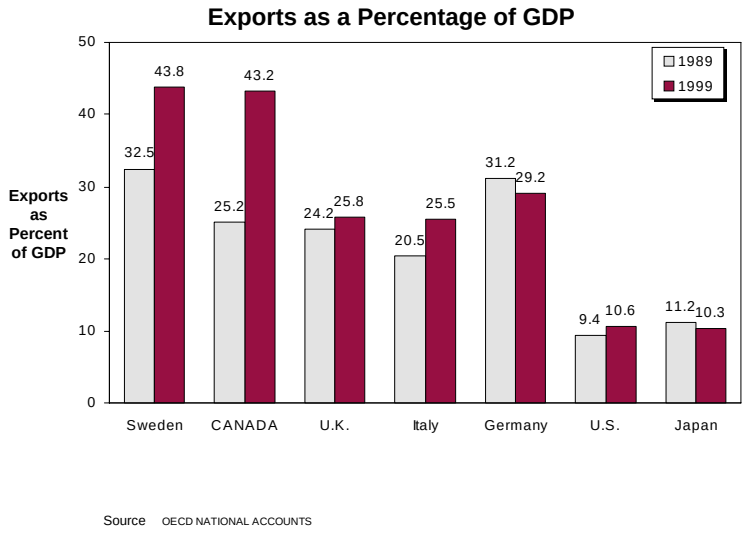
¹Note: Excludes deposit insurance outlays
²Note: Includes balances of the German Railways Fund from 1994 on.
Note: Includes cash flow surplus of federal state and local employee pension schemes
SOURCE: OECD ECONOMIC OUTLOOK, 2000

Interest rates, using the 3-month Treasury bill rate as a proxy, fell over 60% from an average of 11.55% in the 1988-90 period to 4.97% in the 1998-2000 period, providing a much more attractive environment for investment. Inflation fell from 4.6% (1988-1990) to 2.1% (1998-2000), a level not seen in 30 years.[5]

The economy also became more export-oriented with exports as a share of GDP increasing from 25.2% in 1989 to 43.2% in 1999, the highest share among G-7 countries and by far the largest increase over the period.[6]

[5] Bank of Canada Review
[6] OECD National Accounts

Increase in Canadian Relative Export Intensity



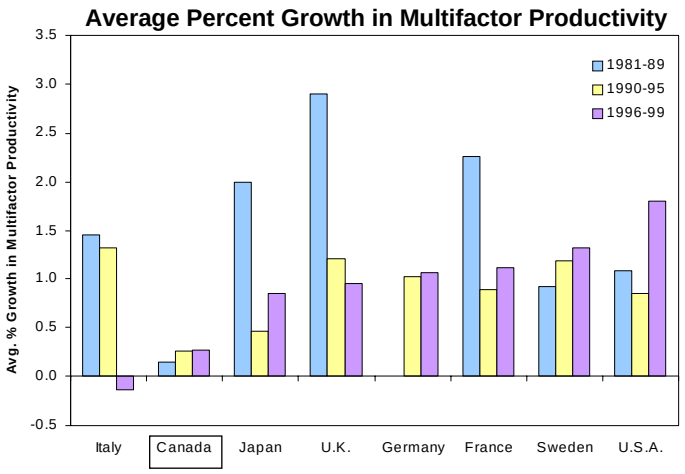
Despite the impressive macroeconomic performance, Canada's relative prosperity has fallen. While GDP per capita measured at purchasing power parity grew at a compound annual rate of 4.1% between 1990 and 1999, much of that growth was due to the depreciation of the Canadian dollar. The same metric measured at the current exchange rate only reached 1.2%, putting Canada at the lower range of OECD countries. Canada slipped from 3rd in the world, a position it had occupied for decades, to 5th over the period.[7] Had Canada maintained 3rd place in the world, the income for the average family of four in Canada would have been higher by CDN$10,000 in 1999, or approximately $500 per month in after-tax family purchasing power – a substantial difference in standard of living.

Consistent with its performance on standard of living, Canada registered strikingly poor performance in productivity growth. Poor relative productivity growth in the 1980's was continued in most of the 1990's during which Canadian multifactor productivity growth trailed all of the G-7 countries by a wide margin.[8]

[7] OECD National Accounts Volume 1-Main Aggregates. Measured in real US$ at Purchasing Power Parity. Rankings cited exclude city-state Singapore and tiny countries Luxembourg and Iceland, which would be more comparable to a single Canadian city than to a country such as Canada.

[8] In an interesting analysis, Baldwin, Maynard and Wells demonstrate that Canada's productivity performance during the 1990s was adversely effected by a significant drop in the proportion of the population holding jobs, rather than the productivity of those holding jobs. John Baldwin, Jean-Pierre Maynard and Steward Wells, *Productivity Growth in Canada and the United States*, ISUMA, Spring 2000, pp. 119-124.

Canadian Productivity Growth



Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Long-Term Priorities Report. Drawn from Gust, Christopher and Jaime Marquez, "Productivity Developments Abroad," *Federal Reserve Bulletin*, October 2000

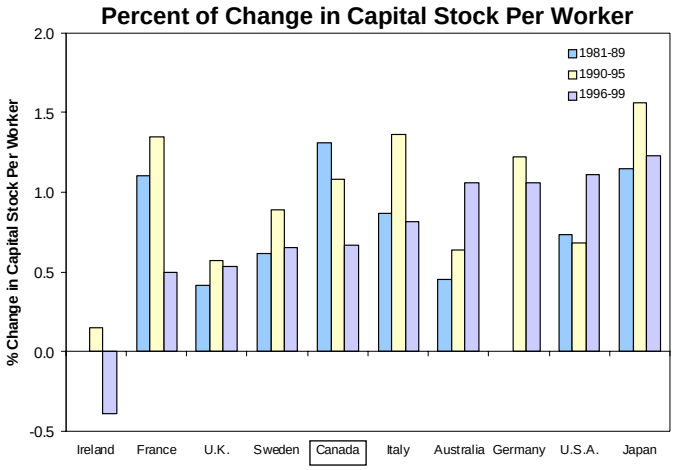
In manufacturing, this poor productivity performance resulted in a decline in Canada's manufacturing productivity relative to the US from 81.0% in 1990 to 69.9% in 1999.[9]

Canada took the lesser path from the crossroads in 1991. There has not been a clear and relentless focus on upgrading productivity and pursuing global competitiveness.

The growth of the Canadian economy in the last ten years has been fuelled primarily by a higher proportion of employed persons in the workforce and longer working hours, especially in the second half of the decade. In contrast, capital investment experienced a declining growth rate, and multifactor productivity growth was strikingly low.

[9] Industry Canada, *Presentation to the Corporate Governance Branch*, February 7, 2001, based on Statistics Canada and US Bureau of Labor Statistics.

Growth in Canadian Capital Stock Per Worker



Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Long-Term Priorities Report.

In the traded goods sector, the decline in relative productivity[10] combined with the fall in worldwide commodity prices during the 1990's precipitated the dramatic fall in the Canadian dollar. It traded at 87 cents US at the release of *Canada at the Crossroads*, but fell by mid-1998 to a trading range of 63-69 cents US.[11] The fall in the exchange rate eroded the living-standard of Canadians further.

While some laud the lower Canadian dollar as enhancing competitiveness by decreasing the relative prices of our exports, the true effect is exactly the opposite. A low Canadian dollar dulls the incentive for upgrading and competing on any basis other than lower price. In addition, in the Canadian context, the low dollar makes investment in upgrading more expensive. Approximately 70% of Canada's installed machinery and equipment is imported.[12] Consequently, the low dollar during the 1990's made machinery and equipment imports dramatically more expensive, which is likely to have contributed to a fall in the growth rate of capital stock per worker, thus making labour productivity growth still more difficult to achieve.

The impressive growth in exports as well was fuelled by the devaluation of the Canadian dollar. Furthermore, the share of exports to the U.S. climbed to a striking 88% in 1999, up from 70% in 1988. The strong performance of the U.S. economy was a mayor driver of Canada's export growth. Canada's export performance, then, is more a function of lower Canadian prices due to the exchange rate and proximity to the U.S. than a sign of enhanced competitiveness.

Canadian Microeconomic Challenges

Why did Canada's impressive macroeconomic turnaround fail to translate into higher productivity and thus a higher standard of living? We first turn to the development of Canada's

[10] Robert Lafrance and Lawrence Schembri, " The Exchange Rate, Productivity, and the Standard of Living", pg. 22, Bank of Canada Review, Winter 1999-2000.
[11] Bank of Canada Review.
[12] Lafrance and Schembri, p. 22.

microeconomic business environment in the last decade. Then we discuss typical choices companies have made in this context.

In the 1991 study, we found that several features of the microeconomic environment reinforce the slow productivity growth. These made it more challenging for Canadian firms to innovate because there are fewer tools and less pressure for upgrading and seeking more advanced competitive advantages.

Canada has made progress in the microeconomic business environment in a number of areas. The level of competition has increased, fuelled primarily by more openness to trade both from other countries and within Canada.

Though there are weaknesses, Canada also enjoys strengths in its microeconomic environment on which it can build. While overall R&D spending is low, there are indications that the productivity of R&D is high. Canadian scientists have performed well in global terms growing the number of patents granted in the US over the 1986-1999 period by 153%, second highest in the world (after Israel at 302%) and higher than the US itself (123%). And the patents earned by Canadians were of high quality. The proportion of patents that are highly cited was third in the world behind only the US and Israel. Canada has long trailed the advanced countries on the proportion of research personnel in the workforce. But Canada moved up from sixth to fifth among the G-7 countries in research personnel per ten thousand workers between 1985 and 1998 and grew the proportion at the second fastest rate among the seven countries.[13]

There has also been some sign of improvement in the sophistication of Canada's exports. For example, in 1990, 45% of Canada's exports were resource-based goods and of these 78% were unprocessed or semi-processed commodities. By 1997, these proportions fell to 43% and 64% respectively, showing that Canadian exporters were moving away from the stereotype of hewers of wood and drawers of water.[14] Also, over the 1989 to 1997 period machinery exports, long a Canadian weakness, increased from 3.4% to 5.5% of exports, a substantial increase, albeit from a low base.[15]

Canada's firms have also made progress in operational effectiveness. The adoption of FTA and NAFTA and globalization led Canadian firms to reduce their levels of diversification and rationalize product lines in order to focus on businesses in which they could compete internationally. A comprehensive study by Baldwin, Beckstead and Caves (2000) examines changes in diversification in Canadian manufacturing firms and plants over 1973-1995.[16] They found that firms reduced diversification across industries and plants reduced diversification across products in the 1990's. The significant changes may be attributed to the FTA and NAFTA, but changes were beginning in the mid-1980's as a consequence of the trade liberalization process that began with the Kennedy round of the 1970's and the Tokyo and Uruguay rounds of the 1980's. The study also shows that export intensity (i.e. exports/GDP) in manufacturing increased in the 1990's and the plants of export industries became highly specialized.

[13] Porter, *US Competitiveness 2001*.
[14] Porter, *UN SITC Trade Statistics.*
[15] Porter, *UN SITC Trade Statistics*.
[16] Baldwin, J., Beckstead, D. and R. Caves, *"Changes in the Diversification of Canadian Manufacturing Firms (1973-1997)"*, Statistics Canada No. 11F0019MPE, 2000.

Despite this progress, however, Canada's overall microeconomic competitiveness has waned. Canada's investment in specialized human resources to support innovation and upgrading has diminished. Public spending on both secondary and post-secondary education as a percentage of GDP, though high in comparative terms, was in decline between 1982 and 1995.[17] The decline in secondary education spending was less worrisome as the evidence is mixed on whether additional investment at the K-12 level improves educational efficiency.

More worrisome, however, is the accelerating decline in public investment in post-secondary education over the 1996 to 1999 period. Government spending on post-secondary education decreased in six of ten provinces and by an average of 3.3% overall.[18] Over the same period, spending increased in 48 of 50 US states and by an average of 16% overall.[19] The impact on spending per student has been dramatic and negative. Between 1993 and 2000, public spending per student in higher education increased an estimated 21% in the US while it declined an estimated 11% in Canada.[20]

Canada also lags in financing university research. Larger proportions of research costs are reimbursed in the US relative to Canada, where universities and students absorb most of the indirect costs of research.[21] In the U.S., government funds 82.6% of university research grants and contracts compared to 66.6% in Canada.[22] Compounding this problem is that Canadian industry is more dependent on university research relative to American or European industry.[23]

In total, partially because of impediments to university research spending and partially because of lagging firm spending, Canada's overall investment in R&D as a percent of GDP, which was low in 1991, remains low. Canada trails five of seven G-7 countries and trails many other industrialized countries such as Sweden, Korea, Israel, Singapore and even Australia.[24]

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[17] Michael E. Porter, Scott Stern, *"The New Challenge to America's Prosperity: Findings from the Innovation Index"*, Council on Competitiveness, Washington, DC, 1999. Figures 3-17 and 18. The decline in secondary education spending was less worrisome as the evidence is mixed on whether additional investment at the K-12 level improves educational efficiency. Evidence documented in Burtless (Burtless, editor, *" Does Money Matter? The Effect of School Resources on Student Achievement and Adult Success"*, Brookings Institution Press, Washington, D.C., 1996) suggests that approximately half of the studies show no impact of school spending on educational effectiveness, where effectiveness is measured by student achievement while students are in school or by student's earnings after schooling. Hoxby (Hoxby, *"The effects of class size on student achievement: New evidence from population variation"*, Quarterly Journal of Economics, November 2000, pages 1239-1285) estimates that class size does not have a statistically significant effect on student performance. Easton (Easton, *"Education in Canada"*, The Fraser Institute, Vancouver, 1998, p. 47) and Hanushek (Hanushek, *"The evidence on Class Size,"* in Susan E. Mayer and Paul Peterson (eds.), *Earning and Learning: How Schools Matter*, Washington, D.C., Brookings Institution, 1998) find similar results. Studies suggest that effective organization of school resources and socioeconomic conditions are robust factors of educational effectiveness at the K-12 level.

[18] Council of Ontario Universities: Simple average of provincial increases/decreases.

[19] Council of Ontario Universities: Simple average of provincial increases/decreases.

[20] Association of Universities and Colleges of Canada, *Election 2000 Backgrounder: University Funding*, 2000.

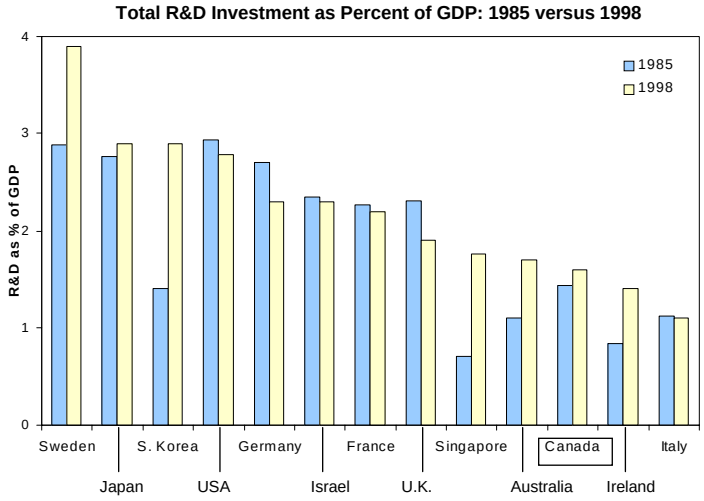
[21] Munroe-Blum, *Growing Ontario's Innovation System*, pp. 23-25.

[22] Munroe-Blum, *Growing Ontario's Innovation System*, Figure 6. The recent decision by the Government of Ontario to support the indirect costs of research in Ontario Universities has been an important positive step.

[23] Heather Munroe-Blum, *Growing Ontario's Innovation System: The Strategic Role of University Research*, Dec 1999, Figure 20.

[24] Michael E. Porter, *US Competitiveness 200*1: *Strengths, Vulnerabilities, and Long Term Priorities Report*

Low Canadian National Investment In R&D



Source: US Competitiveness 2001: Strengths, Vulnerabilities, and Long-Term Priorities Report.

Recent global research helps place Canada's microeconomic foundations for prosperity in a broader context. For the past three years, in conjunction with the World Economic Forum Global Competitiveness Report (GCR), Porter has measured the microeconomic competitiveness of 58 countries, including all the developed economies.[25] Both Canada's absolute ranking and ranking trend are worrisome and are indicative of following the less favourable path.

Canada's overall current competitiveness ranking, which combines measures of the quality of the microeconomic business environment and measure of the sophistication of company operations and strategy, dropped from 6th in 1998 to 8th in 1999 to 11th in 2000. Given that Canada's GDP per capita ranks 5th,[26] this suggests downward pressure on Canadian relative GDP per capita.

Over the same period, the sub-indices have fallen accordingly. Quality of the microeconomic business environment has fallen from 3rd to 8th as Netherlands, Denmark, Singapore, Germany and Australia have moved ahead of Canada. Canada ranks significantly lower on company operations and strategy on which the ranking has fallen from 12th to 16th, the most notable dimension of which is Canada's 23rd ranking on nature of competitive advantage. On the question "Competitive advantages of your nation's companies in international markets: low-cost labor or raw materials; or unique products and processes", the responses of respondents in 22 countries were more weighted towards unique products and processes than for Canada. This attribute had the strongest relationship with GDP per capita of any question. On this essential summary measure of strategy, Canada ranks with Korea, Spain, Costa Rica, and New Zealand, nations with an average GNP per capita only 55% of Canada's GDP (in 1999).[27] Canada's ratings on capacity for innovation (20th), product designs (20th), extent of branding (20th), value

[25] Michael E. Porter, "The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity." *The Global Competitiveness Report 2000*, New York: Oxford University Press, 2000.

[26] Actually the more precise comparison would be 5th in GDP per capita versus 10th in Microeconomic Foundation if we continue to exclude Singapore as not a useful comparison.

[27] OECD National Accounts Volume 1-Main Aggregates.

chain presence (19th), and control of international distribution (17th) are all similarly disappointing.

Work by Porter and Stern on the innovative capacity of nations reinforces the weaknesses highlighted in the Global Competitiveness Report.[28] Canada ranks 9th in the 1995 innovation index based on low spending on R&D as a percentage of GDP, low proportion of R&D personnel as a percentage of population and low percentage of R&D funded by industry.

Overall, Canada ranks squarely in the second tier of countries on the Innovation Index, with countries such as France, Norway, Netherlands and Australia, rather than in the first-tier countries, such as US, Switzerland, Japan, Sweden, Germany, Finland and Denmark. While Canada's absolute progress on the Innovation Index is mildly positive (0.75% per year rise over the 1975-1995 period), its relative trajectory is distinctly downward. Canada ranked 6th in 1975 only to be passed by Finland, Denmark and France by 1995. Canada is on the verge of being passed by Norway, which improved its Index at a rate four times faster than Canada over the 1975-1995 period.[29]

Canada's Corporate Response: The Case of the Newsprint Industry

In the 1991 study, we analyzed four industries in detail: newsprint, central office switches, whisky and geophysical consulting. The progress of the newsprint industry since 1991 illustrates how the microeconomic context combined with company choices can contribute to a nation's slide in relative prosperity.

In 1991,[30] newsprint was one of Canada's leading export industries, with $5.5 billion in sales and a world export share of 62%. The Canadian industry consisted of seven large companies (Canadian Pacific Forest Products, Abitibi-Price, Fletcher Challenge Canada, Stone Consolidated, Quebec and Ontario Paper Company, Kruger, and MacMillan Bloedel) who controlled 65% of Canadian capacity. Newsprint exports comprised 43% of Canadian pulp and paper industry exports.

Our assessment in 1991 was that of an industry with important but narrow strengths and with vulnerabilities for the future. Canada's primary strengths were low wood fibre cost and low energy costs. In addition, Canada enjoyed proximity to the largest market in the world, which lowered shipping costs and facilitated selling and customer service. However, Canada's advantage in wood fibre cost was coming under pressure due to the development of thermomechanical pulping (TMP), which allowed the efficient use of low-cost fibre found in the southeastern US and Latin America. Also, the increasing use of recovered paper, economically available in the US, reduced the advantage provided by inexpensive Canadian fibre.

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[28] Porter and Stern, *Findings from the Innovation Index*, 1999.

[29] Michael E. Porter and Gregory C. Bond, *"Innovative Capacity and Prosperity: The Next Competitiveness Challenge", The Global Competitiveness Report 2000*, New York: Oxford University Press, 2000.

[30] Data in next four paragraphs drawn from Porter and Monitor, *"Canada at the Crossroads"*, 1991 .Due to subsequent revisions of the data, the Canadian world export share of newsprint in 1991 was adjusted upward to 62% from the 59% cited in the 1991 study.

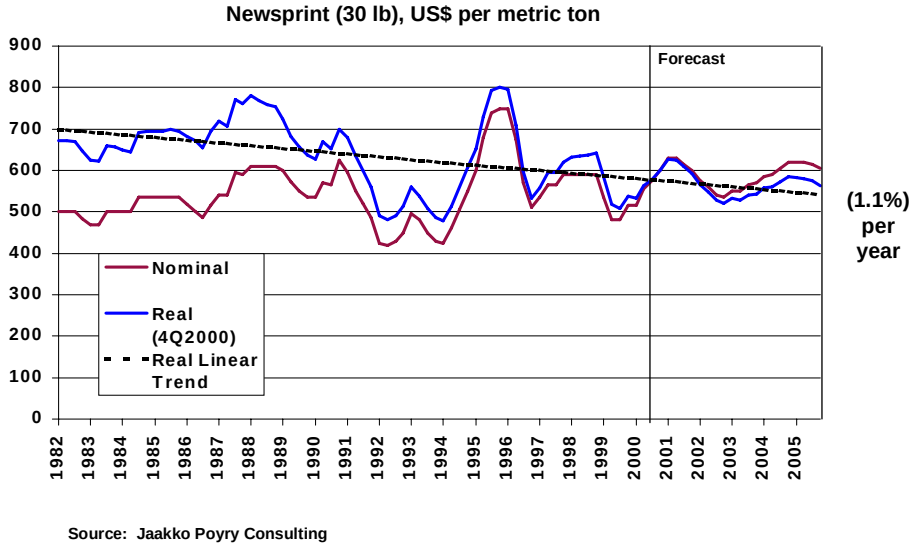
In addition, the industry had weaknesses in its microeconomic context. Although, there were a number of rivals, they did not compete on innovation and upgrading. As with most parts of the Canadian forest products sector, Canada lagged by a decade or more in implementing new techniques such as the production of groundwood pulp and the use of a soda process for chemical pulping. The lack of local related and supporting industries, such as equipment suppliers made the likelihood and challenge of technological upgrading more difficult. Historically lax environmental regulation had also not prepared Canadian firms for the heightening of environment concerns about the forest products sector worldwide.

Overall, the industry personified the crossroads faced by the economy as a whole. The lack of pressure for upgrading had left the Canadian firms with smaller machines, lower labour productivity and lower capital spending than their international competitors. With governments, especially in British Columbia, putting upward pressure on wood fibre costs through higher stumpage fees, the 1990's promised to be more challenging than the previous decades.

The question was: Would Canadian firms move forward to higher productivity and more distinctive strategies or would their fundamental competitiveness erode? Unfortunately, relatively little has changed over the past decade with respect to the Canadian newsprint industry and its approach to competition. The trends already in evidence at the time of *Canada at the Crossroads* have continued and Canada's position in the industry has eroded.

Characteristic of many commodities, prices in the industry have continued their long-term drift downward at a real rate of approximately (1.1%) per year as shown below:

Real Newsprint Prices over Time



Source: Jaakko Poyry Consulting

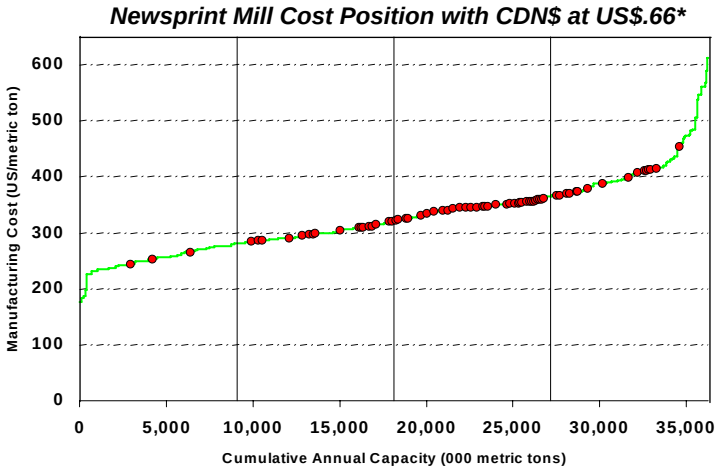
Newsprint, a commodity product, continues to decline as a proportion of global pulp and paper production, dropping from 39% to 30% between 1989 and 1999. Increases have come in the production of value-added grades of paper and paperboard.[31]

[31] 1999 Annual Review, Canadian Pulp and Paper Association website

In this environment of falling prices and slow growth, Canadian share of world exports of newsprint has fallen from 62% in 1991 to 53% in 1997, a significant reduction.[32] Continued growth in the use of TMP and recovered paper has weakened Canada's basic wood fibre advantage.

With a weakening competitive position due to advances in the use of low cost fibres and greater investment in upgrading abroad, the Canadian sector depended on the falling Canadian dollar to maintain its competitiveness. In a commodity industry such as newsprint, competitiveness and firm profitability are determined by the firm's position on the global delivered cash cost curve as shown below. Newsprint mills on the left of the cost curve are competitively strong and profitable while mills on the right are weak and unprofitable. Canadian mills (marked by the dots on the cost curve) are reasonably well positioned on the cost curve with firms most heavily positioned in the third quartile. A smaller number of mills are in the more competitive first and second quartiles, and a substantial number in the uncompetitive fourth quartile.

Global Newsprint Industry Cost Curve



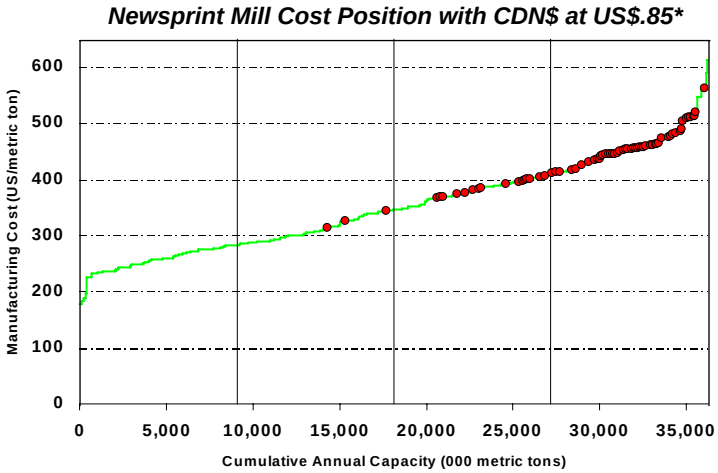
***Canadian Mills marked with dots**

SOURCE: Jaakko Poyry Consulting. Cost curve and Canadian dollar as of December 2000.

However, the acceptable position of Canadian firms is largely a function of a low dollar, which stood at approximately $.66US at the end of 2000. If the Canadian dollar were back near its 1991 level of US$0.85, the Canadian mills would be positioned as follows and the Canadian industry would be in precarious position, as follows:

[32] Michael E. Porter, *UN SITC Trade Statistics, Revision 2;* Cluster Mapping Project at the Institute for Strategy and Competitiveness, Harvard Business School.

Global Newsprint Industry Cost Curve



***Canadian Mills marked with dots**

SOURCE: Jaakko Poyry Consulting. Cost curve as of December 2000, Canadian dollar adjusted to US$.85

At an exchange rate of $.85US, virtually the entire Canadian newsprint industry would be positioned in the fourth quartile of the cost curve with cash costs almost $100/tonne higher. In this way, a depreciating currency hides fundamental competitiveness problems, rather than indicating true competitiveness.

Even with a falling currency, the Canadian paper and forest industry has not performed well compared to global competitors. In 2000, the Canadian industry had a return on capital employed of 4.0%, well below the average return for Europe (5.9%) and the US (6.0%). Finland was a particularly impressive performer with a return of 7.0%.[33]

Perhaps the most substantial change in the newsprint industry is increased globalization, consistent with the overall globalization of the pulp and paper sector. Asian share of global demand grew from 10% to 15% between 1989 and 1999, spurring a wave of investment in Asian capacity.[34] Some major firms began to acquire outside their home markets in order to establish a more global presence.

The leaders in this new wave were the Scandinavian firms, who invested heavily to upgrade themselves and their local environment during the 1990's. At home, they worked together through industry associations and linkages with universities to promote innovation. The average worker in the Scandinavian industry has a related university degree and a high level of technological literacy. Abroad, firms invested heavily in North American assets. Swedish/Finnish firm Stora Enso acquired US fine paper producer Consolidated Papers and Finland's UPM-Kymmene acquired Canadian fine paper producer Repap Canada. Norways's Norske Skog purchased Canadian newsprint player Fletcher Challenge Canada, and recently made a bid for Pacifica Papers, the Canadian firm to which the newsprint assets of MacMillan

[33] Richard A. Kelertas, "Canadian Paper & Forest Products Equity Markets: Over the Edge or a "Managed Cycle"?", Canadian Pulp and Paper Association, Paper Week International, 2001.

[34] 1999 Annual Review, Canadian Pulp and Paper Association website

Bloedel were spun off. In addition, Bowater, a US newsprint manufacturer, acquired Avenor, successor to Canadian Pacific Forest Products.

Norske Skog is a particularly interesting example, because the company made a decisive move out of a home market that it considers detrimental to its long-term competitive advantage. Lacking a strong local cluster, it has moved abroad to keep up with competitors from stronger cluster environments like Sweden and Finland. While success is not certain, this aggressive strategy exposes Norkse Skog to competitive pressure often needed to motivate a strong upgrading effort.

The Canadian newsprint industry has participated passively in the globalization of the industry through the acquisition of three of the seven major Canadian players by global competitors. Abitibi has focused on consolidating the industry within Canada, having combined Abitibi-Price, Stone-Consolidated, Quebec and Ontario Paper Company, and Donahue into Canada's dominant player Abitibi-Consolidated. In contrast, Abitibi-Consolidated has made only very minor forays into the global industry with one joint venture in Asia and no presence in Europe or Latin America. Though the global industry focus has shifted to value-added papers, Abitibi-Consolidated has seen the proportion of value-added papers fall from 30% of its portfolio to 25% over the 1996 to 1999 period.[35]

Unlike its Scandinavian competitors, which have invested more heavily in upgrading at home, expanded in the faster growing value-added papers sector, and acquired to create global reach, the Canadian pulp and paper sector –exemplified by newsprint– has focused primarily on domestic consolidation rather than on upgrading and globalizing.

These trends were evident at the time of the 1991 study. The Canadian industry had a choice to upgrade its capability in newsprint, migrate to more value-added products and establish a more robust global position or to continue the status quo. In large part, the Canadian industry chose the latter, while other countries' newsprint industries chose the former.

While the newsprint industry remains an important Canadian industry and one with leading global export share, it is an industry that has allowed its position to decay slowly rather than invest in upgrading and innovation. It will remain an important Canadian industry for years to come, but it is unlikely to contribute to a high and rising standard of living on the current path. It will continue to lose share in a business whose output is falling slowly in real value.

The newsprint industry is a metaphor for the Canadian economy. Its trajectory, as well as the overall evidence suggests that Canada has followed the less favourable path described in *Canada at the Crossroads*. Substantial progress has been made in the macroeconomic context, and there are some microeconomic improvements. However, the progress has not been sufficient to move Canada ahead in relative terms against other highly developed economies. Finally, companies have on average not reacted to these changes in their competitive environment by taking the necessary decisions to upgrade their strategies and operations. As a consequence, Canada is drifting slowly down in relative ranking across a number of measures from GDP per capita, to productivity, to GCR ranking, to Innovation Index.

[35] Abitibi-Consolidated Annual Reports

III. THE WAY FORWARD

Canada again is at a critical junction of its development and must ensure that it does not squander its macroeconomic achievements. The new, more fundamental challenge is to improve Canada's microeconomic business environment and upgrade the strategies and operations of its companies. Only in this way will the progress made so far translate into real prosperity gains for its population.

The way forward to greater competitiveness and greater prosperity for Canada is through innovation not replication of what other countries and companies have done.

Building on the Macroeconomic Progress

While Canada's macroeconomic environment has improved dramatically, it still trails that of the US, Canada's most important competitor, especially in the area of taxation. Canada only made progress on improving the competitiveness of its tax system late in the 1990's. As of 1997, Canada's tax burden as a percentage of GDP (36.8%) was significantly higher than that of many of Canada's important trading partners such as the U.S. (29.7%), Japan (28.8%) and Mexico (16.9%).

Alberta and Ontario led with tax reforms and were followed by the federal government with its February 2000 budget and the subsequent mini-budget released in October 2000. The federal government improved personal income taxes by restoring inflation indexation, lowering the rates and inclusion thresholds of all the brackets, eliminating the 5% surtax and substantially reducing the capital gains tax (by lowering the inclusion rate from three-quarters to one-half).

The federal government also lowered corporate taxes with the basic federal corporate tax rate expected to decline by 7 percentage points to 21% by 2004. This represents progress, however even with this reduction, Canada's general rate (36.3%) will be higher than the average OECD rate (34%) and will not match the superior tax environments of the US or countries such as Finland, Sweden and Ireland.

The key determinant for firm investment in upgrading is the effective tax rate that will be applied to an additional dollar of investment.[36] The effective marginal rate reflects the implementation of the statutory rate and takes into consideration aspects such as deductions for capital costs, tax credits and capital taxes levied by various levels of government.[37] Even when fully implemented, the effective marginal tax rate in both manufacturing and services in Canada will be substantially higher than in UK, Germany, Italy, Sweden and Ireland, even if they stand completely still while Canada implements its reductions. And it will match the US by 2004 only if the US stands completely still while Canada reduces.[38]

Fundamental tax reform is a daunting task, but at this point Canada remains behind the US, its most critical competitor for human and corporate assets. Tinkering on the margin has little

[36] Duanjie Chen, *"The Marginal Effective Tax Rate: The Only Tax Rate that Matters in Capital Allocation"*, C.D. Howe Institute Backgrounder, August 22, 2000

[37] Jack M. Mintz, *"The February 2000 Federal Budget's Business Tax Measures: Is Canada Missing the Boat?"* C.D. Howe Institute Backgrounder, March 23, 2000, p.4.

[38] Duanjie Chen, "International Tax Program", Rotman School, University of Toronto.

prospect of succeeding. Canadian governments have a great opportunity to show innovative leadership in taxation policy and inspire Canadian firms to do likewise with their strategies for international competitiveness.

On the personal taxation front, further reduction in the capital gains tax to provide still stronger incentives for investment in building new businesses would provide a boost for innovation. In addition, given the importance of building specialized human capital, investment in any sort of specialized skill acquisition should be made fully tax deductible for individuals as well as for firms.

On the corporate taxation front, the governments must take into consideration that with rapidly increasing globalization, corporations have greater scope to choose where to invest and have more opportunity to determine in what jurisdiction to earn corporate income. International tax arbitrage is shrinking the share of revenues from corporate income taxation as corporations move ahead of governments in managing their tax exposure. In this environment, Canada should explore the dramatic reduction of corporate income taxation. Jack Mintz, Canada's leading expert in corporate tax policy, advises that " rather than simply trying to match US corporate rates, Canada should aim to create a distinctive Canadian advantage for businesses to locate here to serve the North American market."[39]

Improving the Microeconomic Business Environment

Canada's microeconomic environment is relatively advanced, but is falling behind. The nation must become more aggressive to stop losing ground compared to other advanced nations.

Investments in education, training and specialized skills upgrading have among the highest pay-off of any investment government can make in improving the microeconomic environment for business. This is especially the case if investments create the specialized skills that are relevant to Canada's clusters of strength. While there are examples of such investments in Canada, for example the Ontario Access to Opportunities program designed to dramatically increase the province's annual output of engineers and scientists, the Canadian record overall is disappointing.

Universities and university research play a significant role in the innovative capacity of a nation. University graduates are major participants in the development of innovation-enhancing, knowledge-based industries.[40] In addition to seeking their graduates, knowledge-based industries look to universities to perform related research and development.

Canada historically led the world in public spending on higher education as a percentage of GDP, but has been on a long-term path of decline that has accelerated during the 1990's. Higher spending itself will not ensure greater prosperity unless there are other improvements in the microeconomic business environment. However, it is interesting to note that seven of the top ten countries on the Innovation Index increased their public spending on higher education (% of GDP) over the 1975 to 1995 period, while Canada and two others did not. On average, the former seven increased their GDP per capita at a rate 37% faster than the latter three (including

[39] Jack M. Mintz, *"Why Canada Must Undertake Business Tax Reform Soon"*, C.D. Howe Institute Backgrounder, November 4, 1999.

[40] Munroe-Blum, *Growing Ontario's Innovation System*, Figure 4.

Canada).[41] Instead, Canada needs to make an unprecedented level of investment in specialized education to bolster Canadian managerial skill in strategy.

A second opportunity area is to encourage firms to build global strategies pursuing more ambitious goals. Canadian firms that succeed competing globally should receive enthusiastic public support. Success models should be given high public profile and successful global pioneers recognized conspicuously. Canada could create an award for Canadian global competitive success with a prestige equivalent to the Baldridge Award for Quality, which has catalyzed a huge and beneficial quality movement in the US.

A third area of opportunity is in cluster development. There is room for governments to show greater entrepreneurial acumen and zeal in providing support to clusters, whether in providing specialized training and research institutions, specialized infrastructure, or incentives for related and supporting industries to co-locate. Governments should seek out cluster participants and proactively understand their needs at a time when early action can have a transformative impact. There is little evidence worldwide that governments can succeed in choosing investment industries proactively. However, governments can and do promote the health and development of clusters by understanding their specialized factor requirements, determining which have such high levels of externalities involved that individual firms will not invest to create them, and proactively invest on behalf of the industry. Such investments can include specialized educational programs, specialized infrastructure, or special regulatory regimes.

Government at all levels has a critical role to play in creating a better environment for upgrading competitiveness. But to do so, Canadian governments also will have to rise above replicating the actions of its main competitors. Canada can move ahead and be the first to implement new learnings on the productive role of government in the 21st century. For example, when Chile privatized its social security system to create the conditions for an efficient capital market to bloom, it broke significantly with the policies of similar developing countries. In doing so it created substantial advantage for Chilean firms in raising private capital.

Transforming Company Operations and Strategies

While the macroeconomic context and the microeconomic business environment create the conditions for prosperity, ultimately companies need to take advantage of these conditions to make choices consistent with productivity upgrading.

Research on firm-level competitiveness has revealed the critical importance of a distinctive strategy. Firm-level competitive advantage rarely results from benchmarking against competitors and replicating their choices. Rather, competitiveness results from making a set of choices that produces a distinctive positioning and is manifested in a tailored system of activities. This activity system creates customer value distinct from competitors and makes replication by competitors difficult by confronting them with painful trade-offs.[42]

The single most important priority for Canadian prosperity is to bring about a transformation in the way Canada's companies compete. Historically, natural resource endowments and high tariff

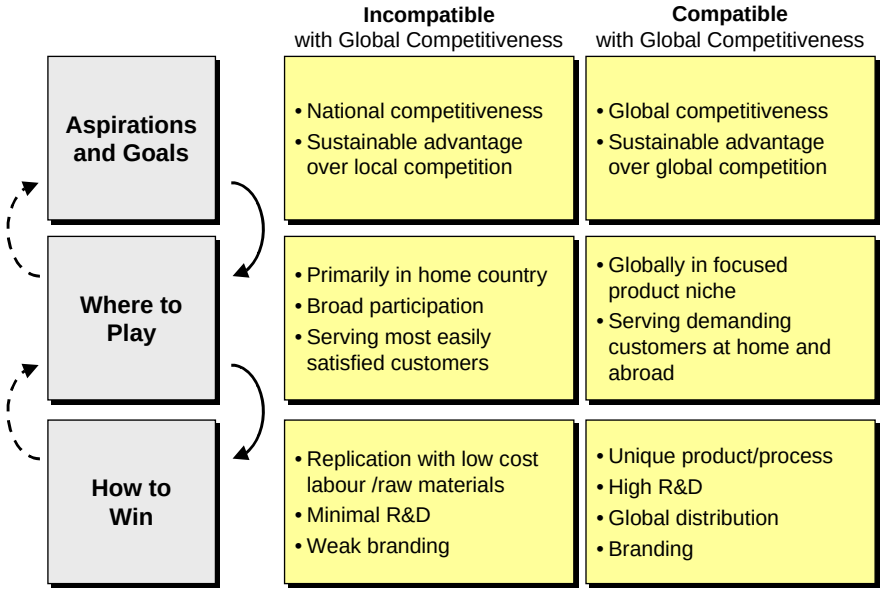
[41] Porter & Bond, *"Innovative Capacity and Prosperity"*, 2000.
[42] Michael E. Porter, "What is Strategy?" Harvard Business Review, November-December, 1997.

barriers have combined to produce a tendency toward a set of company strategy choices that are distinctly incompatible with global competitiveness.

This set of choices is incompatible with rising prosperity. It does not lead to the intensive investments in upgrading necessary for high productivity and international competitiveness. Instead, investments are oriented toward national or local competition. R&D spending is low and investments in branding minimal.

If the nation is to move forward, a greater proportion of Canadian firms must make an alternative set of choices. These are shown on the right column in the figure.

Strategic Company Choices



In resource-intensive industries, Canadian firms must move to more unique production processes and evolve their positions to more differentiated industry segments. The increasing share of processed goods being exported from Canada's resource-based industries is encouraging first step, but much more technological upgrading is needed. Beyond this, resource firms must increasingly export technological and managerial expertise rather than simply export the commodities themselves. This will manifest itself in more aggressive outward foreign investment.

Outside the resource sector, progress will require a changed attitude toward their strategies and their business environment on the part of many Canadian firms. Firms most move beyond assimilating best practices created elsewhere to pioneering new best practices. And most importantly, they must pursue distinctive strategies.

In addition, Canadian firms must take greater responsibility for enhancing the local microeconomic context in their sector and strengthening their cluster. This requires a tricky combination of behaviors. On one hand, fierce competition with local rivals will strengthen the cluster by creating pressure for upgrading and providing customers with more opportunity to be sophisticated and demanding. On the other hand, some forms of cooperation to promote

specialized factor creation (for example, through support of educational institutions) and improvements in infrastructure will result in higher productivity for the industry as a whole.

Competing Through Innovation: The Telecommunications Cluster

While, in an environment that makes innovation and upgrading challenging, many Canadian industries followed the pattern of the newsprint industry, some industries took a different course. That they have succeeded in competing globally on the basis of sophisticated products and processes, even in some high technology fields, reveals the real potential of Canada. The progress since 1991 of a second industry we studied, the central office switch industry, illustrates how an industry can compete globally from a Canadian home base. In 1991[43], central office switch equipment for telecommunications services providers was Canada's most prominent and important high technology industry. Central office switches comprised approximately 25% of global telecom equipment sales. Canada's success illustrates the principles we have outlined. Thanks to an early decision to innovate through moving from analog to digital switches, Canada's Northern Telecom enjoyed the leading market share in the important digital segment as of the time of the study.

The prospects for the industry looked quite strong as of 1991. Northern Telecom had spawned spin-off firms such as Newbridge Networks and Mitel. A vibrant telecommunications equipment cluster in the Ottawa area was forming. Canadian firms had shown the inclination to innovate and upgrade. Northern Telecom had also pursued aggressive international expansion, rather than staying at home.

The telecommunications equipment cluster enjoyed relatively sophisticated home demand from Canadian customers who were privately owned and regulated rather than government owned as they were in most countries outside North America. Canadian cluster participants also enjoyed favourable access to high-quality personnel due to relatively strong investment in specialized human capital development in telecommunications-related fields by Canadian governments. Canada had also built up sophisticated research capacity in this field.

However, there were challenges for the Canadian cluster going forward. Competitors were envious of Northern Telecom's leading market share in this rapidly growing industry. Early deregulation in the US carrier business created an environment in which the most demanding and sophisticated customers were increasingly located in the US market.

Over the past decade the central office switch industry has evolved in ways few have predicted. The central office switch declined dramatically in importance and was replaced by optical systems as the driving segment. Thanks to bold strategy, early collaborative research with the National Research Council (NRC), and a bit of luck, Nortel Networks emerged by the end of the decade as the undisputed global leader in the optical systems market. Another Ottawa-based start-up, JDS Uniphase, became the global leader in optical components.

Northern Telecom was already investing heavily in optical transmission in its small transmission business in the late 1980's. The development of the SONET standard for optical transmission and Northern Telecom's investment in the OC48 standard enabled it to dominate the OC48 market

[43] Data in next four paragraphs drawn from Porter and Monitor, *"Canada at the Crossroads"*, 1991

and supply MCI and Sprint in building out their superior high-speed alternative carrier networks in the deregulated US long distance market. [44]

Meanwhile, in its core business, Northern was aggressively globalizing, including the purchase of STC in the UK (completed in 1991) to open up the European market, a strategic alliance with Matra of France (in 1992), and entry into the China switch market (first sale in 1993).[45]

Though transmission remained a relatively small business, Northern made a critical decision in 1993 to invest heavily in a new generation of optical transmission, OC192, which promised dramatically faster and more cost-effective bandwidth.[46] Optical transmission efficiency was further enhanced by the development of optical amplifier technology and Wavelength Division Multiplexing (WDM and later Dense WDM or DWDM).

The Ottawa cluster proved to be a significant advantage. Research in DWDM was enhanced through industry collaboration among members of the Solid State Optics Consortium (SSOC), an industry consortium supported by the NRC. The SSOC brought together companies like Nortel, government institutions like the Department of National Defense, and research organizations like the Communications Research Centre and the National Optics Institute.[47] One of the pioneers of DWDM and a key member of the SSOC was Joseph Strauss who left Northern in 1989 to found a firm that has grown and acquired to become JDS Uniphase.

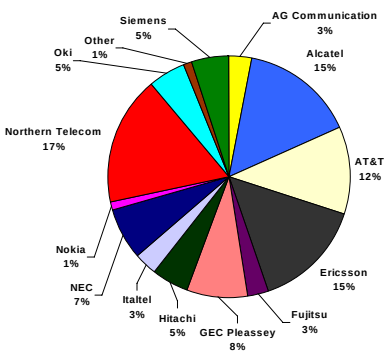
When the US Telecommunications Act of 1996 opened the industry for alternative carriers a huge new market for transmission equipment in the US was created, while the emergence of Internet Protocol (IP) technology grew the demand for bandwidth exponentially.

In 1998, Northern announced a 'right angle turn' to IP data transmission and changed its name to Nortel Networks. Northern's 1991 business of switching voice traffic over copper wire had given way to switching and transmitting enormous volumes of data traffic over optical networks. The acquisition in 1998 of Bay Networks, a Silicon Valley data transmission firm, solidified the future direction of the company. From a base of almost zero as of the time of the 1991 study, Nortel's optical systems sales grew to almost $5 billion in 1999 and forecasted $16 billion in 2001.[48] Central office switching equipment dropped to 23% of sales by 1998 and continued declining.[49] Nortel had managed not only to lead in the dominant product segment of 1990 – digital central office switches– it has managed to lead in the dominant segment of 2000 –optical systems:

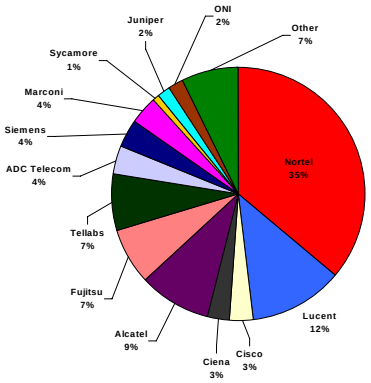
[44] Interviews with current and former Nortel Networks executives
[45] Larry MacDonald, *"How Innovation and Vision Created a Network Giant"*, John Wiley & Sons, 2000
[46] The next two paragraphs draw on interviews with former and current Nortel Networks executives
[47] A. Carthy, *"Industry, government, university relations – Case studies of successful partnerships"*, presentation given to the Annual Conference of the Canadian Operational Research Society, May 1997.
[48] Susan Kalla, *"Lights Dim for Fiber Optics: Industry Overview and Statistics"*, BlueStone Capital, November 2000.
[49] Nortel Networks Annual Reports, 1991-1998.

Leadership in the Optical Systems Market

Share of Digital Local Lines Placed in Service, 1989



Share of Optical Systems Market, 2000E



Source: BlueStone Capital Market Analysis, November 2000, Northern Business Information, 1990 Edition

Nortel became the world's largest telecommunications equipment supplier with approximately US$30 billion in sales in 2000.[50] JDS Uniphase was transformed from an obscure start-up into a global leader in optical components.

A strong telecommunications equipment cluster has developed in the Ottawa region. In addition to Nortel and JDS Uniphase, which have a close alliance, there is Celestica, the world's largest manufacturer of outsourced optical components and systems. The cluster has expanded to include many related industries/business areas such as fibre optics, optoelectronics, semiconductor design broadcast technologies and computer telephony and voice recognition systems.[51] Of these, fibre optics is regarded as the driving force behind the region's surge in economic growth. It is estimated that 100 of the 1,000 technology companies employing nearly 70,000 people in the region are in the fibre optics industry.[52] The region is believed to have the greatest concentration in the world of experienced optical engineers with approximately 4,000-5,000.[53]

Ottawa's two universities have developed a set of programs devoted to telecommunications. The NRC and the Communications Research Centre (CRC) continue to be engaged in leading edge telecommunications research both independently and in strategic partnership arrangements with private firms.[54] As Nortel migrated to fibre optics, it spurred an interest in the broad field of photonics: technologies emerging from the union of laser and fibre. Industry activity and interest in photonics has been encouraged by various government initiatives including activities by Photonics Research Ontario (PRO), an industry organization supported by the Ministry of

[50] Tom McCall, *"Top Eight Telecom Equipment Manufacturers Experienced a Shift of Power in 2000"*, Gartner Dataquest, February 28, 2001
[51] http://www.ottawaregion.com/advancedtech/teleccom.htm, Ottawa Economic Development Corporation
[52] "Ottawa Connects Through Fiber Optics", Rex Crum, September 12, 2000, Upside Media Inc.
[53] Interviews with current and former Nortel Networks executives
[54] http://www.ottawaregion.com/advancedtech/telecom.htm, Ottawa Economic Development Corporation

Energy, Science & Technology. PRO organizes networking workshops, publishes an industry newsletter and supports three research facilities.[55]

Nortel and the Ottawa optical cluster are not without challenge. The optical systems market is so large and so attractive that billions of dollars of private equity are flowing into the market in an attempt to create the next leader. US venture capital financing for optical systems startups is viewed as dwarfing the capital available in Canada, leading to optical clusters in Silicon Valley, Boston, New Jersey, Texas and elsewhere. Start ups such as Sycamore Networks (founded in the US by Canadian expatriate engineer Desh Deshpande) has at least temporarily leapfrogged Nortel on bandwidth with 120 wavelength OC192 compared with Nortel's 32 wavelength OC192 (though Nortel has announced 160 wavelengths).[56] Also, the pool of optical engineers in the Ottawa area has become the target of optical startups.

Nortel Networks, JDS Uniphase and other Canadian telecommunications firms acted boldly and aggressively. Rather than attempt to maintain current positions through replication and operational improvement, they chose innovative strategies with global aspirations, exploited entirely new markets, and succeeded on the basis of heavy R&D and managerial innovation. The net result is that as of 2001, Canada leads the world in optical systems, the most important telecommunications equipment market of the current period. The future will be challenging, but Canadian firms are in an attractive position to address them.

The trajectory of Nortel Networks and Canada's telecommunications cluster illustrate what is possible for Canada as a whole. Competitiveness arises from the combination of good company strategies and a dynamic cluster embedded in a favourable business environment. Nortel Networks and other Canadian companies made clear strategic choices. They drew on the strength of other companies and institutions in the Ottawa telecommunications cluster. A favourable microecomnomic business environment provided well-educated, specialized researchers and employees, and openness to trade was realized towards the dominant market in the U.S.

Concluding Thoughts

The courses taken by the Canadian newsprint and central office switching industries over the past decade provide a graphic illustration of the choices laid out for Canada in *Canada at the Crossroads* in 1991.

While the newsprint industry has made some progress, the industry has taken a path of incremental improvement with the result that a devaluing Canadian dollar has been the only way to maintain profitability despite a global export share that is drifting downward. This picture of a gentle drift downward is utterly consistent with the unfavourable path forward under *Canada at the Crossroads*.

Nortel Networks and the other Canadian companies could have maintained focus on electronic voice switches for the public switched telephone network, and concentrated on financial and managerial improvements. The industry would have experienced a drift downward, and firms could have rationalized the inability to enter new segments because of disruptive technology.

[55] http://www.pro.on.ca/aboutpro/programs/progin.htm, Photonics Research Ontario
[56] Dan Green, Harvard Business School Case: *Sycamore Networks*, 2001

However, the industry provides a vivid illustration of the other path. Firms chose instead to invest heavily in innovation. At each critical step, they were inclined to imagine the possibilities rather than focus on the constraints. In doing so, the Canadian telecommunications cluster grew and broadened managing to establish a dominant leadership role in the new segment and to spur growth in the next generation of leading edge technologies. For shareholders, the Ottawa region, and Canada overall, these choices have contributed mightily to growth in prosperity.

The difference in trajectory is not a function of whether the industry is "high-tech". All industries today are "high-tech", and can employ advanced technology. Every firm has the opportunity to develop competitive advantages building on unique strategic positions. Toronto-based Four Seasons Hotels and Resorts is an impressive example of a company in a so-called low-tech service sector that has created impressive results build on a set of consistent strategic choices (see Box 2, below).

BOX 2 - Strategy in Action: Four Seasons Hotels and Resorts

Four Seasons Hotels and Resorts, a Toronto-based company, provides an excellent illustration of distinctive positioning and a reinforcing activity system leading to global competitive success.[1]

Four Seasons operates 51 luxury hotels and resorts in 23 countries around the world. It wins awards at an unprecedented level in industry publications as the leading player in the luxury hotel and resort business worldwide. Ten or more of its hotels routinely make lists of the top 100 hotels in the world (e.g. AAA Five Diamond Awards, Zagat Survey, Conde Nast Traveler, Travel & Leisure, Mobil Five-Star Awards). The company routinely appears on the Fortune list of best places to work. Its revenue per available room in the highly competitive US market is over 30% higher than that of its closest chain competitor, Ritz Carlton. Countries and cities around the world seek out Four Seasons to encourage the company to build a hotel in their jurisdiction because the presence of a Four Seasons signals that it is a quality location. The result is high and growing profitability and growth opportunities that financial markets have rewarded with a significant premium for Four Seasons stock compared to its peers.

Four Seasons has achieved this impressive performance not by being similar to its peers. Rather, the success has derived from making an integrated set of choices that is highly distinctive.

Four Seasons evolved a strategy to become aspired to be the leading luxury hotel chain in the world. Its goal was to develop a brand name synonymous with an unparalleled customer experience. ***(continued on next page)***

[1] Harvard Business School Case: *Four Seasons Hotels and Resorts*, 2000, Roger Hallowell plus interviews by Roger Martin and Christian Ketels

Relentless innovation and upgrading of productivity are what defines international competitiveness in the modern economy. While Canada has some firms that belong in the ranks of the world's best, the overall economy is not on the right course.

In 1991, Canada chose the familiar and comfortable path of benchmarking competitive firms and countries and replicating their actions and strategies. In 2001, the nation must choose the alternative path of innovation and bold strategy.

Canadian firms must take choices to implement sound strategies. Only strategic positions based on unique competitive advantages can support the upgrading of productivity for the whole economy. Canadian firms also need to take responsibility for the upgrading of their business environment, both through individual investments and collective action in industry associations and cluster initiatives.

BOX 2 - Strategy in Action: Four Seasons Hotels and Resorts *(continued)*

To meet these aspirations it chose to focus exclusively in serving high-end travelers who stay in luxury hotels. This choice was in direct contrast to large competitors such as Hyatt, Marriott, Hilton and Westin, all of which competed across the spectrum of hotel classes hotels including high-end niche brands such as Marriott Marquis and Conrad Hilton. By competing across the spectrum of hotel classes, competitor chains struggled to establish consistent high-end service and branding. The only hotel chain with focused high-end positioning, The Ritz-Carlton chain, with 36 hotels worldwide, saw the foundations of its positioning endangered when it was purchased recently by Marriott and made part of a broad-based chain.

A second choice was to pursue a truly global strategy with its growing portfolio of hotels and resorts in key destinations around the world. This distinguished Four Seasons from the bulk of smaller high-end competitors. Competitors such as Mandarin Orient (20 luxury hotels mainly in Asia) or Peninsula Group (8 hotels in Asia and US) could not provide ubiquitous global service to their high-end clientele.

The final key choice, which was made in 1985, was to specialize as a hotel manager, not a hotel developer and owner. This was an entirely distinct choice in the industry until Marriott's recent decision to divide into two entities: hotel ownership and hotel management companies.

In order to deliver its positioning, Four Seasons set out to win on the basis of a brand that stands for consistently unparalleled customer service. This strategy was reinforced by the decision to focus only on one class of hotel/resort – high-end– and only on hotel management, not both management and real estate ownership and development.

Four Seasons also determined that the favorable customer service experience would be based not on the physical grandeur of the property but rather on the consistent quality of employee-customer interaction.This led to choices consistent with creating and empowering a workforce utterly committed to high levels of service. One such choice was to focus entirely on medium-sized hotels that created a sufficiently intimate environment that the staff could provide customized service to each and every guest. A second choice involved promoting a "golden rule" work environment (i.e. do unto others as you would have them do unto you) throughout the company in the belief that employees working in such an environment would naturally treat guests in a consistent manner.

Choices that reinforce the capacity to provide unparalleled service include intensive selection procedures (for the New York City hotel 400 employees were hired from a pool of 30,000 applicants and 3,000 personal interviews), high commitment to ongoing training, prominent recognition systems, a bias toward promotion from within, and significant incentive compensation. The result is that Four Seasons enjoys considerably less turnover than competitors, more satisfied employees (as demonstrated by high rankings in the Fortune list of best places to work) and greater depth of experience in providing customer service.

Maintaining absolute consistency of the brand is critical to Four Seasons. This is accomplished by rotating experienced role-model employees around many hotels to inculcate new employees in new properties in the Four Seasons approach. It is also reinforced by strict global sourcing standards. Guests must experience consistency around the world in everything from the staff service to the quality of the bed linen.

Four Seasons' strategy has created a number of trade-offs that competitors are unwilling or unable to make. First, the focus on medium-size hotels in the top segment of the market limits the market size in a way many competitors find unacceptable. Second, the concentration on being a hotel manager instead of an owner limits the ability to capitalize on the appreciation of the real estate value.

Four Seasons also has made choices that competitors might be willing to copy but are unable to make, at least in the short- to medium term. The first is the alignment of all employee behaviour toward exemplary customer service. The combination of recruiting, screening and selection, training and incentive system activities took Four Seasons over a decade of committed design and practice to create. Second, Four Seasons focus on the upper segment of the market creates a challenge for competitors that operate a portfolio of brands that they attempt to position separately but under one umbrella. They find it difficult to resist the short-term financial benefits of sharing overhead across the brands, even though such sharing tends to undermine the higher-end brands. ***(continued on next page)***

Strategy in Action: Four Seasons Hotels and Resorts *(continued)*

Imitating some aspects of a strategy, but not all, leads to a large gap in performance. Should one of the large hotel chains, for example, copy Four Seasons focus on medium-sized hotels in a selected number of prime locations, it would forsake a large part of the market. And without the additional activities in terms of recruiting, training, and so on, it would not even reap the benefits of superior personal service that merits higher prices from the most discriminating travelers.

Because the Four Seasons strategy is unique and ensconced in an activity system that would force competitors to make unacceptable tradeoffs in order to match, competitors have been disinclined to imitate Four Seasons despite its obvious success. The result is a Canadian global leader with attractive growth prospects for the future.

Canadian firms must also understand that competing in Canada alone will not provide the kind of incentives and pressures to build a unique competitive position; staying at home will eventually destroy them. Companies must decide to compete on the basis of unique products and processes in the most demanding markets globally. This road will be profoundly worrisome, even frightening at times, but it is necessary for Canada to prosper and not continue to slowly decline relative to other leading nations.

Canada's governments –federal, provincial, and municipal– cannot simply follow other countries and states and exhort Canada's firms to engage in new modes of competition. Instead Canada's governments also must get out of their comfort zones in order to pursue innovative and bold strategies to provide uniquely favourable microeconomic environment for business in a leading macroeconomic context.

Only if both businesses and governments together choose to challenge themselves to new ways of thinking and competing will Canada truly prosper in the new millennium.