Institute for
Competitiveness & Prosperity

Realizing Canada's prosperity potential

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Institute for
COMPETITIVENESS & PROSPERITY

The Institute for Competitiveness & Prosperity is an independent not-for-profit organization established in 2001 to serve as the research arm of Ontario's Task Force on Competitiveness, Productivity and Economic Progress. The mandate of the Task Force, announced in the April 2001 Speech from the Throne, is to measure and monitor Ontario's competitiveness, productivity, and economic progress compared to other provinces and US states and to report to the public on a regular basis.

The aspiration of the Task Force is to have a significant influence in increasing Ontario's competitiveness, productivity, and capacity for innovation. The Task Force believes this will help ensure continued success in the creation of good jobs, increased prosperity, and a higher quality of life for all Ontarians and, by doing so, improve the economic prospects for all Canadians. The Task Force intends to seek breakthrough findings from their research and to propose significant innovations in public policy to stimulate businesses, governments, and educational institutions to take action.

This special report on Canada's competitiveness and prosperity was prepared for the 2005 Annual Meeting of the World Economic Forum in Davos. It was made possible by support from Magna International Inc., Microsoft Canada, and the Joseph L. Rotman School of Management. We welcome your comments on this report.

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Realizing Canada's prosperity potential

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Foreword and acknowledgements

I am pleased to present this special report, *Realizing Canada's prosperity potential,* on the occasion of the Annual Meeting 2005 of the World Economic Forum in Davos.

We can take pride in our achievements as Canadians in creating one of the world's most successful economies. Except for the United States, no other country of comparable or larger population has reached our level of prosperity. We have also achieved an enviable balance between prosperity and equity in sharing the benefits. Yet we are urging Canadians to aspire to perform at an even higher level and realize our full prosperity potential.

Our prosperity gap with the United States continues to be worrisome. In GDP per capita we trail our most important trading partner by 16 percent. This translates into an unrealized potential of $15,000 after tax disposable income annually per Canadian family. In our research, we have found no reason why we Canadians have to accept this lower standard of living.

In last year's report, we determined that the prosperity gap was the result of lagging productivity. Canadians are not as successful as their US counterparts in creating value from our labour, intellectual, physical, and natural resources. In this year's report, we update the research into our under investment and the de-motivating aspects of our marginal effective tax burdens, especially in human, physical, and technological capital investment. We also present new research into market structures in Canada, concluding that our businesses are not benefiting from specialized support resources such as industry/university collaboration and specialized research and training. Nor are they benefiting from the pressure to innovate that comes from capable rivals and sophisticated customers. Our market structures, in concert with government policies, are not strengthening our innovative capacity.

We synthesize this work and the work in our previous two years to set out an action plan for Canadians to realize our prosperity potential.

We gratefully acknowledge the funding support from the Ontario Ministry of Economic Development and Trade and the special funding for this report from Magna International Inc., Microsoft Canada, and the Rotman School of Management.

We look forward to sharing and discussing our work and our findings. We welcome your comments and suggestions.

Roger L. Martin
Dean, Joseph L. Rotman School of Management, University of Toronto
Chairman, Institute for Competitiveness & Prosperity

Realizing Canada's prosperity potential

Canada's prosperity gap

Higher productivity is the key to closing the prosperity gap

Canada's economy is among the strongest in the world, behind only the United States when ranked with jurisdictions of comparable or larger populations. But while Canadians enjoy a high standard of living, we cannot be complacent. We must continuously strive to be internationally competitive with our main trading partners so we can maintain and raise our standard of living. Competitiveness is an imperative, not an option, in today's global economy.

The Institute for Competitiveness & Prosperity has analyzed Canada's international competitiveness and identified a prosperity gap with the United States – our most significant trading partner and North American neighbour – that is worrisome. To reverse this trend and realize our prosperity potential, Canadian individuals, businesses, and governments need to partner more effectively to generate higher prosperity from our physical and human resources. Our efforts today are our investment in prosperity for future generations.

Canada's economy is strong, but the prosperity gap persists

Canada continues to be one of the best places in the world to live, work and invest. Our economy continues to grow and is one of the strongest in the world (Exhibit 1). In absolute terms, Canada enjoys a high standard of living as a result of growth in economic output, reductions in government deficits, and avoidance of inflation spikes. At the same time, governments have maintained the social services necessary to ensure the well-being of all citizens. The country has also taken initiatives to address the challenges presented by an ever-increasing global economy. Today, Canada's exports account for 38 percent of our Gross Domestic Product (GDP), the highest share among the world's most productive economies.

Although Canada's economy compares well against the rest of the world, it significantly trails US economic performance. Given the similarity between the two countries, we believe the US benchmark is the most appropriate measure to compare our economic results against and to draw on best practices.

Exhibit 1 Canada's economy out performs most others

GDP per capita at Purchasing Power Parity in C$ (2003)

RANK	COUNTRY	GDP per capita at PPP
1	United States	$45,700
2	Canada	$38,500
3	Netherlands	$35,500
4	Australia	$35,200
5	Japan	$34,000
6	Germany	$33,300
7	France	$33,000
8	United Kingdom	$32,700
9	Italy	$32,700
10	Taiwan	$29,700

Source: Institute for Competitiveness & Prosperity, World Economic Forum.
Note: Countries with populations over 16 million (i.e., half of Canada's or greater).

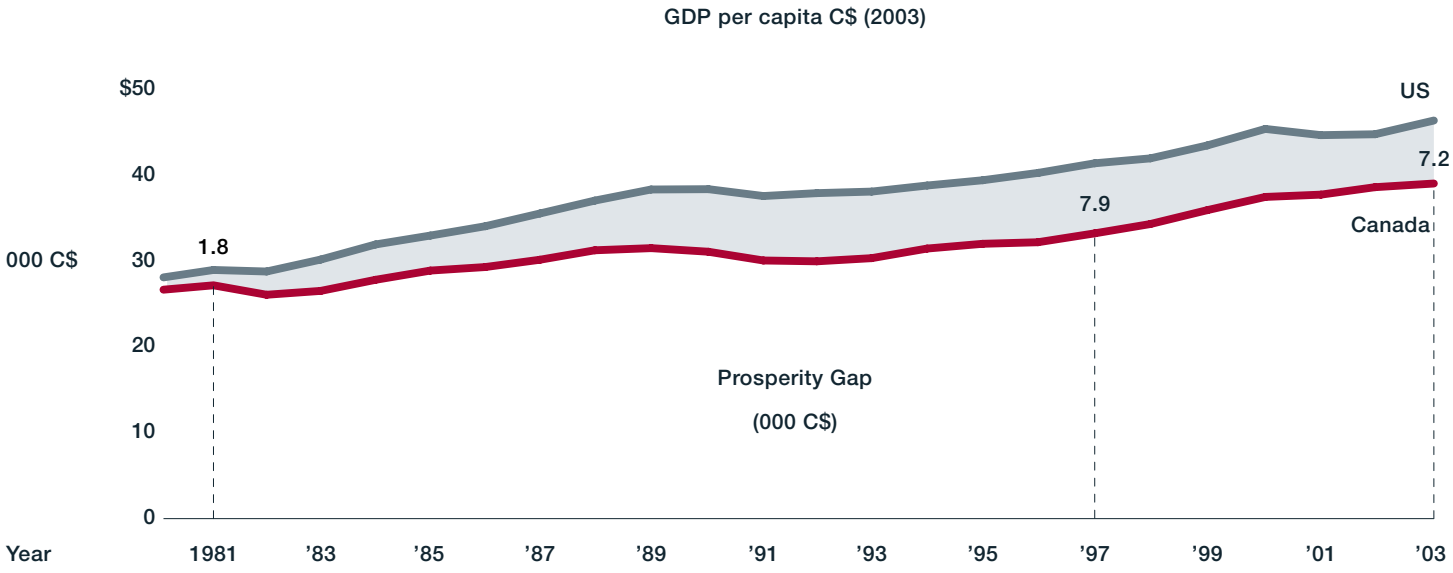
Against the United States, we have a large and persistent prosperity gap (Exhibit 2). In 1981, Canada trailed the United States by only $1,800 in per capita GDP,[1] but the gap rose dramatically until 1997 and stood at $7,200 in 2003. The gap suggests that Canadians are not deriving the same benefits from our endowments in human and physical capital as our counterparts in the United States. But the Institute has concluded that there is no unalterable weakness in the Canadian economy that would prevent us from closing the gap and that Canada should not accept its distant second place ranking among the world's largest and most prosperous economies. Canadians must get to work to raise their aspirations and realize their prosperity potential.

Eliminating the prosperity gap would represent a significant economic improvement to Canadian families and governments. If Canadians were able to overcome this prosperity gap, the average Canadian household annual after tax disposable income would rise by $15,000. Families would be able to choose among several meaningful spending options. For example, among mortgage holders, their annual payments ($9,300) would be more than covered.[2] Among renters, their average annual bill of $6,900 would be more than covered. The increased disposable income could cover renovation costs of $5,500, and Canadians could increase their recreational spending (currently $3,600 per household) significantly. Many more could choose to invest more in their RRSP contribution (currently $3,900 per contributing household in Canada). Further, provincial and federal governments would also benefit, collecting an additional $90 billion annually from Canadian taxpayers without increasing tax rates. This extra tax revenue would enable Canada's governments to raise dramatically the level of investment and quality of service in health care, education, and other social services and simultaneously to reduce tax rates.

In closing the prosperity gap, we think it is important to ensure that we maintain our enviable achievements in the equitable distribution of our prosperity. (See "Canada's prosperity and equity performance.")

While our economy is strong, Canadians must aspire to do better. We need to find creative ways to invest, to innovate, and to upgrade to raise our per capita GDP.

Exhibit 2 Canada's prosperity gap persists



Source: Statistics Canada; US Bureau of Economic Analysis; OECD PPP Indices.

[1] Unless otherwise stated, all dollar figures are in constant 2003 Canadian dollars using Purchasing Power Parity (PPP) conversion rates.
[2] Statistic Canada 2002, "Spending Patterns in Canada." Catalogue no. 62-202-XPE.

Higher productivity will narrow the prosperity gap

The key to closing our prosperity gap is to increase productivity – the ability of our people, firms, and governments to create value from our human, physical, and natural resources. But currently, individuals, businesses, and governments are not investing enough to raise productivity to the level achieved in the United States. Further, market structures are not providing the specialized support and competitive pressure that come from strong rivals and sophisticated customers to drive businesses to innovate and upgrade. Everybody in Canada has a role to play in increasing our prosperity.

In our analyses, we use Gross Domestic Product (GDP) per capita as the key measure of tracking economic progress over time. This allows us to benchmark our progress against other countries around the world. GDP per capita measures the output of an economy, or the "value added" in the conversion of a country's natural, labour, and capital resources into products and services that consumers buy domestically and around the world. GDP captures costs of inputs and the value of outputs.

Our review of the elements that drive growth shows that strengthening productivity has the most potential for raising Canadians' standard of living. But we have seen that the prosperity gap between Canada and the United States has increased over the last two decades. To understand the reasons for the gap versus the United States, we have built on the framework developed at Statistics Canada to disaggregate GDP per capita into measurable elements (Exhibit 3):

- **Profile** – the proportion of our total population who are of working age to contribute to our economic performance
- **Utilization** – the proportion of the working-aged population who actually look for (participation) and find work (employment)
- **Intensity** – the amount of time those who work are actually working
- **Productivity** – the success in translating working hours into products and services of value to customers in Canada and around the world.

Exhibit 3 Institute assesses four elements of GDP per capita

Prosperity		Profile		Utilization		Intensity		Productivity
GDP per capita	=	Potential labour force / Population	X	Jobs / Potential labour force	X	Hours worked / Jobs	X	GDP / Hours worked
				• Participation • Employment				• Cluster mix • Cluster content • Cluster effectiveness • Urbanization • Education • Capital investment • Productivity residual

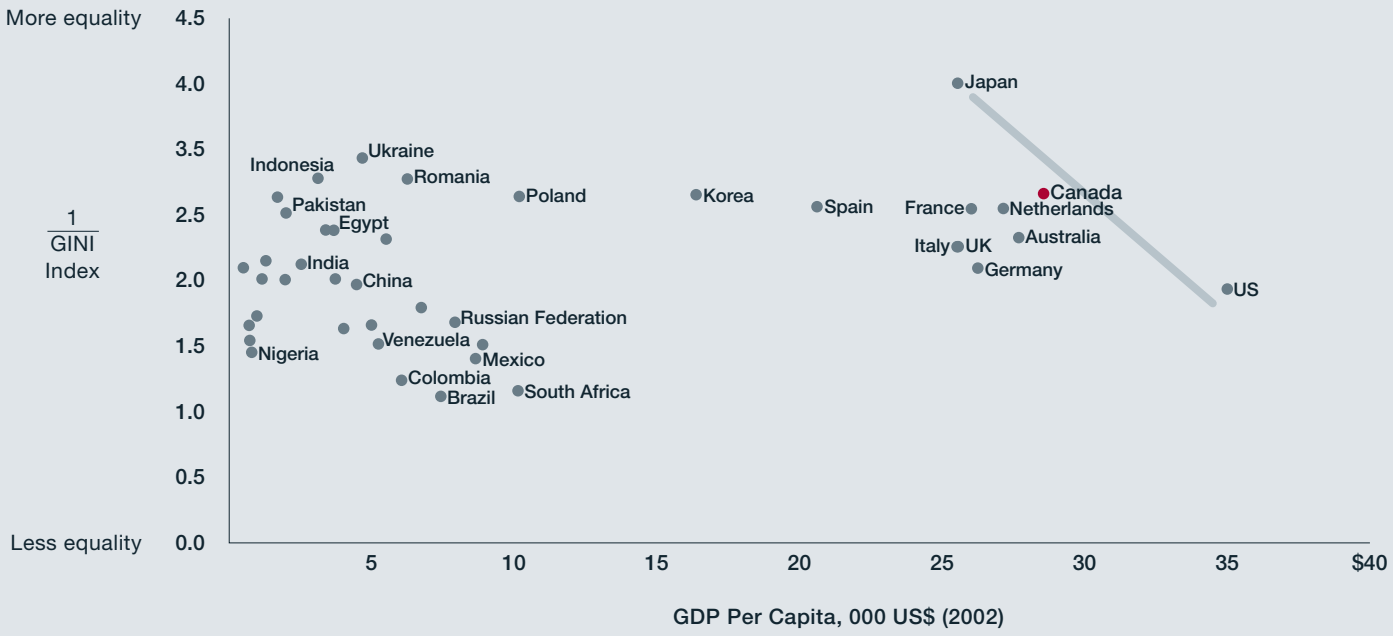
Source: Adapted from J. Baldwin, J.P. Maynard and S. Wells (2000). "Productivity Growth in Canada and the United States" *Isuma* Vol. 1 No. 1 (Spring 2000), Ottawa Policy Research Institute.

Canada's prosperity and equity performance

Economic and social policy observers remind us that, while average prosperity in a country is an important feature to track, so too is the distribution of that prosperity among residents. A high average GDP per capita can be the result of a small group of individuals doing extremely well, while the majority of residents lives in poverty. The challenge is to balance high prosperity overall with equitable distribution.

As we have stated, we use GDP per capita as our measure of average prosperity – it can be tracked over time and it is available for all countries. To measure the equality of distribution, most observers use the GINI index. The index varies between zero and one. A value of zero indicates complete equality – every person or household in the economy has exactly the same income.[a] A value of one indicates complete inequality where one person or one household has all the income and all others have none. In most developed countries, the value of GINI ranges from 0.25 (Japan) to 0.40 (the United States). Canada's GINI is at 0.32. (Exhibit A; note that the Exhibit uses 1 divided by GINI index so that a higher number indicates more equality)

Exhibit A Comparison between average prosperity and equality of distribution



Source: World Economic Forum: Global Competitiveness Report, World Bank, United Nations Development Agency.

[a] It is impossible to calculate an individual's or a family's GDP; however, there is a very close relationship between GDP and personal income.

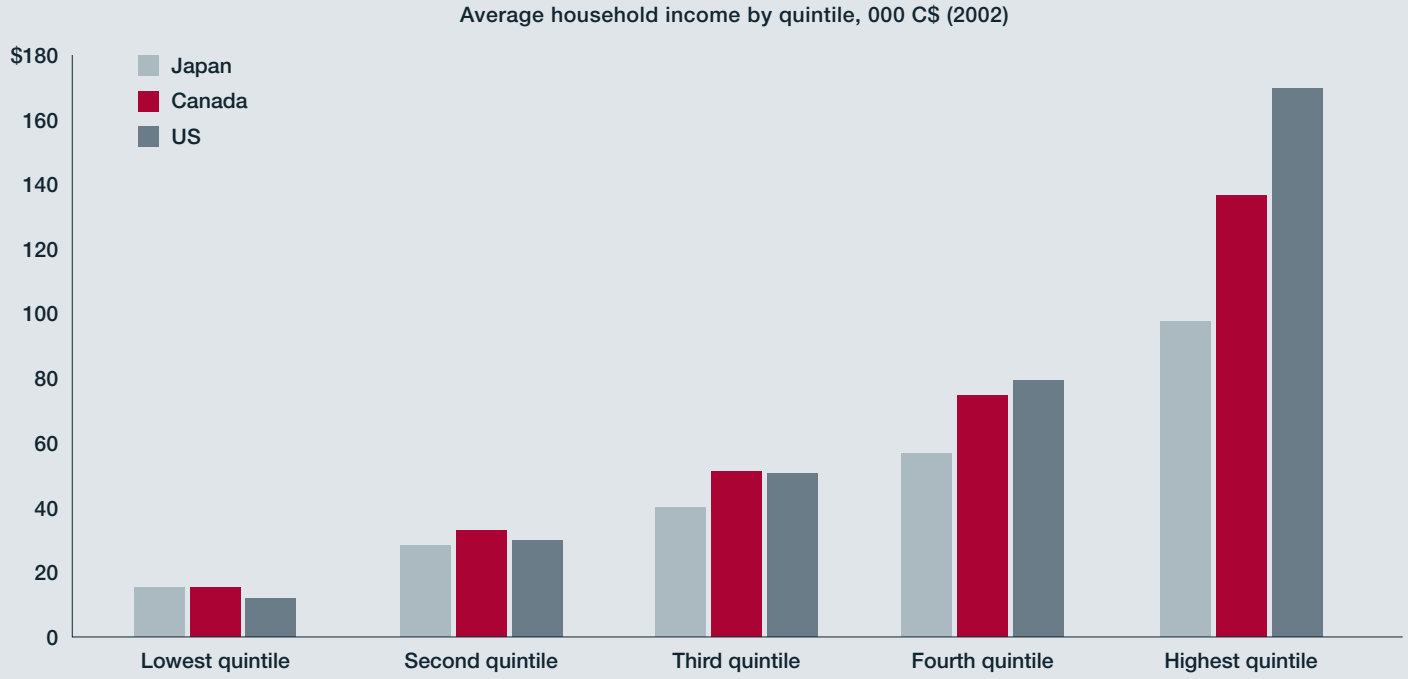
Developed countries have different results in the comparison between average prosperity and equality of distribution. Canada has an enviable position. As we have shown in the report, it has the second highest GDP per capita among countries with comparable or larger populations. Only Japan has achieved a more equitable distribution of income and it has lower average prosperity. Other countries have a lower average and less equitable income distribution. The United States has a higher average, but less equitable distribution of income.

In essence, Japan, Canada, and the United States form the frontier of prosperity and equality. All other countries perform at a lower level. The composition of incomes across households differs across the five income quintiles in Japan, Canada, and the United States (Exhibit B). When we compare Japan to Canada, we can see that even if we were to take an equity perspective we would not favour Japan over Canada because Japan has a better GINI only because its top four quintiles are poorer; its poor are no better off.

When we compare the United States to Canada, a different pattern emerges. The United States GINI is worse because its poor are poorer than in Canada and its rich are richer.

It is arguable that Canada has done the best job in the world of combining prosperity with economic equality. The challenge is to build on that platform and close the prosperity gap while maintaining our equality advantage.

Exhibit B Average household incomes show distribution of prosperity



Source: Statistics Canada, Income Statistics Division, *Survey* of Labour and Income Dynamics, Custom Table (Canada Data); US Census Bureau (2003), *Income in the United States: 2002,* Table A-4 (US Data); Statistics Bureau of Japan (2003), *Family Income and Expenditure Survey,* Table 3 (Japan Data); OECD PPP Indices.

[b] Bergstrom, Frederik and Gidehag,Robert, *EU Versus USA,* June, 2004, Timbro, p. 22.

To gain further insight into *productivity*, we have examined seven sub-elements we have identified to date:

- mix of our industries into traded clusters, local industries, and natural resources
- sub-industries that make up our clusters of traded industries
- productivity effectiveness of our clusters of traded industries
- degree to which our population lives in urban centres
- educational attainment of our population and its impact on productivity
- degree to which physical capital supports the productivity of workers
- residual productivity impact of other factors that we have not yet been able to explain.

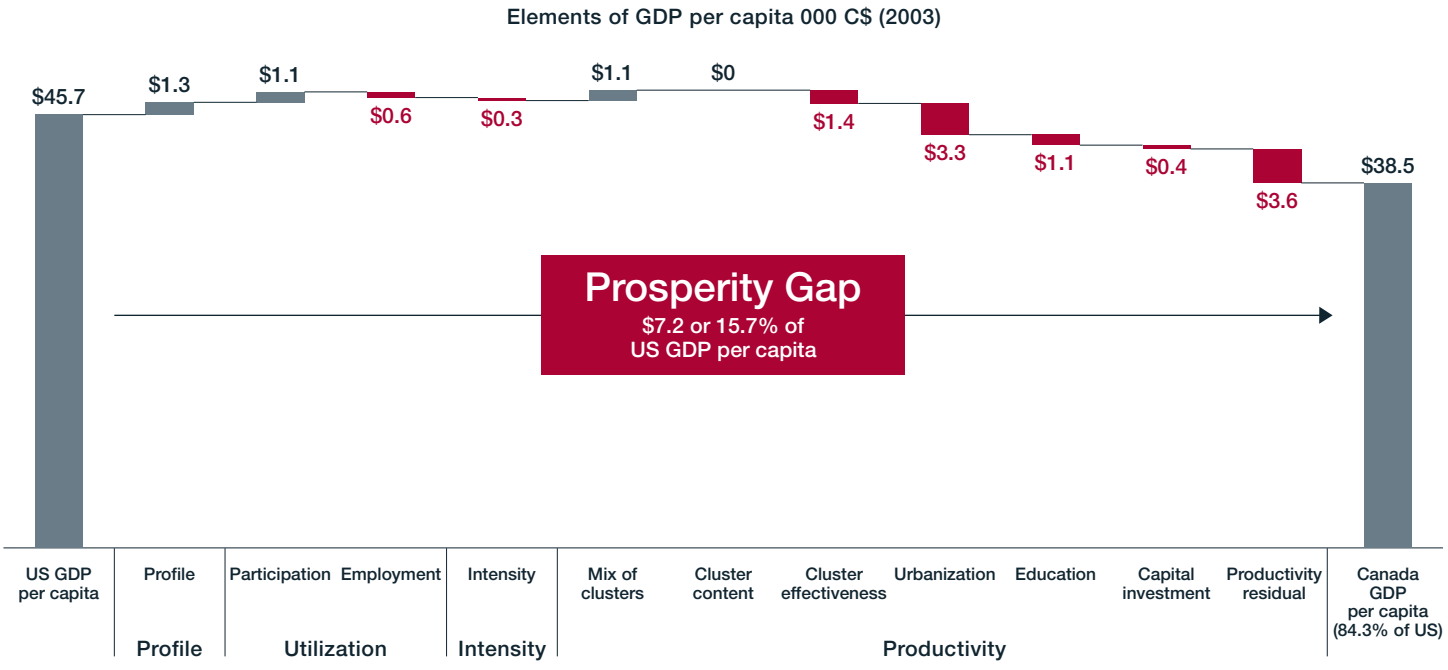
We look at each of these elements in our assessment of the overall prosperity gap. The most significant contributor to the prosperity gap is productivity (Exhibit 4).

Profile, Utilization, and Intensity have a limited impact on the prosperity gap

Canada's economy is strengthened relative to that of the United States by a slightly higher proportion of our population who are of working age; 67.6 percent of Canada's population is between ages 16 and 64 compared to 65.3 percent in the United States. Canada's demographic **profile** generates a $1,300 per capita advantage relative to US performance. In other words, if the only factor that mattered in a country's GDP performance were the proportion of the population of official working age, then per capita GDP would be $1,300 higher in Canada than in the United States.

Utilization of the working age population is a slight advantage for Canada. Canada has a higher percentage of its working-aged population seeking work (68.1 percent) than the United States (66.2 percent) – that is, it has a higher *participation* rate. This equates to a $1,100 per capita prosperity advantage for Canada. However, Canada's economy continues to be slightly less capable of creat-

Exhibit 4 Productivity drives Canada's prosperity gap with the United States



Source: Institute for Competitiveness & Prosperity based on Statistics Canada; Bureau of Economic Analysis.

ing jobs for its residents seeking work – a 92.5 percent employment rate versus 94.0 percent in the United States in 2003. This under performance in employment accounts for $600 of the prosperity gap. The net effect of these two results is an advantage for Canada of $500 per capita.

For most of the last twenty years, official statistics report that Canadians have worked fewer hours than Americans.[3] Based on 2003 results of Canada-US **intensity** difference – 33.0 hours worked per week in Canada versus 33.3 hours in the United States – we can attribute $300 per capita of the prosperity gap to this factor.

As this report was being finalized, Statistics Canada released the first of two studies on employment measurement issues to adjust hours worked data in the United States to improve comparability with Canadian data. This first study indicates that Canada's disadvantage in weekly hours worked could be higher than two hours. This would significantly increase our intensity disadvantage. The Institute will assess these findings as they are published.

Lagging productivity is the key driver of the prosperity gap

Five of the seven productivity elements account for the largest share of our prosperity gap with the United States.

Cluster mix and cluster content in Canada contribute positively to our productivity. In previous work, we identified the importance of clusters of traded industries to an economy's productivity, innovation, and standard of living.[4] Professor Michael Porter of the Institute for Strategy and Competitiveness, Harvard Business School, has identified the importance of clusters of traded industries to regional and national economies. Traded industries are those that are typically concentrated in specific geographic areas and sell to markets beyond their local region, whether domestically or internationally. Traded industries cover a wide range of manufacturing and service industries as well as high-tech and low-tech industries. Examples of traded industries are automotive, biopharmaceuticals, business services, hospitality and tourism, and textiles. Porter identifies two other types of industries: local industries, which are typically present in most geographic areas and primarily serve the local market; and natural resource industries, which are located primarily on the basis of resource endowments. Local industries include retailing, local health care, and local construction activity, while natural resource industries include forestry and mining.

Porter has identified clustering patterns among traded industries using the correlation of industry employment across geographic areas. Industries that are highly correlated constitute clusters.[5] Within clusters, groups of industries with a particularly strong correlation are identified as sub-clusters. For example, the automotive cluster comprises eight sub-clusters (e.g. assembly, parts, and forgings and stampings.) Traded clusters achieve higher levels of productivity and innovation than those industries in the local economy.

While many Canadians think that our economy's composition is dramatically different than the US economy, it is not. Drawing on Porter's methodology, the Institute has determined that employment in natural resources industries is higher in Canada, but is only 2.0 percent of employment versus 0.7 percent in the United States. Fully 37.0 percent of employment in Canada is in clusters of traded industries versus 31.8 percent in the United States. Also, within these traded industries, our mix is remarkably similar. Our analysis of Canada's **cluster mix** indicates a $1,100 per capita GDP advantage. This benefit is derived from higher output than would be likely if the mix in Canada were the same as in the United States.[6]

Each cluster of traded industries comprises sub-clusters. As with clusters, there are wage and productivity differences among sub-clusters. Some observers believe that Canada is losing the high value-added component of its industries, as head offices and decision-makers relocate outside the country. But, as we analyze the sub-clusters that make up our clusters of traded industries and compare these with the mix in the United States, we conclude that the impact of **cluster content** on GDP per capita is essentially the same in the two countries.

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[3] Canadian intensity data are from the Productivity Program Database of Statistics Canada. US data are from unpublished US Bureau of Labor Statistics total hours and employment series. This series adjusts the BLS Current Employment Survey for agriculture, public administration, and self-employment. We have used these data as published by the Centre for the Study of Living Standards which can be found at www.csls.ca.

[4] Institute for Competitiveness & Prosperity, *A View of Ontario: Ontario's Clusters of Innovation,* April 2002, pp. 18-20, 26-7 and *Strengthening structures: Upgrading specialized support and competitive pressure,* July 2004, pp. 17-19.

[5] For more information on the Cluster Mapping Project, see the ISC website: http://www.isc.hbs.edu.

[6] It is important to note that our measure focuses on the mix of clusters only. It estimates the productivity performance we could expect in Canada if each cluster were as productive as its US counterpart. As we show later in this report, this assumption is not true. Many of our significant clusters are not as productive as their US counterparts.

Our weaker cluster effectiveness is a significant part of the Canada's productivity gap. While Canada has an excellent mix of clusters, productivity is much lower in Canadian clusters than in US clusters. US traded clusters are more productive than local industries, as illustrated by average wages. As Porter has observed, the greater competitive intensity from sophisticated customers and well-developed rivals along with specialized support from excellent factor conditions and capable suppliers and related industries push productivity higher in traded clusters. The productivity premium in Canada from its traded clusters versus its local industries is 43 percent – the difference between traded clusters' wages of $39,600 and local industry wages of $27,600 (Exhibit 5). In the United States, this premium is 66 percent. Taking the prevailing wage in local industries as a given, our traded clusters are under performing their US counterparts by 14 percent – the difference between the US performance index of 1.66 versus Canada's 1.43.

If Canada's traded clusters, which account for 37.0 percent of Canada's employment, increased their productivity to achieve the same wage premium over local industries as those in United States, wages in our traded clusters would have been $6,300 per worker higher in 2000. We estimate the GDP loss from our weaker clusters to be $1,400[7] per capita. In other words, while our mix and content of clusters provide a potential benefit to prosperity of $1,100 per capita, we do not realize this potential, and our lower cluster effectiveness costs Canadians $1,400 per capita.

Relatively low urbanization is a significant contributor to the prosperity gap. The Institute has synthesized current research by Canadian and other urban geographers and economists that links urbanization, innovation, learning, and urban policy.[8] We found that the increased social and economic interaction of people and firms, the cost advantages of larger-scale markets, and a diversified pool of skilled labour all improve productivity in urban areas. The interplay of these factors promotes innovation and growth in an economy. Canada's lower degree of urbanization hurts our productivity compared to the United States.

Exhibit 5 Canada's traded clusters under perform US clusters

Source: Institute for Competitiveness & Prosperity; Institute for Strategy and Competitiveness; Statistics Canada.

[7] We have netted out double counting effects from urbanization and investments in capital and education in reaching our estimate of the impact of lower cluster effectiveness. Clusters are more effective in urban settings, and Canada is less urban. Similarly, part of our traded clusters' productivity gap is due to economy-wide under investment in capital and education.
[8] Institute for Competitiveness & Prosperity, *Missing opportunities: Ontario's urban prosperity gap,* June 2003.

City regions are increasingly important drivers of economic activity. This is the result of factors including the advantages of network effects, the lower unit costs deriving from scale benefits, and the effects of deeper labour markets.[9] There is a positive relationship between degree of urbanization[10] and the labour productivity of the 60 jurisdictions in North America.[11] Urbanization is defined as the percentage of the population living in city areas of greater than 50,000 people. Our analysis indicates that our lower rate of urbanization costs Canada $3,300 per capita in GDP relative to the United States. This makes low urbanization the largest negative contributor to Canada's productivity gap that we can explain.

The urbanization difference is a structural feature of the economic geography of Canada and the United States and will change only gradually over time. The Task Force has recommended that governments in Canada ensure their policies are not standing in the way of natural population flows to metropolitan areas and that their urban agendas are developed with productivity and prosperity issues in mind.

Lower educational achievement weakens our productivity. Most economists agree that the level of education attained across the workforce is an important determinant of the "quality" of an economy's human capital. Our analyses reinforce the positive correlation between productivity and wages.[12] Economic studies also show repeatedly that individuals' earnings increase with their level of education.[13] In fact, the best single predictor of personal income is level of educational attainment. Canada's under performance in educational attainment, mainly at post secondary levels, translates into a negative impact on GDP per capita of $1,100 per capita. Later in this report, we explore further Canadians' under investment in post secondary education.

Capital under investment is a drag on productivity growth. In our work in Canada, we have identified under investment in machinery and equipment in Canada compared to levels in the United States.[14] This under investment slowly erodes the relative strength of our capital stock. This erosion in turn reduces the productivity of our labour and hence our prosperity. For Canada, we estimate this under investment to be worth at least $400 per capita in lost productivity and prosperity. Later, we discuss further this under investment and its possible causes, including the higher tax burden on capital.

A productivity residual of $3,600 remains to be explained. We have been able to account for the impact of profile, utilization, and intensity on prosperity. We have also accounted for the effects of several elements of productivity. The gap that remains is related to productivity on the basis of like-to-like cluster mix, content, and effectiveness, urbanization, education, and capital intensity. In sum, Canada under performs the United States in converting our natural, physical, and human resources into goods and services.

In summary, Canadians have built one of the world's most competitive and prosperous economies. But we cannot stand still. Our trading partners in both the developed and developing worlds continue to advance. And compared to our most significant trading partner, the United States, we are still behind. Our key challenge is not to find ways to work harder, but to work smarter. Strengthening productivity is the most significant challenge facing Canadians.

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[9] Task Force on Competitiveness, Productivity, and Economic Progress, *Closing the prosperity gap,* November 2002, pp. 25-26.
[10] Urbanization is defined as the percentage of their population living in Census Metropolitan Areas (CMAs) in Canada and Metropolitan Statistical Areas (MSAs) in the United States. Differences in the definitions of the two concepts have been reconciled.
[11] Institute for Competitiveness & Prosperity, *Partnering for Investment in Canada's Prosperity,* January 2004, p.14.
[12] *Closing the prosperity gap,* November 2002, p. 27.
[13] For a literature review of the rates of returns to education and results of their own calculations, see Vaillancourt and Bourdeau-Primeau "The Returns to University Education in Canada, 1990 and 1995," in Laidler, D. (ed.) *Renovating the Ivory Tower: Canadian Universities and the Knowledge Economy.* C.D. Howe Institute Policy Study No.27.
[14] Task Force on Competitiveness, Productivity, and Economic Progress, *Closing the prosperity gap,* p. 36 and *Investing for prosperity,* November 2003, p. 25.

Under investment in prosperity

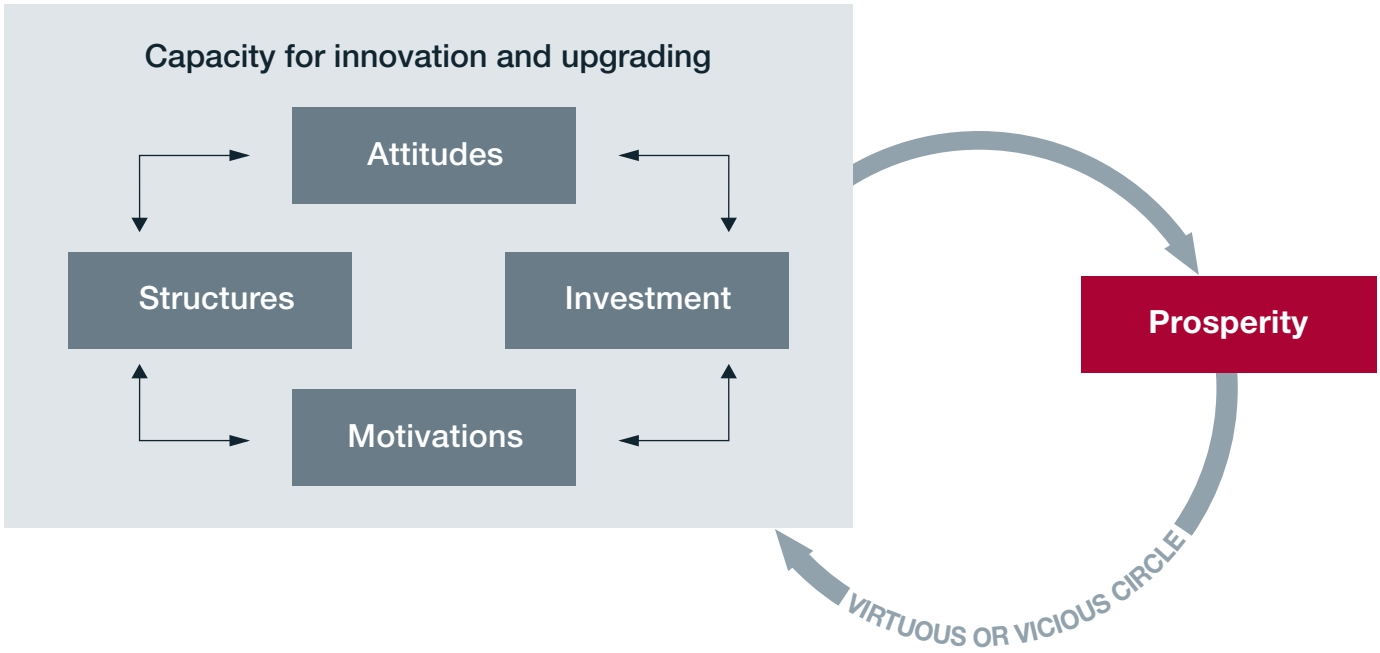
All Canadians need to invest more in their future prosperity

We have seen that Canada has a persistent prosperity gap with the United States that must be addressed. Our analyses have pointed to our under investment in our future prosperity as a major contributor to our lower productivity. This under investment is the result of inappropriate motivations from high marginal effective tax burdens and the lack of vigorous market structures that drive competitiveness and productivity.

Canada's capacity for innovation and upgrading is built on an integrated set of four factors in the AIMS analytical approach (Exhibit 6).

- **Attitudes** towards competitiveness, growth, and global excellence. Our view is that an economy's capacity for competitiveness is grounded in the attitudes of its stakeholders. To the extent that the public and business leaders believe in the importance of innovation and growth, they are more likely to take the actions to drive competitiveness and prosperity.
- **Investments** in education, machinery, research and development, and commercialization. As businesses, individuals, and governments invest for future prosperity, they will enhance productivity and prosperity.

Exhibit 6 AIMS drives Prosperity; Prosperity drives AIMS



Source: Institute for Competitiveness & Prosperity.

- **Motivations** for hiring, working, and upgrading as a result of tax policies and government policies and programs. Taxes that discourage investment or labour will reduce the motivations for investing and upgrading.

- **Structures** of markets and institutions that encourage and assist upgrading and innovation. Structures, in concert with motivations, form the environment in which attitudes are converted to actions and investments.

As we work with the AIMS framework, we are concluding that it can create an ongoing reinforcing dynamic. That is to say, when AIMS drives prosperity gains, each one of the four factors is reinforced. In an economy of increasing prosperity, attitudes among business and government leaders and the public are more optimistic and welcoming of global competitiveness, innovation, and risk taking. Given these positive attitudes and with the greater capacity for investment generated by prosperity, Canadians invest more in machinery, equipment, and software and in education. Motivations from taxation can be more positive, as governments do not see the need for raising tax rates. And greater economic prosperity improves structures as greater opportunities for specialized support are created and increased economic activity drives more competitive intensity. These developments lead to even higher prosperity, which further strengthens each AIMS element, and so on in a virtuous circle.

But this AIMS-prosperity dynamic can create a vicious circle. Unrealized prosperity potential may create pessimism and concerns about competitiveness and innovation rather than openness to them. These less positive attitudes are less conducive to investments and reduced prosperity also leads to fewer investment opportunities. Unrealized economic potential means tax revenues do not meet fiscal needs, leading governments to raise tax burdens thereby de-motivating investments. And reduced economic activity will create fewer nodes of specialized support and less openness to the public policies that result in more competitive intensity.

We are concerned that if we do not address our current challenges in under investment, de-motivating tax burdens, and inadequate market structures, we may be on the trail to a vicious circle. We must avoid this trend and put our economy on the virtuous circle track.

Canadians have positive attitudes towards competitiveness and innovation

For Working Paper 4, *Striking similarities: Attitudes and Ontario's prosperity gap*, we surveyed attitudes among the general public, business community, and business leaders around attitudes towards competitiveness, innovation, and risk-taking in Ontario and the peer jurisdictions. While the survey results are for Ontario and 11 of our peer US states, there is nothing to suggest that we would not find similar results if the sample were expanded across North America.

We expected to find major attitudinal differences that would explain why Ontarians choose to invest less, creating our prosperity gap. Surprisingly, we found little difference. This research concluded that attitudinal differences between Ontarians and their peers are not roadblocks to creating a more prosperous Ontario. On most questions, we have similar attitudes towards risk and success; and on several questions, Ontarians actually responded more positively than their US counterparts towards questions aimed at competitiveness and innovation. Ontarians and their counterparts in the peer group have similar attitudes towards entrepreneurs. Close to half of respondents in both the public and business community report interest in starting their own business. The attitudinal similarities across the border are striking. Ontarians have the will to win and have the attitudes to take the actions to increase their prosperity.

However, we did identify one area where Ontarians and their peers differ. We asked the general public, as well as the business community, what advice they would give to a young person about the level of education that they should achieve. Ontarians are more likely to suggest a college diploma as the highest level of education to pursue, whereas our US counterparts are more likely to suggest attaining a university bachelor's or graduate degree. Given the importance of post secondary education to productivity and prosperity this attitudinal difference matters.

We are encouraged that, for the most part, Ontarians view competition, risk-taking, and the importance of innovation in much the same way as our counterparts in the United States. However, our positive attitudes are not consistent with our actions to invest for future prosperity.

Despite these positive attitudes, Canadians under invest

Canada is not investing as aggressively as the United States. Competitive rates of investment in human and physical capital are necessary if we want to strengthen our capability for innovation and productivity enhancement. Our under investment is a major factor in explaining the $7,200 GDP per capita, or 15.7 percent, prosperity shortfall between us and our US counterparts.

Initially, as in the United States, we invest in the basic requirements for keeping our businesses and individuals competitive in the global setting. But after the last investment dollar in Canada is spent, US investors continue right on investing. This pattern of attenuation is true for Canadian citizens, Canadian businesses, and Canadian governments.

Our under investment is wide ranging. Relative to the United States:

- We under invest in machinery, equipment, and software that drive productivity gains
- We under invest in education as students move through the system and forgo the higher benefits to the economy of more capable human resources
- We under invest in integrating immigrants and do not benefit fully from their economic potential
- We under invest in future prosperity as our governments' spending has been shifting from areas that are investments for future prosperity to those that consume current prosperity.

Our analyses show the impact of under investment in each of these areas.

Canada lags in productivity enhancing capital investments

Canada under performs in investment in machinery, equipment, and software.[15] Capital investment enables workers to be more productive. Given the relationship between capital investment and growth in GDP per worker, Canada's lower investment in equipment contributes to our productivity gap.

Private sector investment trails the United States. In both countries, the private sector accounts for about 80 percent of all capital investment, and thus is crucial in the overall picture. The private sector in Canada has consistently out invested the US private sector by an average of 7.5 percent annually since 1981. However, in machinery, equipment, and software, the component that research has identified as the most crucial for productivity growth, Canada's business community under invested an average of 13.1 percent less annually than US business from 1991 to 2003. In 2003, Canada's private sector invested 7.0 percent of GDP in machinery, equipment, and software compared to the 7.6 percent investment in the United States.

Public sector capital investment trails the United States. While public sector capital investment accounts for a smaller part of overall capital investment than private sector investment, it is still an effective driver of growth in an economy. Public investment in infrastructure stimulates private sector investment in plant and equipment and the two sources are complements in raising productivity.[16] Canada's public sector investment was relatively stable from 1981 to 1996, when the rate of investment was higher than in the US public sector.[17] But starting in 1996, the rate of public sector investment fell behind, while rising steadily in the United States. In 2003, Canada's investment rate was 2.6 percent of GDP, just short of the 2.7 percent in the United States.

In public sector machinery, equipment, and software investments, governments in Canada and the United States invested virtually the same percentage of GDP between 1981 and 2003.

Under investment is costly. The Institute calculated that under investment in physical capital costs Canadians $400 in lost GDP per capita. If Canada's private sector had kept pace with its US counterpart since 1981, our total investment would now be 4.8 percent higher. Capital investment is a major contributor to prosperity growth. The clear answer is for business and governments to raise their investment especially in machinery, equipment, and software to add to the productive capacity of Canada's economy.

Another method to calculate the productivity gap resulting from under investment in capital is to assess capital investment per labour hour.[18] Using this methodology, we estimated that if Canada invested in capital per labour hour at the same level as the United States, the labour productivity gap would decrease by 27.6 percent, translating into an increase of $2,000 GDP per capita.

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[15] Capital investment has two major components: (1) machinery, equipment, and software; (2) and structures. Structural investment included infrastructure such as highway, streets, buildings, and public transit. Machinery, equipment, and software are the main drivers of economic growth and is thus the focus of our capital investment analysis.
[16] Sharon J. Erenburg (1994), "Linking Public Capital to Economic Performance, Public Capital: The Missing Link Between investment and Economic Growth," The Levy Institute. Public Policy Brief No 14.
[17] US investment in the military is excluded from this analysis.
[18] Andrew Sharpe, "Why are Americans More Productive than Canadians?" 2003. Centre for the Study of Living Standards (CSLS).

Education investment trails at higher levels

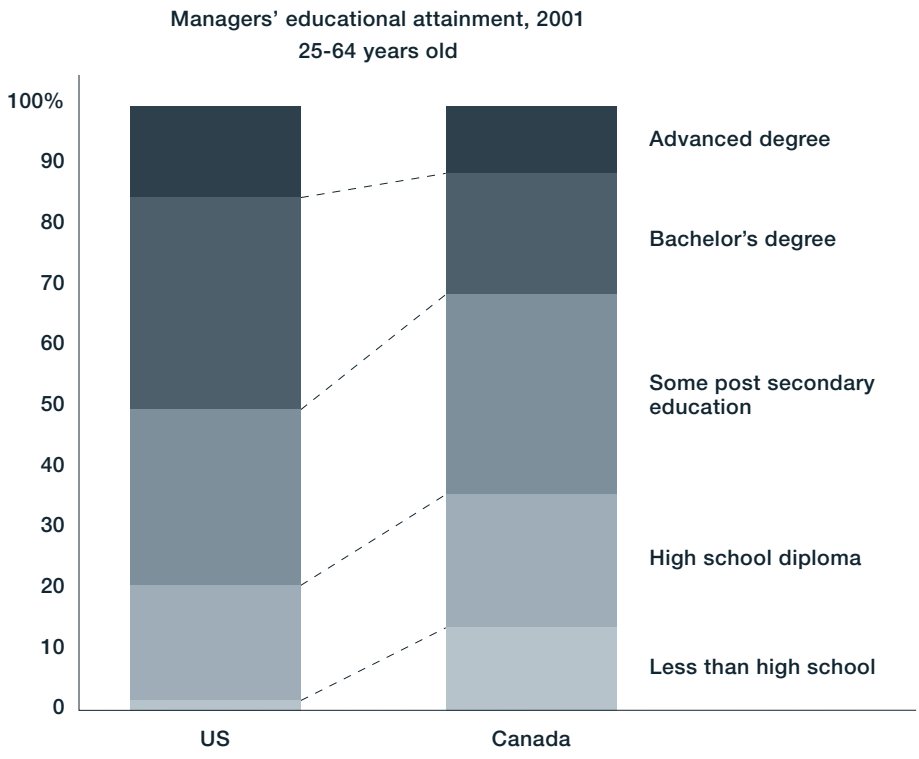
Similar to other areas of investment, Canada does a relatively good job at investing in the basics. At the primary and secondary levels, Canadian students perform well on international standardized tests, graduation rates, and their continuation on to post secondary level. While higher tuition fees account for a significant portion of the difference in the spending capacity at the US post secondary level, they are not the only source of additional revenue. Private gifts and endowments increase income in both public and private universities, and US schools have a wider range of revenue-generating activities than do Canada's universities.[19] Investment in the system and investment by individuals in their futures falls short in Canada, especially at the university level where the United States out spends Canada on a per capita basis by a margin of 2 to 1.[20]

This lower rate of investment in university education can be seen in the difference in graduation rates. Canada trails the United States in degrees conferred per thousand population by 22.9 percent (5.1 per thousand vs 6.2 per thousand), with the difference most pronounced at the graduate level where we graduate less than half the students they do.[21]

As we found in our latest work, this attenuation in investment in education is systemic. In Working Paper 6, *Reinventing innovation and commercialization policy in Ontario*, we found that Canada has more science and engineering graduates per capita than the United States. However, Canada's advantage in degrees conferred is entirely at the bachelor's level; for graduate degrees conferred, the United States has out performed Canada by 39 percent. This is consistent with the recurring theme in our work – Canada's investment matches US spending to increase prosperity to a point, but then trails off as advanced investments are required.

Another important feature of our under investment and under achievement in education can be seen among the managers and CEOs of our businesses in Canada. Our managers have lower educational attainment overall and in business specifically; only 31 percent of our managers possess a university degree versus 50 percent of US managers (Exhibit 7). If the link between education and innovation can be drawn, it is quite apparent why we are less productive and prosperous in Canada. The more educated managers are, the more likely they are to think innovatively and strategically and to operate more effectively. Our lower education level of human capital resources means that we are less able to compete in a technology-based knowledge economy, as well as to serve sophisticated and demanding customers in the global marketplace.

Exhibit 7 Managers are less well educated in Canada than the United States



Source: Statistics Canada; US National Center for Education Statistics, *Digest of Education Statistics, 2002.*

[19] *Investing for prosperity,* p. 24.
[20] *Partnering for prosperity,* pp. 17-18.
[21] *Ibid.,* pp. 19-20. Data in this report have been updated for 1999-2000.

Our under investment in post secondary education is worrisome, since those with higher levels of education earn more over their lifetimes and our economy benefits more from their knowledge and capabilities (Exhibit 8).

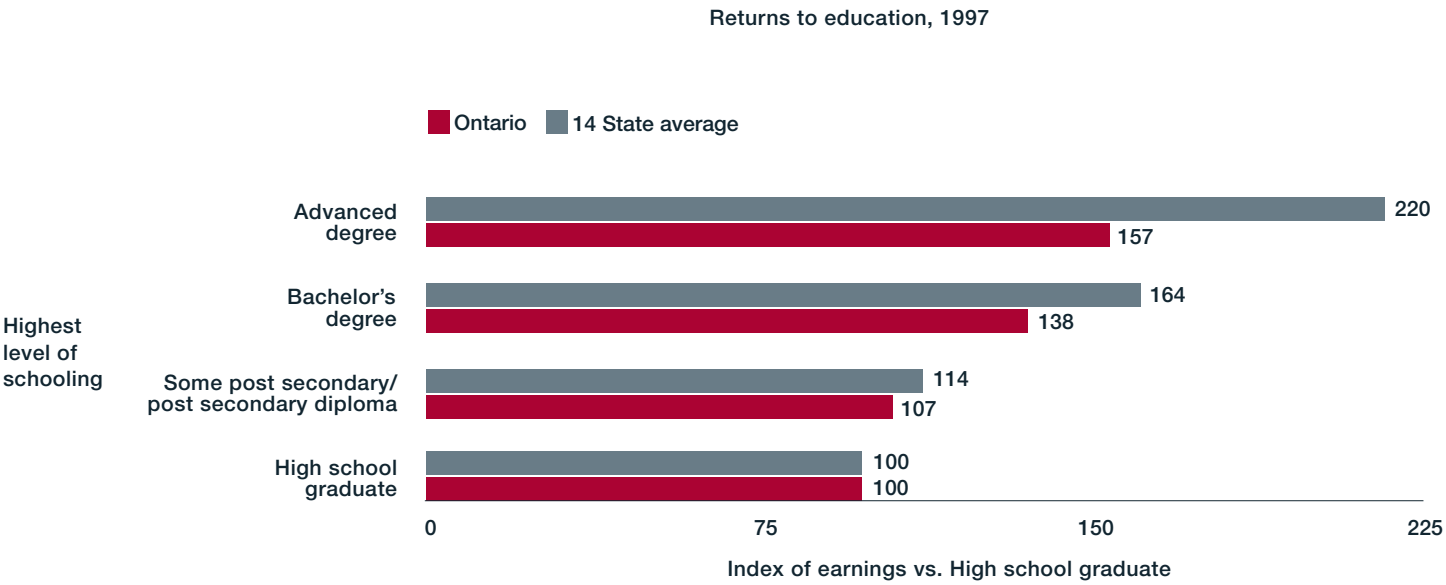
The difference between Canada and the United States in returns to higher level of education indicates that we are in a vicious circle. Our businesses place less value on higher education than their US counterparts; hence returns to post secondary levels of education are lower relative to the United States. Consequently, fewer Canadian students progress to higher levels of education and our businesses are competing with less well-educated human capital. This lowers productivity and reduces opportunities for investment in physical capital and people. This in turn leads to lower value being placed in post secondary education, and so on.

Our challenge is to encourage more of our capable high school graduates[22] to pursue a post secondary education before entering the work force; to encourage more college graduates to consider pursuing a university degree; and to encourage more university graduates to consider pursuing a post graduate degree. We all lose out when individual Canadians fall short of their educational potential. Raising educational aspirations and increasing investment in education at all levels by individuals, businesses, and governments is a critical way to increase productivity. We think that stakeholders in Canada's prosperity should be encouraged as a high priority to increase their investment in education.

Under investing in integration processes reduces the benefits of immigration

Canada must take full benefit of a competitive advantage it has over the United States – the immigration of highly qualified people.[23] Canada has an aggressive immigration strategy, in part to maintain its labour force. We are very successful at attracting highly skilled people, raising our overall educational attainment levels as more immigrants have post secondary diplomas and degrees. However, once here, immigrants have difficulty entering the professions and careers they once held, finding themselves settling for positions they are over qualified for because their credentials and experience are not recognized. As a result, we are forgoing opportunities to enjoy the true economic value of immigration in Canada. We must find ways to accelerate immigrant integration into our economy.

Exhibit 8 Higher education leads to higher economic returns



Source: Institute for Competitiveness & Prosperity based on Baker and Trefler, "The Impact of Education & Urbanization on Productivity," www.competeprosper.ca.

[22] *Investing for prosperity,* p. 22
[23] *Partnering for prosperity,* pp. 23-24

Government spending is shifting toward current consumption

Governments have two important roles – spending on current prosperity to help secure an adequate quality of life for all Canadians, and contributing to future prosperity through investment in upgrading and innovation. Governments have to play a balancing act in their spending decisions. At the base level, governments must fund their own administration, protect citizens and the environment, and pay interest on the public debt. In both Canada and the United States, this accounts for about 30 percent of spending by federal, state/provincial, and local governments. In allocating the remaining 70 percent, a trade off between consumption and investment occurs. Consumption expenditures include health care and social services; investment expenditures include transportation, communication, housing, and education.

Relative to the United States, governments in Canada continue to shift more dollars away from investment expenditures towards consumption (Exhibit 9).

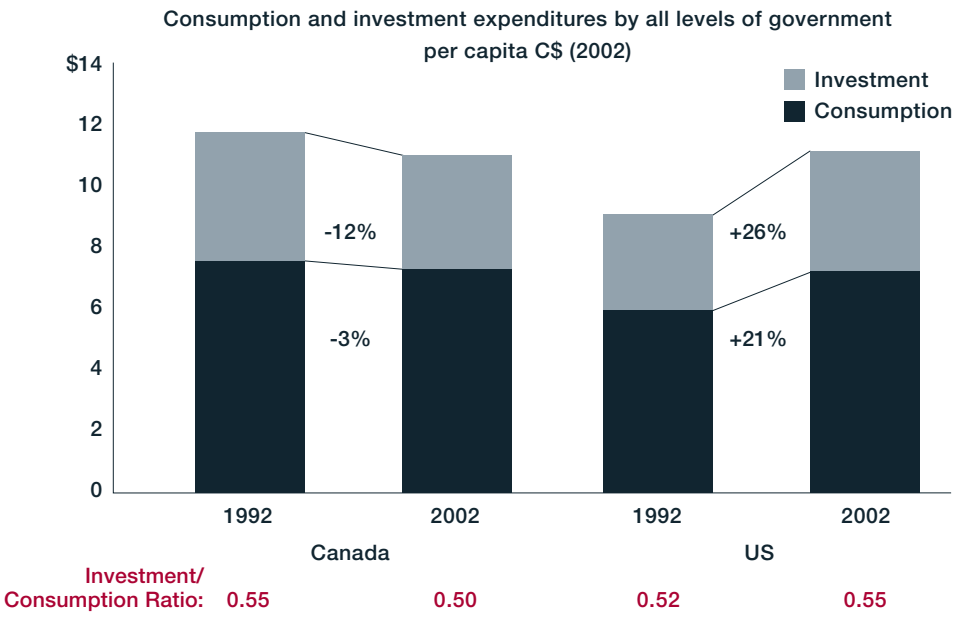
Between 1992 and 2002, governments in Canada at all levels combined actually decreased spending on investment from 55 cents to 50 cents for every dollar of consumption, while our US counterparts raised investment spending from 52 cents to 55 cents for every dollar of consumption.

From 1992 to 2002, total government expenditure as a percentage of GDP declined in Canada, as governments chose to eliminate budget deficits. They were more aggressive in reducing investment expenditure than consumption expenditure, and in recent years, health care expenditure increases have fueled rising consumption spending, increasing per capita from $2,100 in 1999 to $2,500 in 2002. Meanwhile, governments in the United States chose to increase per capita investment spending by 26 percent.

In the last five years, governments in Canada have spent $7,300 per capita in consumption annually – about the same as in the United States. However, on a per capita basis, governments in Canada invested about 6.3 percent less per capita in 2002, compared to 1.2 percent less in 1999. This is a dramatic shift in US governments' policies since 1992 when Canadian governments actually out invested US governments. Canadian governments' inability to match the investment spending by US governments limits our progress in raising productivity. Without addressing this under investment, Canada will not make progress in eliminating the prosperity gap.

Canadians must invest to ensure future growth and prosperity. The balance between consuming for current prosperity and investing for future prosperity is critical. Without addressing this under investment in the critical areas of machinery, equipment, and software and post secondary education, it is unlikely that Canada will be able to make progress in productivity growth and in our quest for raising prosperity.

Exhibit 9 Governments in Canada have been shifting spending from investment to consumption



Source: Institute for Competitiveness & Prosperity based on data from Statistics Canada, Public Sector Statistics 2001-2002 (table 2.2); US Census Bureau, Statistical Abstract of the United States: 2003 (table 463, 579).

Inappropriate motivations and investment

Smart tax policies will encourage Canadians to invest more

Changing Canadians' attitudes is not a requirement for increasing investments to close the prosperity gap. Then why are they under investing? We find part of the reason is the lower *motivation* to invest because of the higher marginal effective tax burdens and the less attractive makeup of our tax structure in Canada than in the United States.

Canada's marginal effective tax burdens are de-motivating

Governments face a balancing act in creating the fiscal environment for competitiveness and prosperity. As we have discussed, government investment expenditures in areas such as infrastructure and education can help establish the foundation for businesses and individuals to increase productivity. The appropriate level of consumption expenditures is an important determinant of our quality of life. These expenditures also reduce the cost of doing business, as governments take on some of these expenditures from individuals and businesses.

At the same time, taxes that are necessary to fund these expenditures can act as de-motivators to work, investment, and entrepreneurship. Governments need to balance expenditures and taxes on an ongoing basis to ensure that Canada is competitive and that citizens are receiving an adequate level of services. Given our shortfall in investment relative to our US peers, the challenge is also to trade off spending on current consumption against long-term capital investment.

One means of assessing this trade off, especially as it relates to competitiveness, is to calculate marginal effective tax burdens on labour and capital. This approach calculates the effective impact of taxation on the cost of doing business by taking into account all the taxes paid, net of public subsidies for health care, education, and others, on all factors used in producing goods and services. The approach calculates the tax associated with the decision to invest in capital and labour. The analysis is important because it assumes that businesses will consider marginal tax burdens on capital in investment decisions, and employers and employees will consider marginal tax burdens on labour in their decision to hire and to work.

Given the importance of taxes to motivations and of changes in tax policies on both sides of the border, the Institute engaged Jack Mintz, one of the world's leading international tax experts, and Duanjie Chen,[24] a research associate with the Institute of International Business at the University of Toronto's Rotman School of Management, to update the research they conducted for last year's report.[25] They assessed marginal effective tax burdens on both capital invested and labour.

Marginal effective tax rates on capital influence the willingness of firms to go the extra step and invest the incremental dollar in capital, such as machinery, equipment, and software. In addition, they influence the decision by investors – from entrepreneurs to angel investors to venture capitalists to financial institutions – to invest in Ontario, Canada, or elsewhere. Mintz and Chen's analysis focuses on corporate income taxes, capital taxes, and sales taxes paid on business purchases. Government expenditures on infrastructures, research and development, and other business subsidies are subtracted from taxes on capital to arrive at the effective tax rate. Property taxes are not included in this analysis, largely because of the lack of comprehensive data. As discussed in the Institute's Working Paper 3, *Missing opportunities: Ontario's urban prosperity gap*, business property taxes tend to be greater than services received by business, while the opposite is true for individual residents.

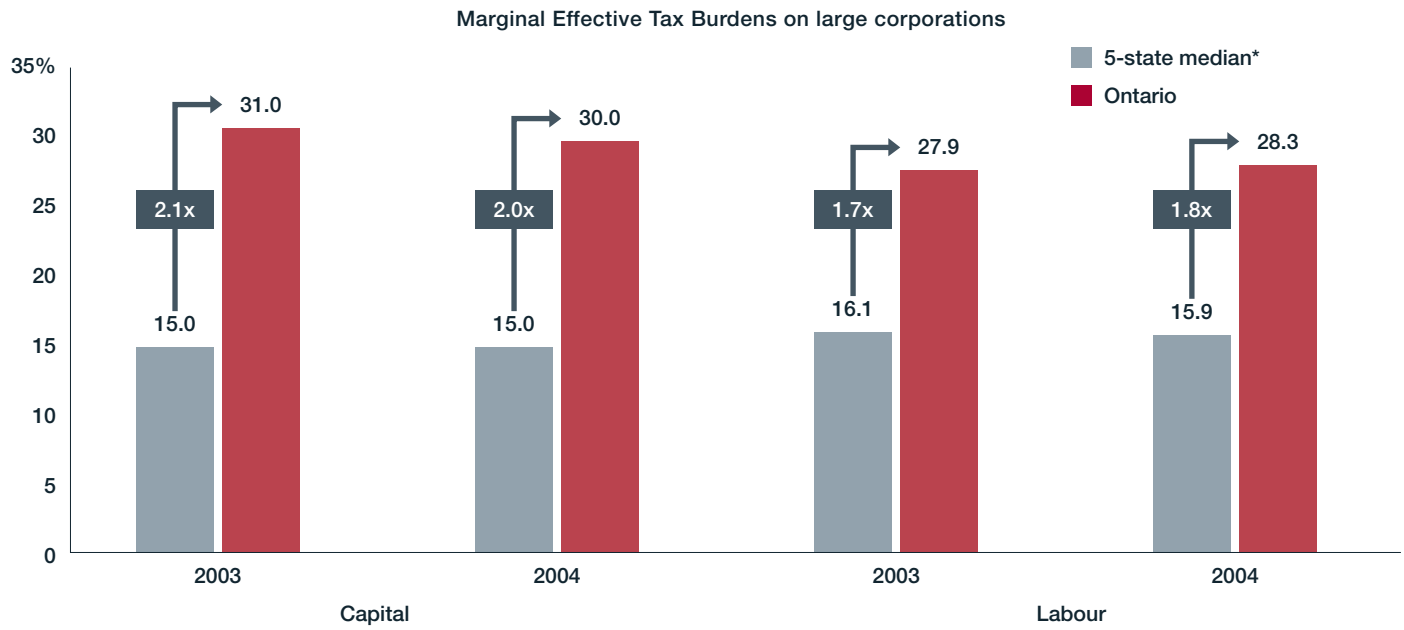
[24] Duanjie Chen and Jack M. Mintz (2004), "Ontario's Fiscal Competitiveness in 2004," Report prepared for the Institute for Competitiveness & Prosperity. Available online at: *www.competeprosper.ca*
[25] *Partnering for investment in Canada's prosperity,* pp. 27-29.

Marginal effective tax rates on labour influence the willingness of people to decide to work versus not to work, to work the extra hour, or to invest in upgrading their own productivity and earn more in the future. In the extreme, the higher the marginal effective tax rate on labour, the greater the incentive for workers to opt out entirely, either into the underground economy or to a lower tax jurisdiction. Mintz and Chen's analysis of taxes on labour focuses on personal income taxes, payroll taxes, and sales taxes. Their analysis captures labour taxes borne by employers and employees. Government expenditures in areas such as education, social security, employment insurance and health care are deducted from these taxes.

To represent Canada, Mintz and Chen assessed federal and provincial taxes in Ontario; to represent the United States, they looked at federal and state taxes in California, Georgia, Illinois, Massachusetts, and Michigan. In Ontario, the burden on *capital* was almost unchanged from last year, because provincial polices and federal polices neutralized each other (Exhibit 10). Mintz and Chen note that "Federal policies – lower corporate income and capital taxes – have been responsible for fiscal relief to Ontario businesses. However, the federal policies have been somewhat blunted by provincial policies that have eroded fiscal competitiveness, including higher corporate income tax rates." The five-state median of marginal tax burdens on capital was also unchanged in 2004. The net result is that Ontario's tax disadvantage on capital decreased slightly from 16 to 15 percentage points. Still, governments in Ontario tax capital investments at 2.0 times the tax burden in the 5-state median, down from a 2.1 times disadvantage in 2003. This difference is likely an important factor in our under investment in capital relative to the United States.

The marginal effective tax burden on labour in Ontario increased as the result of the new Ontario Health Premium. In the five states, it decreased as minor personal income tax reductions were phased in and subsidies for education and health care were increased by the federal and some state governments. As a result, the Ontario disadvantage on labour widened from 11.8 percentage points to 12.4 percentage points in 2004. The disparity increased from a 1.73 times ratio to 1.78 times.

Exhibit 10 Ontario's tax disadvantage persisted in 2004



* 5-state ranges are as follows: Burden on Capital, 2003: 13.3% - 17.5%, 2004: 13.3% - 17.5%; Burden on Labour, 2003: 15.1% - 19.6%, 2004: 14.6% - 19.5%
Source: Duanjie Chen and Jack M. Mintz (2004), "Ontario's Fiscal Competitiveness in 2004," available at: www.competeprosper.ca.

In summary, in Canada, as represented by Ontario, our disadvantage in marginal effective tax burdens is essentially unchanged, largely because the provincial and federal governments' actions counteracted one another.

Smart tax policy can improve motivations for capital investment

Ontario's and Canada's current tax systems prevent us from reaching our economic potential. In recent years, our tax system has de-motivated investment in capital relative to investment in labour, so it is no surprise we under invest in capital. If we want to strengthen capital investment and drive higher productivity and wages, we need to adjust the balance of motivations in our tax system. We need to tax smarter.

Smart tax policies can improve incentives and opportunities for individuals

Another aspect of taxing smarter is ensuring that tax burdens on individuals are not acting as a disincentive to work more or to upgrade skills. Research done by Finn Poschmann shows that our personal tax and benefit system has resulted in high marginal effective tax burdens for low- and moderate-income families (Exhibit 11).

This system acts as a de-motivator for these Canadians, particularly families and seniors. For the most part, these high marginal burdens are the results of clawbacks of tax credits, benefits, and transfer programs.[26]

Clawbacks in benefits means that individuals and families can face dramatically higher marginal tax burdens on the additional income they earn. For example, in 2003, a single earner couple with two children faced a marginal tax burden of 83 percent at about $39,000 in taxable income; that is, they kept only 17 cents of each new dollar they earned on their higher income. This is mainly caused by clawbacks of the GST tax credit and federal and provincial child benefits.

Any progressive tax and benefit system will have the feature of high marginal tax burdens at certain points of the income scale. The problem in Canada is that our system is characterized by high marginal burdens over a long stretch of low to moderate taxable income. We need is to design our tax and benefit systems to balance the need to support lower income individuals and families and the need to ensure that incentives to work and upgrade skills are preserved.

We believe that reforms to our tax system are required to strengthen our competitiveness and living standards. These reforms should be designed to increase investment in physical capital and to raise incentives to work, save, and invest in human capital, thereby enhancing the prosperity of all Canadians.

Exhibit 11 Ontario families face high marginal tax rates over a wide income range

Marginal Effective Tax Rates for a single earner couple* in Ontario, 2003

*Two children under seven (allowing for GST and other refundable credits; Ontario Tax Reduction and Sales Tax Credit)

Source: Michael J. Trebilcock, Ronald Daniels, Andrew J. Green and Roy Hrab (2004), "Creating a Human Capital Society for Ontario," Staff Report, Panel on the Role of Government in Ontario, p.151. Calculations by Finn Poschmann, C.D. Howe Institute. Available online: www.law-lib.utoronto.ca/investing.

[26] Clawbacks refer to the reduction of assistance programs that occurs as an individual's income increases.

Strengthened market structures for investment and innovation

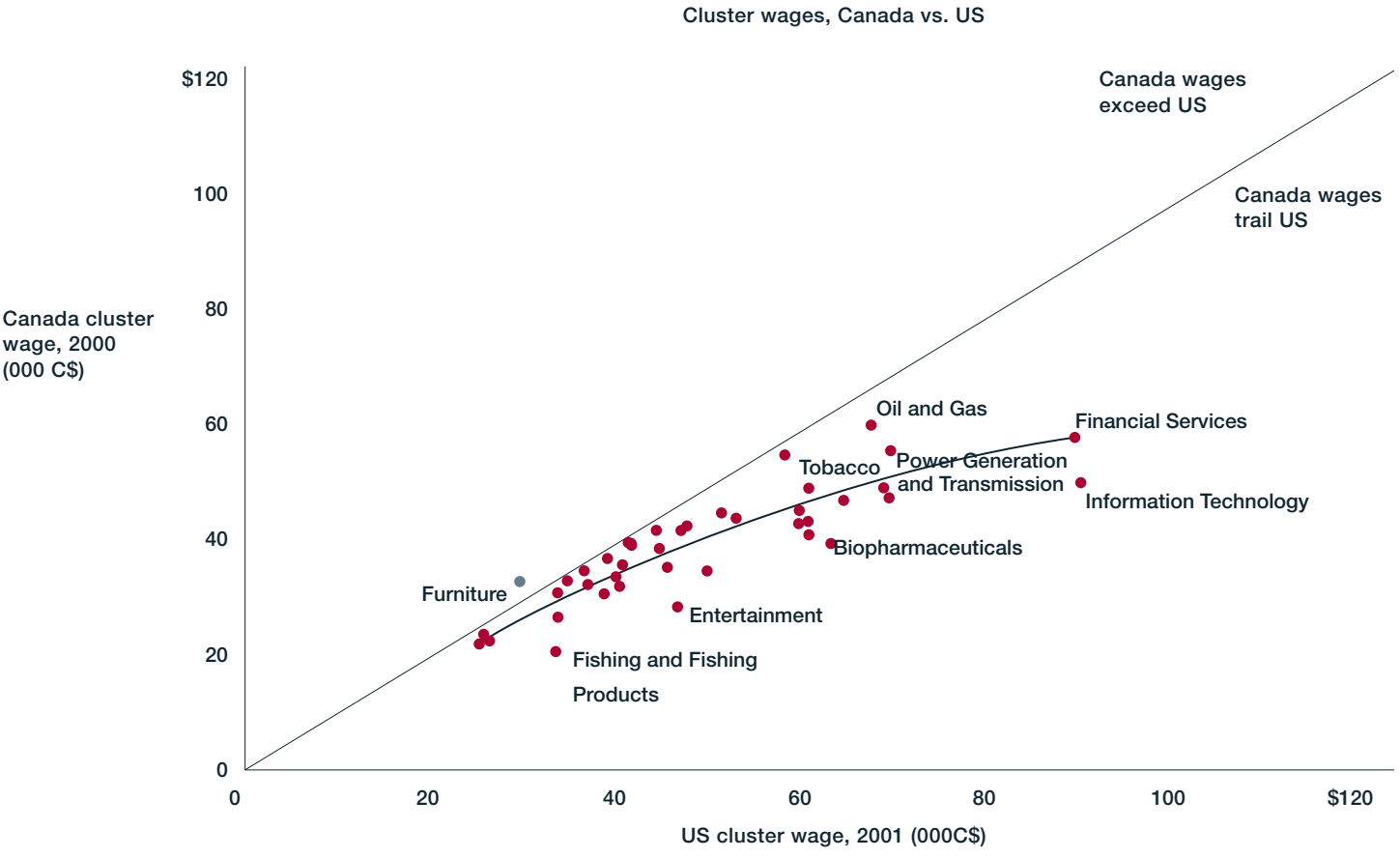
Canada needs invigorated market structures to encourage investments for innovation and upgrading

We turn now to the final element of AIMS – *structures* – to understand their effects on competitiveness and productivity in Canada and to explore the opportunities they may offer for innovation and upgrading. Both governance and market structures provide a critical context for how attitudes affect competitiveness and prosperity.

Governance structures range from attributes of government related to the rule of law at the most basic level, to sophisticated structures and processes that reward innovation and commercialization. Market structures describe the competitive environment that supports and requires firms and industries to innovate and upgrade. Structures of competitiveness affect the demand for and supply of investments in physical and human capital, which in turn affect the overall capacity for productivity and innovation. Structures are affected by motivations as represented by marginal effective tax burdens.

In the past year, our research on market structures has shown that Canada has many of the basic elements in place for driving innovation and higher productivity in our clusters of traded industries. But our clusters

Exhibit 12 Performance in Canada's clusters worsens as wages increase



Source: Institute for Competitiveness & Prosperity; Institute for Strategy and Competitiveness; Statistics Canada.

of traded industries are under performing, delivering poorer results than many clusters in the United States.

Clusters of traded industries in Canada are under performing

As we showed earlier, wages in clusters of traded industries, which are the driving force of overall wage levels in an economy,[27] are lower in Canada than in their US counterparts. In fact, in all but one of the 41 clusters of traded industries, wages are lower in Canada than in the United States (Exhibit 12). Further analysis of this wage – and productivity – gap indicates that Canada is close to peer results in lower wage industries, but falls further behind as the clusters' wage levels get higher. We also find this attenuation phenomenon as we assess wage performance inside clusters. In sub-clusters, in both high-paying and low-paying clusters, the gap between Canada and the US wages widens as the wage level increases.

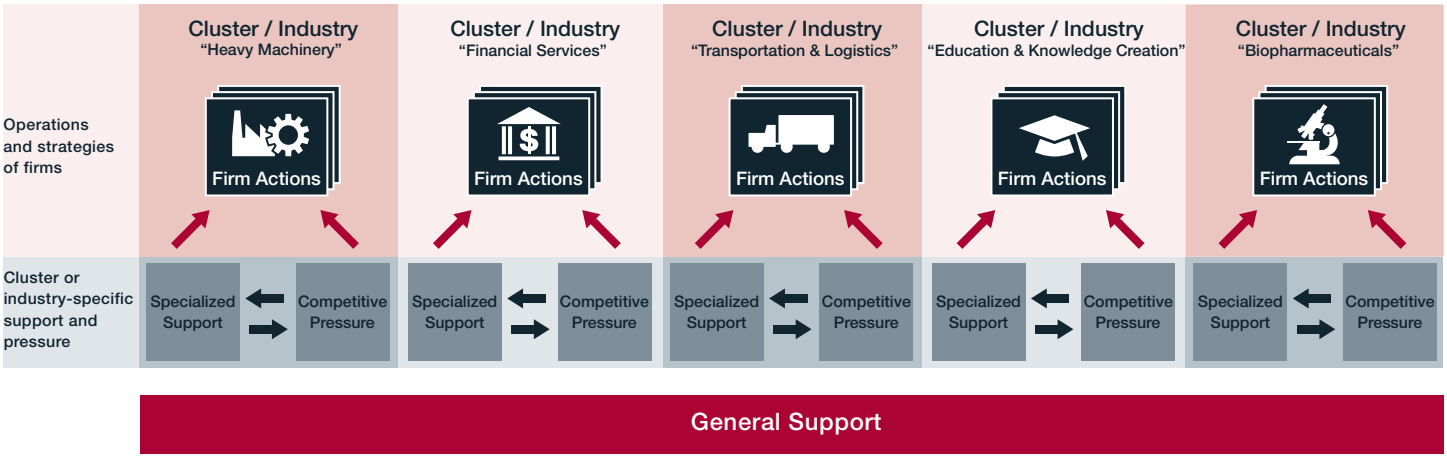
Canada benefits from an excellent mix of clusters of traded industries. In fact, as we stated earlier, our mix of industries adds $1,100 per person in GDP per capita to our prosperity relative to the Unites States. Yet our clusters under perform significantly in productivity and innovation. We conclude that this under performance is largely the result of market structures that are not providing the competitive pressure and specialized support so necessary for success. We turn next to this assessment.

Structures of competitive pressure and specialized support are inadequate

To deepen our understanding of the under performance of our traded clusters, we examined the level of both general and specialized support and competitive pressure in our market structures. Each cluster and industry operates within its own structure of specialized support and competitive pressure. Underpinning these cluster environments is a platform of general support (Exhibit 13). This general support includes factors such as physical infrastructure, legal administrative mechanisms and processes, basic education, and stable macroeconomic conditions. An economy clearly requires excellent general support, but breakthrough performance is the result of innovative firm actions driven by specialized support and competitive pressure.

Specialized support includes factors, such as focused research capability, industry specific skills, and capable specialized suppliers. Pressure for upgrading is supplied by sophisticated and demanding customers, spurring

Exhibit 13 Structures of pressure and support drive quality of firm actions



[27] For US results see Michael Porter, "The Economic Performance of Regions," *Regional Studies,* Vol. 37.6 & 7, pp.549-578, August/October 2003; for Canadian results see *Strengthening structures,* p.21.

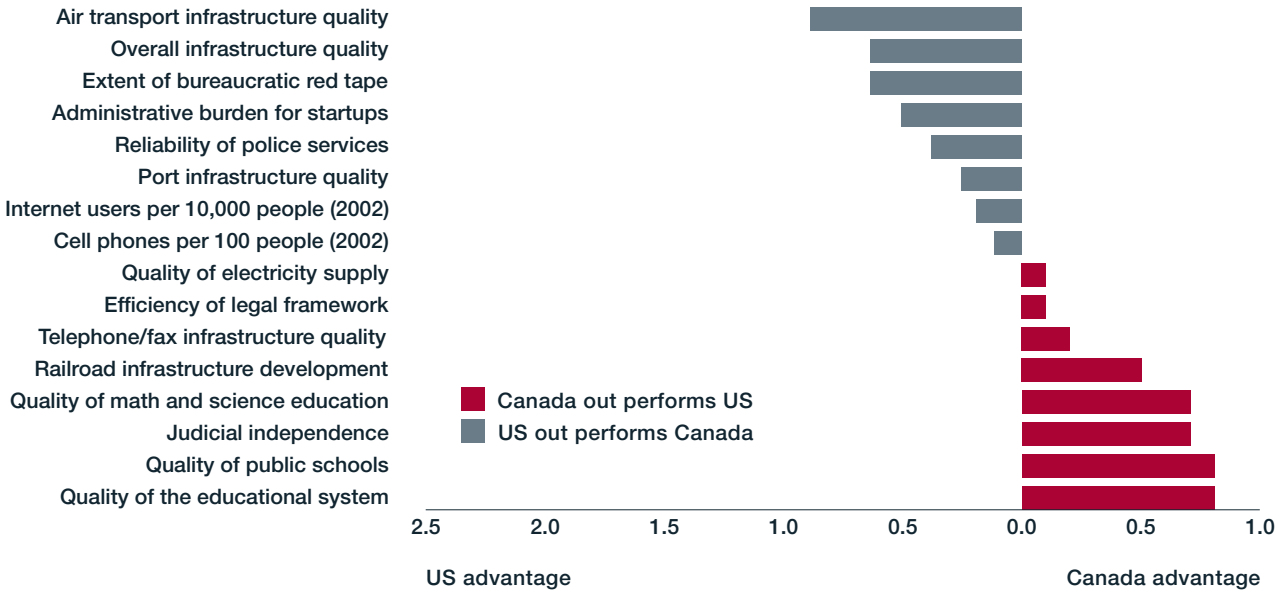
local firms to innovate in order to upgrade their product and service offerings. Particularly valuable are demand conditions that anticipate the nature of demand elsewhere in the world. Beneficial pressure also comes from capable rivals that cause local competitors to seek unique and better ways to meet the needs of customers. But human nature being what it is, individuals and firms generally perform just to the level necessitated by the pressure they are under and the supports that enable them to act.

To help us assess the impact of our market structures, we drew on the research conducted by the World Economic Forum to produce the Business Competitiveness Index. This index is a useful measure of the levels of pressure and support in Canada, the United States, and nearly 100 other countries. Much of the information contained in the index is from the Executive Opinion Survey, a mail survey administered in each country to executives in sectors in proportion to the sectors' shares of the overall economy.[28] The survey is made up primarily of a series of statements for which the respondents indicate how well they think their country's economy performs on various factors. The statements are aimed at eliciting views on the respondent's own country and do not ask for comparisons with other countries.

The World Economic Forum results indicate that Canada has adequate general support relative to the United States (Exhibit 14). Of the 16 factors in general support, each country has advantages on eight. Some of these factors exhibit a close fit with GDP per capita performance; when the factors are weighted accordingly, Canada has a 32 percent advantage on the average score in the survey. These are important building blocks for a competitive and prosperous economy and Canada has strengths there. However, this strength does not carry over into factors of specialized support.

The World Economic Forum data and our own assessment of public policy in innovation and commercialization point to inadequacies in the specialized support for enhancing productivity and prosperity (Exhibit 15). We also observed low competitive pressure (Exhibit 16). The Business Competitiveness Index rates Canada very low on factors of competitive pressure – with Canada trailing the United States in 17 of the 23 factors regarding firm rivalry and degree of sophistication of customers.

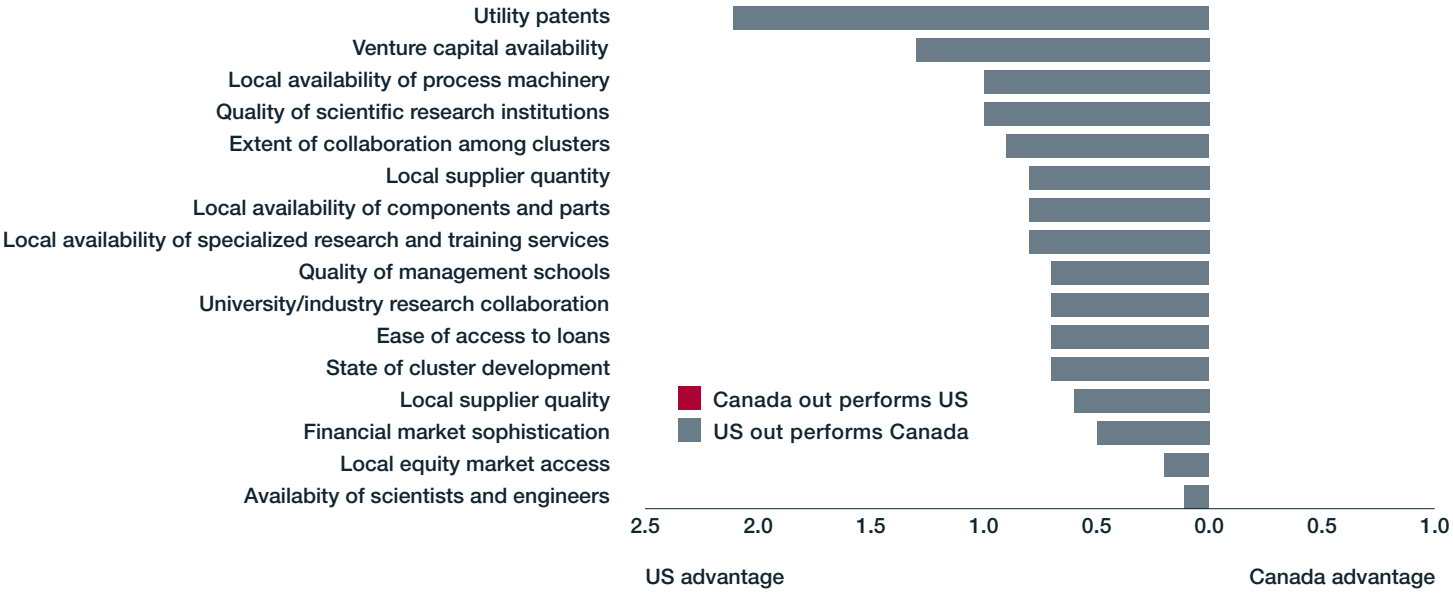
Exhibit 14 Canada out performs United States on "General Support" factors



Source: Institute for Competitiveness & Prosperity analysis based on World Economic Forum.

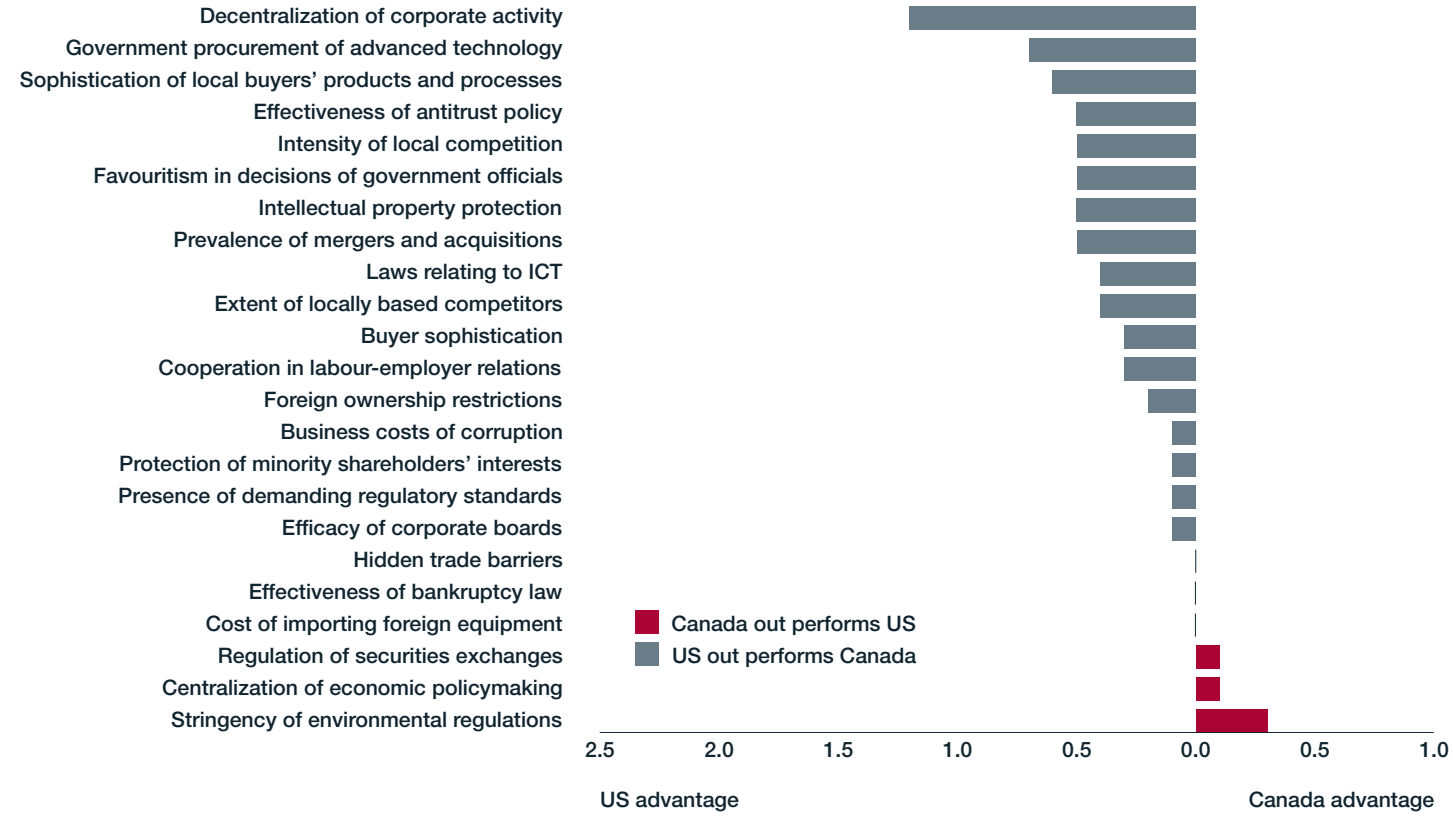
[28] For a more detailed description of the Business Competitive Index and the Executive Opinion Survey see World Economic Forum, *The Global Competitiveness Report, 2003-2004,* pp. 167-178

Exhibit 15 Canada trails in "Specialized Support" factors



Source: Institute for Competitiveness & Prosperity analysis based on World Economic Forum.

Exhibit 16 Canada trails United States on "Competitive Pressure" factors



Source: Institute for Competitiveness & Prosperity analysis based on World Economic Forum.

The lack of adequate structures of specialized support and competitive pressure results in mediocre strategies and average operations by our businesses (Exhibit 17). We have argued that company strategies and operations are only as good as they need to be. If the environment in which companies operate is not providing the specialized support and the intense pressure for innovating and upgrading, then companies will have uninspired strategies and mediocre operations. Results from the Business Competitiveness Index indicate that this hypothesis is borne out. The results of the survey indicate that our market structures are under performing, confirming the Institute's analysis of specific clusters and Canadian firms that are global leaders.[29]

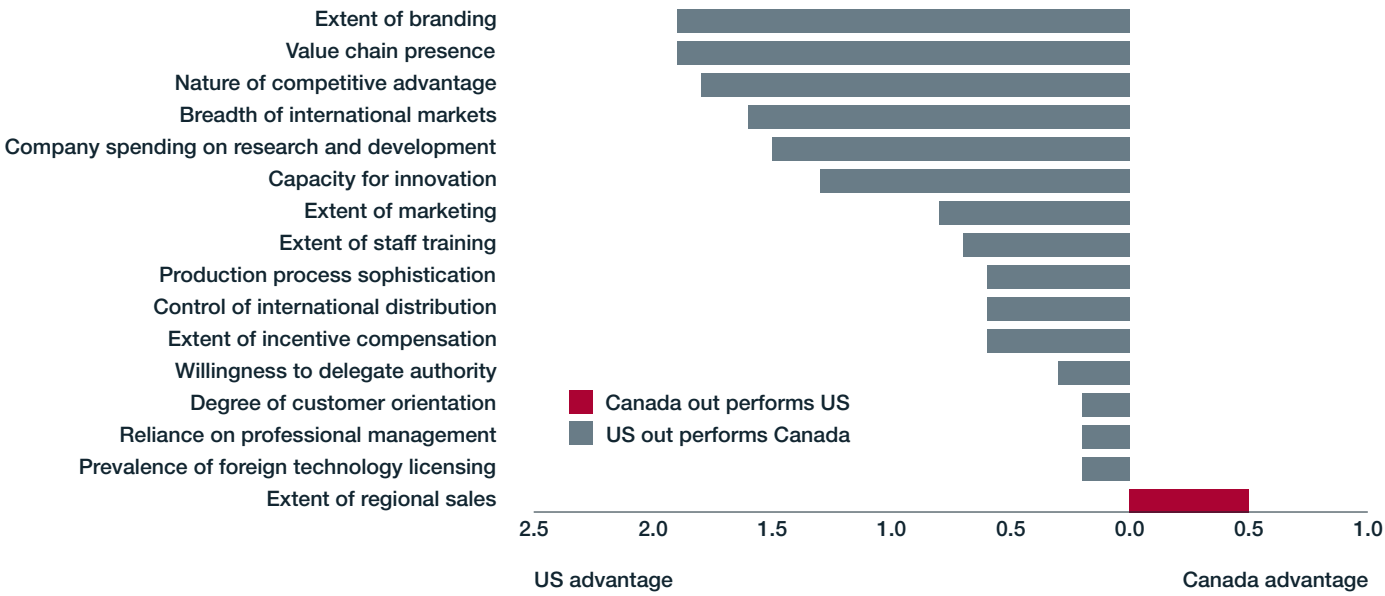
Innovation policy focuses too narrowly on support

Structures of pressure and support are important determinants of innovation output. As we show here, Canada's innovative capacity, as measured by patents, trails US performance considerably. While it is important to note that not all innovative activity is captured by patents – for example, in management process improvements or in software – many academics who study innovation agree that patenting is a key measure of a region's innovative output.

To measure patent output in Canada, we compiled patent records where a Canadian inventor was named.[30] We sorted patents into year of issue, province, Census Metropolitan Area, and industry. We based our industry classification on the traded/local/natural resource distinctions we have used in our work to date. Within the traded industries, we assigned patents to one of 41 traded clusters consistent with the methodology we have adapted from Michael Porter's Institute for Strategy and Competitiveness[31] and used in our previous research. Patenting rates are strongest in traded industries (Exhibit 18).

As in the United States, Canada's traded industries are more innovative than local industries because they are more specialized and face greater competitive pressure from a wider set of competitors and customers. As we have observed with the wage and productivity performance of our traded clusters,[32] Canada has a good mix of traded clusters,

Exhibit 17 Canada trails United States on most "Company Operations and Strategy" factors



Source: Institute for Competitiveness & Prosperity analysis based on World Economic Forum.

[29] *Strengthening structures,* pp. 34-38.
[30] US Patent and Trademark Office data compiled for the Institute by CHI Research.
[31] See *Strengthening structures,* p. 24 for a discussion of traded clusters; Visit www.isc.hbs.edu for more information and US results.
[32] *Strengthening structures,* pp. 24-26.

but they are less effective in delivering innovative output. Our mix of clusters is such that, if they matched US patent results, Canada would be only 25 percent behind the United States. Instead, we trail by 70 percent per employee. Over half of this disadvantage (45 percent of the 70 percent) is because of lower effectiveness (Exhibit 19). In all but three of the clusters, Canada's patent output per employee is behind the US output.

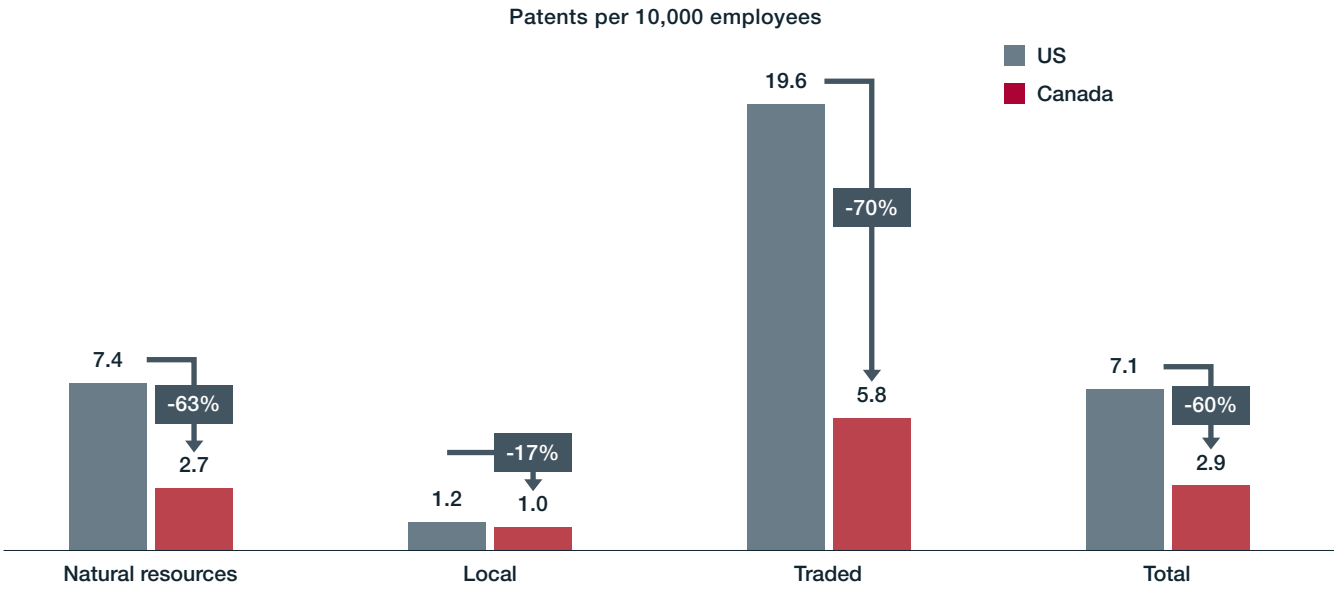
World Economic Forum results indicate that Canada's innovative capacity trails the United States.[33] The pressure/support framework is useful in explaining Canada's lower level of innovation relative to the United States.

Our work indicates that efforts by Canada's governments to strengthen innovation and commercialization have been driven by an approach that puts more emphasis on narrowly defined support measures and less on pressure. As we assess policies at the federal and provincial levels, we find a bias toward a "supply side" or "support" model – with an over emphasis on the hard sciences and traditional R&D. In effect, the policies indicate a belief that the real challenge we have in Canada is having enough technical personnel, technology spending, R&D tax incentives, and the like. Our research indicates that these factors are only part of the challenge and that as long as the model in the minds of policy makers continues to be narrow and incomplete, we will make little progress on innovation and commercialization.

Funding focuses on support for hard sciences

Funding is narrowly defined around support for the hard sciences. The federal government funds and administers a host of foundations, organizations, partnerships, and scholarships designed to fuel innovation and broaden Canada's R&D base. In all, more than two dozen programs directly and indirectly support innovation and commercialization. Much of the federal government's research is across three funding agencies: the Natural Sciences and Engineering Research Council (NSERC), the Canadian Institutes of Health Research (CIHR), and the Social Sciences and Humanities Research Council (SSHRC). The first two account for 87 percent of the combined funding and SSHRC receives 13 percent. Business disciplines receive only 8 percent of SSHRC funding.[34]

Exhibit 18 Canada trails US patent output, especially in traded industries



Source: Institute for Competitiveness & Prosperity; Institute for Strategy and Competitiveness; Statistics Canada; patent data from US Patent and Trademark Office, CHI Research.
Note: Canada results: 1999-2003 average; US results: 1997-2001 average.

[33] Institute for Competitiveness & Prosperity, *Reinventing commercialization and innovation policy in Ontario,* October 2004, p. 17.
[34] *Ibid.,* p. 22.

These three agencies in turn allocate funds in the Canada Research Chairs program. Fully 78 percent of these chairs are in the hard sciences, with the balance in social sciences and humanities. Within this group, only a small proportion supports management disciplines. So, while business degrees account for 11 percent of all degrees granted in Ontario, for example, less than one percent of the province's Canada Research Chairs are in the management discipline. The three agencies are also involved in the direction of the National Research Council, whose expenditures are largely in the hard sciences.

Other programs also focus on the hard sciences. The Canadian Foundation for Innovation supports infrastructure costs associated with research projects. Again we find that this program has a hard science orientation – less than one percent of its funding since 1998 has been in the business discipline. And the Technology Partnerships Canada and the Networks of Centres of Excellence are aimed at supporting the hard sciences. Our review of provincial programs in Ontario indicates a similar orientation towards hard sciences.

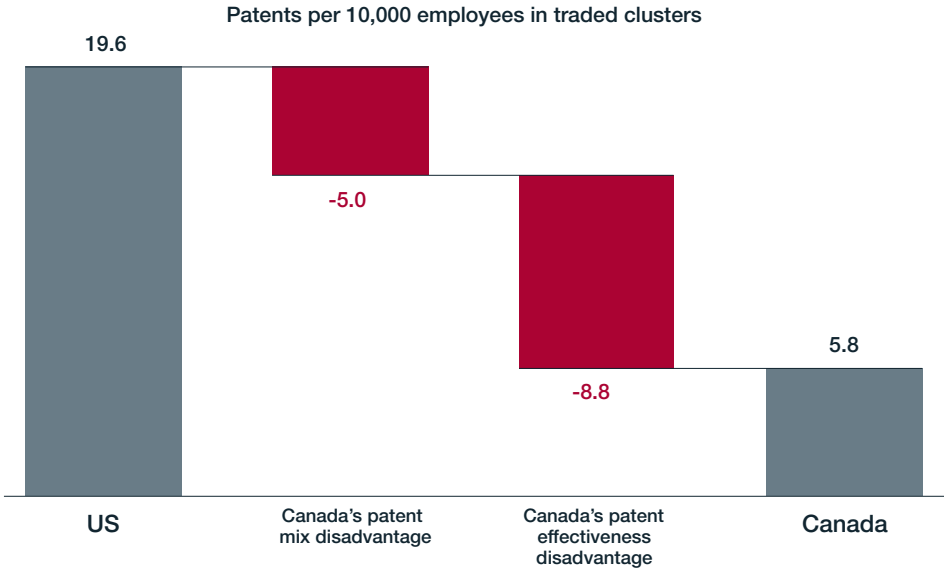
To be sure, both the federal and provincial governments do have programs that support innovation more broadly defined, including the development of management capabilities. But the innovation policy and program orientation in Canada is geared towards hard sciences, limiting research and innovation in other areas that can also contribute to innovation and upgrading.

Supportive tax policies appear ineffective

Another area of support for innovation is taxation. Canada has one of the most generous tax incentive programs for R&D among OECD countries. But Canada also has extremely high effective tax rates on business capital investment. The net effect appears to be that tax policy is not helping to encourage firms to increase their investments in innovation.

To stimulate R&D investments from Canadian companies, the Canadian federal government has created a generous plan of R&D tax credits. The Scientific Research and Experimental Development Program (SR&ED) gives corporations a 20 percent tax credit for relevant investments in research and development, and gives small private companies (CCPCs) a credit of up to 35 percent of R&D expenditure.[35] These tax incentives have been popular over the years, costing the government of Canada an estimated $1.3 billion in 2003 alone.[36] Additionally, the Ontario government has put in place two programs that augment those credits for small and large corporations.

Exhibit 19 Canada clusters trail US patent output largely because of effectiveness



Source: Institute for Competitiveness & Prosperity; Institute for Strategy and Competitiveness; Statistics Canada; US Patent and Trademark Office, CHI Research.

[35] Smaller CCPCs refer to Canadian-controlled private corporations with prior-year taxable income under $400,000 and prior-year taxable capital employed in Canada under $15 million.
[36] Canada, Department of Finance, *Tax Expenditures and Evaluations (2003).*

Unfortunately, despite those incentives, Canada still fares poorly in R&D investments as a proportion of GDP, compared with other nations (Exhibit 20). This is especially true for Business Expenditures in Research and Development, or BERD, the sector of R&D that influences GDP most strongly. Additionally, the BERD investments in Canada have been highly concentrated, with a single telecommunications firm, Nortel, accounting for around 40 percent of all business R&D in 2001.[37]

One possible explanation is that the tax credits encourage firms that are already doing R&D to spend more, or simply gives them a tax break for doing the research they were planning to do anyway. In fact, evidence from international research shows that tax incentives do not influence a company's R&D spending strategy.[38] This would support the hypothesis that these credits do little to stimulate firms that do not already do R&D to start the process.

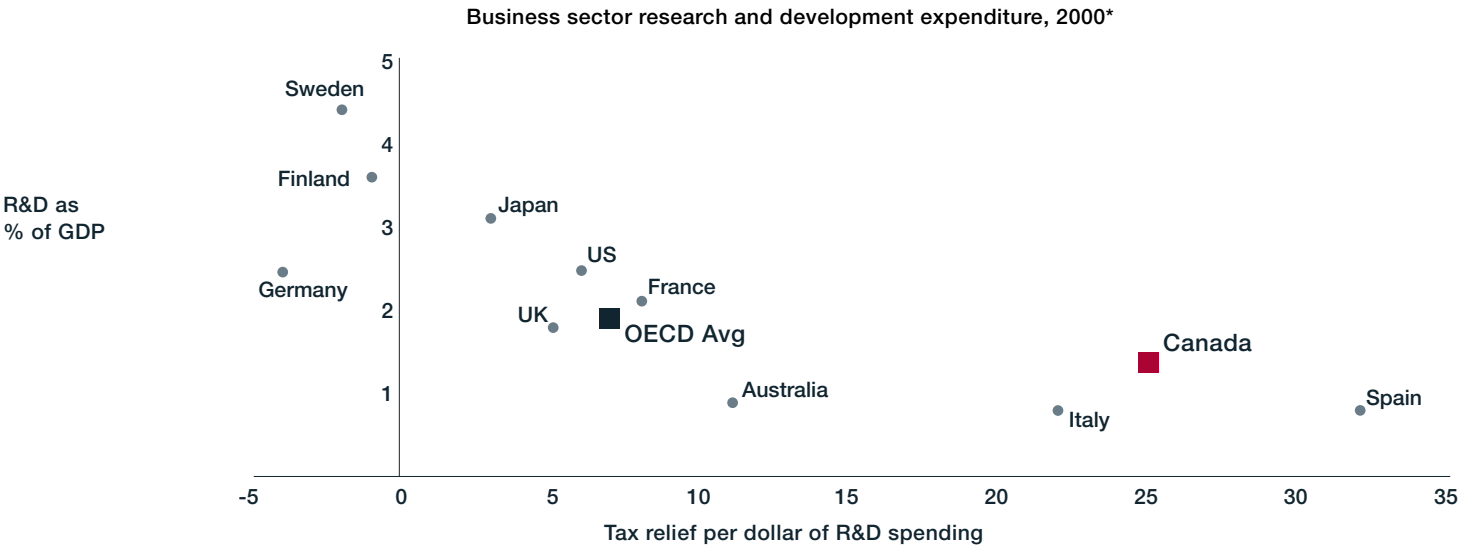
The other potential explanation for Canada's low investment in business R&D is Canada's overall tax structure. Since R&D credits only play a small role in the overall tax profile of a corporation, they may not be the main driver of R&D activity. In fact, as our research into Ontario's marginal effective tax burdens[39] (versus peer states) shows, our businesses face a significant disincentive to invest in capital and in R&D. The high effective tax rate burdens on business investments have a negative impact on all corporations, reducing their incentive to invest in innovation.[40]

Venture capital programs focus on quantity not quality

Venture capital is an important component of the innovation environment, providing the resources needed to create successful, innovative firms. Evidence indicates that the availability of venture capital funds in Canada is in line with US experience, except for the huge run-up of US investment experienced during 1999 and 2000, the peak two years of the dot.com bubble (Exhibit 21).

In fact, over the last three years, the cumulative amount of capital raised in Canada surpassed the amount invested by $1.7 billion.[41] So it is hard to argue that Canada is suffering from an inadequate quantity of venture capital funds. In addition, the low returns from venture capital in Canada

Exhibit 20 Canada has a generous tax incentive program but a low level of business R&D



* *or latest available year*

Source: Institute for Competitiveness & Prosperity, based on *OECD Economic Surveys Canada* – Volume 2003 Issue 14 (2003).

Note: Negative tax relief numbers indicate tax disadvantage for R&D within country's overall tax regime.

[37] OECD, *OECD Economic Surveys Canada* – Volume 2003 Issue 14 (2003).
[38] *Ibid.*
[39] *Closing the prosperity gap,* pp. 36-38 and *Investing for prosperity,* pp. 35-38.
[40] Jack M. Mintz, *Most Favored Nation: Building a Framework for Smart Economic Policy.* CD Howe Institute. p 99.
[41] *Reinventing innovation and commercialization policy in Ontario,* pp. 33-34.

relative to the United States indicate that the challenge we face in Canada is to strengthen the quality of our venture capital investments, not the quantity.

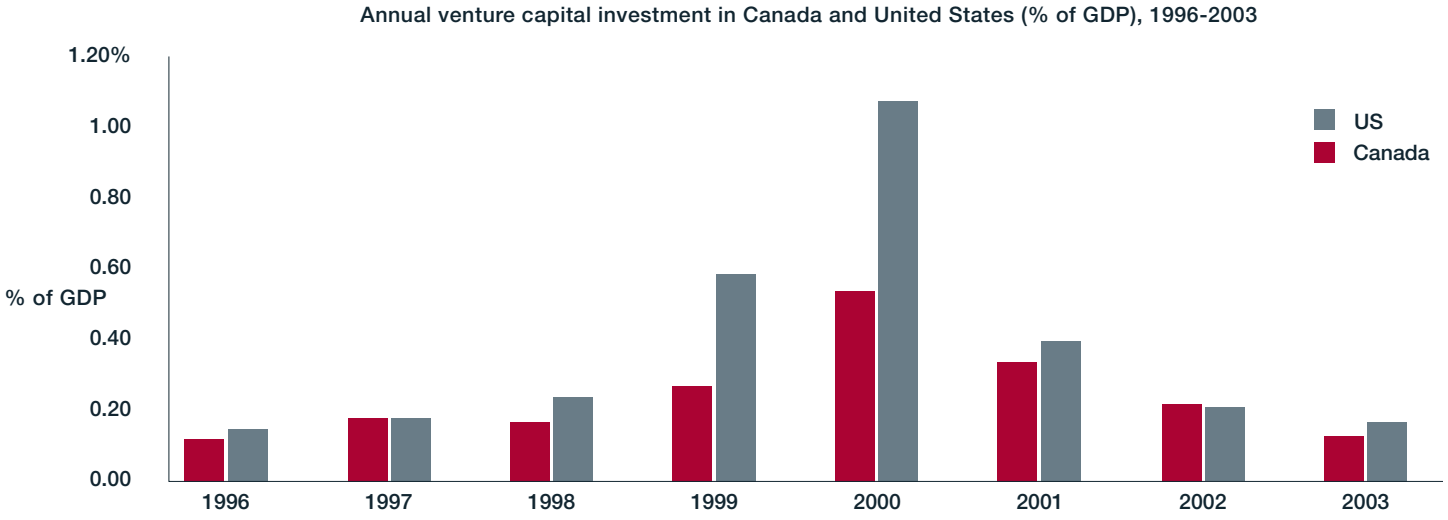
There are many factors behind the large supply of funds and poor performance of the Canadian venture capital industry. However, we cannot overlook the presence of Labour Sponsored Investment Funds (LSIFs) in the Canadian venture capital landscape. In 2003, LSIFs alone contributed 67 percent of all venture capital raised in Canada.

LSIFs are a Canadian phenomenon offering generous tax credits of 15 percent at the federal level and 15 to 20 percent at the provincial level, as long as the investment is capped at $5,000. When combined with RRSP credits, LSIFs the total tax credit for an individual at the highest tax bracket is equivalent to a 10.8 percent return over eight years, the required lifetime of a fund.[42]

Because individual investors receive a high return on their investment irrespective of fund performance, they are not overly concerned with the actual return of the fund. In addition, investors in LSIFs each have very limited exposure and are fragmented. Hence the funds do not benefit from the pressure exerted by sophisticated investors with a significant stake in success. Finally, LSIFs are restricted in the type and geography of their investments and are required to invest some funds in the year they are raised. It is no surprise, then, to see that their returns have been below average. Recent data show that the median five-year return on labour-sponsored funds is minus 2.0 percent, while the median five-year return on Canadian small-cap equity funds is 10.8 percent.[43]

The labour-sponsored program has been successful in raising large amounts of money from retail investors in Canada. However, it may be hurting the overall Canadian venture capital industry more than it helps by increasing the supply of venture capital funds and lowering the industry returns. Finally, the program also represents a significant burden on the provincial and federal treasuries, with an estimated total tax expenditure of $3.3 billion between 1992 and 2002.[44]

Exhibit 21 Venture capital experience in Canada has been close to US experience except for the dot.com bubble



Source: Institute for Competitiveness & Prosperity based on MacDonald & Associates Ltd.; Statistics Canada; PricewaterhouseCooper/Venture Economics/NVCA MoneyTree Survey, Bureau of Economic Analysis (United States).

[42] Finn Poschmann, 2004. "Better Options for the Venture Captial Market." *The Howe Report* (private circulation) July, 2004.
[43] *Ibid.*
[44] Douglas J. Cumming, Jeffrey G. Macintosh, "Crowding out Private Equity: Canadian Evidence", University of Alberta Working Paper. 2003.

Canada needs policies to generate specialized support and competitive pressure

We think the evidence is unmistakable that governments have in mind a model of innovation that puts priority on support factors. These key support factors are those that drive technology- and hard science-based innovation. Public policy needs to be informed by a fuller definition of support and by competitive pressure.

Broader and deeper support for innovation and commercialization is critical. Our model of pressure and support recognizes the importance of science and engineering personnel. But public policy needs to focus on how we get the right number of engineers and scientists with the right skills. We recognize the critical importance of higher education R&D funding. But how can we strengthen industry-university collaboration? And venture capital is very important to innovation, competitiveness, and prosperity. But how can public policy drive towards more high quality investment opportunities and greater returns?

Specialized support factors, such as the quality of management and management schools, are overlooked. As discussed above, Canadian managers are less well educated than their US counterparts generally and also in business education. Fewer of our managers have university degrees of any kind and particularly business degrees. The CEOs of our largest public corporations are less likely to have graduate business education than their US counterparts. It is hard to ignore this disparity in human capital in light of our under performance in competitiveness and innovation and in our relatively poor rankings in our companies' operations and strategies as found by the World Economic Forum.

Pressure for higher competitive intensity will spur business innovation. Complementing specialized support is the stimulation of demand for innovation and commercialization that comes from intense rivalry among firms and from sophisticated customers. Both of these pressure factors are problematic in Canada. A key element of enhancing pressure for innovation is the presence of sophisticated business strategies and operations. Businesses that depend on innovation for survival and success will demand greater innovation in their own firms and from others, such as universities and research institutes. If we really want to solve the commercialization challenge, we must create a higher demand for innovation. To do this we must look at the competitive pressure that faces our leading companies and see what can be done to encourage businesses to be more competitive in the marketplace.

Creating an environment in which Canadian businesses can and must innovate and commercialize is a key public policy challenge to raising productivity. Both require attention, and clear answers and policies can help close the innovation – and in turn the prosperity – gap with the United States.

In summary, our structures of pressure and support are not stimulating superior performance in our industries in Canada. We have built a solid foundation of physical, administrative, and educational support. However, we have not developed adequate structures of specialized support and competitive pressure to drive business strategies and operations that will build Canada's capacity for productivity and innovation – and prosperity.

Action plan for prosperity

All Canadians have a role to play in realizing our prosperity potential

Canada has one of the most vibrant economies in the world. Yet, in comparison to the United States, we have a worrisome prosperity gap that tells us we are not realizing our full economic potential. In our last annual report to stakeholders in Canada's prosperity, we proposed actions for individuals, businesses, and governments to close Canada's productivity gap to better compete in the global economy. We continue to believe that following these recommendations will move Canada from the vicious circle of prosperity performance towards a virtuous circle where greater investment will lead to higher productivity that will generate more prosperity that, in turn, will increase our capacity for investment for future productivity and prosperity gains.

Our recommended action plan for attitudes, investments, motivations, and structures builds on the recommendations we made in last year's report.

Heighten aspirations across Canada

We recommend that Canadians heighten our aspirations for our future prosperity. The first and probably most important change required is to set a higher standard for our economic progress – we want to be a leader not laggard within North America.

For this to become a reality, all Canadians have to raise their sights. Individuals must raise their aspirations for personal upgrading of their skills and capabilities through increased formal education and life-long training. Canadian firms must raise their aspirations from competing locally, provincially, or nationally to competing globally against the best in the world. They must raise their aspirations regarding the educational attainment of their employees at all levels. Finally, governments at all levels in Canada must raise their aspirations to achieve an invigorating environment that encourages citizens and firms to upgrade and innovate and that compares favourably with the US environment. And we need to celebrate the winners who have set and met high aspirations. Without raised expectations, it is doubtful that Canada can enhance its relative prosperity.

Encourage students to invest in their higher education

Although our K-12 educational achievements compare favourably with those of our US counterparts, more of our high school graduates should pursue post secondary education and especially graduate degrees. Since those with higher levels of education earn more over their lifetimes and our economy benefits more from their labours, we are losing out on the contributions of those who fall short of their educational potential. Currently, Canadians are less likely than their US peers to encourage young people to pursue further education. Compared to the United States, Canada is close in the number of bachelor's degrees conferred per 1,000 population. But at the graduate level the United States leads dramatically. Our US counterparts continue the investment farther along the higher education spectrum than do Canadians, especially at the level of "terminal master's" – the final degree for the vast majority of its holders before they enter the economy to enhance productivity. The United States also out produces Canada in conferring PhDs, though by a substantially lower margin than at the master's level. Raising our educational aspirations is an important way to increase productivity.

For individuals, we recommend that they develop a commitment to life-long learning to enhance their own skills and update their capabilities. Nothing improves life time earnings as much as education. We also

encourage graduates at every level to contribute more generously to their alma maters to help finance ongoing development. Finally, we encourage current students to recognize that supporting the freeze of regulated tuitions, while attractive for them in the short run, helps guarantee the long-run under funding of higher education.

We encourage firms to continue partnerships with their employees to participate in ongoing formal training and education programs and to include educational institutions – especially the most dramatically under funded undergraduate and graduate programs – in their charitable donations.

For governments, we recommend that a long-term strategy be developed to raise Canadians' investments in post secondary education. We encourage provincial governments to recognize that, by historically maintaining a government monopoly on university education and strictly regulating most tuition levels, they have been primarily responsible for producing an investment level in higher education that is half that of our US competitors. A long-term strategy for higher education in the provinces should explore a sustainable approach to provincial funding, consider the role of tuition deregulation, and continue to foster the development of a diversity of post secondary institutions. The strategy should ensure that the solutions take into account the role of individuals, firms, and other private organizations in improving our investments in higher education.

Accelerate immigrant integration

Canada is becoming the home for many highly educated immigrants. We observed, however, that a large number are under employed or even unemployed. The result is that we are forgoing their potential to contribute more to our economic well being. Some programs are successfully integrating immigrants into Canadian professions and employment, but more needs to be done.

We encourage individuals to continue supporting the not-for-profit sector in developing the breadth and depth of programs and processes for settling recent arrivals into our economy and communities. We encourage employers to continue exploring innovative approaches to reaching out to the talent inherent in our recent immigrants and to work closely with accrediting organizations to ensure policies and practices are up to date. We encourage governments to continue their co-operation in developing settlement programs and policies.

Overcome chronic under investment in machinery, equipment, and software

Capital investment is a major contributor to GDP growth. But both private and public sector investment in machinery, equipment, and software and infrastructure in Canada now lag US capital spending. We estimate that our under investment costs Canadians $400 in lost GDP per capita every year. The clear answer is for business and governments to raise their investment especially in machinery and equipment to add to the productive capacity of Canada's economy.

Rethink federal and provincial tax systems to encourage investment

To increase our competitiveness, Canada must continue to reduce taxes, especially taxes on capital. In 2002 and 2003, we identified the disadvantage in marginal effective tax burdens in Ontario versus a group of US states and showed how this affected Ontarians' motivations to invest. Our latest research indicates that the disadvantage persisted in 2004. The Institute is not recommending specific tax measures – it is simply urging our governments to recognize that taxes represent a disadvantage for Canada's competitiveness that can be overcome by developing innovative solutions in our tax regimes.

Ensure market structures support break out investment and innovation

Our work during this past year indicates the importance of our market structures and their impact on the support and pressure for investment an innovation. Canada has solid general support structures – infrastructure and basic education – that underpin cluster performance. But our research indicates that our firms are not benefiting from an adequate level of specialized and sophisticated support. Nor have we created adequate competitive intensity – the pressure created through the presence of sophisticated buyers and significant rivalry. Without these upgraded supports and pressures, too few of our firms and industries have developed world-class strategies and operations that drive the productivity and innovation so necessary to realizing our prosperity potential. Governments need to ensure regulatory and innovation policies strengthen specialized support and competitive pressure.

Over the past three years the Institute for Competitiveness & Prosperity has measured and monitored Canada's prosperity against the leading economies in the world. We are confident that we can close the prosperity gap with the United States, the most competitive economy in the world. Following these recommendations will put all Canadians on the path to working together to realize our prosperity potential and ensure the economic well being of future generations.

How to contact us

To learn more about the Institute and the Task Force please visit us at: **www.competeprosper.ca**

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Working Paper 5 – *Strengthening structures: Upgrading specialized support and competitive pressure* – July 2004

Working Paper 6 – *Reinventing innovation and commercialization policy in Ontario* – October 2004

Task Force on Competitiveness, Productivity and Economic Progress:

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