

Canada's innovation imperative

Institute for Competitiveness & Prosperity
REPORT ON CANADA 2011



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Foreword & acknowledgements



ON BEHALF OF THE INSTITUTE FOR COMPETITIVENESS & PROSPERITY, I AM PLEASED to present our Report on Canada 2011 to the Canadian public.

The economy is recovering from the major downturn we experienced in 2008 and 2009. Like all Canadians, we are hopeful that the worst is behind us. Our task in the short term is to achieve a robust recovery that gets us back on track. Our longer term challenge is unchanged – to achieve our full economic potential through better productivity and innovation performance. This is the essence of our 2020 Prosperity Agenda for Canada.

Our focus in this year's report is on improving our innovation capabilities and results.

We have a prosperity gap in Canada – a gap between our potential and actual economic results. This prosperity gap is a productivity gap, and the productivity gap is an innovation gap. Canadians are among the world leaders in work effort. Through a combination of good demographic profile, high rates of participation in the work force, and lower unemployment, we lead large, developed economies in hours of work per Canadian.

But we are laggards in creating economic value per hour worked. For a variety of reasons, we are not leading the world in creating innovative products, services, and processes in our businesses and our workplaces. We can improve our innovation results – partly by investing more in technology and skills, and partly by enhancing competitive pressure and support. However, our governments' innovation policies have been inadequate, focusing on increasing new-to-the-world inventions, rather than stimulating relevant-to-the-market innovations.

Canadians, and our business leaders, understand the need for innovation. Our challenge is to turn our positive attitudes into action. We need to be relentlessly determined to deliver innovative products, services, and processes.

We have to step up our investments in innovation – from increasing R&D and patents to adapting existing technology to businesses; from investments in physical capital to investments in human assets. Businesses have slowly been closing the technology investment gap with their US counterparts as our dollar has strengthened. We encourage them to continue on this path.

Our provincial and federal governments have been investing in education in the past few years and so far have resisted reductions in these investments to tackle deficits. We applaud this stance. If we are serious about competing in the creative age, we have to invest in building the skills and capabilities that will give us the advantage we need. Greater success by our post secondary institutions in competing globally for talent will strengthen the educational experiences in our schools and draw the

“Taking action to close Canada’s innovation gap is an imperative for the public, our business leaders, and our governments”

world’s most skilled people into our workforce. Our ability to compete with other world-class universities for talent is a strong indicator of the quality of our system. Our determination to succeed internationally will foster innovation and improvement in our post secondary sector.

Canada has made huge progress on our Prosperity Agenda by restructuring the way we tax business investment. Converting the provincial sales tax to a value added tax and harmonizing it with the federal goods and services tax in Ontario and British Columbia has been a tough sell politically – but it was the right thing to do. Coupled with the reductions in our corporate tax rates and the elimination of the capital tax, Canada is moving from one of the worst to one of the best tax regimes in the world for encouraging new business investment. This will stimulate investments in innovation and create more high-paying jobs in innovative firms. We continue to recommend that Canada consider a carbon tax in order to deal with the threats and opportunities from carbon emissions. And we urge Canadians to be world leaders in innovative corporate and personal tax policies.

Our economic structures can be improved to drive innovation. Our prosperity is built on trade, and Canada needs to take the lead in expanding international agreements. Our trade negotiations with the European Union are a hopeful sign. We need to pursue other trade expansion opportunities with countries like China and India. We know that more trade provides overall benefits – but with some hardships for specific groups of workers. Current adjustment policies are not as effective as they could be; innovative solutions, like wage insurance, ought to be assessed. Our current policy of evaluating the net benefits of foreign direct investment is opaque and does not give clarity on how specific transactions will be judged. For that, we recommend a new policy of bilateral reciprocity such as we use in trade policy.

Canada has many of the building blocks to achieve our full prosperity, productivity, and innovation potential. We need to put them together for the benefit of ourselves and future generations of Canadians.

We gratefully acknowledge the funding support from the Ministry of Economic Development and Trade. We look forward to sharing and discussing our work and findings with all Canadians. We welcome your comments and suggestions.



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



Canada's innovation imperative

As the new federal government settles in, we continue to recommend that Canadians focus our energies on achieving the 2020 Prosperity Agenda that we have set out. This is the moment for the relentless pursuit of innovation in products, services, and processes, so we can achieve sustainable prosperity and global leadership.

In our Report on Canada last year, we ventured that the recession was nearing an end and that we needed to manage through the recovery to get back on track toward our Prosperity Agenda. We recognized that businesses and families were feeling shell shocked and that governments had to turn their attention to repairing their fiscal situations.

A year later, we are more confident that Canadians have weathered the recession. Our unemployment rate has fallen, though it is still above pre-recession rates. Our fiscal situation is improving slowly. Corporate profits are reviving. The Toronto Stock Exchange remains strong. Business investment is recovering, although as of the last quarter of 2010, it had not returned to pre-recession levels.

A majority government is now taking the reins in Ottawa and is finalizing its economic agenda. We can expect other new governments across the country as several provincial elections will be held later this year. We offer this Report on Canada and our 2020 Prosperity Agenda as contributions to their deliberations. The federal government and some provincial governments have strong fiscal bases on which to develop their agenda as deficits are coming down and a return to balance is in sight. We continue to encourage all stakeholders in Canada's prosperity to regain our footing in the pursuit of long-term prosperity and well being. That means we need attitudes determined to realize our prosperity potential, investments in our human and physical capital, motivations for upgrading and investment through our tax systems, and structures that provide support and pressure for innovation.

Our relationship with the United States is always important, but perhaps is even more so now. Regardless of our current strengths, the robustness of Canada's recovery will be tied to the US success in regaining its economic footing. Its current sluggish growth and challenging fiscal situation will restrict demand for Canadian goods and services from our largest trading partner and cast a pall over investment decisions here. In most areas, US economic decisions are domestic matters, and Canadians have little role to play in their deliberations.

But we can and must consider our interests in our relations with the United States. We must be friendly, but forceful, in dissuading US politicians from protectionist sentiments. We need to resist impulses to strike back at the "Buy American" policy. Our diplomatic efforts must focus on securing preferred treatment in the United States. Better yet, we need to remind our friends in the United States and around the world of the importance of expanded international trade and Canada's leadership in the global economy.

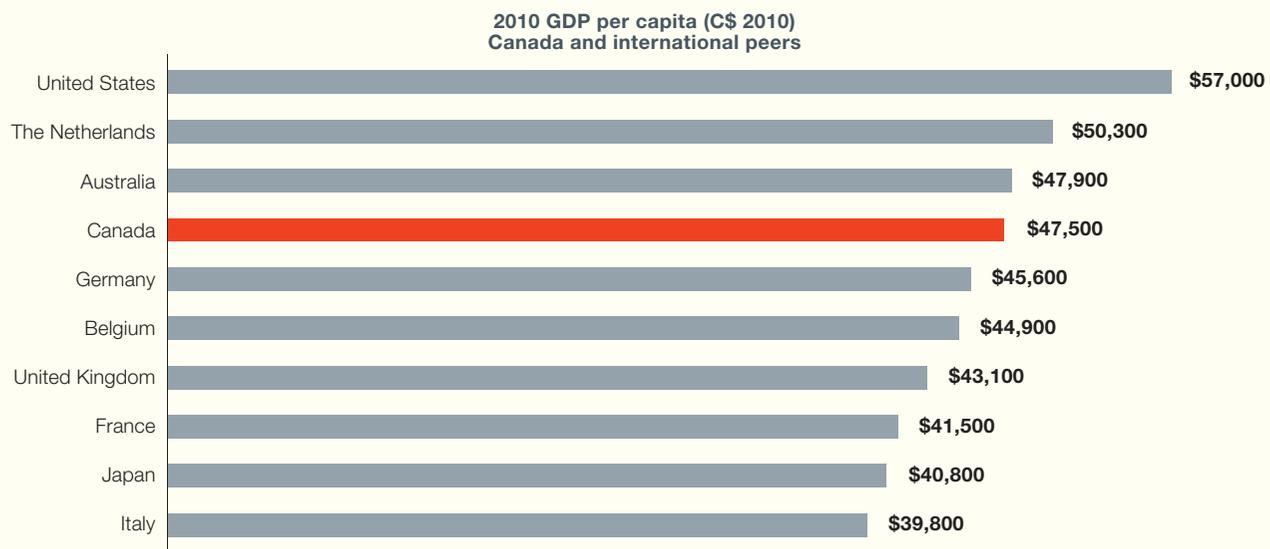
Canada continues to be a world prosperity leader

As in past years, we note that Canada is one of the most prosperous jurisdictions in the world (*Exhibit 1*).

Among the large, developed economies, Canada has been in the top tier for the past decade. In 2010, Canada stood fourth among international peers. But compared to our neighbour and most significant trading partner, the United States, Canada's prosperity continues to lag.

For comparability, we convert international currencies into Canadian dollars using bilateral purchasing power parities (PPP), not day-to-day exchange rates. These PPPs reflect ongoing cost-of-living and cost-of-production differences between countries and change more slowly than exchange rates.

Exhibit 1 Canada is among the most prosperous of international peers



Note: Countries with population greater than 10 million. Currency converted at PPP (OECD). Population data are provisional for Australia, France, Germany, Japan and the United Kingdom.
Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; US Bureau of Economic Analysis, US Census Bureau; Australian Bureau of Statistics; Statistisches Bundesamt Deutschland; Centraal Bureau voor de Statistiek; INSEE – National Institute for Statistics and Economic Studies; Japan Statistics Bureau & Statistics Center; Eurostat; IMF; and OECD.

Note that in all our analyses, unless otherwise specified, we use constant 2010 dollars converted at the Canada/US purchasing power parity of 1.203. More precisely, this is a producing power parity that reflects the Canada-US differences in costs faced by services and goods producers in the two countries. Unlike the purchasing power parity, it does not reflect changes in our terms of trade – that is, improvements or worsening of our consumers' standard of living as a result of changes in commodity prices.

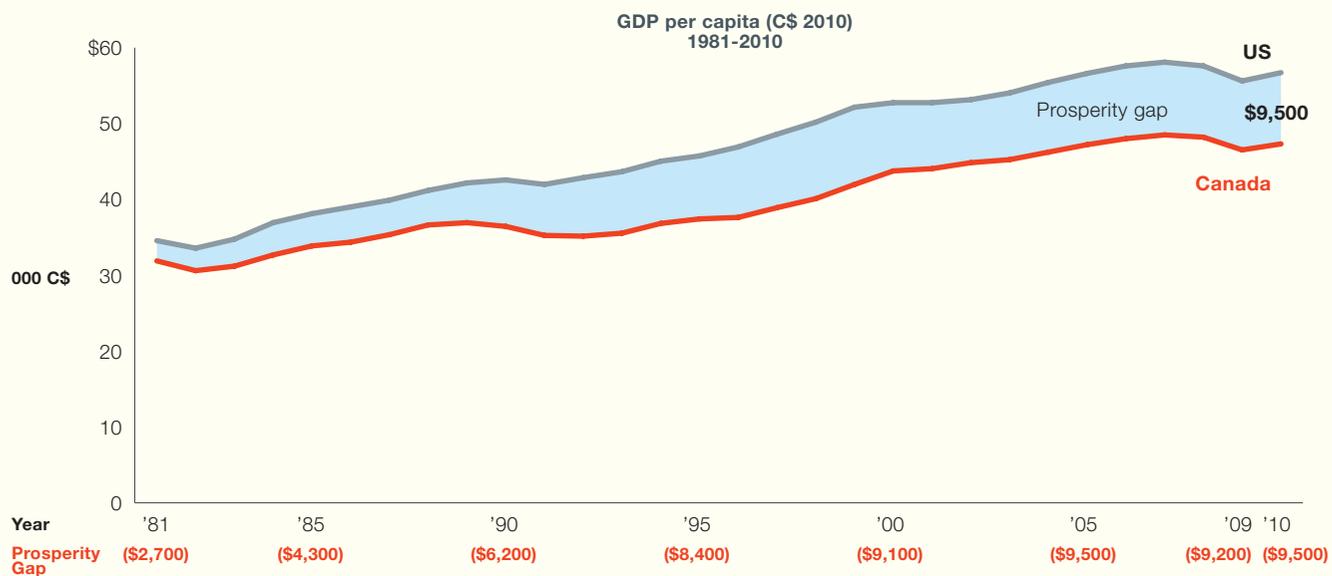
Our interest is in improving sustainable prosperity through innovation and competitiveness. While we are happy that the average Canadian's standard of living has improved as a result of strong global markets for our commodities, this trend can be reversed overnight. Prosperity built on innovation and competitiveness is, by contrast, sustainable.

In the early 1980s, GDP per capita in Canada was \$2,700 behind that in the United States. But since that time, our growth has lagged US performance. In 2009, GDP per capita in Canada was \$9,200 below that of the United States. In 2010, the gap was virtually unchanged at \$9,500 (*Exhibit 2*).

Some have concluded that the recession has been much more severe in the United States than in Canada. But, from the beginning of the recession in the last quarter of 2007 to the last quarter of 2009, Canada's real GDP fell nearly 2.0 percent; over the same period, US GDP fell 2.6 percent. In fact, the economic output of the two countries through the recession matched very closely (*Exhibit 3*).

Where the two economies' performance has diverged dramatically is in the labour force. The recession has hurt job creation and growth seriously in the United States – many working aged Americans have stopped participating in the labour force driving down participation rates, and many of those who continue to look for work are unsuccessful raising unemployment rates. While Canada's performance needs to improve, it has been much better than the US experience (*Exhibit 4*).

Exhibit 2 Canada's prosperity gap with the United States remains significant



Note: Currency converted at PPP = 1.203.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada and US Bureau of Economic Analysis.

Exhibit 3 Recession and recovery are very similar in Canada and the United States

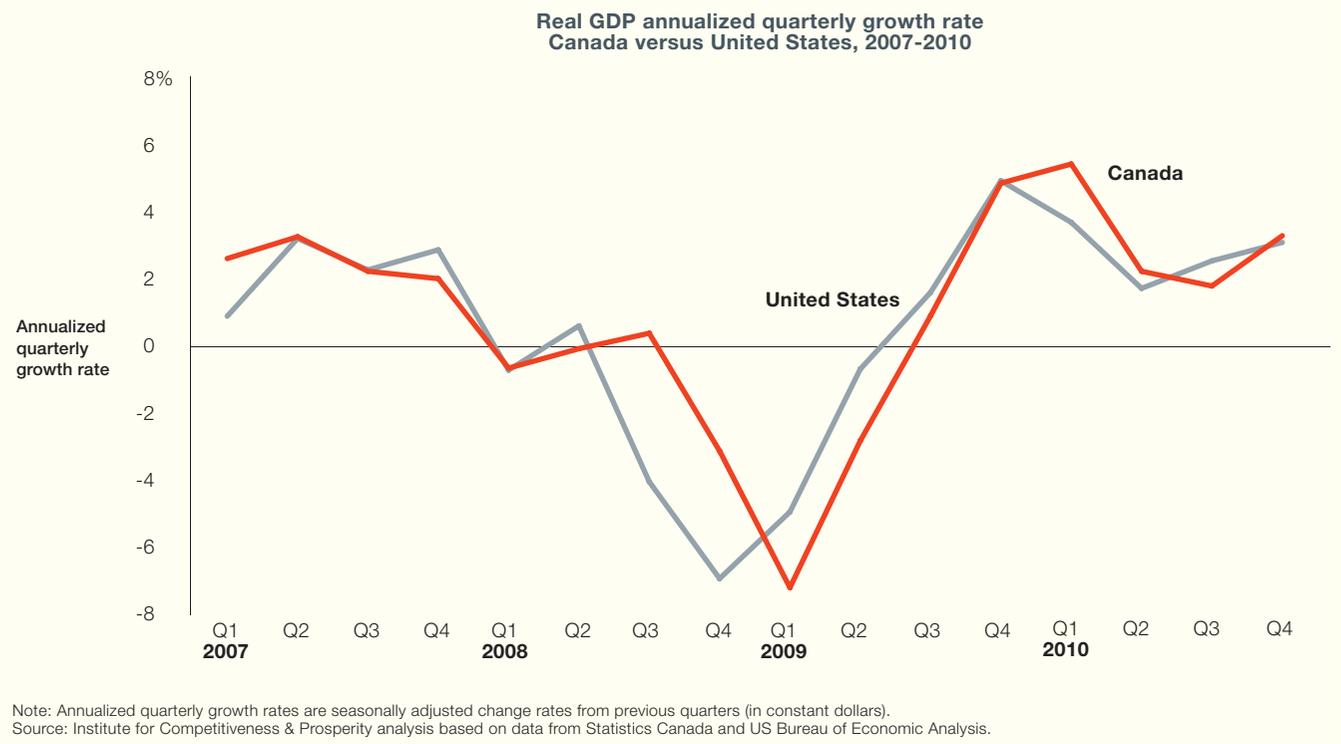
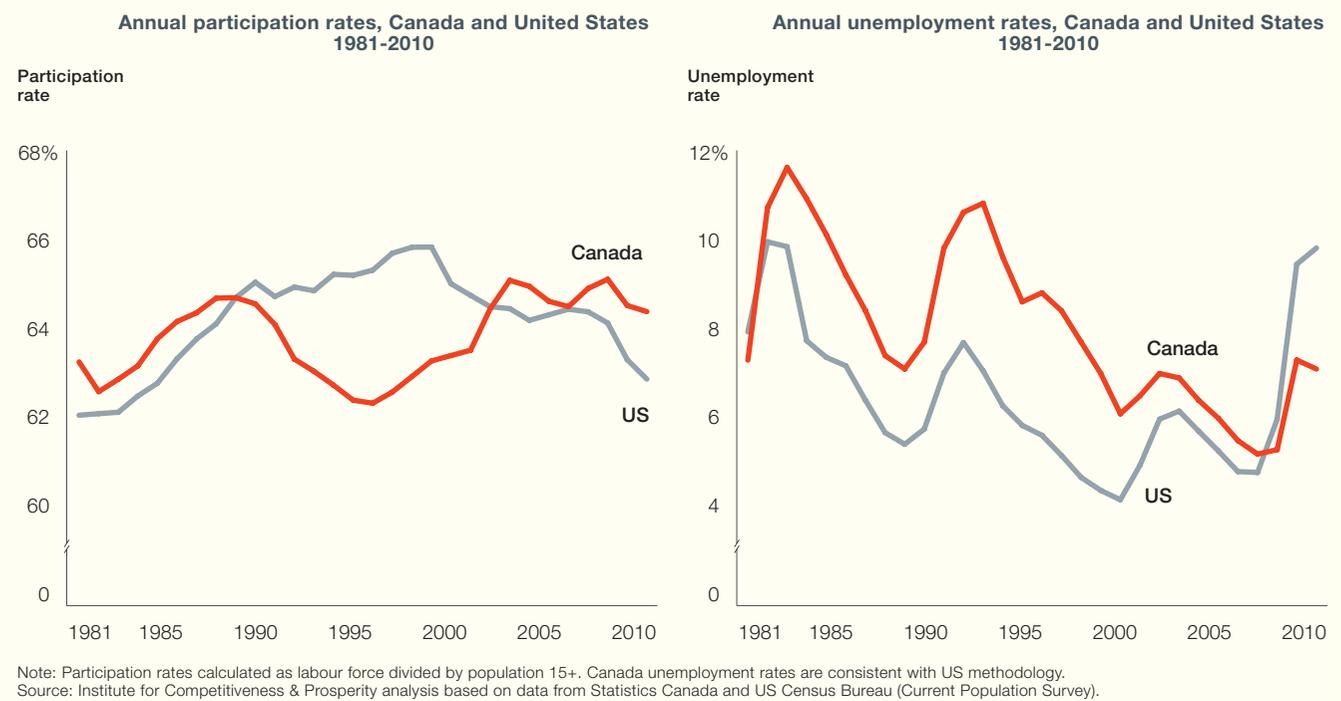


Exhibit 4 Canada has dramatically out performed the United States in recent participation and unemployment rates



Our relative labour force performance versus the United States is to be celebrated. We need to match our job performance with higher prosperity. As we have discussed in past reports, the consequences of not realizing our full prosperity potential are very real. Closing the GDP per capita gap would result in an increase of \$12,900 in after-tax disposable income for each Canadian household (*Exhibit 5*). And closing the prosperity gap would generate an additional \$112.1 billion in tax revenues for all three levels of government across the country.

Lagging productivity versus our US neighbour's performance is the most important source of the prosperity gap, and this undermines Canada's prosperity potential. More innovation will be a major contributor to raising our productivity.

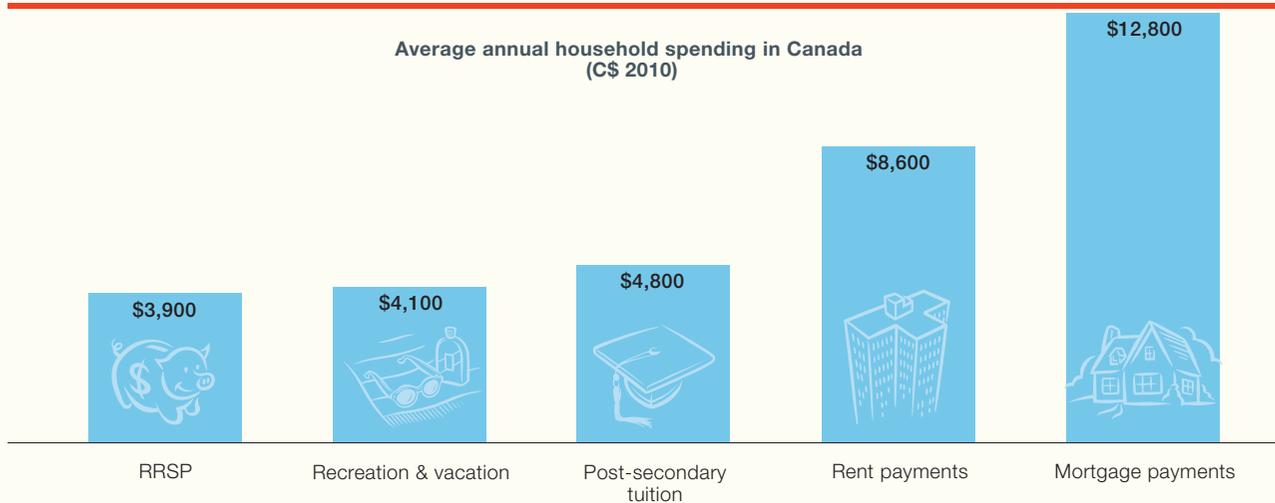
Innovation is an imperative for Canada's prosperity

In recent years, our lower productivity has become a more important contributor to our prosperity gap – and our key challenge (*Exhibit 6*). For each hour we work in Canada, we generate less value from our efforts than our counterparts in the United States. This gap is not due to a mix of industries that are unproductive by nature; instead, it is a result of our inability to realize the full potential of a good mix of industries. The reason for part of this lost potential is that our population has less university education than our counterparts in the United States and is less urbanized, and our businesses invest less in technology.

Canada's productivity is also lower than that in large developed countries outside North America. Our main economic advantage over our international peers is that Canadians expend more hours in work effort – the net effect of our demographic profile, our labour force participation rates, our unemployment rate, and the hours worked per worker. Compared with the three countries that exceed Canada's GDP per capita – the Netherlands, Australia, and the United Kingdom – Canada has the

Exhibit 5 Canadian families would have higher living standards if the prosperity gap were closed

Benefits of closing the prosperity gap for the average household
\$12,900 increase in personal disposable income



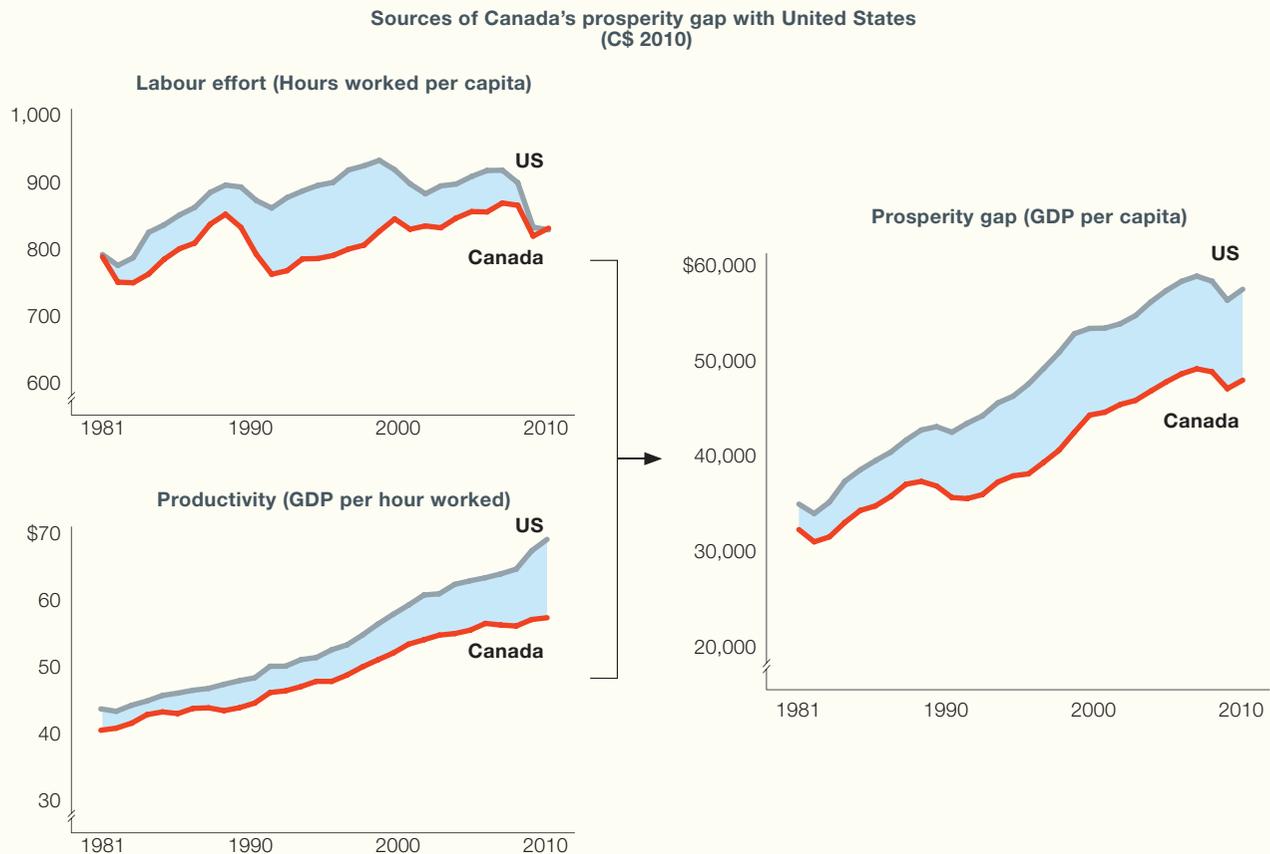
Note: Among Canadians with some spending in these categories; 2009 results restated to 2010 dollars.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, *Spending Patterns in Canada 2009*.

most work hours per capita. Over the past two decades, work hours per capita have grown faster than in all but the Netherlands. Meanwhile, in productivity, Canada is near the bottom and has achieved the second slowest growth. In the old cliché, we are working “harder” than our peers outside North America, not “smarter.”

Productivity and innovation are driven by the same factors. By definition, productivity measures how much value we create per unit of resources used – whether the resources are an hour of labour, a shift of machine time, a barrel of oil, or any other scarce resource. The value created is represented by how much money somebody will pay for the output – beyond the value of resources used. Productivity increases in one of two ways – higher efficiency in the use of inputs, or greater value added per unit of output. Gaining efficiency and adding value through products and services that command higher prices are the two sources of improved productivity (*Exhibit 7*).

While economists may differ on the relative importance of various contributors to productivity growth, most agree on the factors that drive it; for example, skilled workers, capable managers, scientific and engineering talent, and competitive pressure. These factors are the same ones that drive innovation. It is not a stretch to conclude that innovation and productivity growth are inexorably linked – perhaps synonymous.

Exhibit 6 Canada's prosperity gap is a productivity gap



Note: Currency converted at PPP = 1.203.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; US Bureau of Economic Analysis, US Bureau of Labor Statistics, US Census Bureau (Current Population Survey).

Canada’s productivity gap is an innovation gap

We see many manifestations of this innovation gap in our business environment.

Our businesses under invest in technology

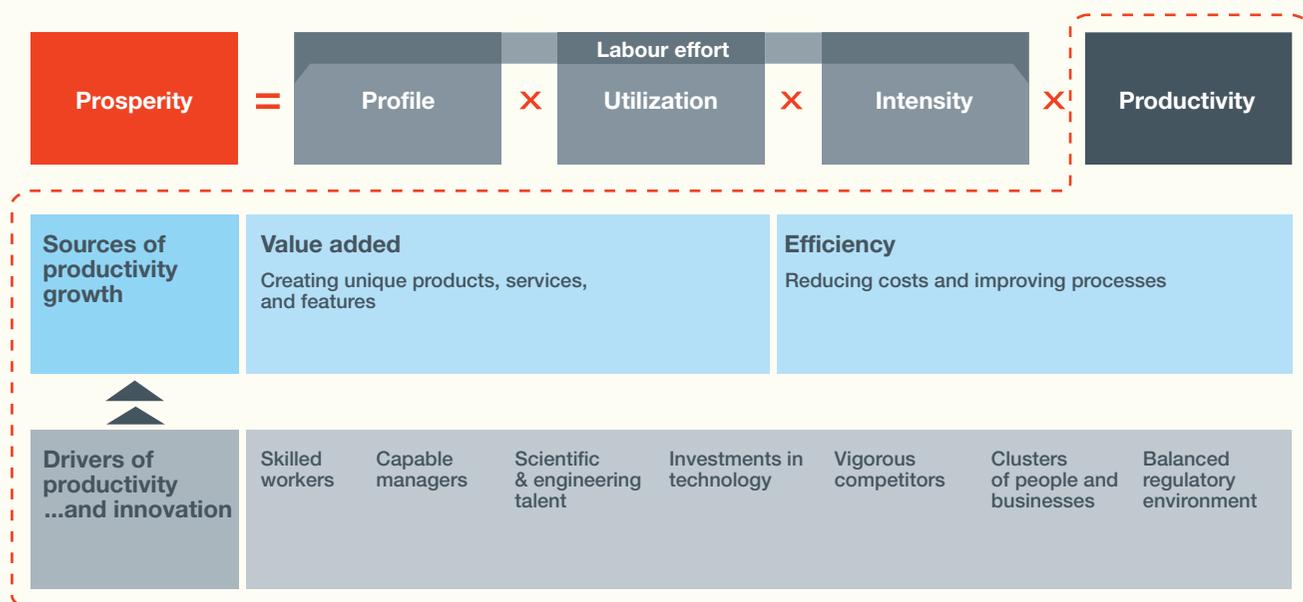
Canadian businesses continue to trail their US counterparts in investing in machinery, equipment, and software to make their workers more productive. Lower investment in information and communications technology (ICT) accounts for about a third of the difference. Higher investment in ICT, which consists of computers, software, and communications equipment, creates an opportunity not only to innovate in our business processes through the application of technology to automate routine tasks, but also – and more importantly – to overhaul entire business processes to deliver more value.

Business R&D lags in Canada

Canada’s R&D investment gap with the United States has largely been in the business sector. As a percentage of GDP, Canada’s business R&D investment over the last two decades is behind the rate achieved by the United States. The provinces that do the most R&D, Ontario and Québec, trail leading states like California and Massachusetts by a large margin.

Economists have gathered significant evidence of the positive relationship between R&D and productivity and have produced substantial proof that R&D investment, particularly business sponsored R&D, is a key driver of long-term prosperity. In addition, R&D investment has been shown to have a positive relationship with patenting, a measure often used as a proxy for innovative activity.

Exhibit 7 Innovation and productivity are closely linked



Source: Institute for Competitiveness & Prosperity.

Canadian businesses produce fewer patents

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 solid measure of a nation's or region's innovative output. Given the link between R&D and subsequent patenting, it is no surprise that Canada's businesses are far less likely to produce patents than their US counterparts.

Our management is among the best in the world, but still trails US counterparts

An important contributor to innovation is the quality of management. Research indicates that breakthroughs in management techniques and practices – six sigma, just-in-time, and lean, to name a few – lead to productivity improvements across the economy. To the extent that managers are integrating these new techniques into their companies' operations, innovation and productivity will increase.

Our research on management in manufacturing showed that, at the plant level, Canada's managers are among the world's best. Our management teams are leaders in implementing specific techniques in the area of lean manufacturing. They are solid performers in effecting good performance management, though with room for improvement. But against the United States, Canada under performs, especially in the area of people management – the willingness of managers to keep and promote high performers and to deal promptly with poor performers.

Subsequent research measuring the quality of store-level management in the retail sector indicated that the quality of retail management in Canada matches that of the United States. Retail management in the United Kingdom is significantly behind both. Canadian retailers fare nearly as well as their US counterparts, but with improvement opportunities in operations management.

Innovation must pervade our public policies and Prosperity Agenda

Public policy to increase innovation is a balancing act along two dimensions. On one dimension, public policy needs to differentiate between invention and innovation. The other dimension requires adequate attention to be paid to both support and pressure for innovation. Unfortunately, public policy in Canada has not achieved the right balance on either.

Policies in Canada have been oriented toward the hard sciences and invention. As we have seen in our past research, our public innovation policy does not adequately recognize the importance of business and management processes for innovation. Our competitiveness and prosperity are built on a solid base of excellence in the sciences. And leading high technology firms are founded by science and engineering graduates.

But successful innovation requires both support and pressure that come from balancing science and other skills, such as problem solving, managing, and communicating business solutions. These other skills are important to achieve a successful transition from startup to thriving businesses. Our governments' decisions to under invest dramatically in business education is perplexing and damaging to our innovation capacity.

As we slowly emerge from the recession, we continue to urge Canadians to keep the focus on the long-term Prosperity Agenda (*Exhibit 8*). As our major challenge for closing the prosperity gap is innovation, we need to ensure that it pervades the Agenda throughout the four AIMS elements we use to analyze our prosperity and initiatives for improvement: Attitudes, Investments, Motivations, and Structures.

Our AIMS framework is an interactive one. While attitudes toward innovation may be positive, if our market structures encourage the status quo rather than risk taking and innovation, we will be less successful. If our tax system does not work to motivate investments, then our businesses will invest less in innovative machinery and equipment and in R&D. And if we are investing less because of these other factors, we will have a less competitive and innovative economy.

Exhibit 8 The 2020 Prosperity Agenda creates opportunity to realize Canada's prosperity potential

THE GOAL	Current	Target 2020
Close the prosperity gap	\$9,500 prosperity gap with United States	Within \$3,000 of US in GDP per capita
Attitudes	Remaining complacent	Sharing determination to close the gap
Investments	Consuming today	Investing for tomorrow's prosperity
Motivations	Implementing smart business taxation	Innovating in Canada's tax system
Structures	Preserving status quo	Encouraging creativity and growth



Attitudes

Encourage innovation and competition to win in an ever more competitive global world

It is a prevailing view that Canadians are too risk averse and too complacent to meet our innovation and productivity potential and that is why our businesses under invest and under achieve. But we conclude that these attitudes are not based on shortcomings in our fundamental character, our collective DNA. In our view, we start with a solid base of positive attitudes among Canadians and our business leaders. We do have the desire to compete and to innovate as much as our US counterparts.

So if attitudes are not holding us back, why do we under perform in competitiveness, innovation, and prosperity? Our challenge as we come out of the recession is to shape the characteristics of the other elements of our economic system to build on this strength.

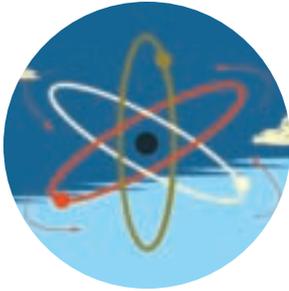


Investments

Invest in the human capital and technology critical for innovation

Investments are the lifeblood of innovation and prosperity. Expenditures on research, technology, and advanced education generate little prosperity today – but they drive our future prosperity. In past reports, we have concluded that Canadians are consuming current prosperity at the expense of future prosperity. Individuals do not invest adequately in their own education – thereby reducing their prospects for success in the growing knowledge economy. Business leaders do not invest adequately to put our firms at the leading edge of technology and research – and therefore cannot compete on the basis of innovation and value added. Governments have put health care spending ahead of education spending, no doubt reflecting the public view.

We need to invest more. If Canadians are to be equipped to take on the opportunities and challenges of the creative age, more of our young people need to acquire post secondary education. We are hopeful that the federal and provincial governments will continue their commitment to post secondary education, even as they attack our deficit. We are also hopeful that our businesses will continue to step up their investments in technology and innovation – stimulated by the strong Canadian dollar, lower tax rates on business investment, and the beneficial effects of increased international trade.



Motivations

Ensure tax changes remain in place and make Canada a tax innovator

Provincial and federal governments have done much to make our tax system a positive contributor to innovation. By harmonizing the provincial sales taxes in Ontario and British Columbia with the federal goods and services tax, reducing corporate tax rates, and eliminating capital taxes at the federal and provincial levels, Canada has taken bold strides to raise the motivations for new business investment. These changes are moving Canada from one of the worst jurisdictions among developed economies in the taxation of new business investment to one of the better ones. British Columbia's move to harmonize its provincial sales tax with the federal GST may be reversed in the upcoming June 25 referendum. That would be unfortunate for British Columbians – and all Canadians.

We continue to recommend that provincial and federal governments explore the benefits of a carbon tax to realize environmental and economic benefits.

Our next taxation challenge is to deal with high marginal tax rates on low-income Canadians. Social benefits are structured to deliver assistance to them, and our taxes are progressive. An unintended consequence of this structure is that the marginal cost to low-income earners can be quite high as they attempt to work more and move out of poverty. For example, the combination of benefit clawbacks and progressive income taxes can lead singles and lone parents earning about \$15,000 to face marginal effective tax rates of more than 50 percent as their earnings rise. We continue to recommend changes in the Working Income Tax Benefit to help reduce the problem of high marginal effective tax rates for lower income Canadians.

We should also investigate innovative tax policies for individuals and businesses. It is fair to say that Canada's improved tax environment is the result of adopting well established policies from other countries. We should strive for innovation on all fronts, including tax policy.



Structures

Drive innovation through smarter public policies and more international trade

Canada is an under performer in innovation, as evidenced by our low productivity, limited patent output, under investment in technology, and under achievement by our clustered industries.

Our public innovation policy emphasizes the hard sciences and does not recognize the importance of innovation in business and management processes. Our competitiveness and prosperity are built on a solid base of excellence in the sciences. And leading high technology firms are founded by science and engineering graduates. But successful innovation requires a balance of science and other skills that are important to achieve the transition from startup to thriving businesses.

A heightened sense of the benefits of more international trade can also improve the structural framework for more innovation in Canada. Canadians have always realized that international trade has been an important contributor to our prosperity. Trade opens markets to our businesses and enables them to achieve scale and specialization and it offers our consumers more variety and lower prices. But we conclude that trade is also an important stimulus to innovation, our economic success, and our prosperity.

Innovation is driven by a combination of support and pressure, and international trade contributes to both. Support refers to the conditions that are a foundation of assistance to all firms and individuals as they develop and compete. Trade leads to larger market opportunities and access to better supplies of materials, people, and capital – critical supporting conditions for innovation. Pressure comes from aggressive and capable competitors, who are a threat to complacency, and from sophisticated consumers, who demand innovative goods and services at low prices. International trade exposes our businesses and managers to these beneficial pressures that create the imperative for innovation.

We need to continue working with our US neighbours to battle protectionism and trade barriers. But at the same time, we need to strengthen ties with other partners to expand our trade – the European Union and China present the greatest opportunities.

The recession still casts a shadow over our economic prospects. Yet the Institute shares the sense of many that this is our time for global leadership. Our major hurdle in realizing our economic prosperity is our anaemic record on innovation and productivity. We need to build on our positive attitudes and invest in our innovative capabilities. Our tax system is no longer a barrier to investment; it is becoming a global advantage that ought to motivate investments and innovation. The beneficial support and pressure that can come with more international trade can provide the structures for greater innovation and productivity.

We have the building blocks; we need to put them together.



Productivity and innovation

Higher productivity depends upon the relentless pursuit of innovation

Canada has a prosperity gap – that is, we are not realizing our full prosperity potential from the daily work we do in our jobs, the strategies we carry out in our businesses, and the public policies our governments put in place. This prosperity gap is a productivity gap; and the productivity gap is an innovation gap.

GDP represents value added and productivity in our economy

As we measure and monitor Canada's competitiveness and prosperity, we focus on Gross Domestic Product (GDP) per capita as the summary measure of success. GDP represents the value added to our endowed base of human, physical, and natural resources.

"Value added" is a widely used term in economics and is the key to calculating GDP and productivity. At its most

basic level, "value" is the worth that the market assigns to a product or service – what somebody is willing to pay; "added" refers to the increase in value from a process, or by an organization, as a product or service moves toward its final stage. More formally, "value added" is the worth of something minus the intermediate inputs used in the process that created it.

As products and services are created, different people and organizations along the way add value at every step. A sandwich bought in a restaurant begins with a farmer sowing and harvesting grain. The value added at this early stage is the selling price of the grain minus the cost of the seeds, fertilizer, and machine power required in the agriculture process. The farmer's wages and profit comprise the value added at that stage. Eventually, when a bakery

sells the bread, the sale price of the bread minus the price paid for the grain and other inputs is the value added at this stage. In the case of a sandwich, this process operates in parallel for the production of sliced meat, cheese, and mustard, for example. Included in the value added is the cost of the restaurant and its wait staff. They too have a measurable value that is added to the cost of the final sandwich minus its many inputs.

Value added at each stage is shared between the worker and the business owner – higher value added means higher wages and profits. This process of adding value continues until a “final good or service” is produced and provided to an end consumer. The total value added throughout the production chain is the sum of each of the individual processes.

Value added is an important concept for understanding innovation and productivity issues. Companies with higher value added processes are likely to produce more innovative and more complex products – and have higher productivity. Their products and processes are also more defensible in the global market place, making the home country more competitive. The advent of globalization has seen the movement of low value added processes to lower wage countries like China and India.¹ Advanced economies like Canada will not thrive by futilely attempting to hang on to these low value added activities.

Innovation is a key driver of higher value added. This is true whether it is in making production processes leaner, without lowering quality, or in creating better products or services, without increasing costs faster than prices.

A country's or region's GDP is the sum of all the value added in the economy. Persons and companies that innovate and produce higher value added products and services will increase the GDP of a region – and usually earn higher wages and profits for themselves.

GDP and other measures offer insights into well being

While GDP measures value added across the economy, it is an imperfect measure of well being. It does not measure quality of life or happiness. It focuses strictly on things that can have a dollar value attached to them. And it does not place a value on leisure time. Policy makers and academics have been studying the issues related to measuring societal progress along economic and social dimensions.

In 2008, French President Nicolas Sarkozy requested that Joseph Stiglitz, Amartya Sen, and Jean-Paul Fitoussi chair a commission to outline and analyze difficulties with using GDP as a measure of economic performance and social progress. The result was an extensive report that spoke of broadening our current evaluations of overall well being, because many factors that influence people's welfare are wholly missed by our existing measures.²

Our review of the many measures of well being indicates that, because a more prosperous economy creates the opportunity for greater quality of life through better health, longer life expectancy, and widespread literacy, GDP per capita remains a useful and manageable measure of well being.³ Higher GDP per capita correlates well with measures like the United Nations' Human Development Index, the Centre for the Study of Living Standards' Index of Economic Well Being, “National Accounts of Well Being” developed by the new economics foundation based on data from the European Social Survey, and the Gallup-Healthways Well-Being Index across the United

States. As long as we maintain the perspective that our focus is on competitiveness and prosperity – which are by nature economic concepts – we conclude that GDP per capita is a sound measure of economic results.

To deepen our understanding of issues affecting life satisfaction, the Institute collaborated with the Centre for the Study of Living Standards (CSLS) to analyze results of the Canadian Community Health Survey for 2007 and 2008. This survey, administered by Statistics Canada, asked about 83,000 respondents across the country to rate their life satisfaction. Statistical analysis of the respondents' reported life satisfaction and their characteristics yielded valuable insights into the drivers of subjective well being. The survey measured individual characteristics, such as age, income, education, and perceived mental health, as well as community variables like the size of the city region, percentage of the local population born in Canada and abroad, and the percentage of the local population with advanced educational attainment.

The good news from the survey is that the vast majority of Canadians reported high levels of satisfaction. When asked the question, “How satisfied are you with your life in general?” 91.2 percent of Canadians indicated “very satisfied” or “satisfied.”⁴ Of these, fully 38.4 percent said they were “very satisfied.” By themselves, these results do not tell us the overall happiness of Canadians. However, Canada also scores near the top in global surveys of life satisfaction, such as the Gallup World Poll.

At first glance, people living in smaller, less populated settings appeared happier. On average, respondents in Ontario and British Columbia reported slightly lower rates of happiness, while those in other provinces answered more positively than the national average. People in larger cities like Toronto and

¹ Institute for Competitiveness & Prosperity, Working Paper 14, *Trade, innovation, and prosperity*, September 2010.

² Task Force on Competitiveness, Productivity and Economic Progress, Eighth Annual Report, *Navigating through the recovery*, November 2009, pp. 19-20.

³ *Ibid.*

⁴ In addition to these two possible answers, respondents could choose “very dissatisfied,” “dissatisfied,” or “neither satisfied nor dissatisfied.”

Vancouver were less likely than the national average to report being happy.

But most of these place-based differences disappeared with deeper statistical analysis. CCLS applied various statistical techniques to identify important variables for individual happiness. Several factors consistently affected individuals' happiness (*Exhibit 9*).

Other characteristics associated with individual happiness, but at a much lower level of statistical significance were: educational attainment (although its effects are realized through income and health), amount of physical activity, and disability. Students are happier than other adults, but they represent a small proportion of the population.

One might argue that, since higher stress reduces happiness, public policies aimed at increasing competitive pressure might be counter-productive. That may be true, but many other

factors affect individuals' stress levels, and we cannot be certain that less competition in our day-to-day lives will increase our happiness. It is also true that greater economic success by a province or a country increases the ability to deliver high quality mental and physical health care – two very important factors for happiness. The results indicate that more economic success, as defined by personal income, is consistent with higher reported happiness from the Canadian Community Health Survey for 2007 and 2008.

The results do not immediately suggest that public policies need to increase happiness, but point to areas for further investigation. High quality health care is certainly a key contributor to our sense of well being; the challenge is to achieve excellent outcomes at the best possible cost. We also need to continue our research into the causes and cures of poor mental health. As well, we already know that recent immigrants face

problems with economic integration. These concerns broaden the range of issues we need to address.

Lagging productivity remains the biggest hurdle to closing Canada's prosperity gap

As we have seen, outside North America, only a few countries have greater prosperity per capita than Canada. But closer to home, we continue to trail the United States considerably. The recession has not changed this, as both Canada and the United States having suffered from similar losses in GDP (see Exhibit 3).

Canada's prosperity gap, the difference in GDP per capita between Canada and the United States, was much smaller thirty years ago. Starting with the 1990-92 recession, Canada began to fall behind the United States, and we have not been able to resume our earlier standing. This prosperity gap matters to

Exhibit 9 Some individual factors affect personal happiness

Individual attribute	LOW life satisfaction associated with...	HIGH life satisfaction associated with...
Perceived mental health	Poor mental health	Excellent mental health
Perceived physical health	Poor physical health	Excellent physical health
Stress level	Extremely stressed	Not at all stressed
Sense of belonging to local community	Very weak sense of belonging	Very strong sense of belonging
Employment status	Disabled	Self-employed
Household income	Lowest income decile	Highest income decile
Marital status	Separated/divorced/widowed	Married
Immigration status	Recent immigrants	Non-immigrants

Source: Centre for the Study of Living Standards, *Explaining Geographical Variation in Happiness in Canada*, November 2010, updated February 2011.

Canadians. It represents lost potential for our residents to gain economic security and well being and for our public institutions to provide services and investments for future prosperity.

To understand the reasons for our prosperity gap, we draw on the same framework we have used in our previous reports. This framework disaggregates GDP per capita into four measurable elements (*Exhibit 10*):

- **Profile.** Out of all the people in a jurisdiction, what percentage are of working age and therefore able to contribute to the creation of products and services that add economic value and prosperity?
- **Utilization.** For all those of working age, what percentage is actually working to add to economic value and prosperity? To gain further insight into this element, we examine the two contributors to utilization: *participation*, the percentage of those of working age who are searching for work, whether they are successful or not; and *employment*, the rate at which

those participating in the job market are employed.

- **Intensity.** For all those who are employed, how many hours do they spend on the job in a year? This element measures both workers' desire to work more or fewer hours and the economy's ability to create demand for work hours.
- **Productivity.** For each hour worked in a jurisdiction, how much economic output is created by a jurisdiction's workers? Within productivity there are six sub-elements and a productivity residual:

Industry mix – how the mix of industries in clustered industries, dispersed industries, and natural resources affects our productivity potential

Cluster mix – the productivity potential of the clustered industries that drive national productivity and innovation

Cluster effectiveness – how well our clustered industries compete

Urbanization – the proportion of our population that lives in metropolitan areas, which typically increases a jurisdiction's productivity

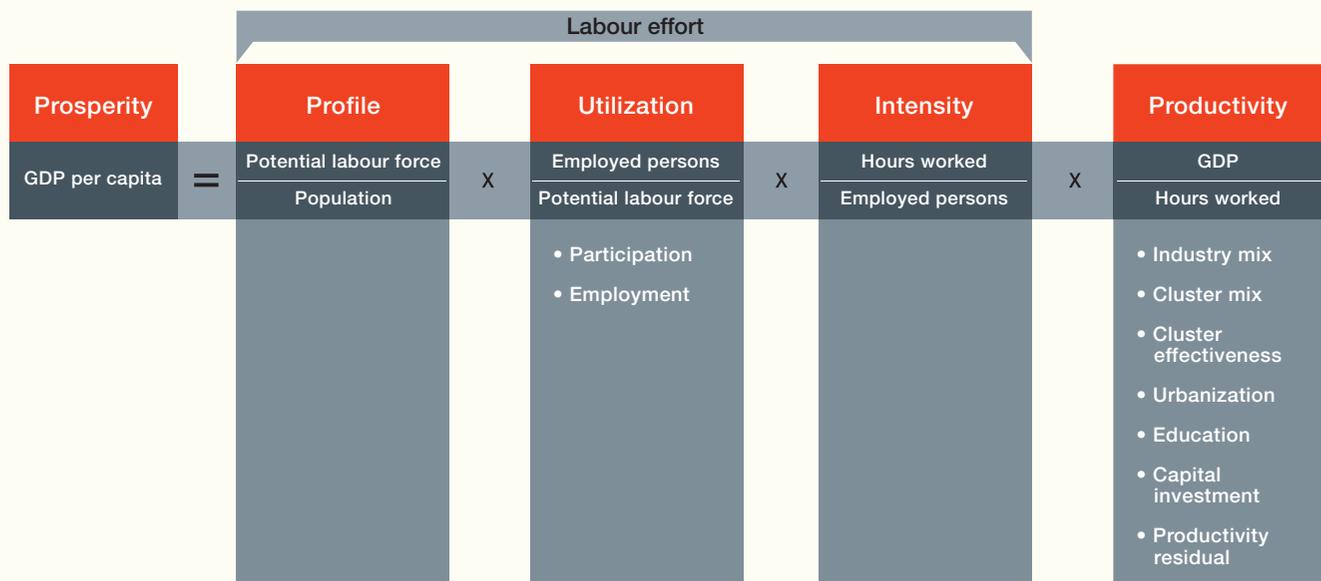
Education – the educational attainment of our population and its impact on productivity

Capital investment – the degree to which physical capital supports our workers' productivity

Productivity residual – a residual value that relates to productivity but remains unexplained.

The first three factors – profile, utilization, and intensity – add up to our labour effort, or the hours worked per capita. That captures the human effort Canadians are expending to create economic value. The fourth factor – productivity – measures how effectively our labour efforts add value to resources, thereby creating economic value and prosperity.

Exhibit 10 The Institute measures four components of prosperity



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 significant divergence from the prosperity performance of the United States occurred during the recession of the early 1990s. During that time the key factor driving our economic weakness was lower labour effort, especially utilization and its two sub-elements, participation and employment. Since 1995, we have been successfully recovering to 1990 performance levels. But, at the same time, a growing productivity gap has emerged relative to the United States. In the recent economic slowdown, US unemployment increased at a much faster rate than in Canada, while GDP performance matched Canada's. Consequently, our productivity gap worsened between 2009 and 2010.

Canada has mixed labour effort performance

Canada continues to have a demographic profile advantage versus the United States, an advantage in utilization, but a significant intensity gap (Exhibit 11).

Profile remains an advantage for Canada. The first factor in a jurisdiction's prosperity creation potential is its demographics. The percentage of the population that is of working age – 15 to 64 years – is a basis for prosperity.

With more people in that age range, a higher percentage of the population can work and create economic value. In Canada, this ratio has been stable over the short run and has had no appreciable impact on changes in our prosperity gap versus the United States. Nevertheless, it does create an ongoing starting advantage in Canada's prosperity.

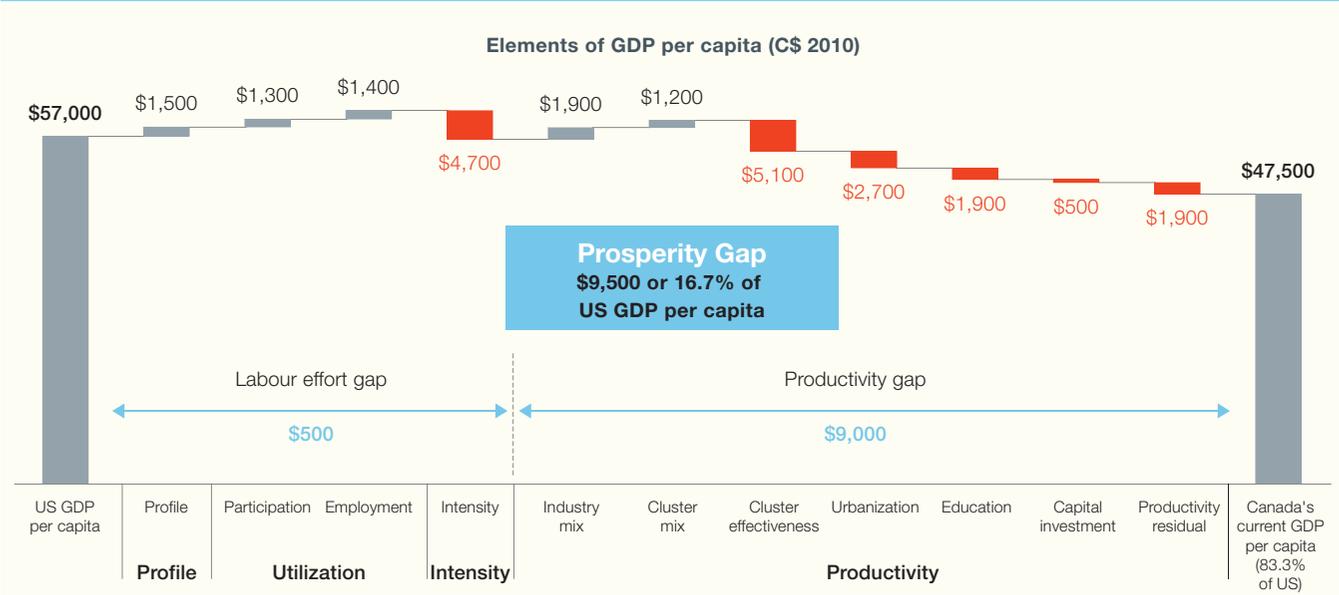
In 2010, 69.4 percent of Canadians were aged 15 to 64. Relative to the 67.2 percent in the United States, Canada has a 3.2 percent potential profile advantage.⁵ Holding all other factors constant, we calculate this advantage to be worth \$1,500 in per capita GDP. In other words, we have a profile advantage because a higher proportion of our population is able to add to our prosperity.

Demographic projections indicate that the proportion of Canadians of working age will decline over the coming decades as baby boomers retire and are not replaced by equal numbers in subsequent generations. Still, the projections indicate the Canada will maintain its advantage versus the United States.⁶

Nevertheless, Canada will have fewer workers to create prosperity in the coming years. We estimate that by 2025 the smaller percentage of working aged Canadians will reduce GDP per capita potential by \$3,100.⁷ We will need creative retirement solutions to address this decline in our prosperity potential.⁸

Utilization is higher in Canada than the United States. Canada successfully reversed a decline in the utilization of its working aged population during the latter part of the 1990s.⁹ In the 1990-91 recession, Canada fell behind the United States on this measure, as our deeper downturn reduced the number of jobs available and discouraged workers from

Exhibit 11 Lower productivity and intensity are the main sources of Canada's prosperity gap with the United States



Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; US Bureau of Economic Analysis, US Bureau of Labor Statistics, US Census Bureau (Current Population Survey).

⁵ Calculated as 1 - [(67.2 (US)/69.4 (Canada))] = 3.2 percent.
⁶ Task Force on Competitiveness, Productivity and Economic Progress, Fourth Annual Report, *Rebalancing priorities for Ontario's prosperity*, November 2005, p. 29.
⁷ This comparison is between Canada's GDP per capita in 2005 and its potential in 2025; not the difference between Canada and the United States.
⁸ Institute for Competitiveness & Prosperity, Working Paper 9, *Time on the job*, September 2006, p. 21.
⁹ Task Force on Competitiveness, Productivity and Economic Progress, Fifth Annual Report, *Agenda for our prosperity*, November 2006. Labour statistics base participation, unemployment, and hours worked estimates on all workers, including those who are 65 and over; we follow this convention for utilization and intensity.

looking for employment.¹⁰ As economic conditions improved, more adult Canadians rejoined the labour force, reversing this trend and contributing to our economic potential. In 2010, our *participation* rate stood at 64.4 percent of Canadians 15 years of age and older who worked or sought work (using data comparable to US methods of calculation). The US participation rate was 62.7 percent. This advantage for Canada translates to \$1,300 in GDP per capita.

In the other component of utilization, *employment*, Canada has traditionally trailed, but as of 2010, the United States continued to suffer higher unemployment than Canada at 9.8 percent, an increase from 9.4 percent in 2009. In 2010, our annual unemployment rate (adjusted to the US definition) fell to 7.1 percent, down from 7.3 percent in 2009.¹¹ In other words, on average through 2010, 92.9 percent of Canadians participating in the work force had full-time or part-time work, which was higher than the US performance of 90.2 percent. This 2.7 percentage point advantage lifted our relative GDP per capita performance by \$1,400 in 2010. And on another positive note, monthly unemployment rates in Canada have been trending down since the peak of around 7.8 percent in June of 2009 – the highest we have experienced since June of 1998.¹²

In the recession and its aftermath in the first half of the 1990s, the combined effect of more discouraged workers and increased unemployment was a key driver of Canada's growing prosperity gap during those years. Beginning in 1997, Canada successfully increased the utilization of its human capital; by 2010, Canada employed 59.8 percent of its working age population, above the US result of 56.5 percent. This superior performance translates into a \$2,700 utilization advantage (the combined effect of a \$1,300 participation advantage and a \$1,400 employment advantage) in GDP per capita.

The intensity gap remains a significant part of our prosperity gap. While Canada outperforms the United States in profile and utilization, we have a significant intensity gap – our workers are on the job fewer hours in a year than their counterparts in the United States. In 2010, the average Canadian worked 1,661 hours, while in the United States, the average employee worked 1,828 hours. This gap of 167 hours, or 4.5 weeks annually, narrowed slightly from 2009, when Canada trailed the United States by 174 hours weekly or 4.6 weeks. Consequently, the importance of intensity on Canada's prosperity gap decreased slightly from 2009, but is still an important part of our prosperity gap. This slight narrowing of the intensity gap is indicative of the weakened US labour market in the recent economic downturn.

Our previous research on differences in hours worked points to more vacation weeks taken by Canadians, higher incidence of part-time work in Canada, and fewer workers on the job for long work weeks (more than 50 hours). Much of our intensity gap reflects the desires of Canadians for more leisure time, which is a preference, not a weakness. But nearly a quarter of the gap is because our economy does not create adequate opportunities for full-time work.

Higher productivity is needed to close Canada's prosperity gap

Over the last decade, lagging productivity has accounted for the greatest share of the prosperity gap with the United States, and in 2010 this productivity gap widened further. We assess the six sub-elements of productivity to determine the impact of this key driver of our prosperity gap.

Our industry mix contributes positively to our productivity. Canada benefits from a mix of industries that is more heavily weighted toward clustered industries, and within these clustered industries, we have a more favourable mix for productivity and

prosperity than the United States.¹³ As research by Michael Porter of the Harvard-based Institute for Strategy and Competitiveness has shown, the geographic clustering of firms in the same and related industries increases productivity and innovation. These clustered industries, or traded clusters as Porter calls them, typically sell to markets beyond their local region. In addition, the presence of clustered industries in a region has a spillover effect, in that they typically generate opportunities for increased success of the local economy.

The other major industry type is dispersed industries (sometimes referred to as local industries). These industries, such as retailers and restaurants, tend only to serve their local markets and so do not realize economies of scale and are less challenged to be innovative. As a consequence, they have lower rates of productivity, innovation, and wages.

Porter also identifies a third industry type, natural endowment industries, whose location is driven by the presence of natural resources. These include forestry, mining, and agriculture. These are very small industries – accounting for 1.4 percent of employment in Canada in 2006.

Drawing on Porter's methodology, the Institute has determined that fully 34.8 percent of employment in Canada is in clustered industries versus 27.4 percent in the United States. We estimate the potential productivity benefit from this higher percentage of clustered industries in our industry mix to be worth \$1,900 per capita. This benefit is derived from a higher value added from our economic activity than would be likely if Canada's mix were the same as that of the United States.¹⁴

Within clustered industries, Canada has a beneficial mix. While all clustered industries are positive contributors to productivity and innovation, some have

¹⁰ *Ibid.*, p. 22.

¹¹ These unemployment rates are based on US definitions; official Canadian unemployment rates were 8 percent in 2010, down from 8.3 percent in 2009.

¹² Note that these results are seasonally adjusted and comparable to US data, not the official Canadian figures. Official Canadian employment reached its highest at 9.1 percent in August 2009.

¹³ Institute for Competitiveness & Prosperity, Working Paper 1, *A View of Ontario: Ontario's Clusters of Innovation*, April 2002, and Working Paper 5, *Strengthening structures: Upgrading specialized support and competitive pressure*, July 2004.

¹⁴ It is important to note that our measure focuses on the mix of industries only. It calculates the productivity performance we could expect in Canada if each cluster were as productive as its US counterpart. It does not measure the effectiveness of our industries in Canada.

higher potential than others. Canada's relative employment strength in financial services, oil and gas products and services, heavy construction services, entertainment, and others has created an attractive mix of traded industries. Our analysis of Canada's cluster mix indicates a \$1,200 per capita advantage over the United States.

Cluster under performance is a significant part of Canada's productivity gap.

While Canada has an excellent industry and cluster mix, the effectiveness of our clustered industries is much lower than that in the United States. That is to say, in the same clustered industries, wages in Canadian firms are lower than those of their counterparts across the United States. Across all clustered industries, the average wage in Canada is 21 percent lower than the average in the United States. This lower wage reflects lower productivity and innovation in our clustered industries, which in turn reduces the economic performance of all industries.

Porter has observed that specialized support from excellent factor conditions, capable suppliers, and related industries pushes innovation higher in traded clusters. At the same time, more competitive pressure from sophisticated customers and vigorous rivals drives innovation. As we discussed in our 2004 Annual Report, our structures of specialized support and competitive pressure are inadequate relative to the experience in clustered industries in the United States.¹⁵ In research we conducted in 2008 in collaboration with the Martin Prosperity Institute, we found that Canada's clustered industries drew less on workers in creativity-oriented occupations than their counterparts in the United States.¹⁶

If Canada's clusters were as effective as US clusters, wages would be \$16,100 per worker higher. As traded clusters account for 34.8 percent of Canadian employment and given the relationship between wages and productivity, our overall productivity would rise by 13.4 percent.¹⁷ From this, we estimate the productivity loss from the lower effectiveness of our clusters to be \$5,100 per capita.¹⁸

We hypothesize that a variety of factors is at work here. Our clustered industries tend to be in less competitively intense environments.¹⁹ The demand conditions for our clustered industries are not as sophisticated as those in the United States.²⁰ In our clustered manufacturing industries, our management capabilities are less well developed.²¹ Our clustered industries are also less effective because of lower educational attainment among workers, fewer of our population living in metropolitan areas, and reduced capital investment. However, we have accounted for these factors separately as we will discuss.

Adding together the effects of industry mix (+\$1,900), cluster mix (+\$1,200), and effectiveness (-\$5,100) Canada's clustered industries provide a net loss of \$2,000 in GDP per capita versus the United States.

Relatively low urbanization is a significant contributor to our productivity and prosperity gap.

In our work, we have established that higher rates of urbanization lead to higher productivity. This is the result of the increased social and economic interaction of people in firms in metropolitan areas, the cost advantages of larger scale markets, and a more diversified pool of skilled labour. The

interplay of these factors promotes innovation and growth in an economy.

Since fewer people live in metropolitan areas in Canada than in the United States, our relative productivity and prosperity potential are reduced.²² Our analysis this year indicates that we have a \$2,700 per capita disadvantage against the United States that is related to our lower level of urbanization.

Lower educational attainment weakens our productivity.

Economists agree that a better educated workforce will be more productive. Education increases workers' base level of knowledge necessary for improved job performance. It increases workers' flexibility so that they are able to gain new skills throughout their lifetime. Many studies show that increased wages accrue to more highly educated individuals.²³ And higher wages are the result of higher productivity.²⁴ Canada's population has, on average, a lower level of educational attainment compared to those living in the United States, particularly for university graduates. Adjusting the mix of educational attainment in Canada to match the US mix and holding wages constant at each attainment level, Canada's productivity would be higher by \$1,900 per capita.

Under investment in capital lowers productivity.

Canadian businesses have under invested in machinery, equipment, and software relative to their counterparts in the United States, so that the capital base that supports workers in Canada is not as modern as that of their counterparts in the United States. As a result, Canadian workers are not as productive. We estimate this under investment in capital equipment lowers Canada's productivity

¹⁵ Task Force on Competitiveness, Productivity and Economic Progress, Third Annual Report, *Realizing our prosperity potential*, November 2004, pp. 40-48.

¹⁶ *Idem*. *Navigating through the recovery*, pp. 27-29.

¹⁷ We have netted out the effects of Canada's lower urbanization, our under investment in capital, and our lower educational attainment in this calculation.

¹⁸ We improved our method of calculating the impact of cluster effectiveness in 2010. In previous years, we used the different wage premium of traded to local industries in Canada versus the United States. Our new method is a more direct comparison between wages in clustered industries and is more intuitive.

¹⁹ See, for example, our 2007 research on the effectiveness of Toronto's financial services cluster, *Assessing Toronto's Financial Services Cluster* available at http://www.competeprosper.ca/images/uploads/FSstudy_June07.pdf

²⁰ See, for example, our 2004 research on the effectiveness of Toronto's biopharmaceutical cluster, *Assessing the Strength of the Toronto Biopharmaceutical Cluster* available at <http://www.competeprosper.ca/images/uploads/biopharmaCluster.pdf>

²¹ Institute for Competitiveness & Prosperity, Working Paper 12, *Management matters*, March 2009.

²² See "Prosperity and productivity lag in Ontario cities" sidebar in our Sixth Annual Report, *Path to the 2020 Prosperity Agenda*, pp. 24-25.

²³ For example, see Ana W. Ferrer and W. Craig Riddell, "The Role of Credentials in the Canadian Labour Market," *Canadian Journal of Economics*, 2002, Vol. 35, No. 4; Statistics Canada, "Education and earnings," *Perspectives on Labour and Income*, 2006, Vol. 38, No. 3; and Anil Verma, "Low Wage Service Workers: A Profile," Working Paper Series: *Ontario in the Creative Age*, Martin Prosperity Institute, March 2009.

²⁴ See Exhibit D in "Why productivity is important for our prosperity," *Path to the 2020 Prosperity Agenda*, pp. 28-30.

by \$500 per capita. This estimate is based on our simulation of Canada's GDP if we had matched the rate at which the US private sector invested in machinery, equipment, and software. For our estimate, we assumed that higher growth in this investment would translate directly into higher growth in GDP. The primary source of this capital investment gap is in information and communications technology (ICT). Canada's businesses invest about 39.5 percent less per dollar of GDP in ICT and 8.4 percent less in non-ICT machinery, equipment, and software.²⁵ Our analysis indicates that Canadian businesses under invest in all machinery and equipment by 22.5 percent per dollar of GDP.

The residual is related to productivity.

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 \$1,900 per capita gap that remains is related to productivity on the basis of like-to-like industry mix and strength, urbanization, education, and capital intensity.

Productivity weakness is worsening

As we have seen, through most of the 1980s, Canada's prosperity was close to that of the United States. During that period, we had a productivity and intensity disadvantage versus the United States – but our utilization advantage compensated for this. Our prosperity gap began to develop at the outset of the 1990–92 recession. It was driven mostly by our poor labour effort performance, caused by worsening participation and unemployment rates during the recession. This utilization problem began to dissipate around 1997, and by 2007 it was an advantage again. However, our productivity disadvantage began to grow in 1995, and doubled by 2005 (see Exhibit 6).

In the current economic downturn, labour effort has fallen off much more in the United States than in Canada, while US productivity has grown faster than Canada's. It is difficult to be definitive on current results in this unusual downturn – it is quite likely that official data will be revised down the road. But our productivity weakness is real and getting worse.

In summary, against the United States, Canada has a wide and growing prosperity gap; sluggish productivity growth is a critical reason we are not realizing our prosperity potential. As we broaden our perspective beyond North America, we see that Canada still lags in productivity.

Canada's prosperity compares well globally, though productivity still trails

Among the most populous countries, Canada stands fourth in GDP per capita (see Exhibit 1). It is fair to say that we have built one of the most globally competitive jurisdictions here. However, just as we have found in comparisons with the United States, Canada's main challenge is to improve its productivity. We are out performing international peers through more labour effort, but we trail the median of our international peers in productivity.

We compared Canada's sources of prosperity with these international peers using the same waterfall approach we applied for US comparisons. Lack of data prevents us from providing the same level of detail, but we can compare Canada's work effort – comprising demographic profile, utilization of adults in the work force, and intensity of hours worked per worker – and productivity – the value created in the average hour of work effort. This international comparison

again indicates that lagging productivity is Canada's challenge – we work more than those outside North America, but we are less successful at creating economic value in the hours we work (see *Canadians work harder, but not smarter*).

Canada's task today is to strengthen the recovery from the recession and to achieve our full prosperity potential for the benefit of all Canadians. Higher productivity is critical to our success. And improving our productivity means improving our innovation performance.

²⁵ Fifth Annual Report, *Agenda for our prosperity*, pp. 34-35. See also Andrew Sharpe, "What Explains the Canada-US ICT Investment Intensity Gap?" Centre for the Study of the Living Standards, December 2005.

Canadians work harder, but not smarter

We identify Canada's international "peers" as those countries with at least 10 million people (about one third of Canada's population) and with the highest GDP per capita. The population criterion excludes smaller, but prosperous countries like Sweden and Switzerland. While their specific policies are of interest, these countries do not have the size and breadth of economic challenges that make them comparable to Canada. The prosperity criterion eliminates countries like Korea, Egypt, and the BRIC countries. China, for example, is important, given its growth and trade performance. However, its current GDP per capita is \$8,600, only one fifth of Canada's. All of Canada's peers have highly developed, diverse economies with internationally competitive labour forces. As we have seen, Canada's performance compares quite well against them (*Exhibit A*).

The United States is unique in that it gains its prosperity through above average labour effort and productivity. Other countries do well on only one of the two measures. The countries of continental Europe rank high in productivity (although Italy's productivity is slightly below average), but are laggards in labour effort. In essence, lower skilled workers are less engaged in the economy and productivity is driven by higher skilled workers. Australia, Canada, the United Kingdom, and Japan have wider participation in their labor forces, but achieve lower productivity.

Canada's economic success is based on an above average labour effort, not on productivity and innovation. In demographic terms, Canada has the most favourable profile of any of our peers, with just under 70 percent of our population in the prime working age range of 15-64 years old, ahead of Australia at 68 percent, our closest competitor. We do very well in job creation and are above average in hours worked per worker.

With a similar economy and considerable bilateral trade, the **United States** is a natural peer for comparison with Canada. Despite this, on a GDP per capita basis Canada trails the United States significantly. Although Canada's labour force statistics are roughly comparable, higher productivity gives the United States greater prosperity.

With a population of approximately 16 million, the **Netherlands** has about half of Canada's population, but in a geographical area that represents only a tiny fraction of Canada's. A country built on trade with the rest of the world, the Netherlands performs well in GDP per capita,

but has labour force characteristics that differ greatly from Canada's. Its labour force participation rate is much higher than those in the other European peers. However, hours worked per working individual are much lower in the Netherlands than in most of Europe or in Canada. Its high productivity level means the Netherlands leads Canada in GDP per capita terms.

A fellow Commonwealth country, **Australia** is in many ways similar to Canada. It has large urban centres separated by sparsely populated rural regions and a significant resource base. Where Canada exports a large amount of processed and unprocessed natural resources to the United States, Australia does likewise to Asia. Australia's GDP per capita slightly leads Canada's, and when we analyze their labour effort and productivity performance, we see very similar performance to Canada's.

With a population of about 10 million, **Belgium** is Canada's smallest peer and falls between its French and Dutch neighbours in prosperity. Its lower labour force engagement is more like France's than the Netherlands', but with higher hours worked per worker. Belgium led all of the peers with the highest productivity level in 2009.

Germany has a population of over 80 million, and trails Canada in GDP per capita. The legacy of reunification continues in Germany. While some of the German Länder (states) are very competitive by international standards, the country as a whole does not lead. Like others in continental Europe, Germany has a significantly lower labour force participation rate than Canada, and those who are employed tend to work fewer hours. However, a significant productivity advantage allows Germany to post a competitive GDP per capita.

While it has a lower GDP per capita than its former colonies, the **United Kingdom** looks much more like the United States, Canada, and Australia than continental Europe. It has a labour effort that falls only slightly short of Canada's, as well as similar urbanization and education measures. Canada's GDP lead over the United Kingdom is a result of the higher labour effort as well as a modest lead in productivity.

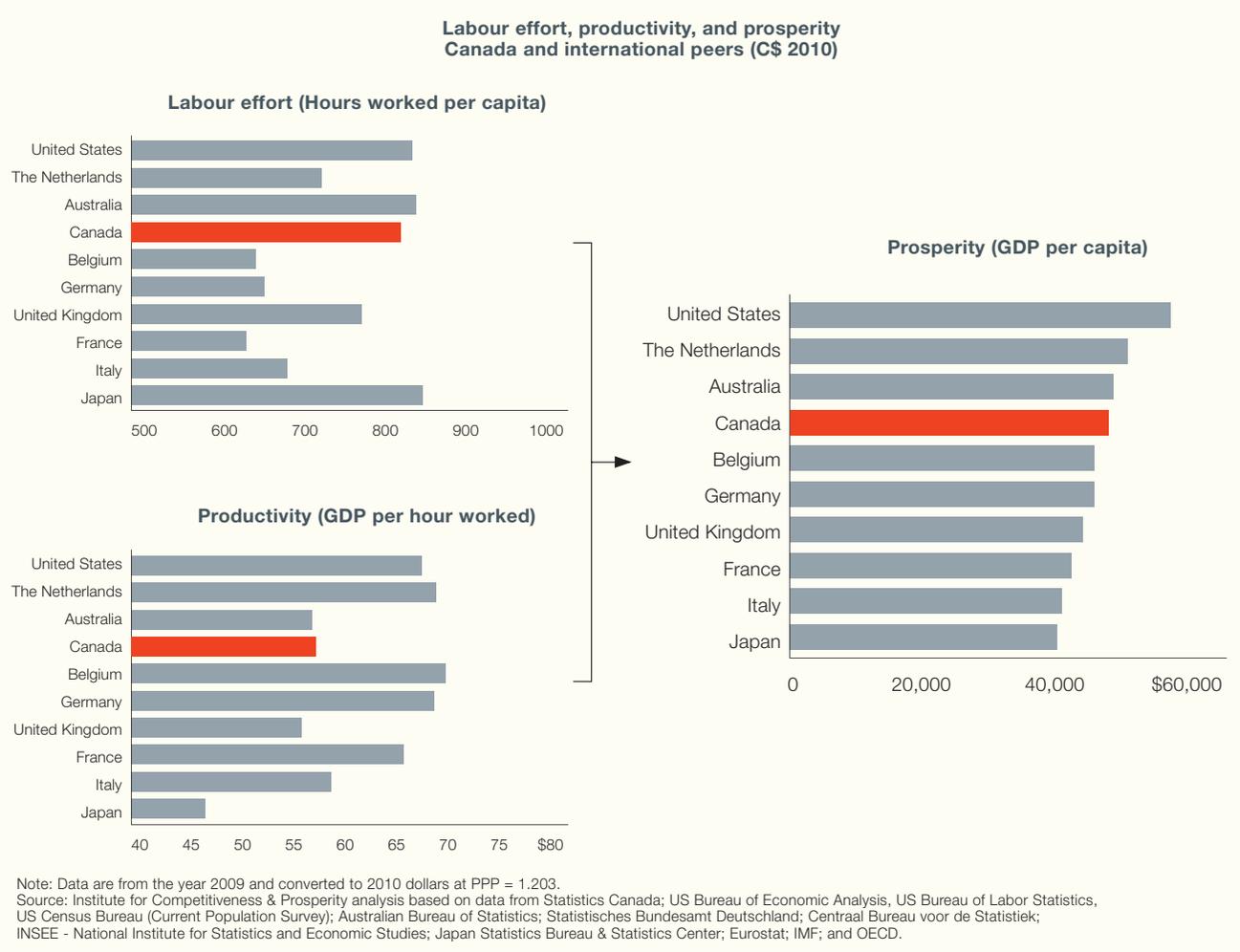
France defines the continental Europe model, with very low labour force engagement compared to that in Canada, even lower than in Germany. Those who do engage in the labour force tend to work a moderate number of hours – higher than in Germany or the Netherlands, but much lower than off the continent. France achieves a high level of productivity, as many of

the lower skilled individuals there do not participate in the economy. The country's lower work effort overwhelms its productivity advantage, and so France's prosperity trails Canada's considerably.

Italy is similar to Germany in that it is a country with two sets of economic performers. Italy's north contains an economic engine that can be compared to the best in France and Germany, with high GDP per capita. However, when averaged out with Italy's southern economy, Italy's prosperity trails Canada's markedly. Compared to Canada, Italy has slightly higher productivity, but much lower labour effort.

Japan looks different from our European peers, with relatively high participation rates, and high hours worked per employed person. However, Japan's traditional labour effort advantage over Canada has been eroding, and in 2009 it barely led the peer group. This decline tracks Japan's demographic changes: two decades ago Japan was among the leaders in terms of 15-64 year olds as a percent of its population; in 2009, it was nearly last. Japan's productivity, and as a result prosperity, trail the other members of the peer group.

Exhibit A Canada leads international peers in labour effort, but lags in productivity





AIMS for innovation

Innovation emerges from the interaction of Attitudes, Investments, Motivations, and Structures

Our agenda for prosperity builds from the AIMS framework that guides our work. AIMS is built on an integrated set of four factors – the foundation for a prosperity eco-system:

- **Attitudes** toward 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 public and business leaders believe in the importance of innovation and growth, they are more likely to take the actions necessary 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.
- **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.

These four factors create an ongoing reinforcing dynamic. When AIMS drives prosperity gains, each one of the four factors would be reinforced. In an economy of increasing prosperity, attitudes among business and government leaders and the public would be 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 would invest more in machinery, equipment, and software and in education.

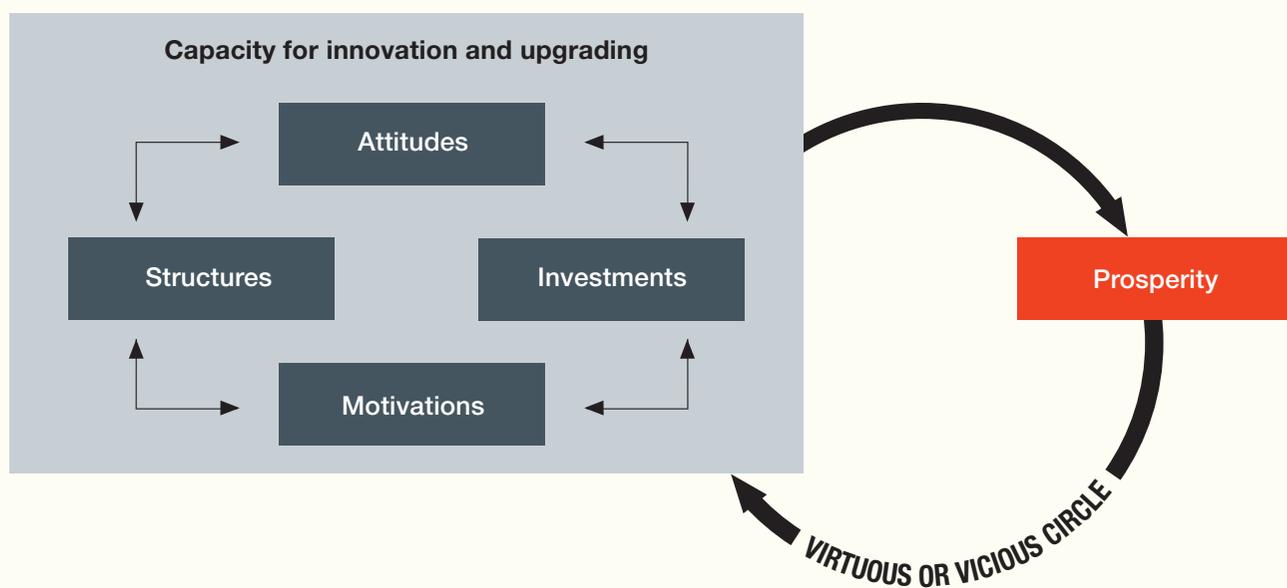
Motivations from taxation would be more positive, as governments would not see the need for raising tax rates. And greater economic prosperity would improve structures as more opportunities for specialized support were created. Then increased economic activity would drive more competitive intensity. These developments would lead to even higher prosperity, which would further strengthen each AIMS element, and so on in a virtuous circle (*Exhibit 12*).

But this AIMS-prosperity dynamic could also create a vicious circle. Unrealized prosperity potential could create pessimism and concerns about competitiveness and innovation rather than openness to them. These less positive attitudes would be less conducive to investments, and reduced

prosperity would also lead to fewer investment opportunities anyway. Unrealized economic potential means tax revenues would not meet fiscal needs, leading governments to raise tax burdens, thereby de-motivating investments. And reduced economic activity would create fewer nodes of specialized support and less openness to the public policies that would result in more competitive pressure.

While the AIMS elements are working reasonably well, we are concerned that if we do not address the current challenges of our complacent attitudes, under investment, and inadequate market structures, we will be on the trail to a vicious circle. We must avoid this trend and ensure we maintain our economy on the virtuous circle track.

Exhibit 12 AIMS drives prosperity; prosperity drives AIMS



Source: Institute for Competitiveness & Prosperity.

Attitudes: Encourage innovation for Canada to win in an ever more competitive world

We need to remain determined to close the prosperity gap through aggressive attitudes toward making innovation happen

Attitudes are an important foundation for a country's innovation performance. Our own work and that of others indicate that poorly formed attitudes are not the cause of Canada's innovation under performance. Our business leaders share a similar outlook on innovation with their counterparts around the world. Our challenge is to turn positive attitudes into action.

Our leaders need to encourage more positive attitudes toward an open economy

Attitudes that lead to high aspirations, self-confidence, the desire to succeed, an entrepreneurial spirit, and creativity are important drivers of economic success. In our First Annual Report, *Closing the prosperity gap*, we hypothesized that our citizens and business people might not possess the aspirations to succeed or the willingness to compete. To test this, the Institute conducted attitudinal research among public and business communities. In Working Paper 4, *Striking similarities: Attitudes and Ontario's prosperity gap*, we concluded that attitudinal differences between the public and businesses in Ontario and its peer states were not significant roadblocks to closing the prosperity gap. In contrast to commonly held perceptions, Ontario differed little from US counterparts in how they viewed business and business leaders, risk and success, and competition and competitiveness.

The survey asked nearly seventy different questions to help us understand the attitudes of Ontarians and their counterparts in the peer states. On most questions, they showed similar attitudes toward risk and success; and on several questions, Ontarians' responses indicated more positive attitudes toward competitiveness and innovation than their peers' answers. More generally, we found no differences in the attitudes toward risk-taking, innovation, and the importance and causes of personal success.

Overall, the survey results suggested that, across numerous dimensions, attitudes among the general business population and members of the business community in Ontario and the United States are very similar. In fact, we found significant similarities in key areas that relate to innovation and upgrading and to competitiveness:

- Ontarians view business and business leaders in much the same way as the public in peer group states
- Ontarians have similar attitudes toward risk and success as their US peers
- Ontarians' attitudes toward competition and factors of competitiveness are similar to those in the US peer states
- Ontarians' willingness to take action to achieve a higher standard of living does not vary from US peers' responses.

Notably, the survey did identify significant differences in attitudes toward post secondary education that affect our financial and human capital investments. Overall, however, the attitude results are heartening, since a significant attitudinal aversion to innovation would be very difficult to overcome.

Recent expert studies on Canadians' attitudes have come to similar conclusions.

In 2008, in its Final Report, the Competition Policy Review Panel called on Canadians to accept the challenge of globalization – to move from defence to offence to increase our competitiveness.²⁶ This Panel challenged governments, businesses, and the public to be more ambitious, to raise their sights, and to take control of their destiny. The Panel made important specific recommendations to realize the vision they set out for Canadians. Most of these are consistent with our 2020 Prosperity Agenda.

In 2009, the Expert Panel on Business Innovation presented its report, *Innovation and Business Strategy: Why Canada Falls Short*, to the federal government. Led by Robert Brown, CEO of global leader CAE Inc., the panel comprised leaders in business, academe, and labour. The Panel's mandate was to assess the innovation performance of Canadian business and to identify the factors contributing to innovative initiatives.

The Panel assembled an array of evidence to show that Canada's productivity challenge is tied directly to our weak innovation performance, a conclusion with which we agree. In its review of the various factors behind our weak innovation performance, the Panel addressed the issue of business ambition – “the attitudes that many believe have reduced the supply of entrepreneurial talent, the appetite for

risk, the urge to grow and the propensity to innovate.”²⁷ It observed that there is a widespread conviction in the Canadian business community that there is a deficiency of business ambition in Canada. Yet it could find no hard, quantitative evidence that supported the view that Canadian business people had fundamentally different outlooks on business from those in other countries.

The Panel concluded that, while there are not enough Canadians with the necessary aggressiveness, risk outlook, and outward perspective to compete in global markets, this “is not due to any lack of innate capacities of business people – it is not in the ‘DNA’ so to speak. Rather, the traditional attitudes of business people have been shaped over a very long time by particular circumstances of Canada's economy.”²⁸

These circumstances include easy access to the large US market, limited domestic competition, the small size of our domestic market, and inertia from our traditional success. A key challenge for us in Canada is to overcome the complacency that results from the many advantages we have.

Business leaders see innovation as a high priority, but risk and uncertainty are barriers

In early 2010, as the recession appeared to be ending, the Boston Consulting Group released the results of a global survey of the innovation practices of senior business executives.²⁹ Overall, the survey revealed that executives had returned innovation to the top of their priority list after a moderate retrenchment in 2009. Canadian executives were included in the survey, and their responses indicated that our business leaders see innovation as important, or even more important, than their counterparts in the United States and around the world. Fully 30 percent of Canadian respondents indicated

innovation to be a top priority versus 18 percent in the United States and 30 percent of executives in the rest of the world. In Canada, more than three quarters of respondents rated innovation as being “extremely important” or “important” to their company's strategy, well ahead of respondents in the United States and around the world.

In November 2010, Industry Canada released its Survey of Innovation and Business Strategy (SIBS). Industry Canada surveyed CEOs of more than 6,000 enterprises across Canada to understand how innovation factors in Canadian business strategy. Between 2007 and 2009, 67 percent of all survey respondents reported that they introduced product, process, organizational, or marketing innovations in their organization.³⁰ This is an impressive finding. Overall, the survey indicated that our business leaders are favourably disposed to the concept of innovation.

²⁶ Competition Policy Review Panel, *Compete to Win*, Final Report, 2008.

²⁷ Expert Panel on Business Innovation, *Innovation and Business Strategy: Why Canada Falls Short*, Council of Canadian Academies, 2009, p. 167.

²⁸ *Ibid.*, p. 174.

²⁹ 2010 BCG/Bloomberg *BusinessWeek* Innovation Survey.

³⁰ Industry Canada, Economic Research & Analysis, *Survey of Innovation and Business Strategy* (SIBS), available online: http://www.ic.gc.ca/eic/site/eas-aes.nsf/eng/h_ra02115.html

The SIBS survey did find that a lack of skills was a constraint to innovation (*Exhibit 13*). In our previous work, we have concluded that our lower level of managerial capabilities compared to the United States is a constraint to our innovation.³¹ While the SIBS results do not point specifically to managerial skills, deeper analysis of the survey results currently underway by Industry Canada should shed more light on this area.

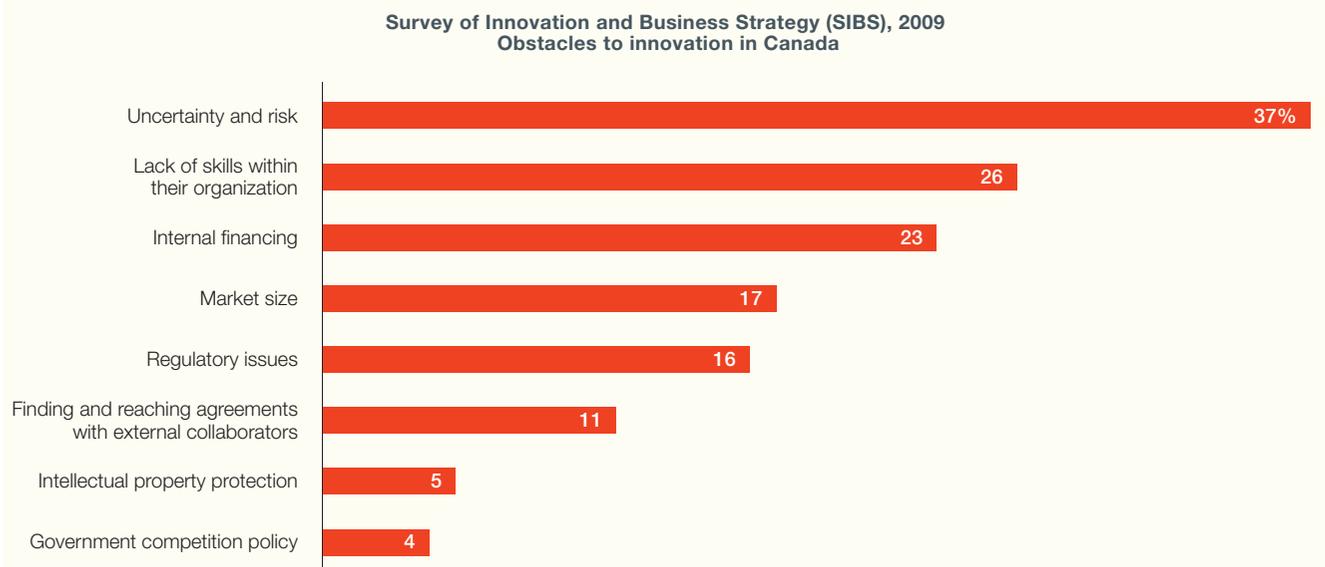
The SIBS innovation survey found, too, that more than a third of respondents indicated that “uncertainty and risk” were the main obstacles to innovation. Another barrier was lack of internal financing.

But is the concern about risks uniquely Canadian? In a recent survey of junior and mid-level office workers in Canada and the United States, Microsoft Canada found similar perspectives on the issue of risk and uncertainty.³² Large percentages in both countries – 84 percent in Canada and 77 percent in the United States – indicated that business leaders need to take more risks to develop innovations. Just over half of

the respondents – 53 percent in Canada and 55 percent in the US – thought the company they work for is already driving innovation. Nearly all respondents in both countries agreed that companies must embrace new technologies to remain competitive.

It is difficult to find evidence that Canadians’ attitudes toward risk, innovation, and competition are significantly different than those of their US counterparts. If our attitudes are not the roadblock, why then do we under perform on innovation? In this report and in our other work, we have concluded that our lagging performance is the result of context and public policy. In the area of context, we recommend that greater pressure be brought to bear on our firms through more international trade and less protection in many of our important industries. In the policy area, we need to focus more sharply on innovation, rather than invention, and we need to invest in developing and applying business skills to at least match our support for the hard sciences.

Exhibit 13 Canadian managers consider uncertainty and risk as the key roadblocks to innovation



Note: Respondents were asked to pick one or more obstacles to innovation.

Source: Industry Canada, Economic Research and Analysis, *Survey of Innovation and Business Strategy (SIBS)*, 2009, available online: http://www.ic.gc.ca/eic/site/eas-aes.nsf/eng/h_ra02092.html

³¹ Task Force on Competitiveness, Productivity and Economic Progress, Ninth Annual Report, *Today's innovation, tomorrow's prosperity*, pp. 48-49, 52.

³² Microsoft Canada, “Wanted: Canadian business leaders who innovate,” Microsoft Canada New Centre, March 31, 2011, available online: http://news.microsoft.ca/press_releases_business/archive/2011/03/31/wanted-canadian-business-leaders-who-innovate.aspx

Investments: Invest in the human capital and technology critical for innovation

Investments, the lifeblood of innovation and prosperity, need to be the focus of business and government spending

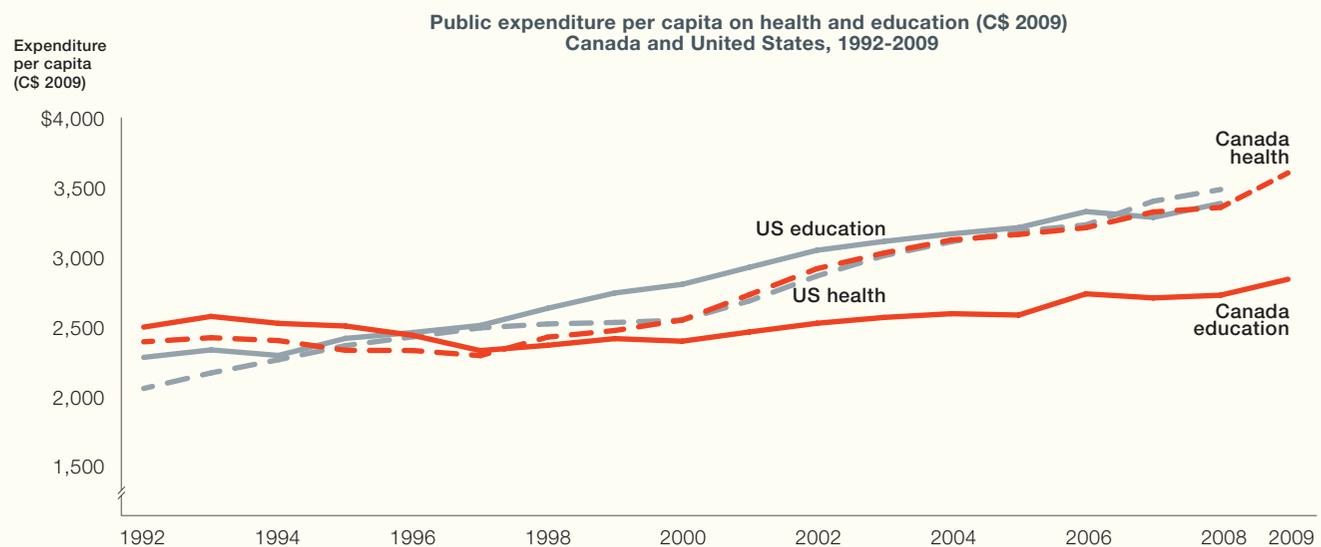
Prosperity is driven by productivity, and productivity is driven by innovation. A key ingredient to innovation is a base of investments in human and physical capital to facilitate the development of new ideas, new processes, new products, and new services. These in turn create prosperity, which in a virtuous circle generates funds for future investments. As governments, businesses, and individuals recover from the recession, their fiscal situation has no doubt been impaired. While we recognize this practical reality, we argue that spending in areas that strengthen our human and physical resources needs to be a high priority.

Ensure education spending is a government priority

A clear example of this is our public investment in education. As we compare our current public spending patterns in Canada with those in the previous decade and in the United States, we find our investment in education is falling behind.

As recently as 1992, all levels of government across Canada spent \$2,500 per capita on education (in 2009 dollars) – 4.4 percent more than we spent on health care (*Exhibit 14*). But a perfect storm arose to change the course of our public investment patterns. Since 1971, ongoing deficits federally and in many provinces caused

Exhibit 14 Since 1996, public investment in education in Canada has trailed US spending significantly



Notes: US health spending includes workers' compensation, medical benefit outlays and excludes administrative and other costs; Canada health spending includes all workers' compensation. US dollars converted to Canadian dollars at 2009 PPP.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Consolidated Government Revenue and Expenditures (CANSIM Table 385-0001); US Census Bureau (State and Local Government Finances), Office of Management and Budget (Historical Tables), National Academy of Social Insurance (Workers' Compensation: Benefits, Coverage, and Costs, 2008).

the accumulated debt for federal and provincial governments to grow to \$665 billion, or 96 percent of our GDP. Debt rating agencies and public concern forced governments to rein in spending.

Over the fiscal years 1995–96 to 1997–98, the federal government turned a \$30 billion deficit to a \$3 billion surplus through increased revenues and spending cuts. A major source of the spending cuts was the rollback in transfers to the provinces – money used to fund education and health care, the two biggest provincial expenditures. Ottawa chopped almost \$8 billion, or 24 percent, from this budget line during the period, a time when the provinces were all dealing with their own fiscal challenges.

In response to dire economic times, our politicians responded by cutting education. This was in keeping with our governments' emerging bias toward consumption over investment.

Broadly speaking, public expenditures can be broken into two fundamental buckets: investment in building future prosperity, and consumption of current prosperity. As governments at the federal and provincial levels tackled deficits, they cut real per capita spending on education, an investment, at a much faster rate than that on health care spending, which is mostly consumption, although our expenditure does include some R&D. By 1998, governments in Canada were spending more on health care than on education. This gap widened considerably as health care spending per capita increased at an annual trend line growth rate of 3.6 percent between 1998 and 2009, while education spending increased only 1.6 percent annually. In 2009, per capita public spending on health care outpaced spending on education by 27 percent, a significant reversal from a decade ago.

Contrast our response to the 1990–93 economic downturn with that of the United States, which admittedly entered the recession in better fiscal shape than Canada: total deficits across all levels of government in the US represented 4.2 percent of GDP in 1990, before the recession struck. That figure grew as high as 5.8 during the recession, but by 1995 it was back down to 3.1 percent. By comparison, in 1990 Canada had deficits amounting to 5.8 percent of GDP, and by 1992 that figure had reached 9 percent across all levels of governments. The United States did not need to engage in the dramatic deficit fighting seen in Canada. So, over the same period, spending by governments in the United States grew at about the same rates for health care and education. Across Canada, per capita public investments in education increased slightly at a rate of 1.5 percent annually between 1997 and 2005, this annual growth rate increased to 1.8 percent between 2005 and 2009 (in constant 2009 dollars).

Still, much remains to be done, as the gap to be closed on education spending remains considerable – at just under \$800 per capita in 2009. As federal and provincial governments turn their attention to the massive deficits they have generated in the past two years, they need to ensure that spending cuts are made appropriately with innovation and future prosperity in mind.

Continue investing in people to encourage innovation

Why the emphasis on education? Since our first Report on Canada in 2003, we have identified the importance of investing in post secondary education for Canada's prosperity. There is much research that shows the positive impact of such investment on prosperity for regional economies and for individuals.

Post secondary education has a significant impact on the performance of a regional economy

Traditionally, the inputs for economic growth have been understood to be capital and labour. But economists now conclude that knowledge plays a critical role in economic growth. Human capital – the ideas, skills, and expertise of people – is a fundamental input into the economic process. The education of the workforce is therefore a fundamental driver of economic growth.

Research has tied national investment in post secondary education to economic growth. In an international study by the OECD, researchers found a positive and significant relationship between number of years of schooling and per capita growth in output.³³ University of British Columbia economist, W. Craig Riddell also found a strong correlation between labour force quality (as measured by test scores) and per capita economic growth rates.³⁴ In addition to providing a better educated workforce, spending on post secondary education has been positively correlated with both innovation and high technology industrial activity.³⁵ And investing in universities also results in more basic research. If the university is embedded within what researchers call the regional innovation system, this research flows to the private sector, where it can be commercialized and drive economic progress.

Spending on post secondary education is also believed to create several kinds of regional benefits. Universities have been shown to be the source of direct economic spillover effects, generating new businesses and spinning off billions of dollars in economic activity. In 1999, for example, the University of Waterloo accounted for over \$1 billion in economic activity in the local region and \$1.6 billion province-wide.³⁶ An earlier study found that graduates of the Massachusetts Institute of Technology had created over 4,000 companies worldwide, with total sales of US \$232 billion.³⁷

³³ Andrea Bassanini and Stefano Scarpetta, "Does Human Capital Matter for Growth in OECD Countries? Evidence from Pooled Mean-Group Estimates," OECD Working Paper No. 282, 2001.

³⁴ W. Craig Riddell, "Education and Skills: An Assessment of Recent Canadian Experience," The University of British Columbia and Canadian Institute for Advanced Research, Discussion Paper No. 01-06, 2001.

³⁵ Richard Florida, *Technology and Tolerance: The Importance of Diversity to High Technology Growth*, The Brookings Institution: Center on Urban and Metropolitan Policy, 2001.

³⁶ PriceWaterhouseCoopers, *The University of Waterloo: Regional Economic Benefits Study*, 2001.

³⁷ Bank of Boston Economics Department, *MIT: The Impact of Innovation*, 1997.

Research has indicated that the presence of research universities is also a key factor for multinational corporations as they make their R&D location decisions. Multinational firms seek out the benefits of spillovers from other companies in their industry, a highly qualified labour force, first-class infrastructure, and access to specific research universities.³⁸

Universities also indirectly stimulate economic growth through the spillover of knowledge through their graduates. As centres for discovery, universities' express purpose is to generate ideas. In this way, they engender an environment where continuous learning is supported. The leagues of graduates who enter the local economy interact with university based researchers, thereby creating the flow of tacit knowledge and ideas from industry, to university, and back again.³⁹

Linkages between universities and industries facilitate this knowledge flow. Cooperative education programs, industry-sponsored research, and

joint industry-university research organizations are a few examples of such linkages. The result is a network of people who share knowledge continuously. The presence of such a network is a critical component to the culture of relentless upgrading and innovation. Innovation at the firm level is reinforced by the firm's interactions with university researchers, whose primary function is to discover new ideas. Spinoff companies and technology transfer are common results of university-industry relationships.

As the Institute found in its recent Working Paper on trade, manufacturing industries with a higher percentage of their workers in creativity-oriented occupations were less vulnerable to import inroads from China.⁴⁰ These occupations draw on knowledge to make decisions on a course of action, such as doctors, lawyers, software designers and teachers. They require higher levels of education – so in some sense higher education is a good defence for Canada as globalization

advances relentlessly. But it is more than that – investments in higher education are a critical foundation for our innovation capabilities.

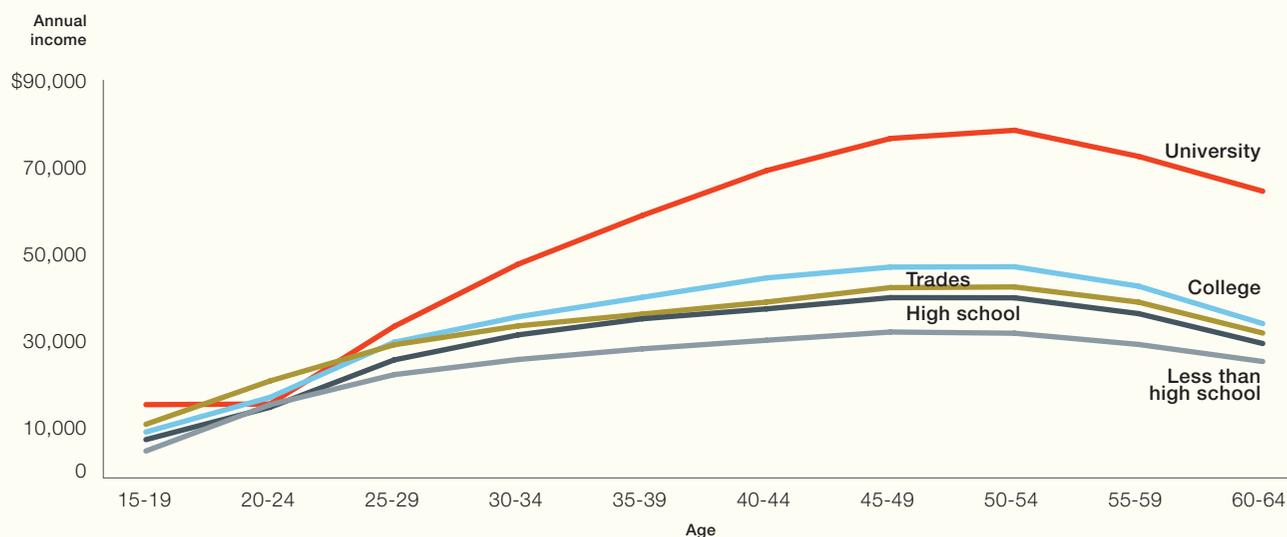
Education makes a difference to individuals' economic well being

Ample research has shown that level of schooling is one of the best predictors of the relative wealth of individuals. Research on happiness found that higher education, through its impact on health and income, is correlated with greater individual happiness. Highly educated individuals have higher earnings and experience less unemployment (*Exhibit 15*). They are healthier, live longer, and are less likely to be involved in crime than those with fewer years of schooling.⁴¹

In our study of poverty in Working Paper 10, the Institute concluded that post secondary education was a critical ingredient in reducing poverty.⁴² We identified several groups who had a higher-than-average propensity for being in poverty – high school dropouts, recent

Exhibit 15 More education means higher earnings

Average annual employment income by age and educational attainment, 2005



Source: Statistics Canada 2006 Census of Population and Council of Ministers of Education; education indicators in *Canada: Report of the Pan-Canadian Education Indicators Program, 2005*, Catalogue no. 81-582-XIE.

³⁸ Institute for Competitiveness & Prosperity, Working Paper 11, *Flourishing in the global competitiveness game*, September 2008, p. 27.

³⁹ David Wolfe, "Social Capital and Cluster Development in Learning Regions," in A. Holbrooke and D. Wolfe (eds.) *Knowledge Clusters and Regional Innovation*, Montreal: McGill-Queens University Press, 2002.

⁴⁰ Institute for Competitiveness & Prosperity, *Trade, innovation, and prosperity*, pp. 40-43.

⁴¹ See for example W. Craig Riddell, "Education and Skills: An Assessment of Recent Canadian Experience," University of British Columbia and Canadian Institute for Advanced Research, Discussion Paper No. 01-23, 2001; Ana W. Ferrer and W. Craig Riddell, "The Role of Credentials in the Canadian Labour Market," *Canadian Journal of Economics*, 2002 Vol. 35, No. 4; Statistics Canada, "Education and earnings," *Perspectives on Labour and Income*, 2006, Vol. 38, No. 03.

⁴² Institute for Competitiveness & Prosperity, Working Paper 10, *Prosperity, inequality, and poverty*, September 2007, pp. 46-47.

immigrants, lone parents, the disabled, unattached individuals between the ages of 45 and 64, and Aborigines.

Except for recent immigrants, educational attainment across each risk group was below the Canadian average. In general, within each risk group, those with more education achieved better economic outcomes than those with less.

Higher levels of educational attainment also mean people face less likelihood of working part time involuntarily – a cause of reduced economic success. In our study of hours worked in Working Paper 9, the Institute found that the incidence of involuntary part-time work in Ontario decreased as educational attainment increased.⁴³

Despite the benefit to individuals and society at large, Canadians are less likely to earn a university degree than their US counterparts in all fields, particularly business (*Exhibit 16*). There is a clear need to increase the number of university graduates in Canada.

Increase the number of international students at our universities

Not only should more Canadians attend university, we should also be seeking out more international students. First, enabling Canada to attract the best students from around the world has a positive impact on schools and Canada more broadly. Second, our ability to attract international students is a good indicator of the quality of our schools in an international context. It is one thing to assert that our schools are world-class; but competing successfully in a global setting for students is a more reliable indicator. Third, international students have the potential to increase the financial sustainability of our post secondary institutions, as they typically pay full tuition fees, albeit with some scholarships and aid from their institution.

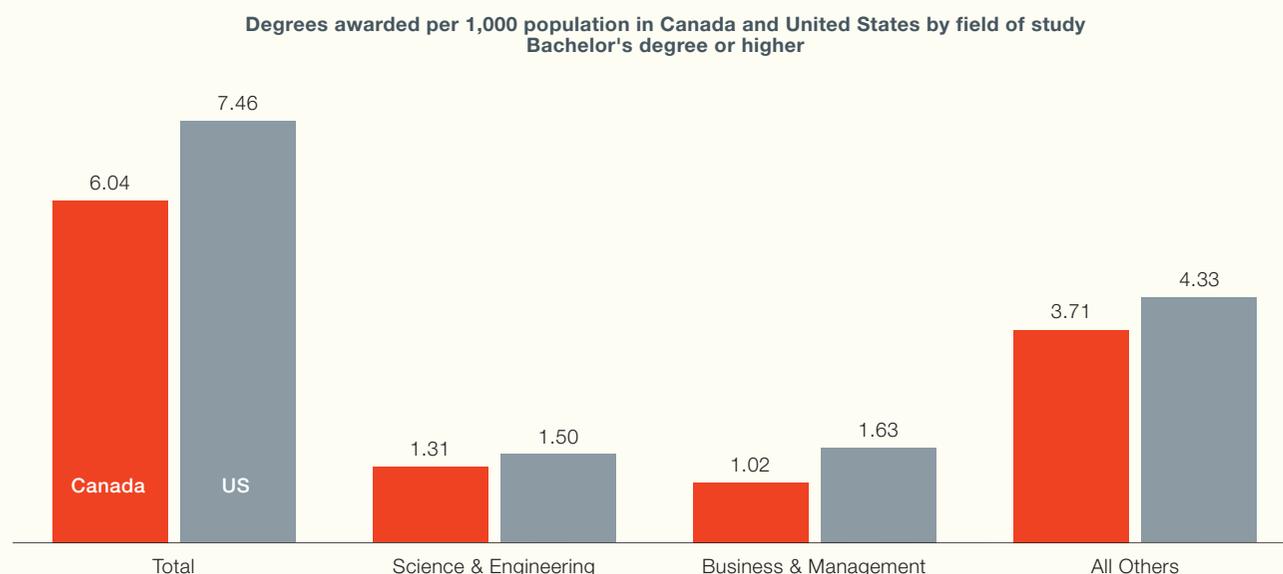
The Institute's research indicates that Canada is well down the list of countries attracting international students. At 92,881 students annually, Canada trails the United States, which attracts

595,719 students, although on a per capita or per domestic student basis, we out perform the US. But, both Canada and the United States trail the United Kingdom, France, and Australia on a per capita basis.⁴⁴

At the undergraduate level, Canada matches the OECD's experience, with around 7 percent who are international students. A higher percentage of our graduate students are international – 20 percent in Canada versus 18 percent across OECD countries. In the United States, only 3 percent of undergraduate students are international in contrast to 28 percent of graduate students. The United Kingdom and Switzerland have the highest percent of their students from abroad – around 15 percent of undergraduates and 45 percent of graduate students.⁴⁵

The type of discipline chosen by international students does not vary much across Canada, the United Kingdom, and the United States. Just under half of international students in Canada are enrolled in social sciences,

Exhibit 16 Fewer degrees are awarded in all fields of study in Canada than the United States



Note: For Canada: Calendar year 2008, US: Academic year 2007-2008.

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Association of Universities & Colleges of Canada; US Department of Education (National Center for Education Statistics).

⁴³ *Idem.*, Working Paper 9, *Time on the job*, September 2006, pp. 25-26.

⁴⁴ Institute for Competitiveness & Prosperity analysis of data from Statistics Canada and UNESCO.

⁴⁵ OECD, *Education at a Glance 2010*, Table C2.1.

arts, and humanities (which includes commerce), nearly matching the United Kingdom at 55 percent and the United States at about 41 percent. About a third across the three countries are enrolled in sciences or engineering. The next most common area of enrolment is in health disciplines, accounting for 6 percent in Canada, 9 percent in the United Kingdom, and 5 percent in the United States.⁴⁶

The number of international students is projected to increase dramatically in the coming years – and so is the competition to attract these students. UNESCO estimates that there were 2.8 million international students in 2007; and in 2002, Böhm, Davis, Meares and Pearce of Education Australia projected that the number of international students would reach 7.2 million by 2025 – an annual growth rate of 5.4 percent. Research done by the British Council, the UK international cultural relations body, indicates that traditional “exporters” of international students like China, Malaysia, and Singapore are working at becoming host countries of international students. Japan and South Korea are experiencing a decline in university-age students and will attempt to sustain their post secondary institutions through hosting more international students. India is looking to attract foreign institutions by building bricks and mortar facilities to keep more of their students at home.⁴⁷

The provincial and federal governments in collaboration with individual institutions will need to step up their marketing efforts to compete for international students. The federal government does little to market Canada other than a limited web site sponsored by Human Resources and Skills Development Canada and a listing of scholarships and awards received by international students on the Citizenship and

Immigration Canada web site. Canadian embassies run their own programs in which provincial international education programs can participate.

By contrast, Australia and the United Kingdom have more complete web site offerings and have developed intensive marketing campaigns; for example, to promote the “EducationUK” brand. The US government, in addition to a web site, provides a physical centre for free advisory and information services in every major country in the world. Universities also participate in trade missions run by individual states.

The Institute also found that student visa requirements for graduating international students are similar across jurisdictions. Typically, students must prove that they have been accepted at a recognized post secondary institution, that they are law abiding and pose no threat to national security, and that they intend to leave the country upon completion of their studies.

Upon graduation, international students in Canada are eligible for a three-year open work permit. This is similar to the policy in the United Kingdom, where graduates are eligible for a two-year open work permit. In Australia, international graduates can apply for permanent residency status or an eighteen-month temporary visa. In the United States, international students can qualify for the H1-B visa if they have a sponsoring employer. The visa is in place for three years with the possibility of a three-year extension. There is a quota for the number of H1-B visas and the US government has recently imposed some short-sighted restrictions on these visas – companies receiving Troubled Asset Relief Program funding may not hire international graduates under the H1-B visa.⁴⁸

Attracting more international students to Canada's universities has many benefits. Yet the financial impact on institutions needs to be assessed further. In strict financial terms, our analysis in Ontario indicates that institutions do not have the incentive to attract international students.⁴⁹ If our provinces are to pursue the worthwhile objective of attracting more international students, we need to think through the financial incentives carefully.

⁴⁶ *Ibid.*, Table C2.5.

⁴⁷ Janet Illieva, “Trends, stats and the future of the international student market place,” British Council, available online: <http://www.slideshare.net/AoCinfo/trends-stats-and-the-future-of-the-international-student-market-place>

⁴⁸ Moira Herbst, “H-1B Visas: ‘Buy American’ Comes to TARP,” *Bloomberg Businessweek*, February 6, 2009, available online: http://www.businessweek.com/blogs/money_politics/archives/2009/02/h-1b_visas_buy.html

⁴⁹ Task Force on Competitiveness, Productivity, and Economic Progress, *Today's innovation, tomorrow's prosperity*, p. 36.

Step up business investments in innovation

Our businesses continue to under invest in innovation, as measured by information and communications technology (ICT), and research and development spending, relative to patent output. While no one measure is a perfect proxy for innovation, together they paint a depressing picture.

Canadian business investments continue to trail the United States

Such investments that are made are typically allocated to ICT and to all other categories, such as traditional factory equipment and vehicles. ICT accounts for about one third of investment in machinery, equipment, and software.

On a per worker basis, US businesses out invest Canadian businesses in machinery and equipment overall with the gap being larger in ICT (*Exhibit 17*). As much of our machinery and equipment is imported, the strengthening of the Canadian dollar has been an advantage for our businesses.

Consequently, the gap between Canada and US investment per worker began to narrow in 2005. However, the gap has widened with the recent recession. In 1987, our businesses invested 21 percent less per worker in all machinery, equipment, and software; in 2001, this gap had grown to 31 percent; in 2010, it had risen again to 36 percent.

In 2010, the Canada-US gap in ICT investment per worker was \$2,400 or 50 percent, while in other machinery and equipment the gap was \$1,400 or 24 percent. One benefit of a stronger Canadian dollar is that it lowers the cost of imported machinery, equipment, and technology – and this is likely a factor in the narrowing of this investment gap.

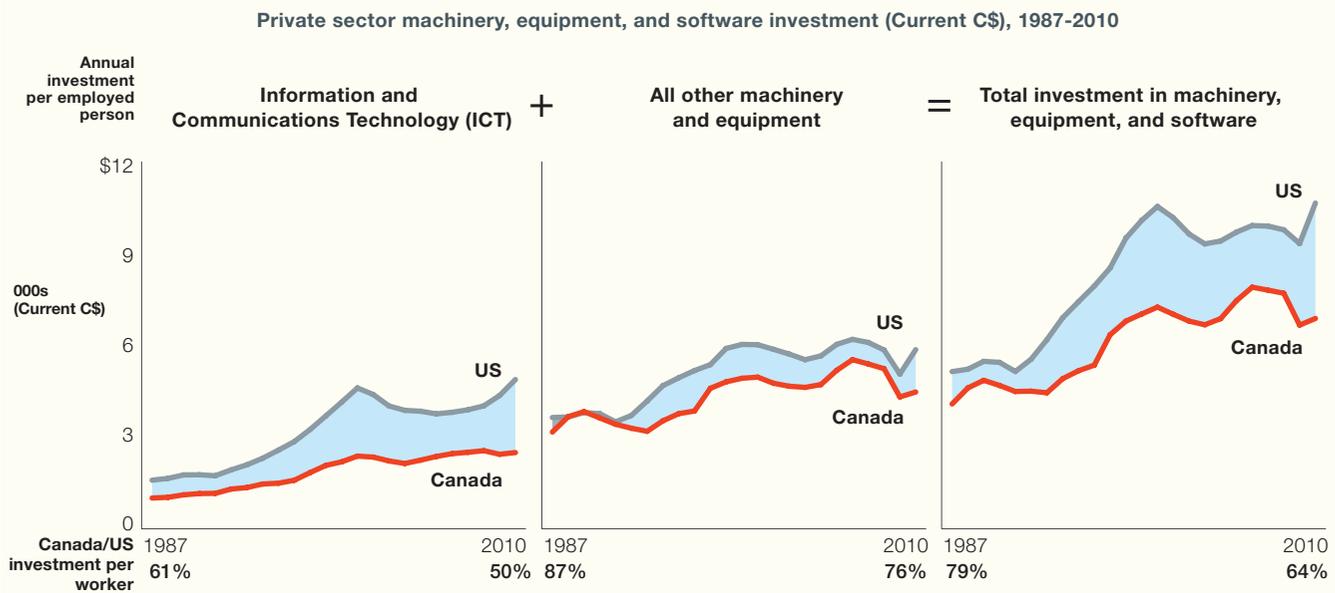
Closing the investment gap offers the potential for closing the prosperity gap. With higher machinery, equipment, and software investment, our workforce could be more productive. In 2007, the Institute assessed the lower adoption of ICT by Canadian businesses, particularly small and medium enterprises.⁵⁰ The research we reviewed indicates that

investment in ICT enhances productivity at three levels. At the most basic level, research by OECD and others indicates that equipping staff with computers and software increases firm and national productivity. At the second level, connecting computers in networks and drawing on more technologies can drive productivity even higher. At the third level, the most significant benefit of ICT adoption can be that it enables profound transformation of businesses through changes in business processes or organizational design or both.

We conclude that the lack of investment in ICT can be attributed to factors identified in research in other areas – lack of competitive pressure to spur Canadian businesses to adopt technology, weak management capabilities to discern the benefits of technology and to capitalize on them, and higher taxation on business investment.

Canada’s significant tax reforms will eliminate the tax disadvantage. And opening up trade with Europe and developing economies will increase the support and pressure for investment.

Exhibit 17 Canadian businesses lag their US counterparts in ICT investments



Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada (special tabulations); US Bureau of Economic Analysis.

⁵⁰ Roger Martin and James Milway, *Enhancing the Productivity of Small and Medium Enterprises through Greater Adoption of Information and Communication Technology*, Information and Communication Technology Council, Ottawa, March 2007, available online: http://www.ictc-ctic.ca/uploadedFiles/Labour_Market_Intelligence/Enhancing-the-Productivity-of-SMEs.pdf

Business R&D investment lags US spending

Canada's R&D investment gap with the United States has largely been in the business sector. As a percentage of GDP, Canada's R&D investment over the last two decades is behind the rate achieved by the United States (*Exhibit 18*). A closer examination of Canada's R&D spending indicates that our gap is in the area of private sector business research and development, not in publicly funded higher education and government research and development. We discuss these two findings after reviewing the evidence of the importance of R&D to innovation and prosperity.

R&D matters. The OECD broadly defines R&D as "creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications."⁵¹ R&D comprises basic research, applied research, and experimental development and is distinguished from other pursuits, such

as design, market research, or quality control, in that it is ultimately concerned with the production of original knowledge, processes, or products.

Economists have gathered significant evidence of the positive relationship between R&D and productivity and have produced substantial proof that R&D investment is a key driver of long-term prosperity. The research also shows that, while a significant relationship exists between private R&D investment and growth in subsequent productivity, the relationship between government R&D and productivity growth is not as direct. Public R&D may, however, stimulate business R&D, which in turn affects productivity.⁵² Statistical tests also show a positive relationship between the change in average intensity of business R&D and the change in multifactor productivity growth.⁵³ In addition, R&D investment has been shown to have a positive relationship with patenting.⁵⁴

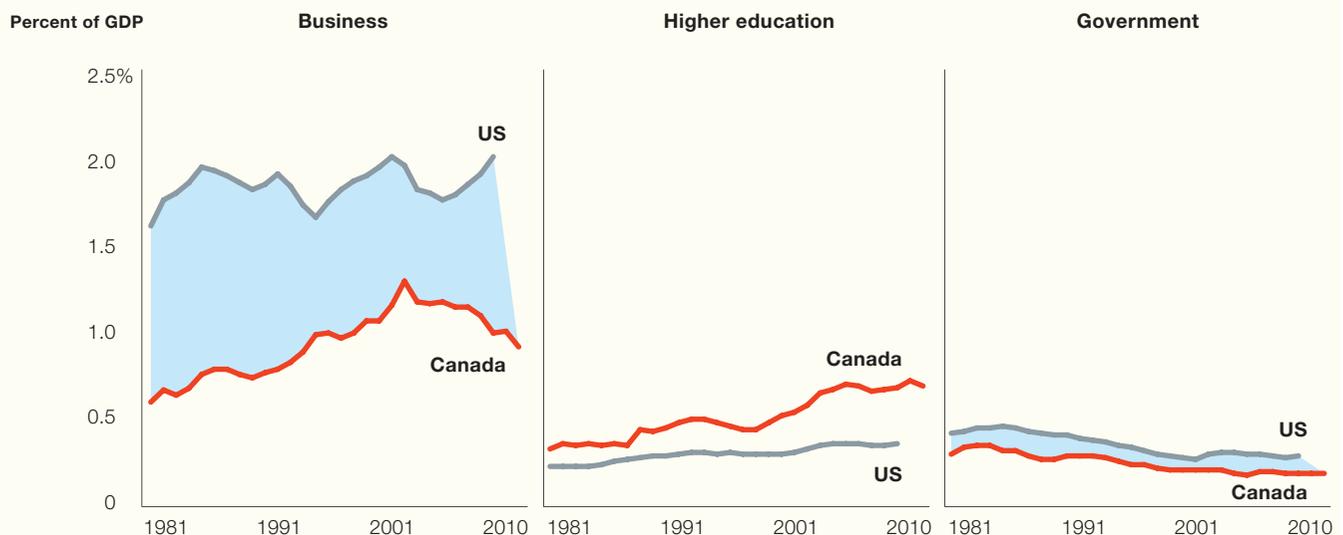
Overall R&D expenditure in Canada lags the United States, because of shortfalls in business R&D.

Gross expenditure on research and development (GERD) is typically assessed for three main performers: business, higher education, and government. In the area of business R&D, Canada lags the United States most significantly. This gap had been closing during the dot-com boom, led by Nortel, but since then, it has opened up again. In publicly funded R&D – by higher education and governments – we compare more favourably.

- Business enterprise expenditure on research and development (BERD) is the main component of GERD. Over the past decade, BERD in Canada increased by 19 percent from \$12.3 billion in 2000 to \$14.8 billion in 2010. But as a percentage of GDP, it fell from its peak of 1.3 percent in 2001 to 0.9 percent in 2010. Much of the run up experienced in the 1990s was likely because of Nortel's investments. And much of the decline through the 2000s was the result of Nortel's pull back in R&D and its demise in 2009.

Exhibit 18 Canada trails the United States in business R&D

Types of R&D spending as a percentage of GDP, 1981-2010



Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada (Table 358-0001); National Science Foundation (Division of Science Resources Statistics, *National Patterns of R&D Resources: 2008 Data Update*, NSF 07-331).

⁵¹ OECD, *Frascati Manual*, 1993, p. 29.

⁵² Zvi Griliches, "Introduction," in NBER, *R&D, Patents, and Productivity*, 1984, p. 18.

⁵³ OECD, *The New Economy: Beyond the Hype*, 2001, p. 43.

⁵⁴ Zvi Griliches, Ariel Pakes and Bronwyn Hall, "The Value of Patents as Indicators of Inventive Activity," *NBER Working Paper No. 2083*, 1988, p. 3.

- Higher education expenditure on R&D (HERD) has increased steadily in Canada over the past twenty years. During the late 1990s, HERD rose in response to increases in funding by the provincial and federal governments. In comparison to the United States and most other advanced economies, Canada invests heavily in higher education R&D both as a percentage of GDP and per capita.
- Government expenditure on R&D (GOVERD) makes up a small proportion, only 11 percent in 2010, of total R&D performed in Canada. In Canada and the United States, government R&D as a percentage of GDP is stable or in decline.

In summary, in the early 2000s, Canada began to close the gap with the United States in R&D as a percentage of GDP, but the gap has since widened again with the key under investment being in business R&D.

Canadian businesses produce fewer patents

A key measure of innovative capacity and processes is patenting. 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 solid measure of a nation's or region's innovative output.⁵⁵

R&D and patent output are closely linked – more dollars spent by businesses on R&D lead to more patents (*Exhibit 19*). A patent grants exclusive commercial use of a newly invented device. According to Trajtenberg, “For a patent to be granted, the innovation must be non-trivial, meaning that it would not appear obvious to a skilled practitioner of the relevant technology, and it must be useful, meaning that it has potential commercial value.”⁵⁶

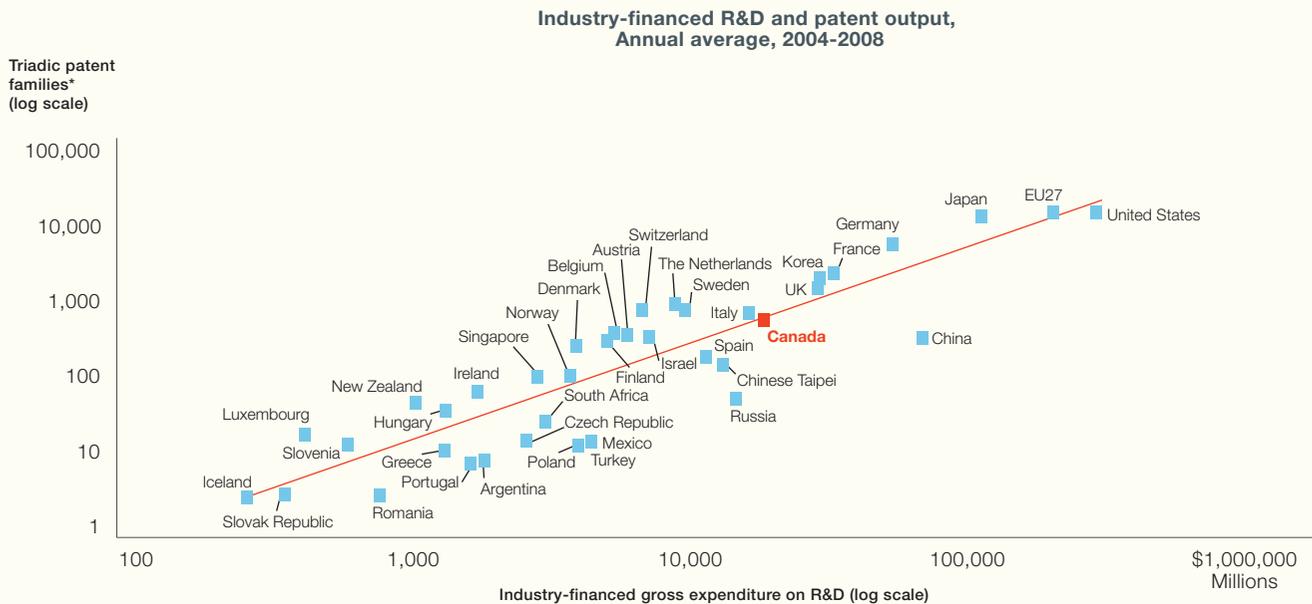
Patent data across all industries for the years 2004 to 2008 from the OECD indicate a significant lag for Canada versus the performance of peer countries (*Exhibit 20*).

The patent performance of developing economies like China and Russia is well behind that of advanced economies, including Canada. As we concluded in our Working Paper on trade, much of the business R&D performed in China, for example, is duplicative, not inventive.⁵⁷ As seen in Exhibit 19, China and Russia produce fewer internationally significant patents given their level of expenditure on R&D.

Large incentive packages to attract businesses are often not wise investments

Governments at all levels across Canada should avoid large incentive packages to attract new businesses to the country. As in many other countries, our governments have drawn on specially targeted incentives to attract new businesses or to assist in expansions of existing ones. Academic research shows that such incentives do not produce economic results that justify the expense.

Exhibit 19 Business R&D spending is closely linked to patent output



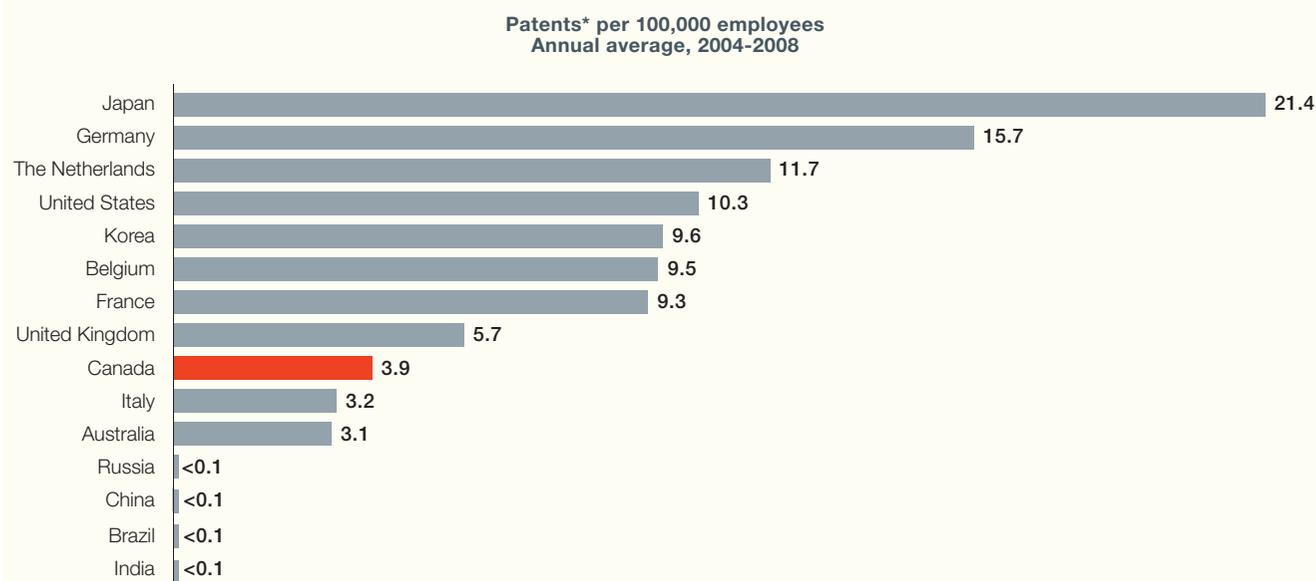
* US Patent and Trademark Office, Japan Patent Office, and the European Patent Office. Source: Institute for Competitiveness & Prosperity analysis based on data from OECD Science and Technology Statistics.

⁵⁵ See Michael Porter, “The Economic Performance of Regions,” *Regional Studies*, Vol. 37, No. 6-7, 2003, p. 551 and note 9, p. 572 for a review of the academic work in using patents as a measure of innovative capacity.
⁵⁶ Manuel Trajtenberg, “Is Canada Missing the ‘Technology Boat?’” Centre for the Study of Living Standards, 1999, p. 5.
⁵⁷ Institute for Competitiveness & Prosperity, *Trade, innovation, and prosperity*, p. 8.

Among the empirical research, we found the following.

- In a 1993 study of the net economic impact of Industrial Development Bonds, the US Government Accountability Office concluded that the economic impact of the bonds do not justify the costs to the government. Industrial Development Bonds are issued by governments to companies requiring financing to locate or expand in a particular jurisdiction. The bonds have favourable interest rates and other conditions as an incentive to attract business. The study assessed 68 projects in Ohio, Indiana, and New Jersey – states that issue 20 percent of such bonds in the United States. The study found that 60 percent of developers said they would have pursued their project without the bond. Half of the developers would have pursued smaller developments without the bond.⁵⁸
- In a 1993 study, economists John Bishop and Mark Montgomery assessed the effects of the Targeted Jobs Tax Credit, a federal tax subsidy for firms that hire workers who are on welfare or who are disabled. The study was based on a survey of 3,400 employers who received the tax credit in 1982 and 1983. The study concluded that 70 percent of the tax credit went to firms that would have hired these workers anyway, and that each job created was subsidized at the rate of \$5,270 to \$11,581.⁵⁹
- The State of Washington compared the number of jobs created through incentives programs to the number promised. The researchers studied 1,279 cases in 1994 and focused on three incentive programs – a distressed area sales tax deferral or exemption, a new manufacturer sales tax deferral, and a distressed area tax jobs credit. They found that, of the 23,348 jobs promised, only 5,997 actually materialized. Fully 83 percent of sales tax deferrals were repaid by companies to the state. Only 9 of the 22 distressed areas improved their unemployment rate in 1994.⁶⁰
- A study by economists Todd Gabe and David Kraybill of 366 manufacturing expansions in Ohio between 1993 and 1995 differentiated between those that had received government incentives and those that did not. The study compared job number announcements compared to jobs actually achieved. It found that the presence of incentives was statistically unrelated to actual job growth, even though firms' expansions related to incentives announced 40 percent more new jobs than those without incentives. In effect, incentives stimulated job announcements, but not actual job creation.⁶¹
- Economists Ernest Goss and Joseph Phillips studied companies that received incentives through the Nebraska Employment and Investment Act between 1991 and 1995. They compared the incentive effects in counties with low income and high unemployment against counties with high income and low unemployment. They found that the return from the

Exhibit 20 Canadian businesses trail their international peers significantly in patent output



*US Patent and Trademark Office, Japan Patent Office, and the European Patent Office.

Source: Institute for Competitiveness & Prosperity analysis based on data from OECD Science and Technology Statistics; *China Statistical Yearbook 2009*; World Bank for Brazil and India (2004–2007).

⁵⁸ United States General Accounting Office, *Industrial Development Bonds: Achievement of Public Benefits is Unclear*, April 1993, GAO/RCED-93-106.

⁵⁹ J. Bishop, and M. Montgomery, "Does the Targeted Jobs Tax Credit Create Jobs at Subsidized Firms?" *Industrial Relations*, 1993, 23 (3), pp. 289-306.

⁶⁰ Terry F. Buss, "The Effect of State Tax Incentives on Economic Growth and Firm Location Decisions: An Overview of the Literature," *Economic Development Quarterly*, February 2001, pp. 90-105.

⁶¹ Todd M. Gabe and David S. Kraybill, "The Effect of State Economic Development Incentives on Employment Growth of Establishments," *Journal of Regional Science*, Vol. 42, No. 4 2002, pp. 703-730.

investment in rebated taxes was much lower in counties with weaker economic results.⁶²

- Finance professor Robert Chirinko and Federal Reserve Bank economist David Wilson studied the impact of 48 US state tax rates on the formation and performance of manufacturing establishments over twenty years. The study focused on establishments in counties that bordered on other states. They found a small, but positive impact on the formation of establishments on the side of the border with lower taxes on capital. They also found the performance of the manufacturing establishments was positively related to tax reductions in the state and negatively related to tax induced reductions in the cost of capital in the neighbouring state.⁶³
- Jed Kolko, David Neumark, and Ingrid Lefebvre-Hoang, researchers at the Public Policy Institute of California, studied the establishment and relocation of California firms between

1992 and 2004. They used a special set of data to track firms as they were established or relocated to the state. They found that state-to-state relocations accounted for a very small number of jobs. The net effect of jobs gained and lost through relocation was 0.06 percent of total jobs in the state (the net effect of 0.10 percent from jobs gained through in-migration and 0.16 percent from jobs lost through out-migration). In addition, they found that job losses as a result of relocation were not statistically related to job growth in California.⁶⁴

- Business professors Pacey Foster and David Terkla assessed the effect the Massachusetts film tax credit on the development of a film cluster in the state between 2005 and 2008. They noted that employment in the motion picture and post production industries more than doubled, while overall employment growth in the state declined over the same period. They estimated that each new film job in the state produced another 0.79 jobs

there.⁶⁵ However, economists Susan Christopherson and Ned Rightor reviewed several studies assessing the economic impact of incentives to attract film production (but not the study by Foster and Terkla) and concluded that while these studies make estimates of employment multipliers, they rarely conduct rigorous analysis of the broader economic impact of such incentives.⁶⁶

To add to the existing empirical research, the Institute and the Martin Prosperity Institute looked at the impact of large-scale incentive packages, asking several questions. Did these deals ultimately deliver the jobs or investments that were announced? Was state or provincial economic success related to these large-scale incentive packages? And was there any evidence that states had expanded industry clusters as a result of these large-scale deals?

Exhibit 21 Large-scale incentive packages are costly; most fall short of their announced goals

Outcome in meeting announced objectives of 52 Site Selection "Deals of the Month," 1999-2009



Source: Martin Prosperity Institute and Institute for Competitiveness & Prosperity analysis based on Site Selection.

⁶² Ernest P. Goss and Joseph M. Phillips, "The Impact of Tax Incentives: Do Initial Economic Conditions Matter?" *Growth and Change*, Vol. 32 (Spring 2001), pp. 236-250.
⁶³ Robert S. Chirinko and Daniel J. Wilson, "State investment tax incentives: A zero-sum game?" *Journal of Public Economics*, 92 (2008) pp. 2362-2384.
⁶⁴ Jed Kolko and David Neumark, with research support from Ingrid Lefebvre-Hoang, *Business Location Decisions and Employment Dynamics in California*, Public Policy Institute for California, 2007.
⁶⁵ Pacey C. Foster and David Terkla, *Film and Television Production in Massachusetts: An Industry of Overview and Analysis*, February 11, 2010, Boston: University of Massachusetts.
⁶⁶ Susan Christopherson and Ned Rightor, "The Creative Economy as 'Big Business': Evaluating State Strategies to Lure Filmmakers," *Journal of Planning Education and Research*, 29 (3) 2009, pp. 336-352.

Did these deals deliver the announced jobs or investments? *Site Selection*

is a leading publication among the economic development community. It identifies “Deals of the Week” and “Deals of the Month” based on the level of private-sector capital investment, the degree of high-value jobs, creativity in negotiations and incentives, regional economic impact, competition for the project, and speed to market. *Site Selection* documents the value of the incentive packages offered by governments and the expected jobs and capital investment ensuing.

Of note is the high cost per job of these large incentive packages. The average deal of the month cost \$75,000 per job promised.

The researchers tracked the actual results of each deal of the month from 1999 to 2009, mainly through Internet searches of news stories or company communications. In all, they were able to find results for 52 large-scale Deals of the Month. They found that about a third of the deals were almost totally successful in achieving the announced job and investment results. Another third were partially successful – they achieved some, but not all of the stated goals. Finally, a third of deals were judged to be failures in achieving the targeted results (*Exhibit 21*). So these best-in-class incentives deals do not typically deliver on the results expected at the time of the announcement.

Is there any evidence of spillovers to broader economic growth from these large-scale deals?

The researchers measured the statistical relationship between the incidence of *Site Selection*'s Deals of the Week and subsequent economic success measured several different ways. They found no positive relationship with growth in employment, wages, GDP, and head offices.

Did any of these large-scale incentive packages help create or significantly expand the industry clusters?

The researchers identified the state and industry for each weekly deal and compared the results against the fastest growing state clustered industries, as measured by Michael Porter's Institute for Strategy and Competitiveness at Harvard University. They found that Alabama and South Carolina had large-scale incentive deals in the automotive industry, and indeed their automotive industry cluster did grow significantly over the 1998–2007 period. Otherwise, there was little evidence of specific cluster development related to these large-scale deals.

The researchers found that the automotive industry generated the most weekly deals over the 1999–2009 period, accounting for 38 deals (30 assembly, 5 parts, and 3 tires) or a fifth of the 184 deals of the week studied. The other industries receiving large-scale incentive packages covered a broad range including semiconductors, retailers, aircraft manufacturers, and computer manufacturers.

It is very appealing to attract major investments by world-class firms to a jurisdiction. And it is true that nearly all states and provinces are in the hunt for these incentive opportunities. Yet the evidence that these are wise investments is very limited. If our governments across Canada want to reduce spending to get deficits under control, this would be a good area to investigate.

Investments are the lifeblood of innovation and prosperity. No doubt, governments face some tough decisions as they tackle our deficits. But governments, businesses, and individuals need to step up investments in people, technology, and research to realize our innovation and prosperity potential.

Motivations: Ensure tax changes remain in place and make Canada a tax innovator

Tax reform in Canada will provide a boost to business investment, which in turn will improve our innovation and prosperity

Thanks to sales tax harmonization

in Ontario and British Columbia and reductions in provincial and federal corporate income tax rates, Canada is currently on a path to have lower than average tax rates on new business investment.

Canada's tax changes benefit the average citizen

We need more investment by our businesses to improve prosperity for the average Canadian. As we have seen, our businesses do not invest as much as their US counterparts in machinery and equipment, particularly in high technology equipment and software.

In 2010, Canadian businesses invested \$3,800 less per worker – or 36 percent less – than their competitors in the United States. This matters, because our workers and businesses could create more value if they were supported by the most advanced software and equipment. Our wages are directly related to the amount of value our workers create – through more innovative products or services, or greater efficiency. To gain higher wages and more secure jobs, we need more investment by our businesses.

Do taxes discourage investment? In past reports, we have cited research by tax experts and other economists to show that new business investments increase when taxes on them fall.⁶⁷

One study by Finance Canada economists indicated that for every 10 percent reduction in taxes on business investment, the expenditure

on machinery and equipment increased by 10 percent.⁶⁸ Our work and that of others reached the same general conclusion – lowering the cost of business investment means more investment. And this means more innovation and more high paying jobs. Other research by Finance Canada showed that a reduction in business taxes does more for the average family than an equal reduction in the sales tax.⁶⁹ This paradoxical result comes about because more business investment drives higher wages and more job creation.

Two studies were released recently on each side of the debate on the efficacy of corporate tax reductions. CAW economist Jim Stanford tracked non-residential capital spending and corporate tax rates in Canada going back to 1961.⁷⁰ His analysis showed that tax rates have had no direct, statistically significant impact on investment; business investment depends much more on GDP performance, interest rates, exchange rates, and oil prices than the additional cash flow generated by tax reductions. He concluded that business tax cuts are “economically ineffective and distributionally regressive.”

Economists Bev Dahlby and Ergete Ferede assessed the net impact on society's welfare from raising government revenue through corporate taxes, personal income taxes, and provincial sales taxes.⁷¹ They calculated the “marginal cost of funds” for each of the three tax types to measure the net cost of raising additional tax revenue. A tax increase raises government revenue,

⁶⁷ Task Force on Competitiveness, Productivity and Economic Progress, Seventh Annual Report, *Leaning into the wind*, November 2008, pp. 39-41.

⁶⁸ *Ibid.*

⁶⁹ *Ibid.*

⁷⁰ Jim Stanford, “Having Their Cake and Eating It Too,” Canadian Centre for Policy Alternatives, April 2011.

⁷¹ Bev Dahlby and Ergete Ferede, “What Does it Cost Society to raise a Dollar of Tax Revenue,” *Commentary*, No. 324, C.D. Howe Institute, March 2011.

but reduces economic activity and the associated tax base. By capturing the net effects on government revenue, Dahlby and Ferede concluded that every new dollar of federal corporate income tax had a cost of \$1.71. For personal income taxes, the cost was \$1.17. And for sales tax, the cost was \$1.11. The results were directionally similar across the provinces. They concluded that significant welfare gains accrue from reducing corporate income tax rates – with a revenue neutral increase in provincial sales tax rates.

We will follow the debate as it proceeds, but it is fair to say that among tax economists, the consensus is that lowering the marginal effective tax rate on business investment will increase the economic situation of the average Canadian.

Unfortunately, Canada has traditionally been a high-cost jurisdiction when it comes to taxing new business investment. When we added up all the taxes businesses bear when they invest in new equipment and technology, we found that this rate in Canada has been

one of the highest among the world's advanced economies. But thanks to bold provincial and federal tax policies, Canada will move to have lower than OECD average tax rates by 2013 in two ways (*Exhibit 22*).

First, we have had relatively high tax rates on corporate profits. Businesses make investments to earn profits, so when we tax profits, we in effect tax investments. The federal government has been on track to reducing its corporate income tax rate over the past three years. As well, Canada's capital tax was eliminated in 2006. These changes should encourage businesses to invest.

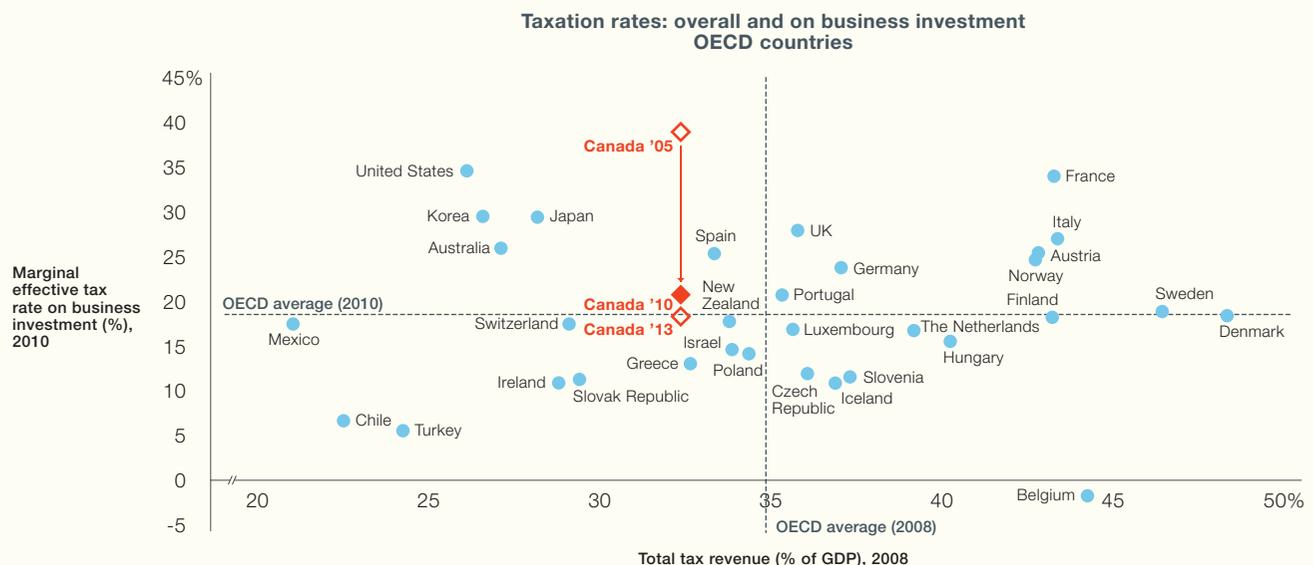
Second, until Ontario and British Columbia changed their sales taxes, they were charged on business investments. Retail sales taxes applied not just to people buying clothing or appliances; they also applied to businesses when they invested. To be sure, there were many exemptions, as their governments had recognized the problem with charging sales taxes on business investments. But still, more than a third of their "retail" sales

tax was paid by businesses making investments or purchasing goods for their operations. By changing their retail sales taxes to value added taxes, they have largely eliminated those taxes on business investments and other inputs. When the three Atlantic provinces made this conversion, they saw their business investment in machinery and equipment jump 17 percent.⁷²

Sales tax harmonization is not a tax grab

The introduction of the harmonized sales tax in Ontario and British Columbia does not mean that consumers pay more taxes in total. Reductions in individual income tax rates accompanied the introduction of the harmonized sales tax in Ontario. There is no tax change at retail for goods that already bore the retail sales tax. In fact, retail prices will actually decline, as the producers of those goods see their costs go down when they stop paying sales taxes on their purchases – and competition forces them to pass on these savings through lower prices. This was the experience in the Atlantic provinces.

Exhibit 22 Tax changes in Canada have significantly reduced marginal effective tax rates on business investment



Note: Estonia excluded due to data availability. Source: Institute for Competitiveness & Prosperity analysis based on data from OECD, *OECD Revenue Statistics 1965-2009 2010 edition*; Duanjie Chen and Jack Mintz, "Canada's 2010 Tax Competitiveness Ranking" *SPP Research Papers* Vol 4 Issue 2, February 2011.

⁷² Michael Smart and Richard Bird, "The Impact on Investment of Replacing a Retail Sales Tax with a Value-Added Tax: Evidence from Canadian Experience," *National Tax Journal*, Vol. LXII, No. 4, December 2009.

To be sure, prices will increase on services that are now being taxed provincially for the first time. But, according to TD Economics, the likely net effect is that the overall average prices for goods and services will increase only slightly.⁷³ Indeed, a recent study by tax expert, Michael Smart, revealed that, in Ontario, prices initially rose only 0.9 percent following the reform. By December 2010, the effect of tax harmonization had fallen to a 0.6 percent increase, as businesses passed on their tax savings to consumers in the form of lower prices.⁷⁴ A study of the effect of tax harmonization in British Columbia found a similar result: prices had only risen 0.6 percent as a result of the reform.⁷⁵

It is fair to say that converting retail sales taxes on goods to value added taxes on goods and services affects those with lower incomes more than others. But Ontario's and British Columbia's governments exempted items like books and children's clothing from the new tax. And they introduced tax credits for those with lower income to help alleviate the tax burden on services. For many families, these measures compensate for the higher sales tax.

Taken together, these tax improvements move Canada from being well above the OECD average in tax rates for new business investment to being better than average.

Research recently completed by international tax expert Jack Mintz concluded that the adoption of a harmonized sales tax and the reduction of corporate income tax rates will benefit Ontario and British Columbia significantly. Mintz estimated that, in Ontario, the tax measures in the 2009 Ontario budget, together with other recent tax changes will stimulate increased capital investment by \$47 billion by 2020. This business expansion will help create an estimated

591,000 new jobs, 103,000 of which will be in manufacturing. The new investment and the new jobs will lead to a combined increase in labour and investment income of \$29 billion or 8.8 percent of 2008 labour income.⁷⁶ In British Columbia, Mintz estimated that, by 2020, corporate tax cuts and sales tax harmonization and other recent tax changes will increase the province's capital stock by more than \$14 billion, translating into an increase of 141,000 jobs.⁷⁷

The harmonization of British Columbia's provincial sales tax with the federal GST may be reversed in the province's upcoming referendum. This would be truly unfortunate for workers and businesses in the province and for all Canadians.

Consider a carbon tax

Taxing carbon emissions, while politically unpopular, should still be part of our approach to reducing carbon emissions and stimulating green jobs. Many governments here in Canada and around the world are putting in place energy pricing regimes that encourage the rapid deployment of renewable energy generation.

A typical element of this approach is a guaranteed feed-in-tariff (FIT) – a commitment by the public energy authority to pay much higher than prevailing market rates for energy created by favoured sources. FITs are necessary because the economics of sources like solar and wind have not yet delivered energy at a competitive cost. FIT proponents argue that these temporary subsidies are necessary to bring generating capacity on line and to stimulate the process of reducing costs as experience is gained. But there are few examples of such subsidies working to get costs down and of the subsidy being eliminated. In addition, many FIT schedules advantage specific

technologies like wind and solar. But it is not clear that these technologies will turn out to be the best solutions for addressing carbon emissions cost effectively. In the end, ratepayers may be paying a higher cost for electricity without a commensurate benefit in emissions reductions.⁷⁸

FITs price one input – electricity from renewable sources. But they do not deliver the outcome we desire: reductions in GHG emissions. To reduce GHG emissions and promote innovation across Canada, we continue to recommend that the federal and provincial governments consider a carbon tax instead.⁷⁹ A carbon tax would, like a FIT, impose costs on households and businesses, but since it remains agnostic between technologies and prices GHG emissions directly, it is likely to achieve greater emissions reductions at lower cost. The revenues generated from a carbon tax could be used to lower personal or corporate income taxes. As both an environmental and an economic policy, a carbon tax is the better option.

An alternative market-based approach would be a cap-and-trade system. This has the advantage of setting a desired level of carbon emissions – the cap – and then allowing firms to trade permits to produce carbon emissions.

In a carbon tax environment, there is no guarantee that the chosen tax rate will reduce emissions to the desired level. However, over time, the tax rate can be moved to respond to emission results. On balance, we prefer the carbon tax, because it has the advantage of being much simpler to implement versus cap-and-trade.

⁷³ TD Economics, "The Impact of a Sales Tax Harmonization in Canada and B.C. on Canadian Inflation," September 18, 2009.

⁷⁴ Michael Smart, "The Impact of Sales Tax Reform on Ontario Consumers: A First Look at the Evidence," *SPP Research Papers*, School of Public Policy, University of Calgary, March 2011.

⁷⁵ Jonathan Kesselman, "Consumer Impacts of BC's Harmonized Sales Tax," School of Public Policy, Simon Fraser University, February 2011.

⁷⁶ Jack Mintz, "Canada's Bold Move to Create Jobs and Growth," *SPP Communiqué*, School of Public Policy, University of Calgary, November 2009.

⁷⁷ Jack Mintz, "British Columbia's Harmonized Sales Tax: A Giant Leap in the Province's Competitiveness," *SPP Briefing Papers*, School of Public Policy, University of Calgary, March 2010.

⁷⁸ Jan Carr, "A rational framework for electricity policy," *Journal of Policy Engagement*, Vol. 2, No. 2, April 2010.

⁷⁹ Task Force on Competitiveness, Productivity, and Economic Progress, *Leaning into the wind*, pp. 42-43.

Consider other innovations

We are very supportive of the current improvements in tax policy across Canada. But these changes simply adopt best practices from around the world. We have not had an innovative tax policy since indexing personal income tax brackets in 1974. The incoming federal government and new governments coming in to power this year in the provinces should consider real innovation in our tax system.

Implement cash flow accounting for investments

In its March 2011 budget, the federal government proposed a two-year extension of the temporary accelerated capital allowance rate for machinery and equipment investments made in the manufacturing and processing sector. In its recent election platform, the NDP proposed a four-year extension.

Accelerating the capital cost allowance rate means that businesses can write off the cost of new investments against income more quickly, thereby reducing current income taxes. Traditionally, when businesses invest in assets that are in place for longer than a year, they can deduct the costs of this investment over the life of the asset – thereby matching costs and benefits. Typical annual capital cost allowance rates, depending on the assets, range between 4 and 100 percent. The accelerated rate is 50 percent, meaning that businesses see tax reductions early in the life of these assets, but these reductions are recaptured in later years when business have no deductions left. In effect, through the time value of money, businesses face lower investment costs with accelerated capital cost allowance. The expectation is that businesses will make more investments, thereby creating jobs and improving our productivity. Governments often turn to this measure when they are trying to stimulate growth.

Why not make accelerated capital cost allowance permanent? And why not go to a one-year write-off? In essence, businesses would operate on a cash flow basis for tax purposes. In the year when they make a major investment, their tax liability is reduced. Our tax research from 2005 indicates that this approach would have a very modest cost to government and admittedly a modest increase in capital investment and GDP – but the net effect is beneficial, including the benefits of a much simpler corporate tax regime.⁸⁰

Eliminate corporate income taxes

A more dramatic and effective approach would be to eliminate corporate taxes altogether. Corporations are accounting and legal entities – they are not people. And people pay taxes, not corporations. Much academic research indicates that the incidence of corporate tax is felt by workers whose wages are lower.⁸¹

Some might argue that eliminating corporate taxes would be a boon to the wealthy. But if the goal is to have a progressive tax system, then the most effective way to realize progressivity is through the marginal rate structure in the personal income tax. To the extent that corporate tax elimination increases dividend payments – and this advantages higher income earners more than pension funds – then the personal rate structure could be modified.

This is a simple idea but with many “knock-on” effects. We urge the incoming federal government to explore the idea in more detail because of the potential benefit it has for our innovation, productivity, and prosperity.

Fix high marginal effective tax rates (METRs) for low income workers

Lower income Canadians continue to face high marginal tax rates as they attempt to improve their economic circumstances. Because many social benefits are means tested, benefits are

“clawed back” as incomes increase. As an example, for every new dollar earned by a single earner on welfare, 50 cents of the welfare benefit will be reduced. This clawback feature is present in all social benefits. Adding in the progressivity of income tax, our tax and welfare system can result in exceedingly high marginal effective tax rates. A single earner in Ontario in 2009 with annual earnings around \$15,000 lost 54 cents of every dollar of increased earnings through benefit clawbacks and tax increases.

This is a difficult problem to fix, as it is the result of two fundamentals in our tax and social benefit policies: benefits should accrue to those with lower, not higher, incomes; and our income tax system should be progressive. Each program needs to be assessed with respect to its impact on marginal effective tax rates of low income earners on top of all other programs.

Our analysis of the Working Income Tax Benefit (WITB) pointed to some improvements in design that could alleviate high METRs for low-income workers.⁸² This benefit is an income supplement for low-income earners and is designed to supplement low earnings for people trying to move out of welfare through employment. While benefits are fairly small currently, with more funding, the WITB represents a significant opportunity to help low-income earners break out of poverty. But it needs to be redesigned to encourage full-time work, rather than part-time employment. It currently reaches its maximum benefit around 14 hours of work weekly for a single earner. It should be changed to reach its maximum around 32 hours – closer to full-time employment.

⁸⁰ Institute for Competitiveness & Prosperity, Working Paper 7, *Taxing smarter for prosperity*, March 2005.

⁸¹ Task Force on Competitiveness, Productivity, and Economic Progress, *Leaning into the wind*, p. 39.

⁸² Institute for Competitiveness & Prosperity, *Time for a 'Made in Ontario' Working Income Tax Benefit*, September 2009.

Tax consumption, not income or investment

The Institute, among others, has recommended more focus on taxing consumption, not savings and investment. To date, much of the policy emphasis has been on persuading some provincial governments to change their retail sales tax to a value added tax to shift tax burdens from investment to consumption.

On an ongoing basis, governments should assess increases in the federal and provincial goods and services taxes and reductions in taxes on income and investment. Governments should also consider shifting the personal income tax to a personal consumption tax. As suggested by US economist Robert Frank, "Under such a tax, people would report not only their income but their annual savings...a family's annual consumption is simply the difference between its income and its annual savings...that amount, minus a standard deduction...would be the family's taxable consumption."⁸³ Tax rates would maintain their progressivity so that those who consume more (in most cases, equivalent to those with higher income) would pay higher tax rates. But the tax system would motivate investment over consumption more fully.

The past few years have seen an improvement in our federal and provincial tax policies. Lowering taxes on business investment is not just favourable for businesses; it is favourable for people. The governments of Ontario and British Columbia government took important initiatives when the easier political strategy would have been to wait until economic conditions were better. Many argue that governments cannot "take bold action" and "do the right thing," because it is not politically feasible. The results of the current referendum campaign in British Columbia may prove that to be correct. But both governments should be congratulated for believing that it is possible to do both. All governments should consider the next set of improvements and innovations in tax policy.

⁸³ Robert Frank, "Why Not Shift the Burden to Big Spenders?" *New York Times*, October 7, 2007.

Structures: Drive innovation through smarter public policies and more international trade

Government policies and market structures are important determinants of innovation in our economy. There are opportunities for public policies to bolster competitive pressure and specialized support for innovation

The Institute has developed a framework that shows how specialized support and competitive pressure drive productivity and innovation (*Exhibit 23*).

- *Support* refers to the conditions that provide a foundation of assistance to all firms and individuals as they develop and compete. Typical support elements include the availability of capital to entrepreneurs, well-educated and skilled workers, specialized suppliers of goods and services, easy access to markets, and excellent infrastructure.
- *Pressure* comes from aggressive and capable competitors, who threaten complacency, and from sophisticated customers, who demand innovative goods and services at low prices.

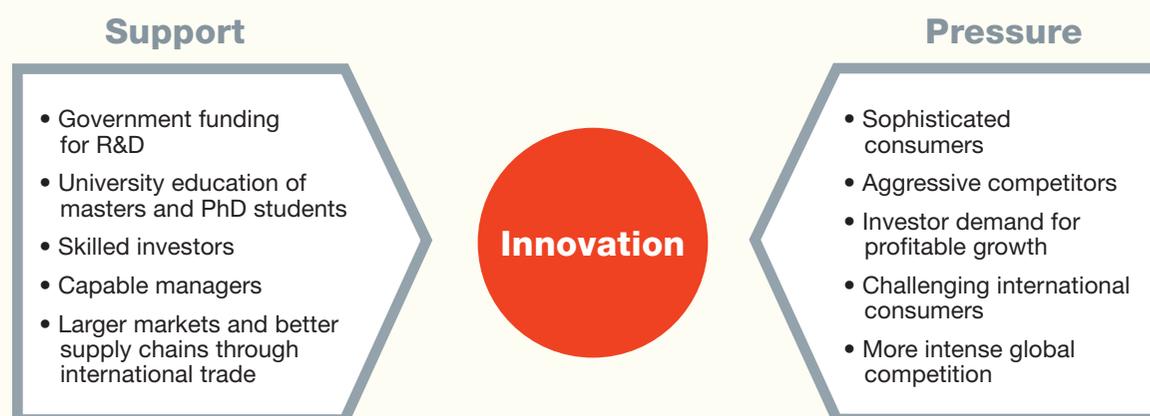
These two drivers of higher productivity and continuous innovation in an economy need to work in balance – both have to be present. Each element of the economy needs to have not only support to make its task easier, but also pressure

to provide incentives to move ahead. All support and no pressure creates a cushy and lazy environment inimical to productivity and innovation. All pressure and no support creates a harsh and barren environment, equally detrimental to productivity and innovation.

Higher productivity and more innovation result in product and process upgrades across the entire economy. But if one element of the economy lacks the necessary support or pressure, then the whole system will not perform to its potential.

Having an imposing strength in one element will not make up for weakness in another. But in combination they drive productivity and innovation which form the wellspring of broad based prosperity and key paths toward national well being. So it is important to understand how our innovation policies affect the support and pressure faced by firms in Canada.

Exhibit 23 Support and pressure drive innovation



Source: Institute for Competitiveness & Prosperity.

Public policies should be geared more toward innovation

Current public policy is directed toward invention, not innovation. Inventions are driven by the researcher's desire to discover something new and unique – whether or not they add value to people's lives or their prosperity. Though invention is important for human progress, it should not be confused with innovation, which improves products or processes to enhance economic value.⁸⁴

Our public innovation policy emphasizes the hard sciences and does not adequately recognize the importance of business and management processes for innovation. Our competitiveness and prosperity are built on a solid base of excellence in the sciences. And leading high technology firms are founded by science and engineering graduates. But successful innovation requires a balance of science and other skills, such as problem solving and communication skills. These other skills are important to achieve a successful transition from startup to thriving business.

At federal granting councils related to innovation, we see an ongoing orientation toward funding invention and the hard sciences. Research grants for business school academics represent an insignificant portion of funding overall and within the Social Sciences and Humanities Research Council (SSHRC).

The federal government funds, administers, and supports a host of foundations, organizations, partnerships, and scholarships designed to fuel innovation and broaden Canada's R&D base. Much of the federal government's research support is organized across three funding agencies:

- The Natural Sciences and Engineering Research Council (NSERC) supports basic research and advanced training,

with \$1.05 billion budgeted in 2010–11 to support 12,000 professors, 28,000 students and postdoctoral fellows, and 1,500 Canadian companies. It aims for three strategic outcomes: highly skilled science and engineering professionals, high quality Canadian-based competitive discovery research in the natural sciences and engineering, and productive use of new knowledge in the natural sciences and engineering. Of its \$1.05 billion budget, \$282 million is spent on “innovation” – primarily connecting university researchers and businesses.⁸⁵

- The Canadian Institutes of Health Research (CIHR) is a specialized program with a 2010–11 budget of \$981 million supporting up to 10,000 researchers in 13 specialized life science institutes across Canada.⁸⁶
- The Social Sciences and Humanities Research Council (SSHRC), which supports research outside the technical and scientific fields, is the smallest of the three, with a 2010–11 budget of \$679 million.⁸⁷ SSHRC's level of funding has increased less than NSERC's and CIHR's in the last five-year period, 2006–10.

An important role of the three agencies is to allocate funds in the Canada Research Chairs (CRC) program. This program invests about \$300 million annually, and by March 2010 it had established 1,834 research professorships – in part to keep the most capable and qualified Canadian researchers teaching in Canada. Fully 78 percent of these chairs are in natural sciences, engineering, and health research, with the remainder in social sciences and humanities.⁸⁸

Another key player in Canada's research support is the *National Research Council* (NRC) – Canada's oldest federal research institution. With an annual

budget in 2010–11 of \$749 million, it supports more than 20 research institutes and national programs. Its key disciplines are physical sciences, engineering, and life sciences; the NRC also provides technology support to industry.⁸⁹ Much of the funding is aimed at hard sciences and technology.

In addition, the *Canada Foundation for Innovation* (CFI) was founded in 1997 with an endowment of \$3.7 billion. It supports 40 percent of the infrastructure costs associated with a research project, with partners from outside government covering the remainder. CFI focuses on hard sciences; since 1998, only 8.8 percent of projects, accounting for 4.1 percent of funding, have been in the social sciences and humanities.⁹⁰

A key factor in the shortage of managerial talent for leading innovation and commercialization in Canada's firms is the lack of investment in business education in Canada. It is a large and important sector accounting for 23 percent of graduate degrees and 17 percent of undergraduate degrees. However, its federal funding is miniscule. Within SSHRC, only 6.9 percent of its grants and fellowships were in the business discipline in 2010–11, although this has increased from 4.8 percent five years ago.⁹¹ This represents less than 2 percent of total research funding from the three federal granting agencies. Scholarships bypass students in graduate business education programs almost entirely, because the professions are not included within the mandate of the granting councils. The business discipline accounts for only 1.2 percent of spending on Canada Graduate Scholarships.

Given the low rate of business research funding by SSHRC, only 21 of the 1,834 already-named Canada Research Chairs are in management studies.⁹² If business education received a share of these chairs in proportion to undergraduate

⁸⁴ Task Force on Competitiveness, Productivity and Economic Progress, *Today's innovation, tomorrow's prosperity*, pp. 50–51.

⁸⁵ Treasury Board of Canada Secretariat, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/nse/nse01-eng.asp>

⁸⁶ *Idem.*, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/cri/cr01-eng.asp>

⁸⁷ *Idem.*, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/ssh/ssh01-eng.asp>

⁸⁸ Canada Research Chairs, details available online: <http://www.chairs-chaires.gc.ca/program-programme/allocation-attribution-eng.aspx>

⁸⁹ Treasury Board of Canada Secretariat, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/nrc/nrc01-eng.asp>

⁹⁰ Canada Foundation for Innovation, details available online: <http://www.innovation.ca/docs/projects/CFIawards230410.xls>

⁹¹ SSHRC funding allocations, available online: <http://www.outil.ost.uqam.ca/CRSH/RechProj.aspx?vLangue=Anglais>

⁹² Canada Research Chairs, details available online: <http://www.chairs-chaires.gc.ca/chairholders-titulaires/index-eng.aspx>

degrees awarded, instead of the 21 chairs, there would be 312; based on the share of graduate degrees, there would be 421.

Since 1998, CFI has funded only 31 projects in the business discipline ("management, business, and administrative studies") accounting for \$5.4 million or 0.12 percent of funding to date. If funding had been along the lines of graduates in the business discipline, it would have received between \$740 million and \$1 billion.

Government policy seems to be built on the assumption that business research and education are simply not relevant to innovation. In recent federal budgets, Ottawa highlighted its innovation initia-

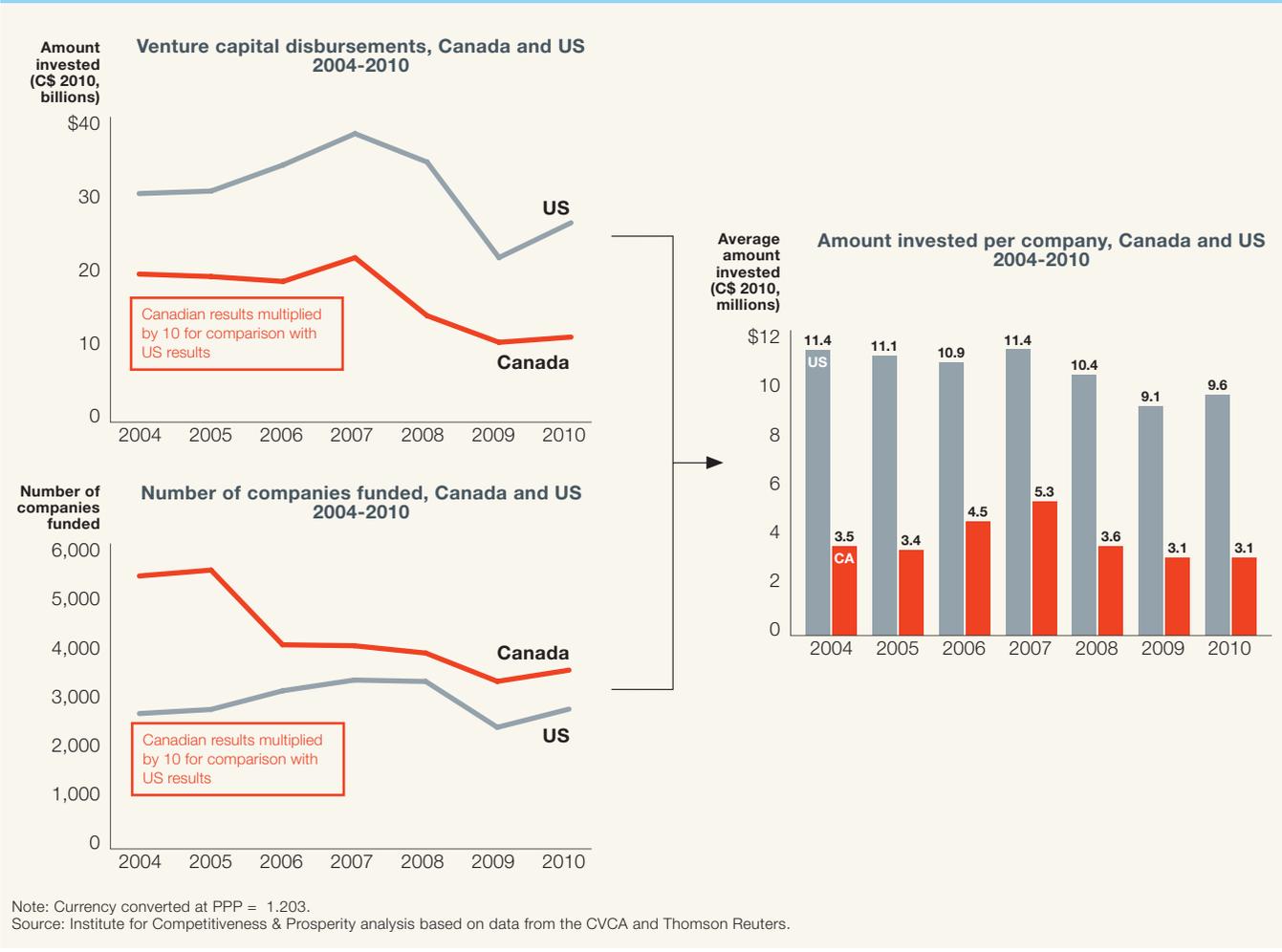
tives, but it continued its misdirected focus on invention through the hard sciences. The 2010 budget increased funding for the research granting councils by \$32 million. Of this increase, \$13 million was directed to NSERC and \$16 million to CIHR. Only \$3 million was directed to the social sciences and humanities through SSHRC. The 2011 budget continued this trend with much larger increases proposed for NSERC (a \$15 million increase) and CIHR (\$15 million) versus SSHRC (\$7 million).

In summary, federal policies and programs are narrowly aimed at supporting invention, and within that support they have a narrow focus on the hard sciences, such as engineering and the natural sciences.

Despite increases in venture capital, significant changes may be necessary in the business model

The Institute reported last year that venture capital disbursements weakened from 2007 to 2009 in Canada and the United States.⁹³ Recent results show disbursements increasing in 2010. Investments in the venture capital industry in 2010 were \$1.1 billion in Canada compared to \$26.2 billion in the United States, an increase from 2009 (Exhibit 24).

Exhibit 24 Venture capital deals are smaller in Canada than the United States



⁹³ Institute for Competitiveness & Prosperity, Report on Canada 2010, *Beyond the recovery*, p. 48.

The number of companies financed in both nations also increased from 2009 to 2010, to approximately 2,741 in the United States and 354 in Canada. On a per capita basis our venture capital industry invests fewer dollars but in more companies. Thus our investment per company is much lower. Investment per company in the US was \$9.6 million versus \$3.1 million in Canada. Despite a number of major Canadian venture capital deals done last year, amounts invested per firm did not move up appreciably and, as a result, the competitive gap in venture capital financing between Canada and the US continues to be wide.⁹⁴

The quality of venture capital is a problem in both Canada and the United States. Despite the sums of capital invested in the venture capital market, the industry has been a struggling sector in Canada. Investors have not reaped great benefits from their capital in new Canadian ventures – and we conclude that this is a much greater challenge to innovation in Canada than a shortage of capital. Compared to the

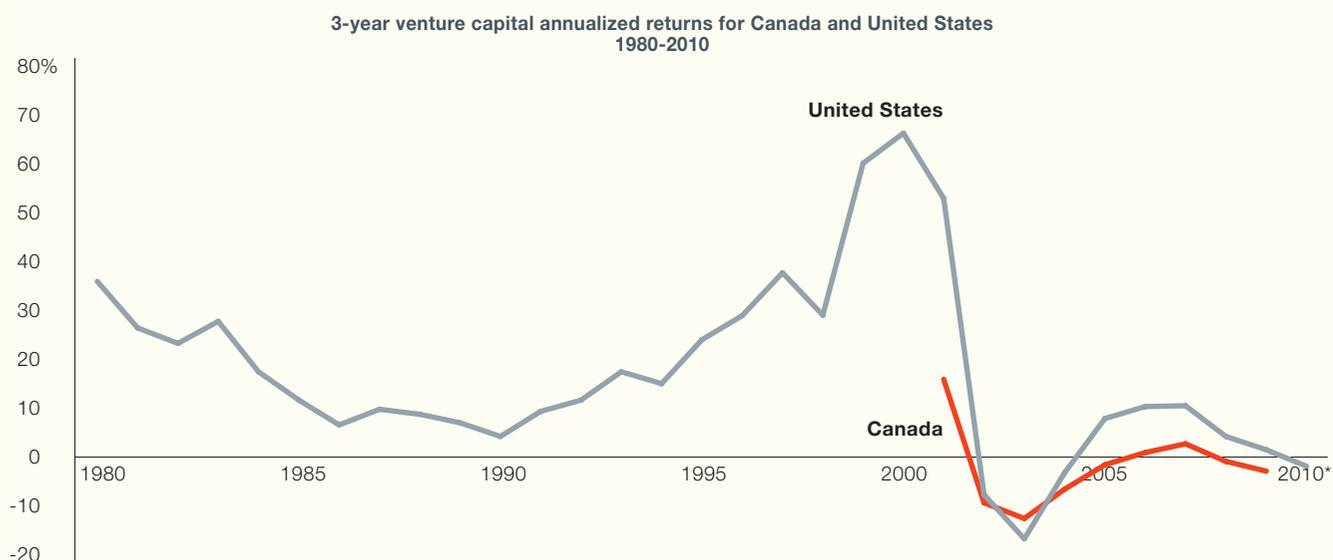
United States, Canada has consistently under performed on both the quality and quantity of venture capital over the years. Since 2004, returns to venture capital in Canada have hovered around zero, faring worse than those in the United States (*Exhibit 25*). Historically, returns in the United States have been very positive, but since 2001 they have dropped significantly. Still, they out perform results in Canada.

Measured as a percentage of GDP, Canada and Israel are two of the top countries to provide startup and early growth financing in venture capital.⁹⁵ But we have concluded that Canada's major approach to stimulating venture capital availability, the Labour Sponsored Investment Fund (LSIF), is a deeply flawed mechanism. LSIFs focus on stimulating investments in specific types of venture funds by unsophisticated investors and attaching time and location constraints on the investments they make.

Recent research by University of British Columbia economists James Brander, Edward Egan, and Thomas Hellman has concluded that government sponsored venture capital (GVC) significantly under performed private venture capital (PVC) over the 1996–2004 period.⁹⁶ GVCs, comprising investments by entities like the Business Development Corporation (BDC) and LSIFs, account for more than half of all venture capital under management in Canada. The researchers found that these had lower rates of return than PVCs. PVCs were more likely to generate good returns for investors through successful Initial Public Offerings on senior stock exchanges, such as the TSX or NYSE, or third-party acquisitions. GVCs generated lower exit values through junior exchanges and were less likely to be acquired.

Brander and his colleagues anticipated the response that GVCs are in place to help overcome the market's inability to raise adequate venture capital to stimulate innovation and competitiveness and should be judged

Exhibit 25 Venture capital returns have been abysmal recently in both Canada and the United States



* US results through September 30. 2010 results not available for Canada.

Note: Canadian venture capital performance data are only available from 2001 onward.

Source: Institute for Competitiveness & Prosperity analysis based on data from Canada's Venture Capital & Private Equity Association (CVCA); National Venture Capital Association (NVCA), Thomson Reuters, and Cambridge Associates LLC.

⁹⁴ "Canada's Venture Capital Market in 2010," prepared by Thomson Reuters for the Canadian Venture Capital & Private Equity Association.

⁹⁵ *Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a More Responsible and Inclusive Globalisation*, Executive Summary of The Background Reports, OECD, Paris, 2004.

⁹⁶ James A. Brander, Edward J. Egan, and Thomas F. Hellmann, "Government Sponsored versus Private Venture Capital: Canadian Evidence," *NBER Working Papers 14029*, National Bureau of Economic Research, Inc., 2008.

on those criteria, not returns. Their research indicates that PVCs were more involved in high-technology industries and were more likely to generate patents and attract foreign investment.

Survival rates for GVCs were lower than those for PVCs, suggesting that the investments were in lower quality enterprises. Less capable management expertise also contributed to the lower survival rate in GVCs. Individual fund managers were less experienced and less well paid; managers moved from the GVC to the PVC sector and rarely the other way.⁹⁷

Brad Cherniak who has been a principal, adviser, and investor in private companies argues that the government should not be involved in the venture capital market at all. "Government flowing capital directly into the VC space will continue to depress returns and delay the recalibration of the market. Cyclical capital downturns are painful, but regardless of the short-term pain, small and medium businesses and the overall economy can only benefit from the VC sector in the long-term if it is fundamentally sound and free."⁹⁸

The venture capital model in Canada and the United States appears to be broken. Alternative measures for funding new ventures must be researched and discussed. The Institute has examined lean startups and microfunding – new, innovative approaches to the venture capital industry. (See *Are there alternatives to the traditional venture capital model?*)

Management matters

Strong management is a critical element for increased innovation in our economy, and hence its productivity and prosperity. Strong management drives the demand for innovation through well

developed and ably executed business strategies; it affects the ongoing supply of high quality innovation by setting research priorities and orchestrating technical resources; and it is key to the financing of innovation by assembling resources and allocating them wisely to promising investments.

Research shows that the development of new management techniques, such as just-in-time logistics and lean operations, can lead to economy-wide growth in productivity and prosperity. Research conducted by the Institute reveals that our manufacturing management is among the best in the world, though it trails that in the United States.⁹⁹ And in our latest research on the retail sector, we found that store-level management in Canada is as strong as that in the United States.¹⁰⁰

The research also found a strong connection between the quality of a retailer's management and whether it competes only in the domestic market. Large-scale multinational retailers are better managed than those that focus only on their home market. This holds true in Canada and other countries. Our findings showed that firms that expand globally to become global leaders have dramatically better management, though we acknowledge that determining a cause-and-effect relationship is harder (See *Our global leaders have relied on innovation and benefited from competition*).¹⁰¹ More than likely, there is a virtuous circle at work – firms with global aspirations need effective management to expand, and expanding firms attract better managers.

Therefore, we continue to call on public policy to ensure that developing strong management is an important element of research and innovation strategies. Both the federal and provincial governments need to strengthen their commitment

to management education. We have a significant gap compared with our US counterparts in business degree holders – and this gap is the result of fewer spaces in our schools, not the lack of demand by students.

More alarming is the lower educational attainment of those in management occupations, irrespective of field of study. Just over a third of our managers have a university degree, compared to half in the United States. If we believe that education is important to the development of human capital and prosperity, this situation seems competitively dangerous.

Trade stimulates innovation and prosperity

Through its impact on the structures of support and pressure, international trade is an important stimulant to innovation and Canada's prosperity. Last fall, the Institute released new research on the impact of international trade on our innovation capabilities.¹⁰²

International trade has been an important contributor to prosperity here in Canada and around the world. It is a key factor in the rise of developing economies like China and India. But Canada, with its small market size, has probably benefited more from international trade than larger economies that are closer to self sustainability. For now and for our future prosperity, trade will continue to be an imperative.

Trade opens markets to goods producers and service providers beyond the local economy. Among economists, there is widespread agreement that this increase in volume potential enables specialization, which in turn reduces costs, increases variety, and fosters innovation.¹⁰³ When trade is carried out across several economies, the

⁹⁷ *Ibid.*

⁹⁸ Brad Cherniak, "The problem with other people's money," *Financial Post*, April 11, 2011.

⁹⁹ Institute for Competitiveness & Prosperity, *Management matters*.

¹⁰⁰ *Idem.* Working Paper 13, *Management matters in retail*, April 2010.

¹⁰¹ Task Force on Competitiveness, Productivity and Economic Progress, *Today's innovation, tomorrow's prosperity*, pp. 61-64.

¹⁰² Institute for Competitiveness & Prosperity, *Trade, innovation, and prosperity*.

¹⁰³ See for example Robert Whaples, "Do Economists Agree on Anything? Yes!" *The Economists' Voice*, Vol. 3: Iss. 9, Article 1, 2006, who found that 87.5 percent of members of the American Economic Association (AEA) agreed that "the US should eliminate remaining tariffs and other barriers in trade," available online: <http://www.bepress.com/ev/vol3/iss9/art1>; or Dan Fuller and Doris Geide-Stevenson, "Consensus on Economic Issues: A survey of Republicans, Democrats and Economists," *Eastern Economic Journal*, Vol. 33, No. 1, Winter 2007, who found that, in 2000, 72 percent of AEA members agreed that "tariffs and import quotas usually reduce the general welfare of society"; 21 percent agreed, but with some proviso; and only 6 percent disagreed.

Are there alternatives to the traditional venture capital model?

The amount of available funds in the venture capital industry has shrunk considerably.

But this is not unique to Canada. Available venture capital funds are now also at a much lower level in the United States – declining by more than a third from 2007 to 2010.

At a time when available venture capital is much less plentiful, traditional approaches aimed at creating large pools of funds with significant investments per company may not be appropriate. Moreover, Canada's venture capital industry invests far fewer dollars per company than their peers in the United States (see Exhibit 24). There may be an opportunity to turn our sub-scale investments into an advantage. Observers of the industry have noted that venture capital has become too capital intensive and has lost its traditional position as a “no-frills” funder of startups.

Entrepreneur and consultant to the venture capital industry Eric Ries coined the phrase *lean startup* and, along with Stanford professor Steve Blank, developed a new approach to venture capital. Based on ideas of design thinking – iteration, fact-based decision making, and experimentation – lean startup organizations are temporary in nature, designed to discover and implement a profitable business model that can start small and be scaled up quickly for commercial success.^a

At its core, the lean startup minimizes the amount of cash required in the early stages of a company. Lean startup managers are challenged to earn revenue from day one and make investments only as revenue is generated. This requires real customers from the outset, as well as continuous interaction with them to guide iterative product development. According to Blank and Ries, the lean startup has a low burn rate of its cash by design, not by crisis.

Lean startups place a premium on management agility to test hypotheses and answer unknowns. As Ries observes, “The agile practices have to be adapted, shifting the focus somewhat from generating stuff to learning about what customers will want. Most technology startups fail not because the technology doesn't work, but because they are making something that there is not a real market for.”^b

Product development is carried out in a continuous cycle measured in hours, not years, and is necessarily

coupled with customer contact. Costs are minimized through the relentless search for supporting open-source programming tools and easily distributed web-based software.

Examples of successful lean startups cited by its proponents include:

- » IMVU, an online chatting service with fully customizable avatars and 3D chat rooms. IMVU used early customer contacts to eliminate confusing add-ons like instant messaging and to identify visitor retention problems. In three years, it achieved \$10 million in revenue, and in six years it reached one million active users
- » Foursquare Labs, an application that lets people share their whereabouts via mobile phones, built a business of more than one million users from a small startup investment
- » Grockit, an online educational network to help students of all ages improve academic results, started with first-round funding of \$2.5 million and has since raised \$15 million
- » KISSmetrics, a provider of analytical tools to help marketers track the customer conversion process, began with only \$1 million of seed funding followed by \$3 million a year later
- » Dropbox, a file sharing and synchronization service, which started in 2007 with \$1.2 million in seed funding, gathered another \$6 million a year later, and reached the 4 million customer milestone in 2010.

Traditional large venture funds aim for larger investments and do not focus on bootstrap operations. In the current market of shrinking VC returns, these traditional approaches are problematic.

Lean startups are a promising antidote to the current ills of Canadian and US venture capital business models. Given the challenges of achieving large investments in startup companies, it would be wise for Canadian industries and governments to understand this concept more deeply. Our business schools and incubating

^a Steve Blank and Eric Ries, “The Lean Startup – Low Burn by Design not Crisis,” available online: <http://www.slideshare.net/venturehacks/the-lean-startup-2>

^b Steve Lohr, “The Rise of the Fleet-Footed Startup,” *The New York Times*, April 24, 2010, available online: <http://www.nytimes.com/2010/04/25/business/25unboxed.html>

organizations like MaRS in Toronto may be able to establish formal courses in lean startup ventures, similar to the popular “Evaluating Entrepreneurial Opportunities,” a practical course offered at Stanford’s Graduate School of Business. Opportunities may exist for small investments by the provincial and federal government to help the lean startup approach gain traction here in Canada.

The concept of *microfunding* has also gained popularity in recent years in the venture capital industry. While many associate the concept with microlending in developing economies, the idea has spawned interest in the venture capital field. Microfunding matches potential investors or venture capitalists with startup or small businesses through platforms such as the Internet. It is different from traditional venture capital funding because it is a peer-to-peer lending system where the startup’s business plan is guaranteed to be viewed by at least one or more potential investors. A firm pioneering microfunding is MicroVentures in Austin, Texas, which focuses on businesses searching for funding around the \$50,000 to \$250,000 range and hopes to expand its base to firms seeking up to one million dollars. The benefit of microfunding is the guarantee that the startup company’s proposal will be analyzed by a number of potential angel investors, who can invest part of the required funding and wait for other interested investors to join in.

MicroVentures provides a platform for potential investors and entrepreneurs to meet virtually and discuss concerns and tactics to take the business forward before the deal is finalized. In its funding model, startups submit their business plan with a \$99 application fee. Once approved by the MicroVentures’ team of experts, the applicant pays another \$250 for due diligence costs before the plan is released to the investors who can enroll for free and can contribute between \$250 and \$5,000 (a “soft cap”). Once 100 percent of the required capital is confirmed, the startup can be funded; otherwise, the money is returned to the investors.^c MicroVentures makes it simple for entrepreneurs and investors to have an open dialogue about investments. We are unaware of other competing platforms here in North America. The establishment of MicroVentures required a lengthy back-and-forth process with the US Securities and Exchange Commission.^d

In the United Kingdom, a variation on this business model has emerged. The microFunding® Exchange is a web based trading platform to connect inventors, managers, and investors.^e Inventors post their inventions confidentially and securely on the exchange site; managers select inventions; and investors select managers and projects.

Managers identify inventions of interest, define a not-for-profit ‘proof of concept’ project to test, and confirm that all the factors needed to realize commercial potential are there – for example, protectable intellectual property, market, price points, manufacturing feasibility, and so forth. The cost for the proof of concept is paid by investors who buy units valued at £2,500 each. Once sufficient capital is raised, the proof of concept proceeds.

Investors, again securely and confidentially, have access to these pre-investment opportunities, both those selected by the managers and those they might wish to draw to potential managers’ attention. Unlike the MicroVentures model described above, investors need to work through an “authorised intermediary” to provide funding to the projects they choose. The exchange has a detailed process for determining ownership shares in the new venture.

Smaller investments through lean startups and microfunding may be alternative models for the problematic venture capital model here in Canada – and possibly the United States. This is an opportunity for our entrepreneurs to explore with or without government assistance.

^c MicroVentures, available online: <http://www.microventures.com>

^d Jason Ankeny, “Venture Funding, One Dollar at a Time: MicroVentures connects startups with angel investors,” *Entrepreneur Magazine*, July 2010.

^e microFunding® Exchange, available online: <http://www.microfunding.co.uk/>

result is a much greater availability of goods and services to consumers. In sum, businesses are more successful, employees earn higher wages, and consumers enjoy better quality, more choices, and lower prices.

This articulation of the benefits of international trade is standard economic fare. But we conclude that trade is also an important stimulant to innovation and our economic success through two mechanisms, support and pressure.

- *Trade supports* innovation by opening larger market opportunities for innovators, thereby achieving greater scale and easier return on investment. Additionally, trade helps innovators achieve more effectiveness and efficiency in their operations through access to better supplies of materials, people, and capital. These are critical supporting conditions for innovation.
- Equally important, international trade exposes our businesses and managers to the beneficial *pressure* that creates the imperative for innovation. It requires our businesses to confront and out manoeuvre aggressive and capable competitors, who are a threat to complacency. It also opens our businesses to a greater number of sophisticated customers, who demand innovative goods and services at low prices.

Expanded trade has to be a key element of Canada's response to the innovation imperative. But the current environment presents challenges for trade expansion. The global economic slowdown has lowered the volume of trade, as consumers and businesses around the world reduce their spending. Protectionism has featured more prominently in political discourse, especially in the United States. While much of the political rhetoric and protectionist legislation has been aimed at China, Canada cannot relent for a moment in reminding our neighbours of

the importance of trade with us for their own prosperity. Colin Robertson, Vice President and Fellow of the Canadian Defence and Foreign Affairs Institute and former Canadian diplomat, has pointed out that the current economic malaise in the United States and the heated rhetoric in last year's mid-term elections have made free trade a target there. He cites a recent NBC News/*Wall Street Journal* poll that says that 69 percent of Americans believe free trade agreements with other countries have cost US jobs, while just 18 percent believe they created jobs. Robertson urges Canadian leaders to remind our neighbours how beneficial trade with Canada has been for the United States.¹⁰⁴

In addition to protectionist sentiment, our trade with the United States faces other serious challenges, especially the greater security concerns and inadequate investment in our infrastructure, which have "thickened" the Canada-US border.

At the same time, our global trade patterns are changing. While the United States continues to be our dominant trading partner – accounting for 63 percent of total exports and imports – its share of our international trade volume has been declining over the past decade. During this period, the European Union and China have increased their share of trade with us. The other major developing economies – Brazil, India, and Russia – are becoming more important participants in our trade, but our trading relationships with them are still under developed.¹⁰⁵

China and other developing economies are currently competing on the basis of their lower costs. Developed economies like Canada compete on the basis of innovation – although our recent trade value growth has been driven largely by commodities.¹⁰⁶ In time, the developing economies will become more sophisticated, as their large populations of consumers become more highly educated, better compensated,

and more demanding. Public and private institutions will increase their effectiveness and transparency. In parallel, their businesses will become more sophisticated.

These developing economies will reach an "innovation tipping point" and begin to compete less on cost and more on innovation. The time will come when design and fashion trends in a host of products, like cars, furniture, and appliances, and even in services, like finance and health care, will be set in these increasingly sophisticated economies. If Canada and other developed economies are to sustain our world leading standard of living, we cannot stand still on our current innovation capabilities. We need to improve these significantly, and trade with these economies provides the support and pressure needed to do so.

Trade is a critical element of our prosperity. The traditional reason is that it creates advantage through specialization and the availability of a wide variety of products and services at the lowest possible price. Equally important is the impact that expanded trade can have on our innovation results – which are in much need of improvement. Several avenues will help develop our trade and innovation success.

- **Expand trade relationships.** Despite the current sluggishness in trade, enhanced trade is an exciting opportunity for Canada and all economies. We are currently negotiating expanded trade with the European Union (EU). We need to move purposefully to deepen our relationship with China, India, and other developing economies.
- **Invest in education.** Increased investment in education is critical to building an economy that survives and thrives in the face of increased global competition. As larger economies become more sophisticated and cross the innovation tipping point, our

¹⁰⁴ Colin Robertson, "Gulf widens between Wall St. and Main St." *Financial Post*, October 20, 2010, available online: <http://opinion.financialpost.com/2010/10/20/gulf-widens-between-wall-st-and-main-st/>

¹⁰⁵ Institute for Competitiveness & Prosperity, *Trade, innovation, and prosperity*, pp. 23-24.

¹⁰⁶ *Ibid.*, p. 21.

creative skills will be tested, and it is by no means certain that we will be able to assume prosperity as usual. Education is a critical foundation for the broad skills we will need, and we need to step up our investments in this area.

- **Invest in infrastructure.** Our infrastructure needs to be upgraded at our borders, seaports, and airports.
- **Draw on the capabilities of our immigrants.** Canada has been blessed with a large group of well educated immigrants from a wide variety of countries around the world, especially China and India. As we and others have noted, our challenge has been to draw on their skills to help them integrate more closely into our economy. This is a great opportunity for our businesses to develop their strategies for expansion outside of North America. Public expenditures to help immigrants develop businesses that are built on trade with their native countries may be wise investments that expand trade and strengthen the economic success of our recent immigrants. Our businesses should not overlook these resources. There may be opportunities for governments to support internships with small- and medium-sized businesses.
- **Develop better ways to help displaced workers.** The effect of expanded trade is a net benefit to our people, our workers, and our businesses. But there are workers whose livelihood is threatened by expanded trade, and we need to help them make the necessary adjustment to new employment opportunities. Unfortunately, there is little evidence that retraining efforts in place are working. We need to develop better tools and policies for helping displaced workers. Programs that could help workers adjust to lower paying jobs may be part of the solution to

unemployment, especially among older and lower skilled workers. (See *Wage insurance may be the best bet for older displaced workers*)

Canada's productivity and innovation track record have been uninspiring. Expanded trade can have a huge impact on our innovation efforts and their success. More access to world markets enhances business results, thereby providing the support for investing in innovation and lowering the potential risks. More exposure to foreign customers and competitors provides beneficial pressure on our businesses and individuals to innovate. Canada needs to become even more of a trading nation than in the past.

Our governments have to step up their efforts to negotiate trade expansion agreements. Our business leaders need to seize the opportunities that trade presents.

Public policy related to our market structures can contribute most effectively to an innovation agenda by establishing a healthy balance of support and pressure. Changes in our innovation policies and more international trade are important elements of the balance.

Innovation and competition are key for the success of Canadian global leaders

Canada boasts more global leaders today than in the past. Our companies have been pathfinders on several innovative fronts: they are effectively operated by strong management; are more productive than non-globally competitive companies; and are, in turn, major wealth creators for Canadians as a whole.

We currently have 89 Canadian global leaders – companies with revenues greater than \$100 million and ranked in the top five in their industry based on revenue or market share worldwide. Their number has been increasing over time. In 1985, we had only 33 global leaders, and this grew substantially to 90 companies in 2003. In both 2008 and 2009, we had 90. In 2010 and currently in 2011, we identify 89 global leaders.¹⁰⁷

Including only the largest of these global leaders – those with revenues greater than \$1 billion – Canada had 15 in 1985. That number grew to 40 in 2003, and to 46 in 2008 and 2009. Recently this has fallen back slightly to 42 companies (*Exhibit 26*).

Since 2010, two global leaders left our billion-dollar list:

- *Goldcorp Inc.* – no longer ranks in the top five of gold miners as measured by revenue
- *World Color Press* – was acquired by an American firm, Quad/Graphics.

However, two global leaders joined our billion-dollar list since 2010:

- *Dorel Industries* – by acquiring a Chinese firm, they became one of the world's largest juvenile products company
- *Russel Metals* – rejoined the global leaders list as one of the five largest metal service centres in the world.

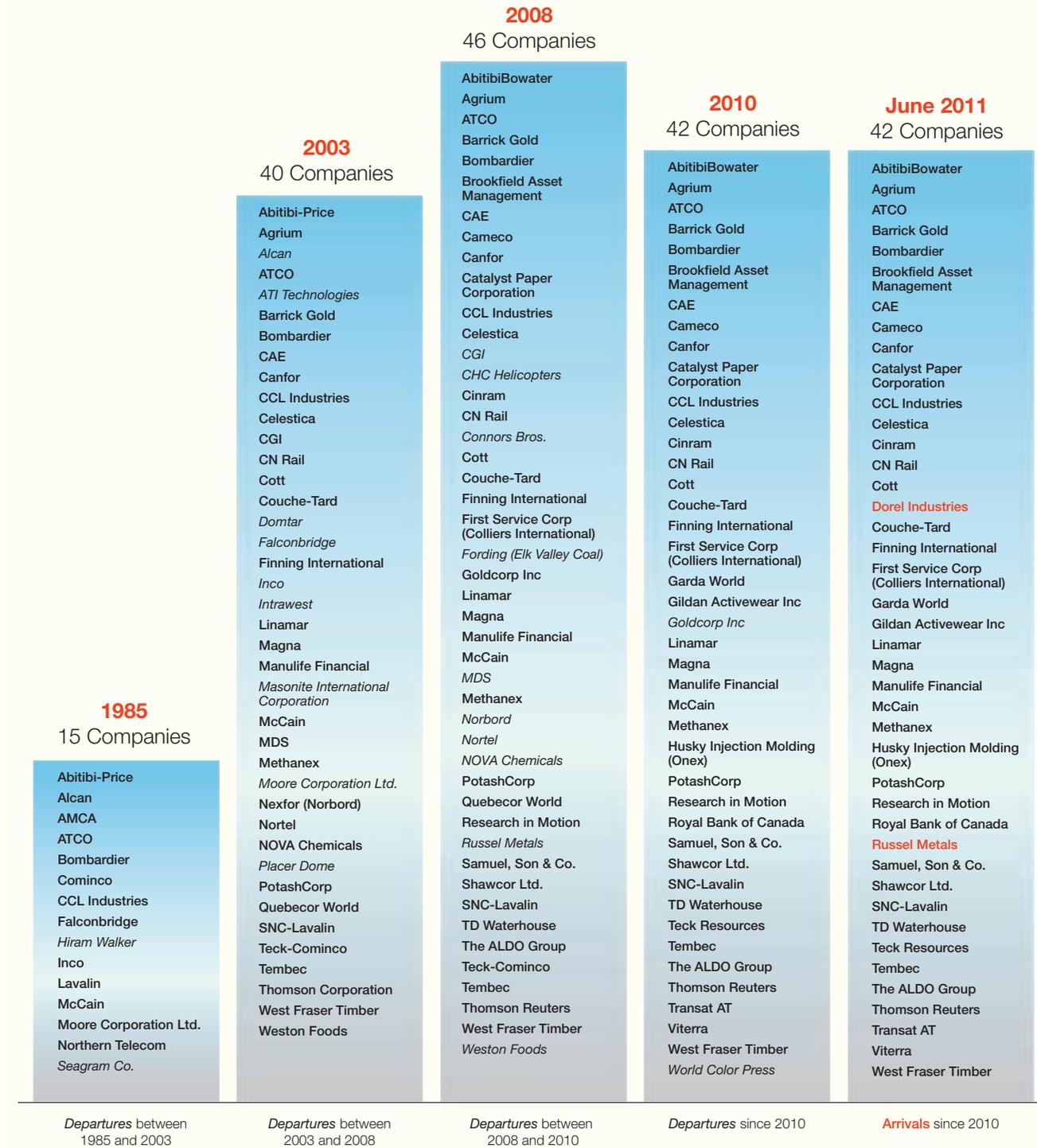
Canada's global leaders succeed through innovation

We distinguish between innovation and invention. Inventions are usually producer-driven creations or discoveries of something new. Innovations are customer-driven new products or processes that enable a superior customer experience, at lower cost and prices.¹⁰⁸

¹⁰⁷ For more information on Canada's global leaders, please visit the Institute's web site at http://www.competeprosper.ca/index.php/canada_global_leaders. For a complete list of our global leaders in 2010, please refer to the Task Force on Competitiveness, Productivity and Economic Progress, *Today's innovation, tomorrow's prosperity*, p. 61.

¹⁰⁸ *Ibid.*, pp. 50-51.

Exhibit 26 As of June 2011, Canada has 42 billion-dollar global leaders



Note: Companies with sales revenue above \$1 billion and are in the top five in their market. Source: Institute for Competitiveness & Prosperity analysis.

Wage insurance may be the best bet for older displaced workers

Displaced workers face enormous difficulties in attempting to re-enter the workforce. Governments attempt to resolve this problem through retraining programs for these workers to equip them with the necessary skills and knowledge for a new career.

A 2007 Statistics Canada study by René Morissette, Xuelin Zhang, and Marc Frenette indicates that men aged 25 to 49, who lost their jobs sometime between 1982 and 2002 through firm closures or mass layoffs and subsequently found new jobs, were earning on average between 9 and 22 percent less five years later.^a

The average decline for women was 12 to 35 percent. Earnings losses by displaced workers with five or more years of seniority were higher than those for other workers. The earnings loss was more severe in the 1987–92 period, which included a deep recession.

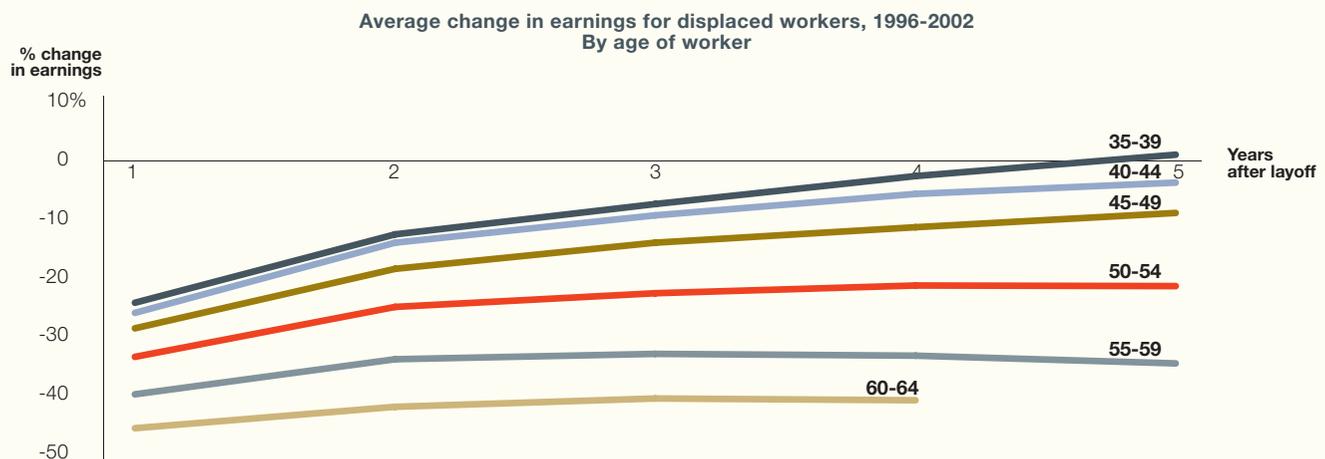
A recent study by University of Ottawa economists Ross Finnie and David Gray highlights the special challenges faced by older workers.^b The older the laid off worker, the greater is the subsequent earnings loss. Five years after a layoff, workers aged 35 to 39 who were still working were earning more in constant dollars before their layoff. At the other extreme, workers aged 60 to 64 realized earnings losses of more than 40 percent (*Exhibit B*).

Unfortunately, there is no proven plan to help these displaced workers. Retraining is the panacea most often promoted. But definitive positive results are hard to come by.

One of the most extensive studies on retraining was conducted in 2008 for the US Department of Labor.^c It indicated that retraining laid-off workers has limited success at best. The study tracked the experience of 160,000 laid-off workers in twelve states from 2003 to 2005, a period of economic expansion. It compared the results for who had participated in formal training with those who had not and found very little difference in earnings three and four years later. It concluded that the “ultimate gains from participation [in formal training programs] are small or non-existent.”

A study conducted by the Canadian Auto Workers, Chrysler Canada, and the Ontario Government assessed the experiences of laid-off auto workers moving through the adjustment process at CAW Action Centres, first point of contact for workers seeking retraining. Despite high interest and involvement among the laid-off workers, results were disappointing. Only a quarter of the participants in the study sample found jobs and most of these were part time or low paid, with fewer benefits than the old jobs and with greater employment insecurity.^d

Exhibit B Older workers are most severely affected by layoffs



Source: Ross Finnie and David Gray, “Labour-Force Participation of Older Displaced Workers in Canada,” IRPP Study, No. 15, February 2011, Table 5.

^a René Morissette, Xuelin Zhang, and Marc Frenette, “Earnings Losses of Displaced Workers: Canadian Evidence from a Large Administrative Database on Firm Closures and Mass Layoffs,” Statistics Canada, January 2007.

^b Ross Finnie and David Gray, *Labour-Force Participation of Older Displaced Workers in Canada*, IRPP Study, No. 15, February 2011.

^c “Workforce Investment Act Non-Experimental Net Impact Evaluation,” IMPAQ International, December 2008, available online: http://wdr.doleta.gov/research/FullText_Documents/Workforce%20Investment%20Act%20Non-Experimental%20Net%20Impact%20Evaluation%20-%20Final%20Report.pdf

^d Sam Vrankulj, “CAW Worker Adjustment Tracking Project: Preliminary Findings,” First Round Report, June 2010, available online: http://www.caw.ca/assets/pdf/Tracking_Study.pdf

Some studies show positive returns for retraining displaced workers. Research conducted for the Federal Reserve Bank of Chicago indicated that under some conditions, formal retraining can pay off.^e The research, drawn on data from the State of Washington, concluded that the equivalent of a year of community college raises the long-term earnings of displaced workers by about 9 percent for men and 13 percent for women. Returns varied significantly and were higher if the courses were “quantitative” (e.g., technical trades, health related, and science) and near zero if the courses were “non-quantitative” (e.g., basic skills, sales and service, social sciences).

A study released recently by Statistics Canada also shows positive benefits from formal training of younger (aged 25 to 44) displaced workers. Marc Frenette, Richard Upward, and Peter Wright analyzed impact of retraining in post-secondary institutions for displaced workers in Canada, using the Longitudinal Worker File (LWF). The wage results over a period of five years preceding and nine years following job loss, indicated that workers who attended post secondary education shortly following displacement (in the next calendar year) saw their earnings increase by almost \$7,000 more than displaced workers who did not.^f The impact, however, for men between 35 and 44 was non-existent. The authors noted that only a small percentage of displaced workers actually participated in post secondary retraining – and acknowledged that characteristics of the workers who choose this formal retraining may be the cause of the increased earnings.

Given the high cost of retraining programs and the paucity of research findings on the benefit of this spending, we ought to review carefully the results of such efforts.

Wage insurance could be a useful approach to supplement existing programs for workers transitioning to lower paid work. It could help ease the transition that some workers face in our rapidly changing economy – particularly older workers with less transportable skills. At the same time, it motivates unemployed workers to find a new job; in fact, by reducing the sting of lower wages, it encourages them to consider jobs in other sectors where their current skills are not as valuable. In a sense, it subsidizes employers to hire and re-train these workers on the job. Wage insurance can also assist older workers to remain in the labour force rather than retire early because of poor job prospects at a wage equal to what they earned before being laid off.

Wage insurance, as presented by its proponents, could work as follows. It would be targeted at workers who have been in a job for a period of, say, ten years. In fact, while benefits could be available to all workers, wage loss is a much less significant problem for workers who have been in the same job for less time, partly because they are younger.

When these workers are re-employed at a lower wage rate, wage insurance benefits would cover half the earnings difference for a period of two years. The benefit would be capped at \$10,000 annually to ensure targeting at lower- and middle-income earners. The coverage rate, the coverage period, and the benefit cap could be adjusted up or down.

Some problems could undermine the effectiveness of the program. Higher earnings replacement rates would lower the incentive for a worker to secure a higher paying job and to invest in retraining while in the new job. The same challenge exists for the length of coverage. Program costs could also be an issue, but US calculations of a wage insurance program as outlined above indicate a \$3.5 billion annual cost, equal to an annual premium of \$25 per worker.

Although the concept of wage insurance is promising, one experiment conducted in 1995–96 by the federal government’s Social Research and Demonstration Corporation yielded disappointing results. The experiment focused on workers who had lost their job after at least five years of continuous employment. Participants who chose to leave Employment Insurance for full-time work within a specified period of time received 75 percent of the difference between earning in their previous job and their new job, up to a weekly maximum of \$250 for up to two years. Among eligible displaced workers, interest was high. However, the program produced only a modest increase in full-time employment and, after fifteen months, earnings for participants were about 5 percent lower than for those who chose not to join the program.^g

It is possible that better results could come from a redesign of the experiment – different qualifying time periods, richer benefits, and a focus on situations with older, less skilled workers, for example. There is still much work to be done in assessing the costs and benefits of wage insurance. We would be wise to study the program further.

^e Louis Jacobson, Robert LaLonde, and Daniel G. Sullivan, “Estimating the Returns to Community College Schooling for Displaced Workers,” Working Paper 2002-31, Federal Reserve Bank of Chicago, December 2002.

^f Marc Frenette, Richard Upward, and Peter W. Wright, “The Long-term Earnings Impact of Post-secondary Education Following Job Loss,” Statistics Canada, March 2011.

^g Howard Bloom, Saul Schwartz, Susanna Lui-Gurr, Suk-Won Lee with Jason Pend and Wendy Bancroft “Testing a Re-employment Incentive for Displaced Workers: The Earnings Supplement Project,” Social Research and Demonstration Corporation, May 1999.

None of our current 42 billion-dollar global leaders relied solely on invention to attain leadership. In fact, the majority, 36 global leaders, employed innovative strategies to gain global leadership; 6 companies used both invention and innovation (*Exhibit 27*).

Bombardier is a firm built on the invention of the snowmobile, but its leading role today in aerospace and transportation is the result of innovative new products and acquisitions. CCL Industries has inventive label technology and is innovative in each of its markets through expert manufacturing and product development, such as laminated tubes, braille labels, and wash-off labels. Dorel Industries patented the Air Protect™ technology for juvenile side impact protection for car seats. They have also innovated through a merger and acquisition strategy for a strong brand portfolio. Research in Motion leads in wireless technology inventions and innovated through strategic partnerships with telecommunication carriers. ShawCor is a leader in R&D-intensive patented pipeline protection technology for cold climates, rugged terrains, high operating temperatures, and deep water. Tembec holds some patents for wood processing, but grew to its current size based on an aggressive merger and acquisition strategy.

By our research, 36 of Canada's 42 billion-dollar global leaders employed primarily innovation based strategies to deliver a product, service, or process that created new value for customers.

Some companies introduced new products based on a broad set of strategic, marketing, operational, and technical skills. For example, Cott launched more than 100 new products in 2009 alone. Catalyst Paper also leads in new product development, such as its lighter weight high-brightness papers used by newspapers and retailers. Cinram International excels in product innovation such as Blu-ray HD discs.

And The ALDO Group is well known for superior branding and product design in fashion footwear.

Cost savings for customers are crucial for innovation as well, as evident by Husky Injection Molding, which maintains its market share because bottlers lower their costs through Husky's technologically advanced machines. West Fraser Timber is also a global leader succeeding on the basis of its innovative technologies, which rely on continuous re-investment in their plants and facilities. Gildan has maintained tight cost controls for non-fashion clothing, and its vertical integration has allowed it to out perform competitors.

Among these innovative billion-dollar global leaders, 18 corporations employed merger and acquisition (M&A) strategies to build on their successful business model here in Canada and to expand globally. Examples include Barrick Gold, which hedged its exposure to fluctuating gold prices innovatively to help finance acquisitions of existing mining operations and the development of new ones; and Russel Metals and Samuel, Son and Co., which both acquired companies to streamline their metals distribution. Other companies have also pursued M&A strategies, such as Garda World Security, which provides software and security services, and SNC-Lavalin, which has used its size not only to provide engineering consulting and planning, but also to participate in financing and public-private partnership projects. CN Rail and Potash Corporation of Saskatchewan are examples of companies that were formerly government owned. While they began with favourable positions in the marketplace, their global leading status has also been due to aggressive M&A strategies.

Since many of our Canadian global leaders rely on acquisitions around the world, it is important that our policy on foreign direct investment be well thought out. Unfortunately, our net benefit

test does not provide a clear guide to companies looking to make acquisitions in Canada. A policy of reciprocity ought to be adopted. (*See Reciprocity should be the guiding principle in foreign takeovers.*)

Protected industries don't create many global leaders

We have concluded that competitive pressure is an important factor in increasing our innovation capabilities. A review of the industries that have produced Canada's global leaders indicates that industries protected from domestic and foreign competition or foreign ownership do not typically produce global leaders. By our count, only 11 of Canada's 89 global leaders originated in such industries, and for many of these, the protection offered to them was not critical in achieving global leadership.

Our *financial services* industries are regulated quite closely. While there are no formal limitations on foreign ownership, foreign interests are limited by rules on head office location, residency of the CEO, and the composition of the board. In addition, no one entity can own more than 20 percent of the voting shares. Four of our global leaders – Royal Bank of Canada, TD Waterhouse, ScotiaMocatta, and Manulife Financial – all fall under the rules governing large banks and demutualized insurance companies.

Transportation is a highly regulated sector, and it has produced few Canadian global leaders. We have identified three exceptions.

Former crown corporation CN Rail is protected by legislation that followed its privatization from takeovers by foreign companies. No more than 15 percent of CN Rail may be owned by any individual or corporation, and the company's headquarters must remain in Montréal. There are, however, no limitations on widely held foreign ownership of the stock.

Exhibit 27 Invention versus innovation: What propelled Canada-based billion-dollar global leaders to leadership?

42 billion-dollar global leaders achieved leadership from...	Global leadership from...		
	Global leader	Innovation	Invention
Innovation 36	AbitibiBowater	Merger & acquisition strategy	
	Agrium	Merger & acquisition strategy to "cross the entire value chain" and to achieve low cost-to-serve wholesale position; new product development	
	Alimentation Couche-Tard	Strategic partnerships in US; merger & acquisition strategy to enhance distribution	
	ATCO	Product innovation in infrastructure construction	
	Barrick Gold	Financing & hedging strategy; merger & acquisition strategy	
	Brookfield Asset Management	Merger & acquisition strategy	
	CAE	Flight simulator technological innovation to respond to customer needs; merger & acquisition strategy	
	Cameco	Innovative uranium mining techniques; merger & acquisition strategy	
	Canadian National Railway	Merger & acquisition strategy in US	
	Canfor	Investments to improve production efficiency and reduce costs in mills	
	Catalyst Paper	New product development in pulp and paper; cost effectiveness	
	Celestica	Innovative product development; supply chain management; after sales support	
	Cinram	Supply chain management; process innovation	
	Cott	Design; new flavour drinks; private label marketing & distribution	
	Finning International	Expansion strategy to enhance customer service for Caterpillar brand	
	FirstService (Colliers)	Merger & acquisition strategy	
	Garda World Security	Industry leading training, technology, and customer-focused solutions; growth partly through acquisitions	
	Gildan	Cost control and vertical integration	
	Husky Injection Molding (Onex)	Cost savings from investments in machinery	
	Linamar (Skyjack)	Product innovation and differentiation	
	Magna	Integration of parts design and manufacturing; cost savings	
	Manulife Financial	Product differentiation and expansion strategy	
	McCain	Process and product innovation for greater convenience and lower costs	
	Methanex	Low cost producer strategy; investment in low cost countries; integrated shipping division	
	PotashCorp	Increased foundation of low cost reserves through mergers & acquisitions	
	Royal Bank of Canada	Business strategy	
	Russel Metals	Merger & acquisition strategy	
	Samuel, Son & Co.	Merger & acquisition strategy	
	SNC-Lavalin	Expansion by mergers & acquisitions beyond core business of project engineering to provide turn-key solutions, project management services, and financing	
	TD Waterhouse	Marketing & strategy	
	Teck Resources	Merger & acquisition strategy	
	The ALDO Group	Branding and product design	
	Thomson Reuters	Merger & acquisition strategy; marketing & strategy	
	Transat AT	Vertical integration	
	Viterra	Product quality; customer service; and technological development	
	West Fraser Timber	Low-cost production strategy	
Both innovation and invention 6	Bombardier	Product innovation in rail transportation and aerospace	Snowmobile patents
	CCL Industries	New applications	Label technology
	Dorel Industries	Merger & acquisition strategy for strong portfolio of brands and R&D for product innovation	Patented technology such as Air Protect™ technology for side impact protection for car seats
	Research in Motion	New product (BlackBerry) and distribution strategy	Wireless technology
	ShawCor	Innovative product development	Pipeline protection technology
	Tembec	Merger & acquisition strategy	Wood processing patents

Source: Institute for Competitiveness & Prosperity analysis.

Bombardier is helped in numerous ways through aerospace subsidies and Canadian-content requirements for transportation bids.

Transat A.T., a leading tour company, operates in Canada's airline industry (which is heavily protected from foreign competition). Typical of regulations around the world, the sector currently allows 25 percent foreign ownership of Canadian companies, and prohibits foreign carriers from serving passengers travelling to international destinations other than their home country.

Communications is highly regulated. Canadian icons like Rogers and BCE have competed quite successfully inside Canada, but have not ventured successfully out of our protected domestic market.

In *publishing*, Harlequin and its parent Torstar cannot be purchased by a foreign interest, and competition from foreign producers is restricted within Canada. Yet it is unlikely that these restrictions were significant contributors to its global leadership in romance publications.

Only two of our *commodity* leaders may have benefited from regulation and protection. Potash Corporation is protected by its participation in the legalized cartel, Canpotex. Cameco is limited to only 25 percent foreign ownership, below the 49 percent threshold set for the uranium mining industry in Canada as a whole.

Our *health care* sector is highly regulated, and it has produced no global leaders other than MDS Nordion, although it is fair to say that MDS operates in the most open part of the health care sector.

Our global leaders have achieved success largely through innovation and by being challenged by global competition. If we are to have more global leaders, we need public policy that is driven by a useful definition of innovation and ongoing pressure from sophisticated competitors and customers.

Public policy related to our market structures can contribute most effectively to an innovation agenda by establishing a healthy balance of support and pressure. More international trade will enhance both support and pressure for innovation. We also need to rebalance our policy emphasis from invention to innovation. And innovative public policies to assist displaced workers and to assess foreign direct investment are required.

Reciprocity should be the guiding principle in foreign takeovers *by Roger Martin*

Sadly, the federal government's decision to block the purchase of Potash Corporation by BHP Billiton Ltd. is likely to hurt the future competitiveness of Canadian companies. This does not imply that Canada has no right or cause to challenge foreign takeovers of Canadian companies. Far from it. The problem is with the *net benefit* theory and rationale used by our government to block the takeover.

The Investment Canada Act is intended to ensure that Foreign Direct Investment (FDI) in Canada provides a net benefit to Canada, but never defines the terms – instead directing the Minister of Industry to consider several factors related to economic activity, productivity, competition, and others. Suffice to say, there is no certainty how the Minister will determine specific cases.

If net benefit were used in merchandise trade, there would never be a lowering of trade barriers because every single industry or company that is adversely affected would wrap itself in the protective flag of net benefit. For example, Québec textile makers would declare there to be no net benefit to allowing free trade in textiles, and Washington State sawmills would declare there to be no net benefit in allowing free trade in softwood lumber.

If our policy remained based on net benefits, other countries would start using net benefits logic against Canadian companies when they attempt to grow globally through foreign acquisition. And unfortunately, net benefits is such a vague and subjective concept that every single foreign takeover here or abroad can be struck down if the government in question wants to show that there are no net benefits.

This net benefit approach to FDI is in stark contrast to the approach to merchandise trade, the traditional focus of trade policy, based on the theory of *reciprocity*: you let us send you our BlackBerrys without tariffs or restrictions, and we will let in your GE MRI machines. We need to move policy from net benefit to reciprocity as the defining criterion.

The world has gotten to freer trade through reciprocity. Nations understand that there will be some net beneficiaries and net benefactors, but that overall there will be an efficiency gain for both economies, so it is sensible to put up with the minuses.

It was not at all pleasant to have RTZ buy Alcan and turn it into a tightly-managed subsidiary. But it was critical that the United Kingdom allow Thomson to buy their Reuters. It was not a highlight to have America's

AMD buy our ATI, but our Couche-Tard needed to be allowed to buy their Circle-K to become an international heavyweight in convenience store retailing. That is reciprocity in action.

We are in the middle of a historic fifty-year reshuffling of the ownership of the world's business assets, making international capital flows centrally important to long-term country competitiveness. Around the world, national franchise companies (such as Labatt's) are being bought up by global players (Interbrew). And smaller or narrower global players (Zenon Environmental or Falconbridge) are being bought up by bigger or broader global players (GE and Xtrata, respectively).

For this reason, Canada needs to bring the sophistication of the long-established thinking from merchandise trade to the realm of foreign takeovers. We need our Canadian companies to globalize without being hobbled by government policies. And we cannot be naïve while this is all transpiring.

Basing our policy on reciprocity, not net benefits, is essential to the desired outcome.

But it is not reciprocity to allow Vale to buy Inco. The Brazilian government has the absolute right to stop any takeover of Vale. Reciprocity would mean that if Vale has the right to buy Inco, then Inco would have the right to buy Vale. Similarly, it is not reciprocity to allow BHP to buy Potash. As part of the BHP-Billiton merger, the Australian government imposed draconian restrictions on BHP, meaning that BHP can go hunting internationally, but it can never be hunted.

The approach that would have protected Canadian competitiveness would have been to allow the Potash takeover with two conditions. First, that the Australian government remove all restrictions on the foreign takeover of BHP – and prove it by allowing a subsequent standstill period that would enable Potash to put together a consortium to bid for BHP. Second, that it also sign an agreement binding it to not to block any acquisition of an Australian company by a Canadian company. In addition, there could be mutual agreement to exclude certain sectors or to enforce certain requirements post-acquisition, just as we would find in merchandise trade agreements. That would be the first of what would become a series of free FDI agreements.



The innovation imperative: Steps to Canada's prosperity

We recommend the following actions to realize Canada's innovation imperative

We encourage stakeholders in Canada's prosperity to keep the imperative for sustainable productivity growth at the forefront of our debates and discourse. That growth comes from innovation and upgrading – creating unique products, services, and processes that truly add value to people's lives. Higher productivity is our main opportunity for realizing our prosperity potential.

As some new governments take the reins across Canada this year and others continue, we encourage them to keep the focus on increasing innovation and productivity in our businesses, our government programs and policies, and our daily lives. They must have their eyes firmly focused on the future, so that they can avoid the temptation to stay fixed on short-term considerations and achieve our prosperity potential.

Attitudes

Encourage innovation for Canada to win in an ever more competitive world

Remain determined to close the prosperity gap through aggressive attitudes toward making innovation happen.

Canadians do not have an attitude deficit in our will to win, our desire for innovation, or our recognition of the benefits of risk taking. Our real challenge is to master the conditions and the context in which we compete globally. Public policy, effected through our taxation and regulatory environment and our openness to international trade and investment, needs to encourage innovation and competition.

The stakes are high, for the protectionist sentiment in some corners could still derail a global recovery and take us down the path toward economic depression. Instead, Canadians need to be open to innovation as a way of life in our businesses and governments.

Investments

Invest in the human capital and technology critical for innovation

Continue investing in people for Canada's competitiveness.

Our federal and provincial governments face a critical balancing act. Current deficits are unsustainable, and spending has to be reined in. As governments consider their spending priorities, we urge that they continue to place post secondary education high on the list. Funding ought to focus on three priorities: increasing the number of master's degrees attained; expanding access to our universities, especially for youth from demographic groups who tend less than others to participate in post secondary education; and improving the student experience in our universities.

We have to avoid the mistakes we made in the mid-1990s when we faced similar pressures to control spending. Back then, the government curtailed spending on both health care and education. But in the ensuing recovery, when deficits disappeared, health care spending was put back on track, while education spending flat lined. If Canada is to be an economy that is competing on creativity and innovation, our workers and managers need the skills and knowledge to thrive, which come from robust educational opportunities.

As part of our investment in people, our post secondary institutions and the provincial governments need to ramp up their efforts to increase the enrolment of international students. These students add a diverse group and set of experiences for our students and staff, and they provide a powerful signal that our post secondary system is truly of world-class status.

Increase business investment in research and development and in information and communications technology.

Our businesses need to navigate through the recovery by taking full advantage of the improvements that technology can make to their top and bottom lines. We challenge business leaders to invest in technology from Canada and around the world. The stronger Canadian dollar helps our businesses close our technology gap with our US peers; the improved tax structure will also be beneficial. We encourage businesses, industry associations, and academics to engage fully in the deliberations of the Government of Canada's Expert Review Panel on Research and Development reviewing the federal government's support for research and development. Investments in innovation are primarily the responsibility of a competitive and capable business sector – but government policies and programs help establish the context for these investments.

Motivations

Ensure tax changes remain in place and make Canada a tax innovator

Review provincial policies and programs on incentives to attract businesses to Canada.

We want more world-class firms investing here. However, the research indicates that targeted government incentives to attract such investments are not often successful in increasing prosperity in a jurisdiction. As the federal and provincial governments look to reduce spending, this is one area to consider. At the very least, they ought to understand more deeply how well previous targeted incentives have delivered long-term prosperity to our regions and provinces.

Maintain the recent changes in Ontario's and British Columbia's sales and corporate tax structures and encourage governments in Saskatchewan, Manitoba, and Prince Edward Island to follow their lead.

Two provincial governments, Ontario and British Columbia, took a major step forward for our prosperity in improving our tax regime by converting their provincial sales tax into a value added tax and harmonizing it with the federal goods and services tax. This, along with corporate tax reductions, increased the motivations across Canada for investing in innovation and productivity. The conversion is the subject of a referendum in British Columbia, and we encourage voters there to choose intelligent tax policy that will benefit the average citizen. The remaining holdouts should follow suit for the benefit of their own residents and all Canadians.

Lower marginal effective tax rates for low income Canadians.

The Working Income Tax Benefit (WITB) is a potentially effective approach to fighting poverty in Canada. A refundable tax credit for low-income earners, it is designed to supplement low earnings from employment, encouraging them to break out of welfare by seeking more work and to "make work pay." However, the current WITB program is not doing the job as well as it could in many provinces and territories. This is because its current nominal design does not lace well with programs in all thirteen provinces and territories, each with its own unique income security structure. Though the federal government has extended an invitation for their provincial counterparts to modify the design of the WITB to suit their welfare programs, only Québec, British Columbia, and Nunavut have done so. In Ontario, our research indicates that WITB could be redesigned to promote more hours worked; currently the design promotes part-time work by low-income earners.

The provincial and federal governments should strengthen incentives for more hours worked and co-ordinate better with provincial social assistance structures. This is a step in the right direction to help the working poor overcome the welfare wall and achieve full-time employment.

Consider a carbon tax.

To achieve reductions in carbon emissions and help build green industries, a carbon tax best strikes the balance between efficiency and effectiveness.

Pursue tax policy innovations.

Canada has been a laggard in developing innovative tax policy. Not since 1974, with the decision to index marginal income tax brackets, have we implemented tax policy that has not already been adopted elsewhere first. The improvements in our tax environment that we have applauded are strictly adoption of best practices around the world. It is time for Canada to be a tax policy innovator. We propose several ideas that should be explored – corporate taxation on the basis of cash flow, elimination of the corporate tax, and a personal tax system based on consumption, not income.

Structures

Drive innovation through smarter public policies and more international trade

Balance our public innovation strategies.

Our public innovation policy emphasizes the hard sciences and does not recognize the importance of innovation in business and management processes. Our competitiveness and prosperity are built on a solid base of excellence in the sciences. Though leading high technology firms are founded by science and engineering graduates, successful innovation requires a balance of science and other management skills. This combination is important to achieve a successful transition from startup to thriving businesses.

Continue to encourage federal efforts to expand international free trade agreements.

We are encouraged by the decision to negotiate expanded trade between Canada and the European Union. It is already one of our important trade partners, and negotiations should be aimed at expanding this relationship further. We need to recognize that more trade benefits not only our exporters through access to larger markets, but also our consumers and all our businesses, who must rise to the challenge of added pressure from stiffer competition. As part of this, we need to invest in our border infrastructure to ensure goods move as efficiently as possible. We also need to investigate ways of helping our workers who are displaced by increased trade. Current retraining approaches do not seem to work. Other approaches like wage insurance might be more helpful.

Step up our efforts to increase trade with China, our next largest trading partner after the United States and the European Union.

Our trade has been growing rapidly with China, but this expanding market offers more opportunities for us than we are currently realizing.



Replace the net benefit test for foreign direct investment with bilateral reciprocity treaties.

Much of the attention paid to foreign direct investment occurs when foreign firms make bids to acquire Canadian firms. The recent attempt to acquire PotashCorp and the current proposal to merge Canada's TMX Group with the London Stock Exchange have attracted much attention. But our Canadian global leaders and other successful firms are significant acquirers of foreign companies. We need to ensure that they have access to these acquisitions. And we need to acknowledge that foreign acquisitions of Canadian firms, while often painful to our collective psyche, are usually beneficial to our economy. Unfortunately, the net benefit test that we apply to assessing foreign direct investment in Canada is unhelpful and unclear. We have made progress in expanding trade through reciprocity – we should do likewise with foreign direct investment. To determine whether or not we should approve a foreign takeover, we can simply ask if the transaction in reverse would be approved by the country that is home to the acquirer.

Explore policy options to improve venture capital structures.

Our major challenge in Canada has been to improve the quality of our venture capital. Eliminating structures like the tax credits for Labour Sponsored Investment Funds, as is underway in Ontario, will certainly help. But we need to recognize that the current venture capital model is broken – in Canada as well as the United States. Returns to investors have been inadequate for nearly a decade. In some sense, venture capital needs to return to its roots – small investments – to help new firms bootstrap to success. Two trends – lean startups and microfunding – may point the way to the future of venture capital. Public policy in Canada needs to take account of these changes and ensure we are not simply promoting a tired model of venture capital financing.

Keep the friendly pressure on our US neighbours to resist protectionist impulses.

Federal and provincial governments need to be in constant contact with their US counterparts. Our business and labour leaders have excellent contacts with US leaders through ownership and affiliation. It is in their interest to persuade their counterparts that protectionism is unhealthy on both sides of the border.



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