

Today's innovation, tomorrow's prosperity

Task Force on Competitiveness, Productivity and Economic Progress
NINTH ANNUAL REPORT, NOVEMBER 2010



Task Force on Competitiveness, Productivity and Economic Progress

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The Task Force on Competitiveness, Productivity and Economic Progress was announced in the April 2001 Speech from the Throne. Its mandate is to measure and monitor Ontario's competitiveness, productivity, and economic progress compared to other provinces and US states. In the 2004 Budget, the Government asked the Task Force to incorporate innovation and commercialization issues in its mandate. The Task Force reports directly to the public.

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It is the aspiration of the Task Force to have a significant influence in increasing Ontario's competitiveness, productivity, and capacity for innovation. This, we believe, will help ensure continued success in the creation of good jobs, increased prosperity, and a high quality of life for all Ontarians.

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Research in Motion Ltd.

The Institute for Competitiveness & Prosperity is an independent not-for-profit organization established in 2001 to serve as the research arm of the Task Force. Working Papers published by the Institute are primarily intended to inform the work of the Task Force. In addition, they are designed to deepen public understanding of macro and microeconomic factors behind Ontario's economic progress and stimulate debate on a range of issues related to competitiveness and prosperity.

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Comments on this Ninth Annual Report are encouraged and should be directed to the Institute for Competitiveness & Prosperity. The Task Force and the Institute are funded by the Government of Ontario through the Ministry of Economic Development.

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Foreword & acknowledgements



ON BEHALF OF Ontario's Task Force on Competitiveness, Productivity and Economic Progress, I am pleased to present our Ninth Annual Report to the Ontario public. It appears that the economy is slowly recovering from the major downturn we have been experiencing since 2008. Like all Ontarians, we are hopeful that the worst is behind us. Our challenge in the short term is to achieve a robust recovery that gets us back on track. Our longer term challenge is unchanged – how to achieve our full economic potential through better productivity and innovation performance. This is the essence of our 2020 Prosperity Agenda for Ontario.

Our focus in this year's report is on improving our innovation capabilities and results. Our prosperity gap is a productivity gap, and this productivity gap is an innovation gap. Ontarians are among the world leaders in work effort – that is, the hours of work per person. 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. Our governments' innovation policies have been inadequate, focusing on increasing new-to-the-world inventions, but not on stimulating relevant-to-the-market innovations.

Ontarians 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 R&D and patenting to adapting existing technology to business; 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.

The provincial government has been investing in education in the past five years and so far has resisted reductions in these investments to tackle the deficit. 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. The government is implementing a strategy for attracting more international students. Greater success by our post secondary institutions in competing globally for talent will strengthen the educational experiences in our schools and draw on the world's best skills in our workforce of the future. Our ability to compete with other world-class universities for talent is a real world indicator of the quality of our system. Our determination to succeed internationally will foster innovation and improvement in our post secondary sector.

“Ontario’s prosperity gap is a productivity gap and this productivity gap is an innovation gap”

Ontario has made huge progress on our Prosperity Agenda by restructuring the way we tax business investment. Converting our provincial sales tax to a value added tax and harmonizing it with the federal goods and services tax 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, Ontario 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 urge Ontario to consider a carbon tax in order to deal with the threats and opportunities from carbon emissions.

Our economic structures can be improved to drive innovation. Our prosperity is built on trade, and Ontario and Canada need to take the lead in expanding international arrangements. The leadership Ontario has shown in the trade negotiations with the European Union is a hopeful sign. We need to pursue other trade expansion opportunities with countries like China and India.

Ontario has many of the building blocks to achieve our full prosperity, productivity, and innovation potential. Our challenge is putting them together for the benefit of ourselves and our future generations.

We gratefully acknowledge the research support from the Institute for Competitiveness & Prosperity and the funding support from the Ministry of Economic Development and Trade. We look forward to sharing and discussing our work and findings with all Ontarians. We welcome your comments and suggestions.



Roger L. Martin, Chairman
Task Force on Competitiveness, Productivity and Economic Progress
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Today's innovation, tomorrow's prosperity

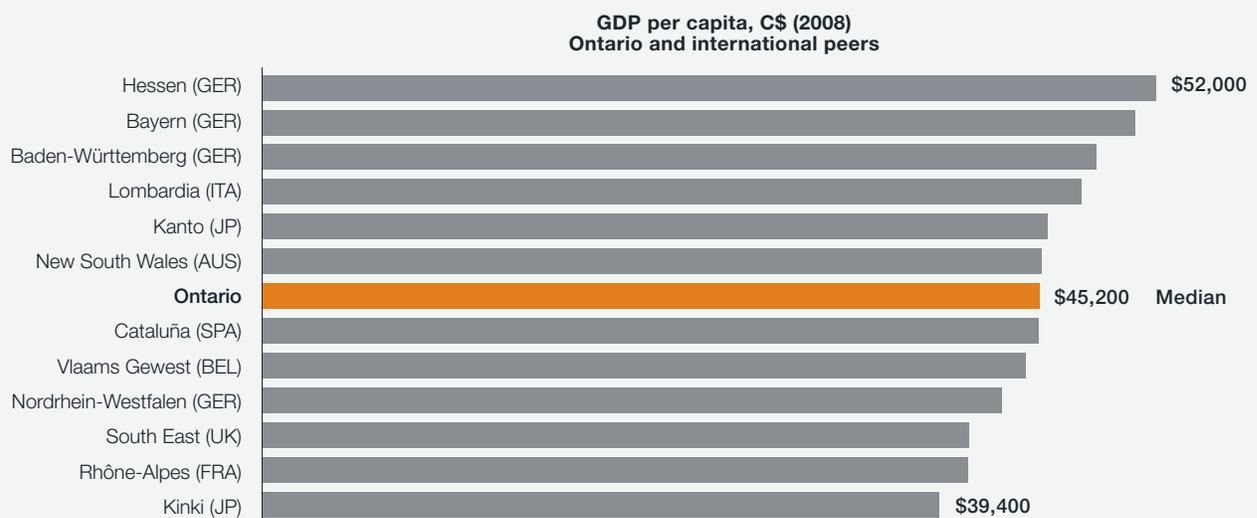
Despite the economic uncertainty that pervades our current discourse, we continue to recommend that Ontarians look to the long term and focus our energies on achieving the Prosperity Agenda that we have set out. By the relentless pursuit of innovation in products, services, and processes, we can achieve sustainable prosperity and well being.

IN OUR ANNUAL REPORT LAST YEAR, we ventured the view 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 now had to turn their attention to repairing their fiscal situations. We encouraged all stakeholders in Ontario's prosperity to regain our footing in the pursuit of long-term prosperity and well being. That meant we needed 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 provided support and pressure for innovation.

A year later, we are still not sure if Ontarians are out of the grips of the recession. Technically, according to the National Bureau of Economic Research, the United States has been out of recession since June 2009. Here in Canada, we do not have an official process for calling the end to a recession, but it is likely we have been in recovery since the second half of 2009. Yet the rebound is anemic on both sides of the border and around the world. Unemployment continues to be above recent norms, business investment is slow in returning to pre-recession rates, and government deficits are steep.

As in past years, we note that Ontario is one of the most prosperous jurisdictions in the world. Ontario performs as well as other regions outside North America. In 2008, we ranked at the median of the largest, most competitive regions (*Exhibit 1*).

Exhibit 1 Ontario is at the median of the most prosperous international regions



Note: Because of limited GDP data on Kanto & Kinki, Japan's national GDP growth rate from 2007 to 2008 is used to estimate Kanto & Kinki's GDP in 2008. Currencies converted at CANSIM PPPs, (Table 380-0037).

Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; Australian Bureau of Statistics; National Bank of Belgium; Institut national de la statistique et des études économiques; Statistische Ämter Des Bundes Und Der Länder; L'Istituto Nazionale di Statistica; Instituto Nacional de Estadística; UK Office for National Statistics; SNA Statistics National Accounts of Japan; OECD; IMF; Eurostat.

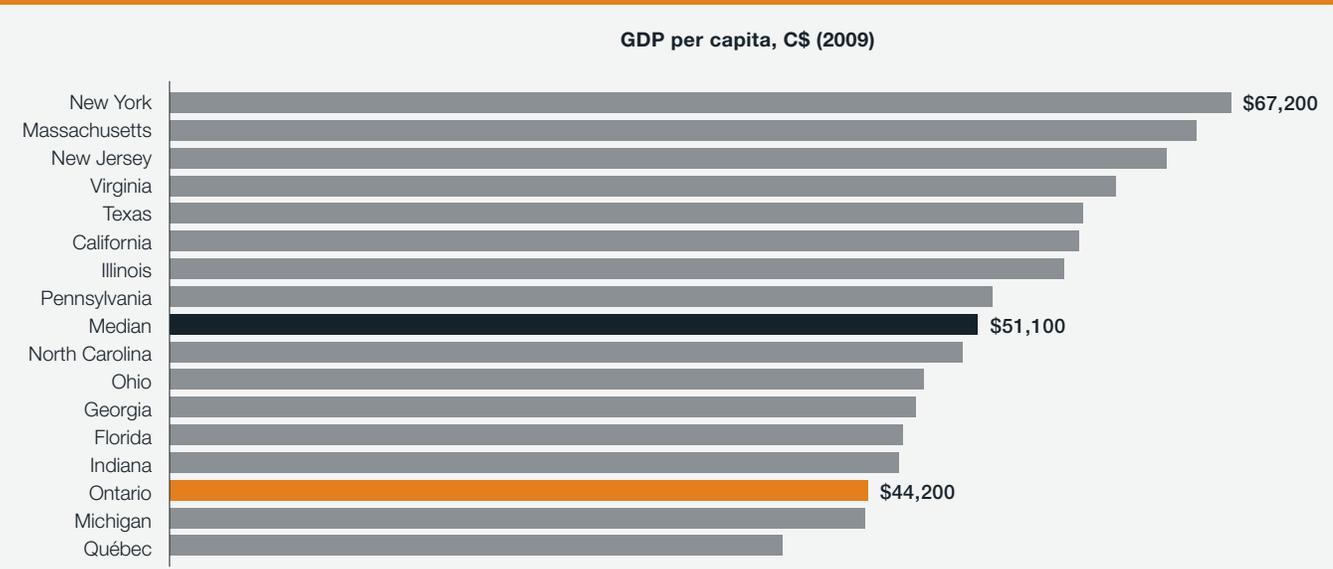
But, as we have also noted in our past reports, Ontario continues to under perform relative to our leading North American peers. In 2009, our GDP per capita of \$44,200 was \$6,900 below the median of the sixteen largest states and provinces in North America (*Exhibit 2*). (In all our analyses, unless otherwise stated, we use constant 2009 dollars converted at the Canada/US purchasing power exchange rate of 1.176.)

Over the long term, Ontario’s prosperity has drifted below that of our US peers. In the early 1980s, Ontario ranked in the midst of the most successful jurisdictions in the world. But since that time, our growth has lagged the performance of our US peers – the fourteen states with more than 6 million people, or at least one-half of Ontario’s population. We have remained ahead of Québec, the other North American jurisdiction of that size, although Québec is closing its gap with Ontario. For the past several years, Ontario’s rank has shifted between fourteenth and fifteenth place out of sixteen North American peer jurisdictions. In 2009, Ontario ranked fourteenth, just ahead of Michigan. In 2008, Ontario’s GDP per capita was \$5,900 below the median of these peers. In 2009 the gap increased to \$6,900 (*Exhibit 3*).

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 with our North American peers would result in an increase of \$10,100 in after-tax disposable income for the average Ontario household of 2.7 persons. And closing this prosperity gap would generate \$31 billion in tax revenues for all three levels of government in Ontario.

In the shorter term, Ontario’s performance in the recession has matched US performance fairly closely in GDP growth rates – that is, by this broad measure of economic output, our performance in Ontario has been tracking that of the United States. Yet, on a positive note, our labour markets have not been as hard hit. Our

Exhibit 2 Ontario trails its North American peers significantly in GDP per capita



Note: State GDP results estimated using personal income, converted to Canadian dollars at 1.176 PPP.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; US Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts.

participation and unemployment rates did not suffer as much as those in our peer states. Our employers have not been as quick to let workers go as US businesses and are hiring workers back at a faster pace – though not fast enough for those who are unemployed.

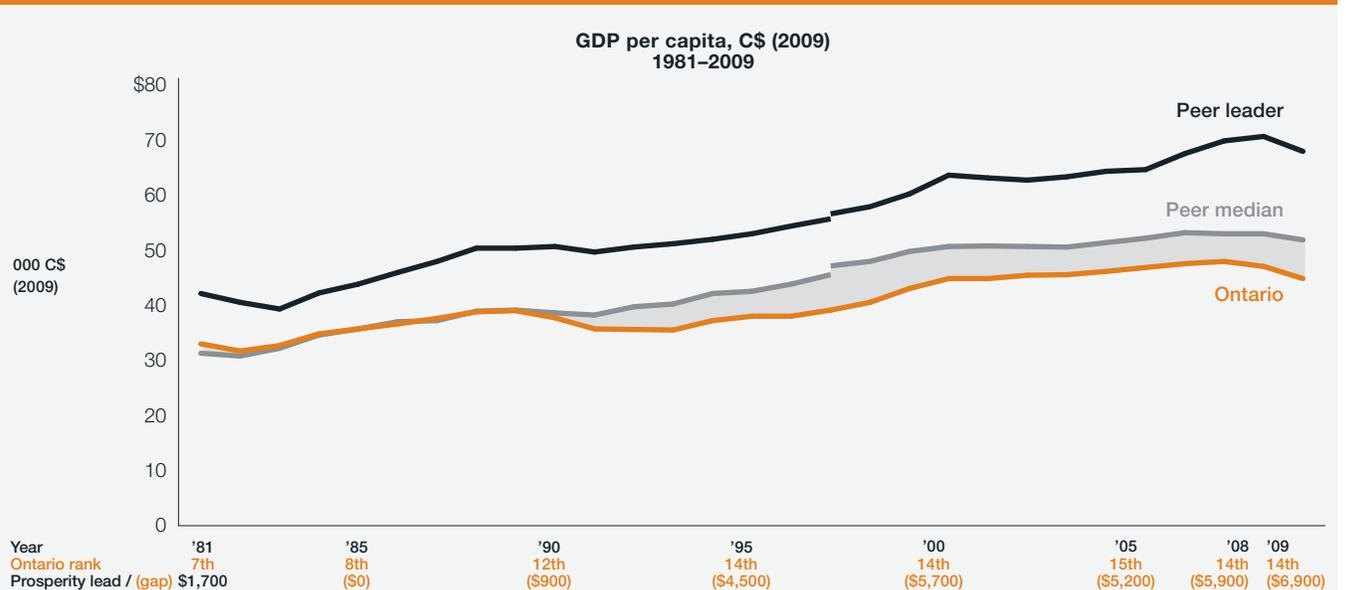
Still, Ontario's productivity trails our US peers' performance and this undermines our prosperity potential. More innovation will be a major contributor to raising our productivity.

Innovation is an imperative for Ontario's prosperity

In recent years, our lower productivity has become a more important source of our prosperity gap – and our key challenge. Of the \$6,900 gap versus our North American peers, \$1,100 can be attributed to less work effort and \$5,800 can be attributed to lower productivity (*Exhibit 4*). For each hour worked in the province, we generate less value from our efforts than our US peers. This gap is not due to a mix of industries that are unproductive by nature, but 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 because our population has less university education than our counterparts in the US peers, is less urbanized, and our businesses invest less in technology.

Ontario's productivity is also lower than that in large developed regions outside North America. Our main economic advantage over our international peers is that Ontarians 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. In the words of the cliché, we are working harder than our peers outside North America, not smarter.

Exhibit 3 Ontario's prosperity gap grew in 2009



Note: 1997 shows the break in the US method of calculating state-level GDP from SIC-based to NAICS-based. 2009 state GDP results are estimated using personal income and converted to Canadian dollars using 2009 PPP.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Provincial Economic Accounts; US Department of Commerce, Bureau of Economics Analysis, National Income and Product Accounts.

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 input. Gaining efficiency or developing products and services that command higher prices are the two sources of improved productivity (*Exhibit 5*).

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.

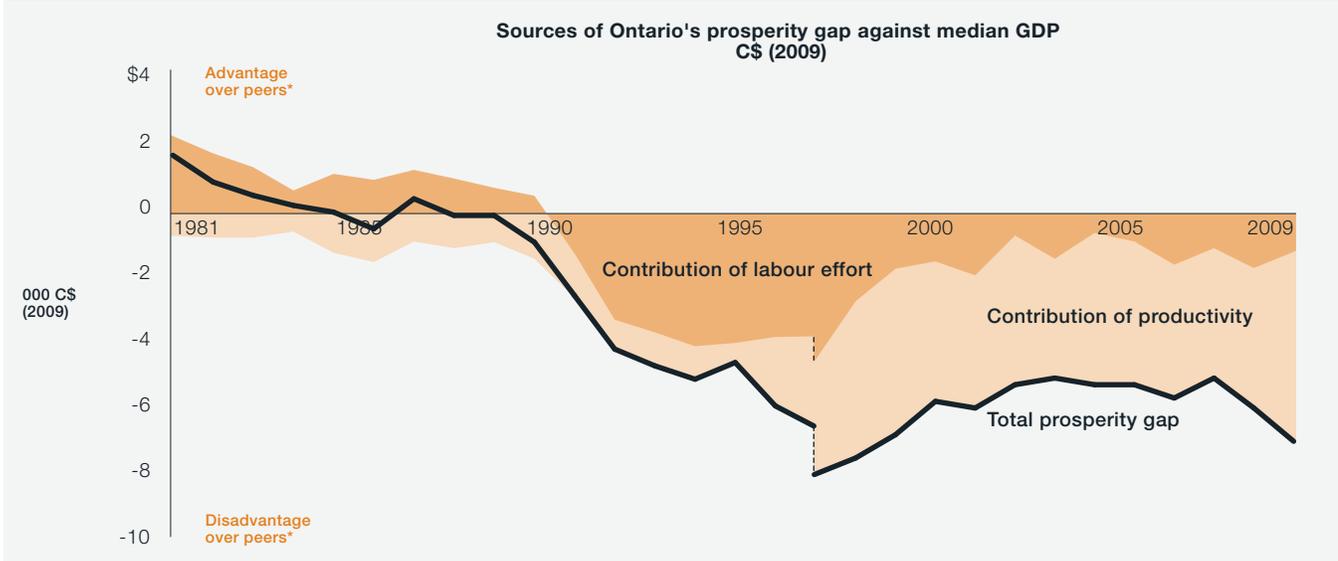
Ontario's productivity gap is an innovation gap

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

Our businesses under invest in technology

Ontario businesses continue to trail their US counterparts in investing in machinery, equipment, and software to make their workers more productive. Investment in information and communications technology (ICT) accounts for about 40 percent of our investment in machinery, equipment, and software – and the major investment gap with our peers. Investment in ICT, which consists of computers, software and communication 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 important – to overhaul entire business processes to deliver more value.

Exhibit 4 Ontario's prosperity gap is a productivity gap



* Versus median of 16 jurisdictions.
 Note: 1997 shows the break in US method of calculating state-level GDP from SIC-based to NAIC-based; 2009 US state GDP results estimated using Personal Income and converted to Canadian dollars using 2009 PPP.
 Source: Institute for Competitiveness & Prosperity, based on data from Statistics Canada; US Department of Commerce, Bureau of Economic Analysis; US Department of Labor, Bureau of Labor Statistics; US Census Bureau.

Business R&D lags in Canada and in Ontario

Ontario's R&D investment gap with its US peers has largely been in the business sector. As a percentage of GDP, Ontario's business R&D investment over the last two decades is behind the rate achieved by the peer states, and it trails 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.

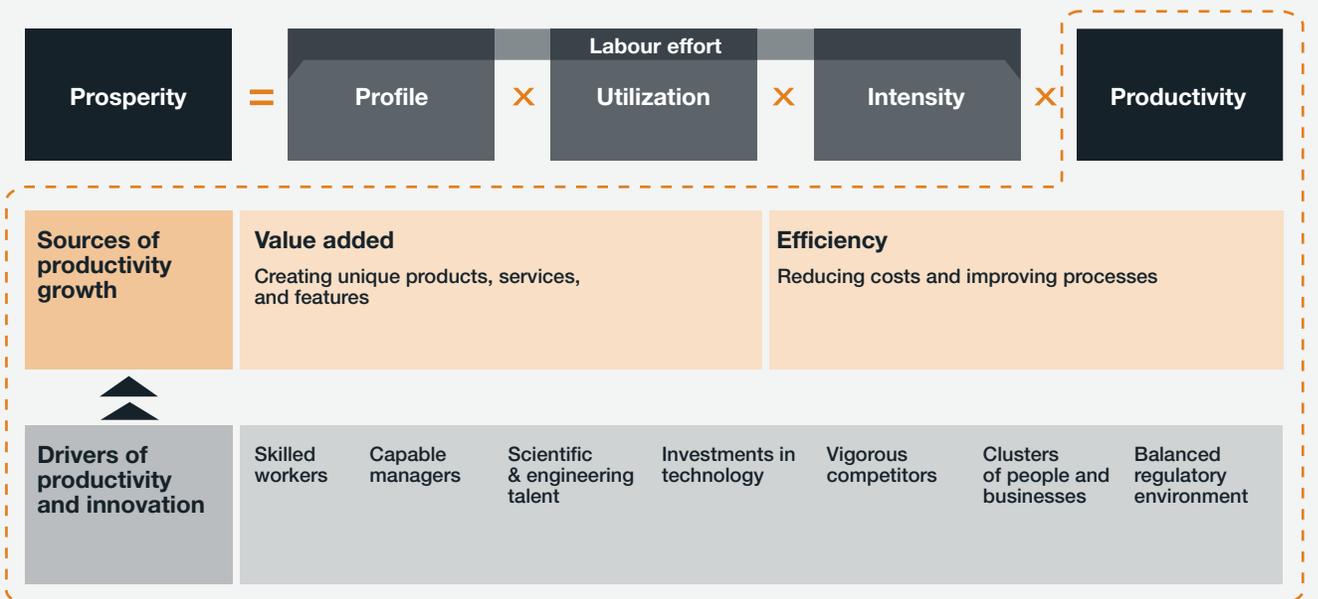
Ontario businesses produce fewer patents

While it is important to note that not all innovative activity is captured by patents (e.g., 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 Ontario businesses are far less likely to produce patents than their counterparts in the US peer states.

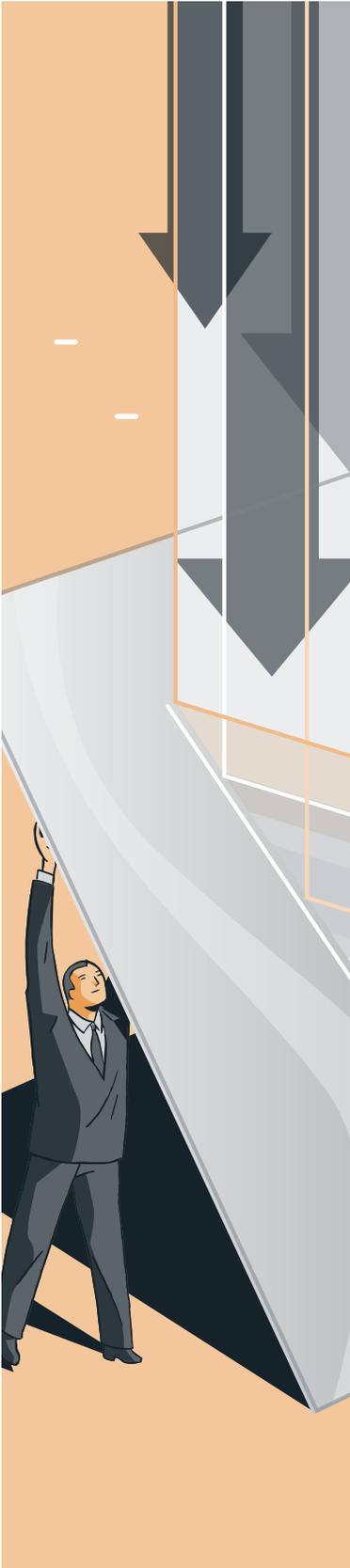
Our management is among the best in the world, but still trails US peers

An important contributor to innovation is the quality of our 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.

Exhibit 5 Innovation and productivity are closely linked



Source: Institute for Competitiveness & Prosperity.



Research by the Institute for Competitiveness & Prosperity showed that at the plant level, Ontario's manufacturing management is 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 fourteen US peer states, Ontario 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 matched that of the United States. Retail management in the United Kingdom was significantly behind both. Ontario retailers fared nearly as well as their counterparts in the US peer states, with improvement opportunities in operations management.

Public policies tend to focus on support and invention, not pressure and innovation

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 being paid to both *support* and *pressure* for innovation. Unfortunately, public policy in Ontario and Canada has not achieved the right balance on either.

Policies in Ontario and 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 a balance of 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 the support of business education is perplexing and damaging to our innovation capacity.

Innovation must pervade our Prosperity Agenda

As we slowly emerge from the recession, we continue to urge Ontarians to keep the focus on the long-term Prosperity Agenda (*Exhibit 6*). 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.

For us, it is a question of context or circumstances. 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 6 Task Force has set out a 2020 Prosperity Agenda to close our prosperity gap

THE GOAL	Current	Target 2020
Close the prosperity gap	14th in peer group in 2009	At the median – 8th by 2020
Attitudes	Remaining complacent	Sharing determination to close the gap
Investments	Consuming today	Investing for tomorrow's prosperity
Motivations	Implementing smart business taxation	Continuing smart business taxation
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 Ontarians 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. So if attitudes are not holding us back, why do we under perform in competitiveness, innovation, and prosperity?

In our view, we start with a solid base of positive attitudes among Ontarians and our business leaders. We do have the desire to compete and to innovate as much as our counterparts in our peer states. Our challenge as we come out of the current recession is to shape the circumstances 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 Ontarians are consuming our current prosperity at the expense of future prosperity. Our people do not invest adequately in their own education – thereby reducing their prospects for success in the growing knowledge economy. Our 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. Our governments have put health care spending ahead of education spending – no doubt reflecting the public view.



We need to invest more. If Ontarians 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 Ontario will continue its commitment to post secondary education, even as it attacks 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 announced tax changes remain in place

The provincial and federal governments have done much to make our tax system a positive contributor to innovation. By harmonizing our provincial sales tax with the federal goods and services tax, reducing corporate tax rates, and eliminating capital taxes, the government of Ontario has taken bold strides to raise the motivations for new investment by our businesses. Coupled with the ongoing reductions in federal corporate income taxes, these changes are moving Ontario from one of the worst jurisdictions among developed economies in its taxation of new business investment to one of the better ones.

We continue to recommend that Ontario and Canada 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 Ontarians. Social benefits are structured to deliver benefits 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 tax rates for lower income Ontarians.

Structures

Drive innovation through smarter public policies and more international trade

Ontario 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 – recurring themes in the Institute's past work.

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. These other skills are important to achieve a successful transition from startup to thriving businesses.



A heightened sense of the benefits of more international trade can improve the structural framework for more innovation in Ontario. Ontarians have always realized that international trade has been an important contributor to our prosperity.

We are all familiar with the traditional arguments for international trade – it 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 many sense that this is our time for global leadership. The Task Force shares this sense of hope. Our major hurdle in realizing our economic prosperity is our anemic 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 structure 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

ONTARIO HAS A PROSPERITY GAP – that is, we are not realizing the 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

In carrying out its mandate to measure and monitor Ontario's competitiveness and prosperity, the Task Force has focused 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 are equal to 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 Ontario will not thrive by attempting to hang on to these low value added activities.

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

The concept of “value added” also matters on a national accounts level. Essentially 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

GDP is an imperfect measure. 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.” In Ontario, 90.2 percent responded “very satisfied” or “satisfied,” with 36.5 percent indicating “very satisfied.” By themselves, these results

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.”

do not tell us the overall happiness of Canadians and Ontarians. 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 Vancouver were less likely than the national average to report being happy.

But most of these place-based differences disappeared with deeper statistical analysis. CSLS applied various statistical techniques to identify important variables for individual happiness. Several factors consistently affected individuals' happiness (*Exhibit 7*).

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.

The results do not immediately suggest the public policies we 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 need to continue our research into the causes and cures of poor mental health.

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 higher 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 greater economic success, as defined by personal income, is consistent with higher reported happiness from the Canadian Community Health Survey for 2007 and 2008. We already know that recent immigrants face problems with economic integration; these results broaden the range of issues we need to address.

Disaggregated GDP explains our prosperity gap

Ontario stands fourteenth out of sixteen peer jurisdictions in GDP per capita and the gap versus the median has been widening. In recent years, our prosperity lead versus 16th place Québec has been narrowing. (See *Québec is narrowing its prosperity gap with Ontario.*)

To understand the reasons for our prosperity gap with the peer jurisdictions, we draw on the same framework we have used in our previous reports. This framework disaggregates GDP per capita into four measurable elements (*Exhibit 8*):

Exhibit 7 Some individual factors affect personal happiness

Individual attribute	Low life satisfaction associated with...	High life satisfaction associated with...	Ontario results (relative to the national average)
Perceived mental health	Poor mental health	Excellent mental health	Proportionately more Ontarians report poor state of mental health – a negative factor for overall happiness in Ontario
Perceived physical health	Poor physical health	Excellent physical health	Proportionately more Ontarians report poor state of physical health – a negative factor for overall happiness in Ontario
Stress level	Extremely stressed	Not at all stressed	Proportionately more Ontarians are more likely to experience high levels of stress – a negative factor for overall happiness in Ontario
Sense of belonging to local community	Very weak sense of belonging	Very strong sense of belonging	Proportionately more Ontarians are more likely to feel a sense of belonging to their local community – a positive factor for overall happiness in Ontario
Household income	Lowest income decile	Highest income decile	Ontario has proportionately more individuals who are in higher income deciles – a positive factor for overall happiness in Ontario
Marital status	Separated, divorced, or widowed	Married or common-law	Ontario has proportionately more individuals who are married or in common-law relationship – a positive factor for overall happiness in Ontario
Immigration status	Recent immigrant	Non-immigrant	Proportionately more Ontarians are recent immigrants – their lower happiness means lower overall happiness in Ontario

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

- **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 urban 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 Ontarians 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.

Ontario's divergence from the prosperity performance of our peer 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 with the peer states. In the current economic slowdown, US unemployment has increased, while GDP growth has returned. In Ontario, unemployment

Exhibit 8 The Task Force measures four components of prosperity

Prosperity	Profile	Utilization	Intensity	Productivity
GDP per capita	$\frac{\text{Potential labour force}}{\text{Population}}$	$\frac{\text{Employed persons}}{\text{Potential labour force}}$	$\frac{\text{Hours worked}}{\text{Employed persons}}$	$\frac{\text{GDP}}{\text{Hours worked}}$
		<ul style="list-style-type: none"> • Participation • Employment 		<ul style="list-style-type: none"> • Industry mix • Cluster mix • Cluster effectiveness • Urbanization • Education • Capital investment • Productivity residual

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

Québec is narrowing its prosperity gap with Ontario

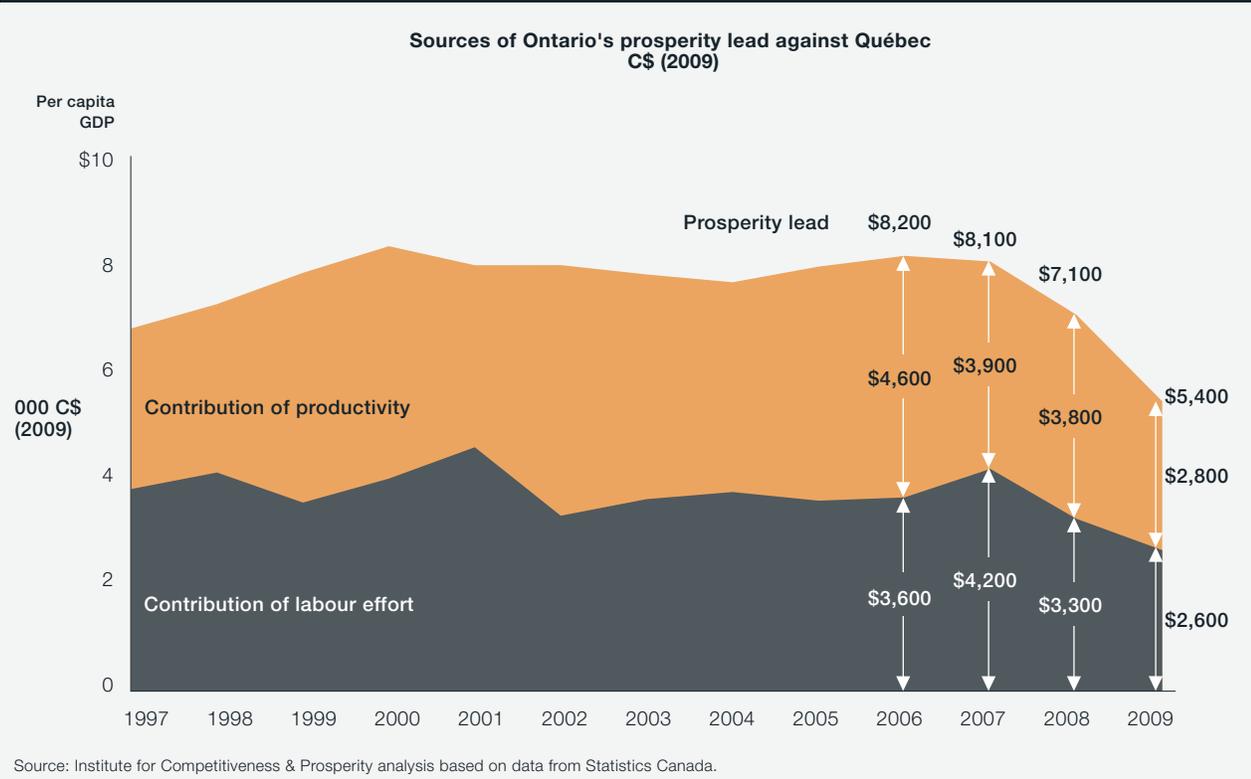
IN OUR ASSESSMENT of Ontario's fifteen peers, we have focused on the fourteen US peers because Québec, the only Canadian peer, has trailed Ontario's performance significantly. Yet, in the past few years, Québec has been quietly closing its gap with Ontario (*Exhibit A*).

A significant weakness for Québec has been its lacklustre labour effort – it traditionally trails North American peers in participation, unemployment, and hours worked. However, in the 2009 downturn, unemployment did not increase as much in Québec as in Ontario and the US peer states. Although Québec's participation rates have remained lower than Ontario's, hours worked per worker dipped much less in Québec – falling 1.1 percent since 2007, compared to a 3.5 percent decline in Ontario. Paradoxically, Québec's traditional labour

effort advantage, its demographic profile, has now fallen behind Ontario's, because of its low birth rate. It now has relatively more seniors and fewer people of working age.

Québec's productivity performance has improved slightly relative to Ontario's – with no one factor accounting for this. And, like Ontario, it trails our North American peers significantly in productivity. As University of Québec economist Pierre Fortin has observed, Québec's economic challenge is not much different from Ontario's and Canada's – the need to improve productivity.^a

Exhibit A Québec's improvement in its labour effort and productivity has helped it close its prosperity gap with Ontario



^a Pierre Fortin, "A Canadian problem, not a Québec one," *Inroads: The Canadian Journal of Opinion*, Issue No. 27, Summer/Fall 2010, pp. 23 – 27.

has not increased as dramatically, while GDP growth has been roughly the same. Consequently, our productivity gap worsened in 2008 and 2009.

Ontario has mixed labour effort performance

Ontario continues to have a demographic profile advantage versus the peer states and Québec, an advantage in utilization, but a significant intensity gap (Exhibit 9).

Profile remains an advantage for Ontario.

The first factor in a jurisdiction's prosperity creation potential is its demographics. The percentage of the population that is of working age – aged 15 to 64 – 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 Ontario, this ratio has been stable over the short run and has had no appreciable impact on changes in our prosperity gap versus our peer states. Nevertheless, it does create an ongoing starting advantage in Ontario's prosperity.

In 2009, 69.4 percent of Ontarians were aged 15 to 64. Among the peer jurisdictions, Ontario and Québec have a higher percentage of working age population than the fourteen peer states. Until 2009, Québec had the most advantageous demographic profile among the sixteen peer jurisdictions. However, with its lower birth rate, this advantage has been eroding – fewer young adults are “replacing” those who are over 64. Québec's demographic profile fell from 69.5 percent in 2008 to 69.3 percent in 2009, so that Ontario now is the most advantaged in demographic profile. By 2025, census projections indicate that Québec's demographic profile will fall to 61.5 percent, the most disadvantaged profile compared to the United States, Ontario, and Canada, excluding Québec.

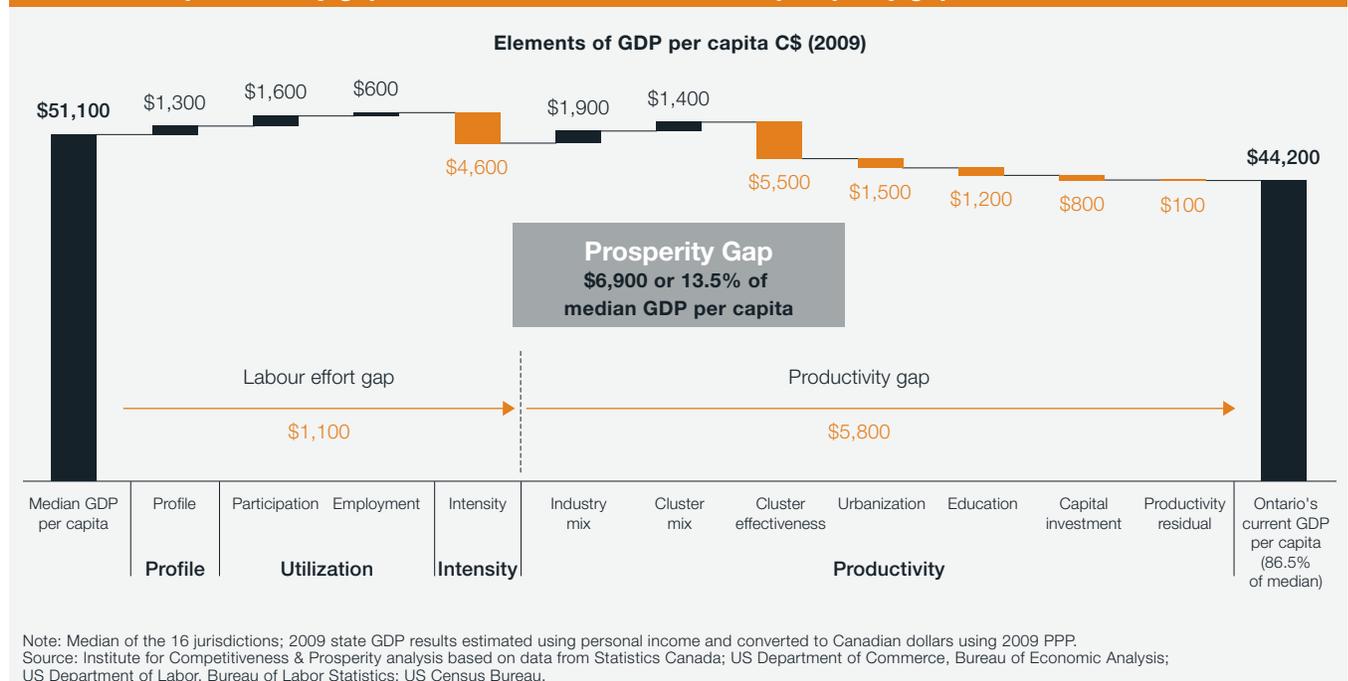
Relative to the 67.3 percent median of the sixteen peer jurisdictions, Ontario has a 3.0 percent potential profile advantage.⁵ Holding all other factors constant, we calculate this advantage to be worth \$1,300 in per capita GDP. In other words, we have a profile

advantage because we have a higher proportion of our population able to add to our prosperity.

As we discussed in our Fourth Annual Report in 2005, demographic projections indicate that, as in Québec, the proportion of Ontarians 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 that Ontario will maintain its advantage versus its peers.⁶ Nevertheless, Ontario will have fewer workers to create prosperity in the coming years. We estimate that by 2025 the smaller percentage of working age Ontarians will reduce GDP per capita potential by \$2,300.⁷ As we discussed in our 2006 Working Paper on hours worked, we will need creative retirement solutions to address this decline in our prosperity potential.⁸

Ontario has higher utilization than the peer states. As we discussed in our Fourth Annual Report, Ontario successfully reversed a decline in the utilization

Exhibit 9 The productivity gap accounts for most of Ontario's prosperity gap



⁵ Calculated as 1 minus [67.3 (Peers)/ 69.4 (Ontario)] = 3.0 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 Ontario's GDP per capita in 2005 and its potential in 2025; not the difference between Ontario and its peer group.
⁸ Institute for Competitiveness & Prosperity, Working Paper 9, *Time on the job*, September 2006, p. 21.

of its working age population during the latter part of the 1990s.⁹ In 1990, Ontario led all its peers except Texas in *participation*. Ontarians were more eager to work than people in any other state or province in its peer group. As economic conditions improved following the recession of the 1990s, more adult Ontarians rejoined the labour force, contributing to our economic potential. In 2009, 65.6 percent of Ontarians fifteen years of age and older worked or sought work (using data comparable to US methods of calculation).¹⁰

We rank first among the peer jurisdictions in labour force participation. The median participation rate was 63.2 percent. The US recession hurt participation rates, as many workers gave up looking for employment – hence they were not counted in the participation rate. Ontario's participation rates have not been as weak, and so our advantage here improved in 2008 and 2009. In 2009, this advantage for Ontario translated into \$1,600 in GDP per capita.

In the other component of utilization, *employment*, Ontario has traditionally trailed its peers, but the gap versus the peer median accounted for only a small part of our prosperity gap. In 2009, because of sluggish peer state performance, employment was a prosperity advantage for Ontario.

In 2009, our annual unemployment rate increased to 8.3 percent, up from 5.9 percent in 2008.¹¹ This rate (adjusted to the US definition) is lower than the median rate across peer jurisdictions of 9.7 percent. In other words, on average through 2009, 91.7 percent of those Ontarians participating in the work force had full-time or part-time work, which was higher than the median

performance of the peer jurisdictions, 90.3. This 1.4 percentage point advantage lifted our relative GDP per capita performance by \$600 in 2009. And, on another positive note, monthly unemployment rates in Ontario have been trending down since the peak of 8.9 percent in May 2009 – the highest rate we have experienced since May 1994.¹²

In summary, in 2009, Ontario employed 60.1 percent of its working age population (the combined effect of a 65.6 percent participation rate and an 8.3 percent unemployment rate), ranking second among the sixteen peer jurisdictions and above the peer median of 57.0 percent. This superior performance translates into a \$2,200 utilization advantage (the combined effect of a \$1,600 participation advantage and a \$600 employment advantage) in GDP per capita.

Ontario employees work fewer hours than their US counterparts – and this intensity gap remains a significant part of our prosperity gap. While Ontario outperforms the peer 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 peer states. In 2009, the average Ontario worker worked 1,652 hours, while at the median of the peer states, the average employee worked 1,806 hours. This gap of 154 hours, or 4.1 weeks annually, narrowed slightly from 2008, when Ontario trailed the peer median by 165 hours weekly or 4.4 weeks. Consequently, the importance of intensity on Ontario's prosperity gap decreased slightly from 2008, and 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 current economic downturn.

In 2006, the Institute conducted significant research into differences in intensity between Ontario workers and their counterparts in the peer states.¹³ We found that half of the intensity gap was due to Ontario workers taking more weeks of vacation and half was due to their working fewer hours when they were on the job. Within this shorter work week, we found that the largest component, about half, was the result of more Ontarians working part time. Much of this gap, in turn, was due to an inability of our part-time employees to find full-time work. Fully 32 percent of part-time workers, aged 25–64, in Ontario over the 1997–2004 period indicated that they worked part time because they could not find full-time work. Across the peer states, this proportion was only 16 percent. Most of our intensity gap reflects the desire of Ontarians to take more vacation, which is a preference, not a weakness.¹⁴ But, in our 2006 research, we found that nearly a quarter of the gap is because our economy does not create adequate opportunities for full-time work. This gap is felt most by several disadvantaged groups whom we have identified in previous work (See *Poverty lowers our prosperity potential*, for updated results).

Economic weakness in 2009 increased the percentage of Ontario part-timers aged 25–64, who reported an inability to find full-time work to 40 percent. Across the US peer states, the percentage had grown to 32 percent. As a result, this involuntary part-time gap shrank from 16 to 8 percentage points.

As we have seen, in the three labour effort factors, Ontario's advantage in the percentage of our population of working age has strengthened, and we have made remarkable progress in the percentage of Ontarians who are

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.

¹⁰ Statistics Canada reports Ontario's participation rate to be 67.3 percent; US definitions for who qualifies for inclusion in the labour force, and therefore is included in the participation rate, differ from Canada's definitions. We use US definitions for our calculations of differences between Ontario and its US peers.

¹¹ These unemployment rates are based on US definitions; official Canadian unemployment rates were 9.0 percent in 2009, up from 6.5 percent in 2008.

¹² Note these results are comparable to US data, not the official Canadian figures. Official Ontario results were 9.5 percent in May 2009.

¹³ Institute for Competitiveness & Prosperity, Working Paper 9, *Time on the job*, September 2006.

¹⁴ *Ibid.*, p. 34.

Poverty lowers our prosperity potential

THE TASK FORCE has been urging Ontarians to adopt a prosperity enhancing agenda to achieve our economic potential. But many are concerned that, while our agenda would increase prosperity, this benefit would primarily accrue to upper income Ontarians and reduce the economic prospects of lower income households and the working poor.

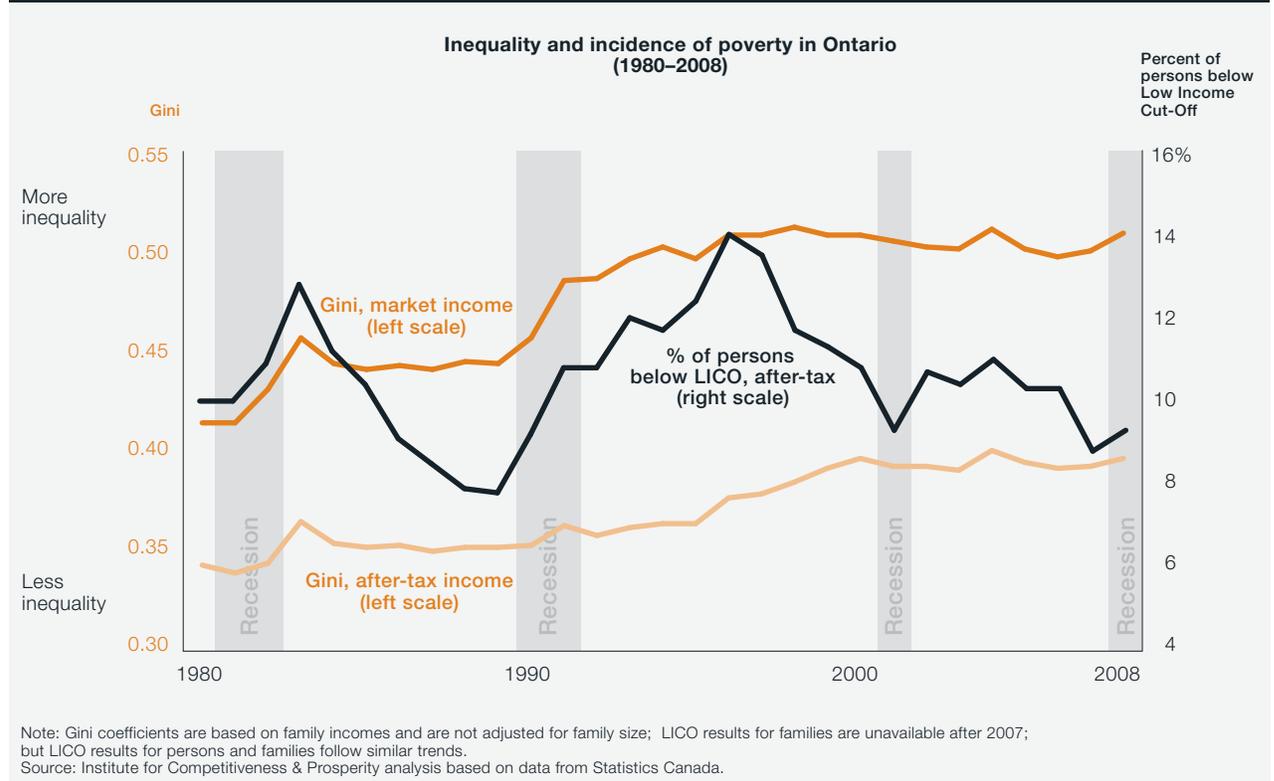
In its 2007 Working Paper, *Prosperity, poverty, and inequality*, the Institute explored the relationship between prosperity and poverty. This past year it updated these findings.

Though the Institute's research found that rising income inequality has been the norm in recent decades across developed economies, including Ontario's, it is incorrect to say that greater prosperity is driving greater inequality

as the two trends are not related. The more important consideration is the incidence of poverty, which is not the same as increased inequality.

In fact, we found that broad-based inequality, as measured by the Gini coefficient has not been closely related to poverty rates, as measured by the percentage of the population whose income falls below after-tax Low Income Cut-Off (LICO). Gini measures income inequality across a group of people. A Gini of 0 means that all people earn exactly the same income, while a measure of 1 means that one person receives all the income. These are extremes that are never found in a country or province; actual measures are typically between 0.3 and 0.5. The higher the Gini, the greater the inequality.^a LICO is a measure of poverty in Canada, defined as the income levels at which

Exhibit B Inequality has remained fairly flat in recent years; low income incidence has changed with economic cycles



^a For more information see Institute for Competitiveness & Prosperity, Working Paper 10, *Prosperity, inequality, and poverty*, September 2007, pp. 18-19.

persons or families spend 20 percentage points or more of their total income on food, shelter, and clothing than the average family of similar size.^b

Inequality gradually trended upward from the 1980s, and has remained relatively flat since around the mid 1990s. By contrast, poverty rates appear to be much more cyclical, increasing in periods of recession and falling during better economic times, especially from the mid-1990s to recent years (*Exhibit B*).

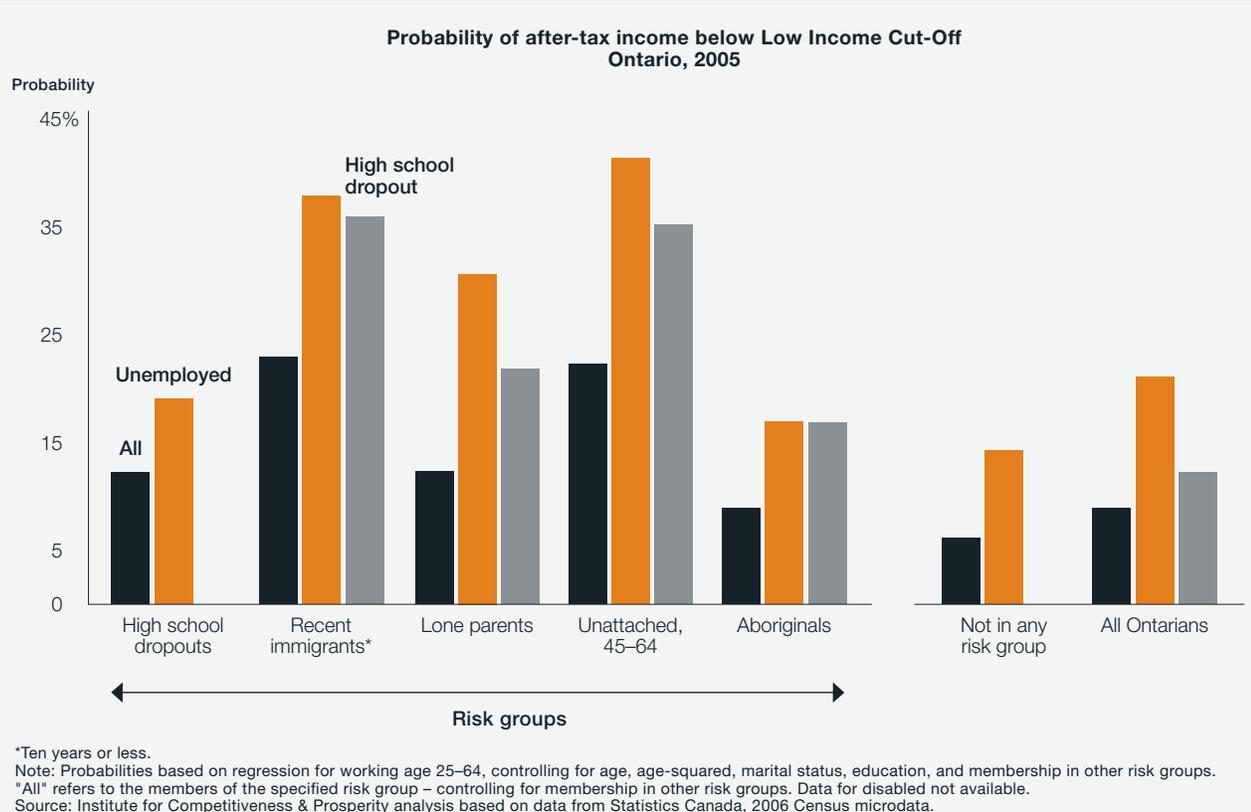
Our research has also revealed that poverty is not distributed randomly throughout society. It falls mainly on six specific high risk groups – high school dropouts, recent immigrants, lone parents, unattached individuals between the ages of 45 and 64, the disabled, and Aboriginals. The likelihood of after-tax income falling below LICO increases significantly for individuals who are in these risk groups. And much of the challenge they face is in achieving greater attachment to the labour force, where the probability of earning income below LICO increases dramatically for each risk group when these individuals are unemployed. The probability also increases when

other risk group members are also high school dropouts (*Exhibit C*).

Most of these poverty groups fall into working and service occupations – jobs that are disproportionately in routine-oriented, rather than in creativity-oriented, occupations. And given that the incidence of poverty has been shown to be driven greatly by business cycles, we must acknowledge that the current transformation of our economy – one that is shifting away from jobs based largely on physical skills and repetitive tasks, to jobs that require analytical and social intelligence skills – can exacerbate the poor economic outcomes of these poverty groups. This is indicative of the fact that in times of recessions, those in physical occupations are most susceptible to becoming unemployed (*Exhibit D*). Thus, education is a key element to lifting those who do not have the skills and opportunities to participate fully in the creative economy.

In addition, as recommended in *Ontario in the Creative Age* published by the Martin Prosperity Institute in 2008, Ontario would benefit greatly if we could develop strategies for enhancing creativity and autonomy in

Exhibit C Likelihood of being below LICO is higher for certain risk groups



^b *Ibid.*

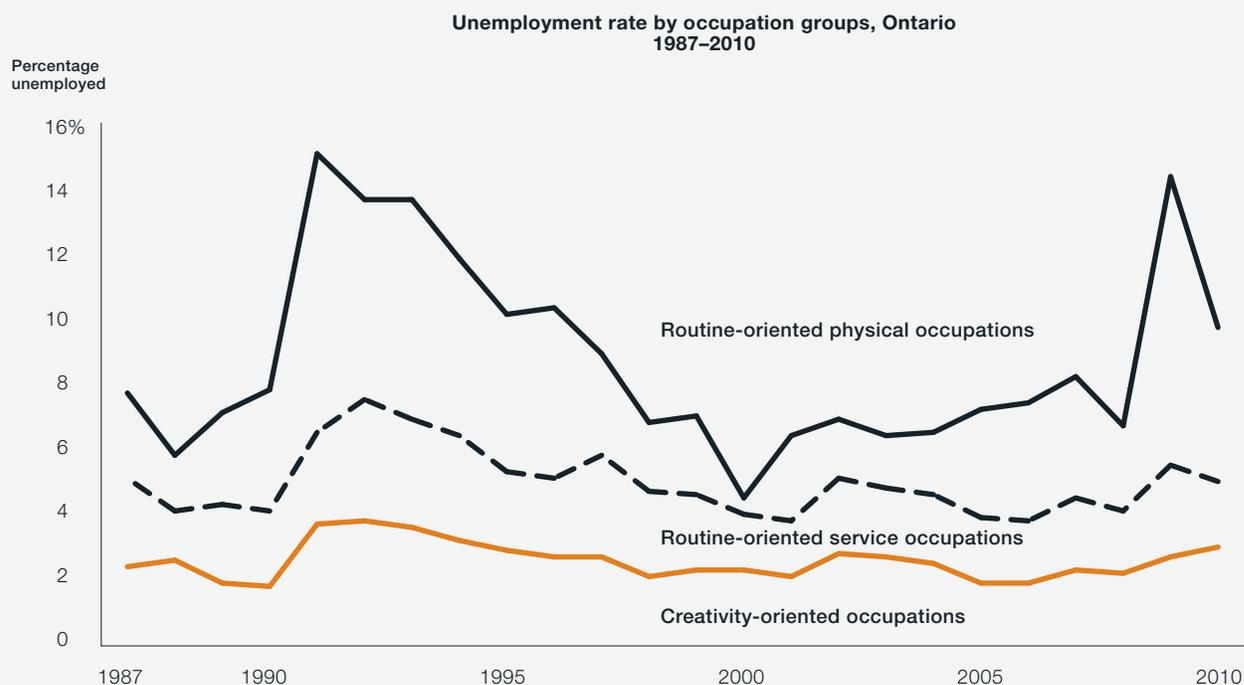
routine-oriented service occupations, so that workers' earnings would increase and employers would have stronger business models.^c

We need prosperity strategies that make real inroads into reducing poverty and increasing prosperity for as many Ontarians as possible. We think that it is more important to focus on public policy that reduces poverty among these high risk groups than to strive for greater equality by holding back opportunities for other Ontarians. And since each of these groups is excluded from Ontario's prosperity for its own reasons, each requires its own tailored solution.

Thus, innovative and highly focused public policies and programs must be established, with education being an important – if not, the most important – solution to reducing poverty. Innovative programs such as the Working Income Tax Benefit and wage insurance can provide encouragement for individuals in high risk groups to find work; and in this case, potentially foster greater job creation conditions.^d We should continue to strive for the best policy initiatives for helping people escape poverty.

If we are not successful in helping individuals in these groups move out of poverty, we are hurting our future prosperity potential. We need the skills and capabilities of all Ontarians to create economic success, and we cannot afford to ignore people in these high risk groups. If Ontario succeeds in realizing its full economic potential by following our Prosperity Agenda and by pursuing focused and innovative solutions for addressing poverty, more Ontarians will contribute to and participate in the rewards of enhanced prosperity.

Exhibit D Routine-oriented physical occupations are the most deeply affected during recessions



Note: The Labour Force Survey produces information of number of unemployed, the unemployment rate and the labour force by industry and occupation. The basis for these categories is industry or occupation of last job for those currently unemployed who have held a job in the previous year. The data are for April of each year and are adjusted for seasonality.

Source: Martin Prosperity Institute and Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada, Labour Force Survey microdata.

^c Martin Prosperity Institute, *Ontario in the Creative Age*, February 2008, pp. 31-32.

^d Institute for Competitiveness & Prosperity and Open Policy Ontario, *Time for a "Made in Ontario" Working Income Tax Benefit*, September 2009.

working. Still, differences in the number of hours worked continue to be a major contributor to our prosperity gap. Even with the overall gains in labour effort, our prosperity gap persists.

Higher productivity is needed to close Ontario's prosperity gap

Over the last decade, lagging productivity has accounted for the greatest share of the prosperity gap with our peers, and in 2009 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. Ontario 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 peer states.¹⁵ 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, or 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 less than 2 percent of employment in Ontario in 2006.

Drawing on Porter's methodology, the Institute has determined that fully 36.4 percent of employment in Ontario is in clustered industries versus the median of 29.2 percent in the peer jurisdictions. 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 output than would be likely if Ontario's mix were the same as that of the peer states.¹⁶

Within clustered industries, Ontario has a beneficial mix. While all clustered industries are positive contributors to productivity and innovation, some have higher potential than others. Ontario's relative employment strength in financial services, automotive, metal manufacturing, publishing and printing, and others has created an attractive mix of traded industries. Our analysis of Ontario's cluster mix indicates a \$1,400 per capita advantage over our peers.

Cluster under performance is a significant part of Ontario's productivity gap. While Ontario has an excellent industry and cluster mix, cluster effectiveness is much lower than that in the peer states. That is to say, in the same clusters, wages in Ontario firms are lower than those of their counterparts across the peer states. Across all traded clusters the average wage in Ontario is 14.7 percent lower than the average in the median peer state. This lower wage reflects lower

productivity and innovation in our traded clusters, 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,¹⁷ our structures of specialized support and competitive pressure are inadequate relative to the experience in clusters of traded industries in the peer states. In research we conducted in 2008 in collaboration with the Martin Prosperity Institute, we found that Ontario's clustered industries drew less on workers in creativity-oriented occupations than their counterparts in the peer states.¹⁸

If Ontario clusters were as effective as US clusters, wages would be \$13,200 per worker higher. As traded clusters account for 36.4 percent of Ontario employment and given the relationship between wages and productivity, our overall productivity would rise by 13.4 percent.¹⁹ From this, we estimate the productivity loss from the lower effectiveness of our clusters to be \$5,500 per capita.²⁰

Adding together the effects of industry mix (+\$1,900), cluster mix (+\$1,400), and effectiveness (-\$5,500) Ontario's clusters provide a net loss of \$2,200 in GDP per capita versus the peer 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

¹⁵ 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.

¹⁶ 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.

¹⁷ Task Force on Competitiveness, Productivity and Economic Progress, Third Annual Report, *Realizing our prosperity potential*, November 2004, pp. 40–48.

¹⁸ *Idem*. Eighth Annual Report, *Navigating through the recovery*, November 2009, pp. 27–29.

¹⁹ We have netted out the effects of Ontario's lower urbanization, our under investment in capital, and our lower educational attainment in this calculation.

²⁰ 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 Ontario versus peer states. Our new method is a more direct comparison between wages in traded clusters and is more intuitive.

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 Ontario than in the peer states, our relative productivity and prosperity potential are reduced.²¹ Our analysis this year indicates that we have a \$1,500 per capita disadvantage against the peer median 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.²² And higher wages are the result of higher productivity.²³ Ontario's population has, on average, a lower level of educational attainment compared to those living in the peer states, particularly for university graduates. Adjusting the mix of educational attainment in Ontario to match the US mix and holding wages constant at each attainment level, Ontario's productivity would be higher by \$1,200 per capita.

Under investment in capital lowers productivity. Ontario 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 Ontario is not as modern as that of their counterparts in the peer states.²⁴ As a result, Ontario workers are not as productive. We estimate this under investment in capital equipment lowers Ontario's productivity by \$800

per capita. This estimate is based on our simulation of Ontario 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). Ontario's businesses invest about a 18 percent less per dollar of GDP in ICT and slightly more in non-ICT machinery, equipment, and software.²⁵ Our analysis indicates that Ontario businesses under invest in all machinery and equipment by 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 \$100 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 getting worse

As we have seen, through most of the 1980s, Ontario's prosperity was close to the median of the peer states. During that period, we had a productivity and intensity disadvantage versus our peers – 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 2001 it was an advantage again. However, our productivity disadvantage began to grow in 1995, and by 2005 it had more than doubled.

In the current economic downturn, labour effort has fallen off much more in the peer states than in Ontario, while their productivity has grown faster than Ontario's. It is difficult to project current experience 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 (see *Exhibit 4*).

In summary, against our North American peers, Ontario 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 Ontario still lags in productivity.

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

Ontario's prosperity compares favourably with that in international peer regions – using a similar criterion for identifying North American peers. Few regions are like Canadian provinces and US states in that they are part of a federal state and have their own economic policy levers, including a wide range of tax powers and spending responsibilities. Australia's states and Germany's länder are the only ones that closely resemble North American provinces and states. Many countries with developed economies – such as the United Kingdom, Japan, and France – are unitary states where regions have little economic control. In most countries, we took their formal structure (for example, France and departments, Italy and regions) as the peers for analysis. In Japan, we relied on the government of Japan's Economic and Social Research Institute's divisions, which combined prefectures, as several of these were city based, into regions. However, we have only included the two largest, Kanto, which includes Tokyo, and Kinki, which

²¹ See "Prosperity and productivity lag in Ontario cities" sidebar in our Sixth Annual Report, *Path to the 2020 Prosperity Agenda*, pp. 24-25.

²² 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.

²³ See Exhibit D in "Why productivity is important for our prosperity," *Path to the 2020 Prosperity Agenda*, pp. 28-30.

²⁴ Capital investment results are not available at the state level. Our analysis uses US results to estimate peer state investments and compares these to Ontario.

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.

includes Osaka. These two make up more than 50 percent of Japan’s population. In addition, some of the important data for Japan are only available at the national level. Japan’s statistical agencies do not report regional GDP data for recent years. As a result, we relied on Japan’s national GDP growth rate from 2007 to 2008 to approximate Kanto and Kinki’s GDP for 2008.

We also removed jurisdictions that were essentially metropolitan areas. Our rule was to exclude jurisdictions or regions whose density exceeded that in the Toronto Census Metropolitan Area or where one city’s metropolitan population accounted for more than 65 percent of the state population – the highest ratio among the North American peer states (Boston and Massachusetts). These filters excluded Île de France (Paris), Greater London, Randstad (Amsterdam, Rotterdam, the Hague, and Utrecht), and Comunidad de Madrid.

Among the peer set of thirteen international regions, Ontario stood seventh in GDP per capita in 2008 (see *Exhibit 1*). It is fair to say that we have built one of

the most globally competitive jurisdictions here in Ontario. However, just as we have found in comparisons with North American peers, Ontario’s main challenge is to improve its productivity. We match our international peers through more labour effort, but we trail the median of our international peers in productivity.

We compared Ontario’s sources of prosperity with these international peers using the same waterfall approach we have developed for North American peer comparisons. Lack of data prevents us from providing the same level of detail, but we can compare Ontario’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 (*Exhibit 10*).

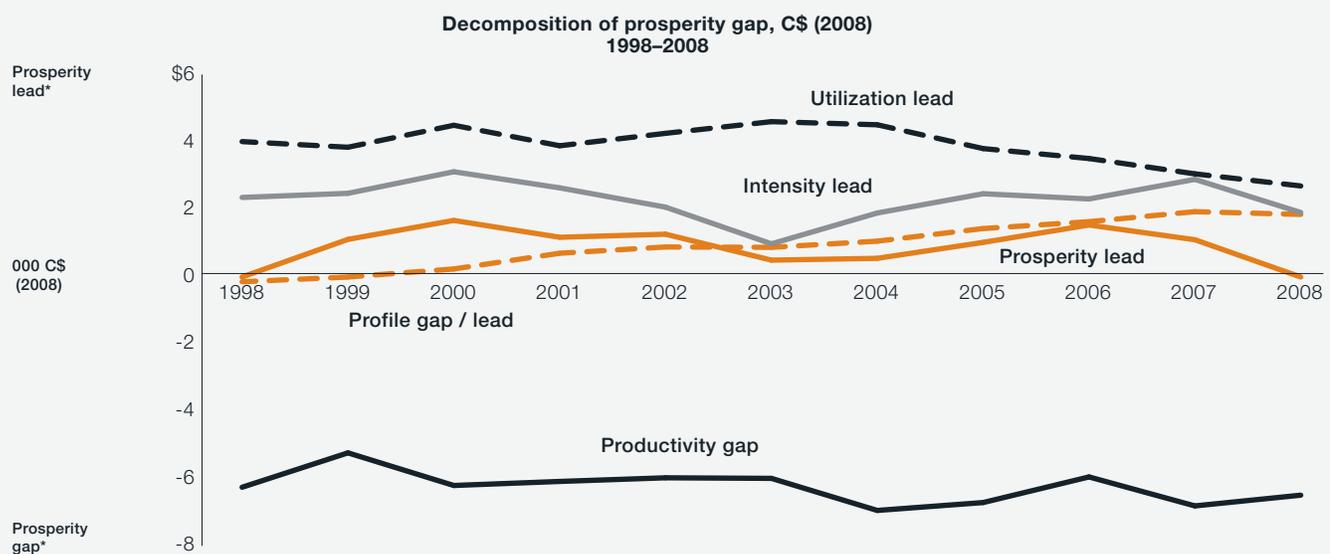
A closer look at two of the regions points to our productivity challenges. The most competitive region outside North America is Hessen in Germany. In 2008, Ontario’s GDP per capita was \$6,800 behind Hessen’s. We had

a \$16,500 per capita labour effort advantage – through better demographics, higher utilization, and more hours worked per worker. But we had a \$23,300 per capita productivity disadvantage. Less dramatic was our experience versus New South Wales, whose GDP per capita exceeded that in Ontario by \$100 in 2008. Ontario had a \$1,600 per capita labour effort advantage over New South Wales, matched by a \$1,700 productivity disadvantage.

These international comparisons again indicate that lagging productivity remains Ontario’s challenge – we work more than those outside North America, but we are less successful at adding economic value in the hours we work.

Our challenge is to recover from the recession and to build our full prosperity potential for the benefit of all Ontarians. Higher productivity is critical to our success. And improving our productivity means improving our innovation performance.

Exhibit 10 Ontario’s productivity lags international peers



* Versus median of 13 world peer jurisdictions.
 Note: Currency converted at PPP.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; Australian Bureau of Statistics; National Bank of Belgium; Institut national de la statistique et des études économiques; Statistische Ämter Des Bundes Und Der Länder; L’Istituto Nazionale di Statistica; Instituto Nacional de Estadística; UK Office for National Statistics; SNA Statistics National Accounts of Japan; OECD; IMF; Eurostat.



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, Ontarians would invest more in machinery, equipment, and software and in education.

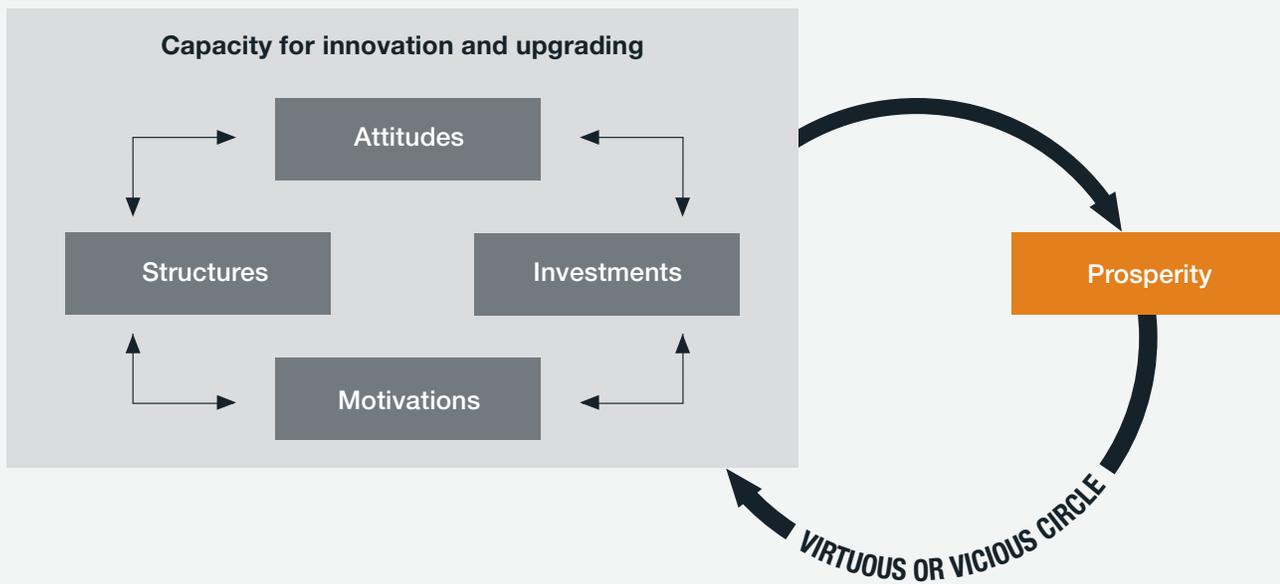
Motivations from taxation would be more positive, as governments would not see the need for raising tax rates. And greater economic prosperity would improve structures as more opportunities for specialized support were created. Then increased economic activity would drive more competitive intensity. These developments would lead to even higher prosperity, which would further strengthen each AIMS element, and so on in a virtuous circle (*Exhibit 11*).

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 11 AIMS drives prosperity; prosperity drives AIMS



Source: Institute for Competitiveness & Prosperity.

Attitudes: Encourage innovation for Ontario to win in an ever more competitive global 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 region's innovation performance. Our work and the work of others indicate that poorly formed attitudes are not the cause of our innovation under performance. Our business leaders share a similar outlook on innovation with their counterparts around the world. Our challenge is to turn those 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. And in our First Annual Report, *Closing the prosperity gap*, we hypothesized that Ontarians 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 the peer states were not significant roadblocks to closing the prosperity gap. In contrast to commonly held perceptions, we differed very little from our US counterparts in how we view 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, we 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 peer 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. But more action is required.

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 to address issues raised by globalization. The Panel made important specific recommendations to realize the vision they set out for Canadians. Most of these are consistent with the Task Force's 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 this performance.

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

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 Ontario is to overcome the complacency that results from the many advantages we have.

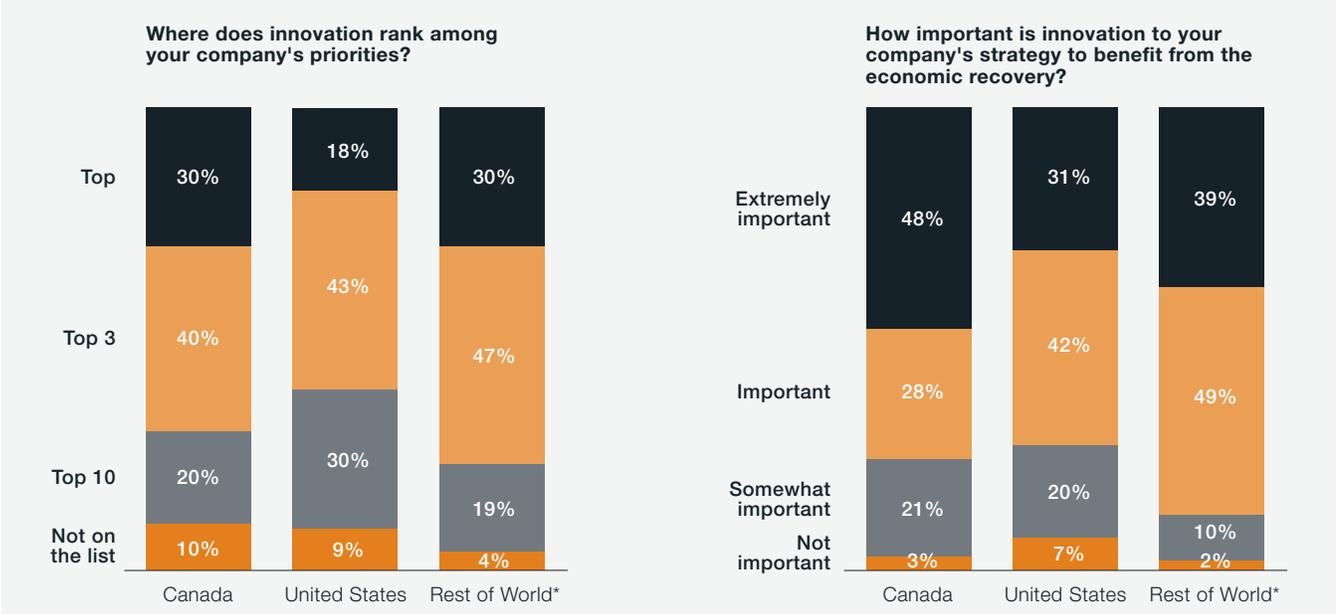
Innovation now has top priority

More recently, the Boston Consulting Group released the results of its annual global survey of senior business executives on their innovation practice.²⁹ Overall, the survey revealed that executives have 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 (*Exhibit 12*). 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.

If our attitudes are so positive, 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. Our polices 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 12 Canadian business executives rate innovation as important as their international peers do



* Excluding the United States, but including Canada. Source: 2010 BCG/Bloomberg BusinessWeek Innovation Survey.

²⁷ Expert Panel on Business Innovation, *Innovation and Business Strategy: Why Canada Falls Short*, Council of Canadian Academies, 2009.
²⁸ *Ibid.*
²⁹ 2010 BCG/Bloomberg BusinessWeek Innovation Survey.

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. Prudence will require that spending be restricted to absolutely necessary current expenditures, since they cannot be avoided. 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.

Raise investment in education

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

Contrast Canada's response to the 1990–93 economic downturn with that of the United States, which admittedly entered that recession in better fiscal shape than Canada. US governments did not need to engage in the dramatic deficit fighting seen in Canada. State systems, such as education, therefore

did not experience the kind of shock that Canadian education experienced. So, over the same period, spending by governments in the United States grew at about the same rates for health care and education.

In 1992 in Ontario, all levels of government spent \$2,400 per capita on education (in 2009 dollars) – 6.8 percent more than we spent on health care (*Exhibit 13*). But a perfect storm arose to change the course of our public investment patterns. Ongoing deficits federally and in many provinces since 1971 had caused 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.

Ontario had still not recovered from the deep deficits created during the recession in 1995, and the new provincial

government had to make spending cuts to get its fiscal house in order.

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

Broadly speaking, public expenditures can be broken into two fundamental buckets: investment in building future prosperity, and consumption of current prosperity. As governments at both 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 consumption. By 1998, governments in Ontario 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 real rate of 4.7 percent between 1998 and 2009, while education spending increased only 2.4 percent annually. Last year, per capita public spending on health care outpaced spending on education by 29 percent, a significant reversal from a decade ago.

It is encouraging to note that public spending on education in Ontario has turned up in recent years, led by the investments of the Ontario government in post secondary education. While constant dollar per capita public investments in education increased slightly, at a rate of 0.8 percent annually between

1997 and 2003, this annual growth rate increased to 3.6 percent between 2003 and 2009. In the United States, the annual growth in constant dollar public expenditure on education was 1.7 percent between 2003 and 2008.

Still, much remains to be done, as the gap to be closed on education spending remains considerable – at \$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 in mind.

Increase the number of international students at our universities

In the 2010 budget, the Ontario government announced a goal of raising Ontario's post secondary attainment rate from 60 percent currently to 70 percent, ensuring there will be a place for every qualified Ontarian who wants to go to college or university. At the same time, the government will also increase international student enrolment by

50 percent while guaranteeing spaces for qualified Ontario students.

More recently, the provincial government announced a new scholarship fund for international doctoral students. The fund provides seventy-five scholarships, worth \$40,000 each year for up to four years, for international students to pursue studies at participating Ontario universities.³⁰

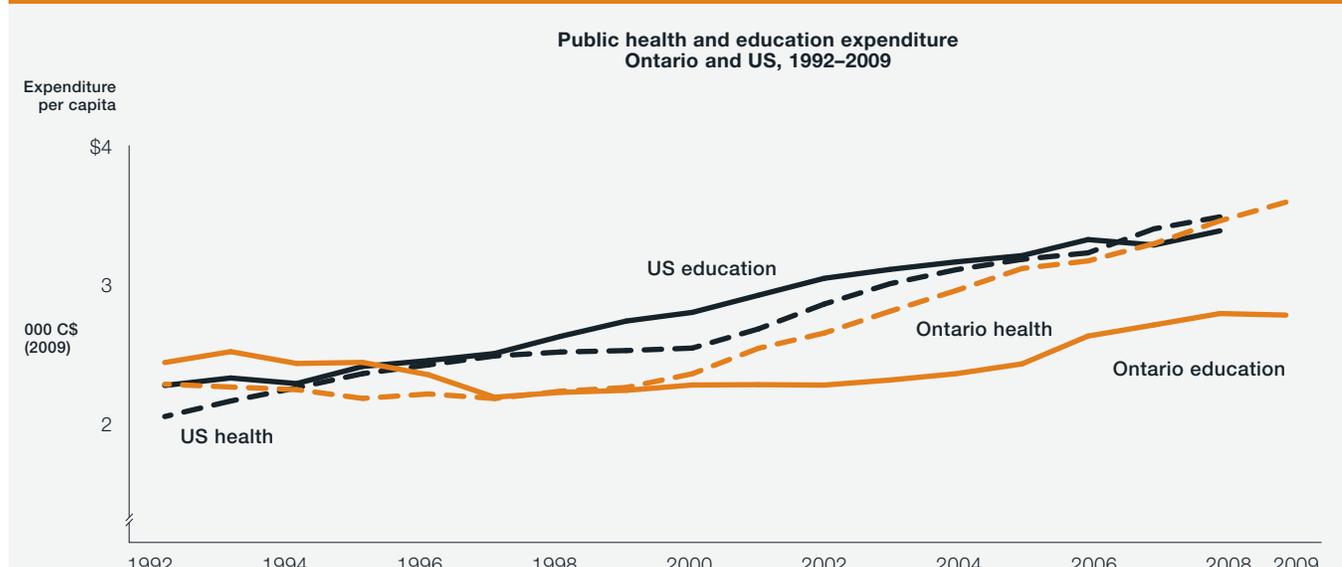
Increased enrolment by international students is a promising opportunity for Ontario. First, it allows Ontario to attract the best students from around the world – a positive impact on the schools and Ontario more broadly. Second, our ability to attract international students is a good indicator of the 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, it has the potential to increase the financial sustainability of our post secondary institutions as international students typically pay full tuition costs, albeit with more scholarships and aid from the institution.

The Institute's research indicates that Canada is well down the list of countries attracting international students. At 68,000 students annually, Canada trails the United States, which attracts 585,000. On a per capita or per domestic student basis, we are roughly the same. Both Canada and the United States trail the United Kingdom, France, and Australia on a per capita basis.³¹

Canada matches OECD undergraduate experience, with around 7 percent who are international students. A higher percentage of our graduate students are international – 21 percent in Canada versus 16 percent across OECD countries. In the United States, only 3 percent of undergraduate students are international in contrast to 24 percent of graduate students. The United Kingdom and Switzerland have the highest percentage of their students from abroad – around 15 percent of undergraduates and 45 percent of graduate students.³²

The type of discipline chosen by international students does not vary much across the Canada, the United

Exhibit 13 In Ontario, public investment in education trails health care spending



Notes: US health spending includes workers' compensation, medical benefit outlays and excludes administrative and other costs; Ontario health spending includes all workers' compensation. Values deflated using GDP deflators. 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.

³⁰ "Ontario to Attract More International Students," available online: <http://news.ontario.ca/opo/en/2010/11/ontario-to-attract-more-international-students.htm>
³¹ Institute for Competitiveness & Prosperity analysis of data from Statistics Canada and UNESCO.
³² OECD, *Education at a Glance 2009*, Table C2.1.

Kingdom, and the United States. Just under half of international students in Canada are enrolled in the social sciences, arts, and humanities (which includes commerce) nearly matching the United Kingdom at 55 percent and about the 42 percent in the United States. 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 5 percent in Canada, 9 percent in the United Kingdom, and 7 percent in the United States.³³

In Ontario, study preferences have been consistent over time, with a third of applicants indicating their first field of study choice to be commerce, management, and business administration. Next most popular are the arts and humanities, chosen first by 19 percent of applicants in 2008, followed by 17 percent choosing engineering and 14 percent choosing sciences. Applications in each of these major disciplines grew over the 2001–2003 period and then declined to 2006. Since 2006, applications have grown slowly at about 3 percent annually.³⁴

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; Education Australia projects 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 to build bricks and mortar facilities to keep more of their students at home.³⁵

The governments of Canada and Ontario 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 website 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 website. Canadian embassies run their own programs in which provincial international education programs can participate.

Through Opportunities Ontario, the provincial government supports employers sponsoring international graduates for fast-tracking permanent residency. In its recent Ontario-China trade mission, the province promoted Ontario post secondary education. The University of Windsor developed its own targeted marketing strategy and reports attracting a significantly higher percentage of international students. The provincial governments in British Columbia, Québec, and Nova Scotia have more aggressive marketing campaigns than Ontario.

Australia and the United Kingdom have more complete website offerings and have developed marketing campaigns (e.g., to promote the “EducationUK” brand). The US Government in addition to a website provides a physical centre for free advisory and information services in every major country in the world. Universities participate in trade missions run by individual states.

The Institute found that student visa requirements for graduating international students are similar across jurisdictions. Typically students must prove that they have been accepted to 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 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.³⁶

Recent survey of international students in Ontario points to opportunities

The Canadian Bureau for International Education, a not-for-profit organization that promotes Canada's international relations through education, surveys international students here in Canada. In general, international students report satisfaction with the various elements of studying in Canada. Fully 95 percent of international students agreed fully or somewhat that Canada is a “great place to develop your potential.” The three most significant reasons chosen for studying in Canada are the quality of education, prestige of the degree, and the availability of the student's desired program. However, more can be done to make our campuses more welcoming places:

- By and large these students were satisfied with the **admission and pre-arrival process**, although a

³³ OECD, *Education at a Glance 2009*, Table C2.5.

³⁴ Institute for Competitiveness & Prosperity analysis of data from Ontario Universities' Application Centre (OUAC).

³⁵ Janet Ilivea, “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>

³⁶ Moira Herbst, “H-1B Visas: ‘Buy American’ Comes to TARP,” *BusinessWeek*, February 6, 2009, available online: http://www.businessweek.com/blogs/money_politics/archives/2009/02/h-1b_visas_buy.html

third indicated some problems with arranging for living accommodation, obtaining funds for tuition, and correspondence with the university

- In response to a question on **why they were studying in Canada**, the highest level of importance was given to the quality of education, the safeness of Canada, the fact that the program of choice was offered in English, and Canada's reputation
- In general, international students were satisfied with their **experience at their Canadian university**. However, a solid minority disagreed that "instructors showed sensitivity to racial issues" or that "instructors showed interest in the student's academic progress." Still, less than 10 percent disagreed that they were "satisfied with the decision to study in Canada" or that they "would recommend Canada to people in their home country."
- International students had challenges in **adjusting to university here in Canada**. Most reported success in choosing a program of study to meet their objectives, in understanding the information presented in class, and living in Canada. But more than a third reported little or no success in getting involved in on- and off-campus

activities, making friends with Canadian students, and in obtaining academic advice.

Financial incentives work well for institutions in attracting international undergraduate students, but not so well for graduate students. Average tuition paid by international undergraduate students ranges between \$17,200 for arts and sciences to \$19,000 for commerce, and \$20,800 for engineering. These levels are about \$4,000 to \$5,000 more than what the institutions receive from domestic students through tuition and government operating grants.³⁷ Institutions receive no government grants for international students.

At the graduate level, the situation is different. Institutions receive tuition from domestic and international students and grants from the provincial government for domestic students. However, the institutions provide significant financial support from their own resources to attract these students – in the form of grants or teaching jobs or both. The net effect is that universities receive less net revenue from international graduate students than from domestic students (*Exhibit 14*). In fact, they undergo a slight loss by admitting international doctoral students.

The cost to provincial and federal governments for graduate students – both domestic and international – is significant.

Attracting more international students to Ontario's universities has many benefits, adding to the prestige and overall quality of the school. Yet the financial impact on institutions needs to be assessed further. In strict financial terms, institutions do not have the incentive to attract international students. If Ontario is to pursue the worthwhile objective of attracting more international students, we need to think through the financial incentives carefully.

Continue investing in people to encourage innovation

Since our First Annual Report in 2002, we have identified the importance of investing in post secondary education for Ontario'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 a regional economy

Traditionally, the inputs for economic growth have been understood to be capital and labour. But economists

Exhibit 14 Universities generate less net revenue from international graduate students

	Doctoral stream Masters		Doctoral	
	International student	Domestic student	International student	Domestic student
Tuition from student	\$ 16,464	\$ 7,538	\$ 16,416	\$ 7,491
Operating grants from province	—	12,864	—	26,659
Gross revenue to institution	\$ 16,464	\$ 20,402	\$ 16,416	\$ 33,150
Institution support (e.g., student aid, teaching position)	(12,292)	(9,875)	(17,398)	(11,593)
Net revenue to institution	\$ 4,172	\$ 10,527	(\$982)	\$ 21,557

Source: Institute for Competitiveness & Prosperity analysis based on data from Council of Ontario Universities and G13 Data Exchange.

³⁷ Universities offer scholarships and aid for international and domestic students, but detailed results are not available. Representatives from the universities indicate that such funding for international undergraduates would not change their financial contribution.

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.³⁸ Craig Riddell also found a strong correlation between labour force quality (as measured by test scores) and per capita economic growth rates.³⁹ 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.⁴⁰ 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.⁴¹ An earlier study found that graduates of the Massachusetts Institute of Technology had created over 4,000 companies

world wide, with total sales of US \$232 billion.⁴²

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.⁴³

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.⁴⁴

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.⁴⁵ These occupations require higher levels of education – so in some sense higher education is a good defence for Ontario 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 wages and experience less unemployment. They are healthier, live longer, and are less likely to be involved in crime than those with fewer years of schooling.⁴⁶

In our study of poverty in Working Paper 10, the Institute concluded that post secondary education was a critical ingredient in reducing poverty.⁴⁷ The Institute identified several groups who had a higher-than-average propensity for being in poverty – high school drop-outs, recent immigrants, lone parents, the disabled, unattached individuals between the ages of 45 and 64, and Aboriginals.

³⁸ 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.

³⁹ 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.

⁴⁰ Richard Florida, *Technology and Tolerance: The Importance of Diversity to High Technology Growth*, Center on Urban and Metropolitan Policy, 2001.

⁴¹ PriceWaterhouseCoopers, *The University of Waterloo: Regional Economic Benefits Study*, 2001.

⁴² Bank of Boston Economics Department, *MIT: The Impact of Innovation*, 1997.

⁴³ Institute for Competitiveness & Prosperity, Working Paper 11, *Flourishing in the global competitiveness game*, September 2008, p. 27.

⁴⁴ 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.

⁴⁵ Institute for Competitiveness & Prosperity, *Trade, innovation, and prosperity*, September 2010, pp. 40-43.

⁴⁶ See for example 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. 01-23, 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.

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

Except for recent immigrants, educational attainment across each risk group was below the Ontario 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 its study of hours worked in Working Paper 9, the Institute found that the incidence of involuntary part-time work decreased as educational attainment increased.⁴⁸

Businesses need to step up their investments in innovation

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

Ontario businesses continue to trail their US counterparts in investing in machinery, equipment, and software to make their workers more productive

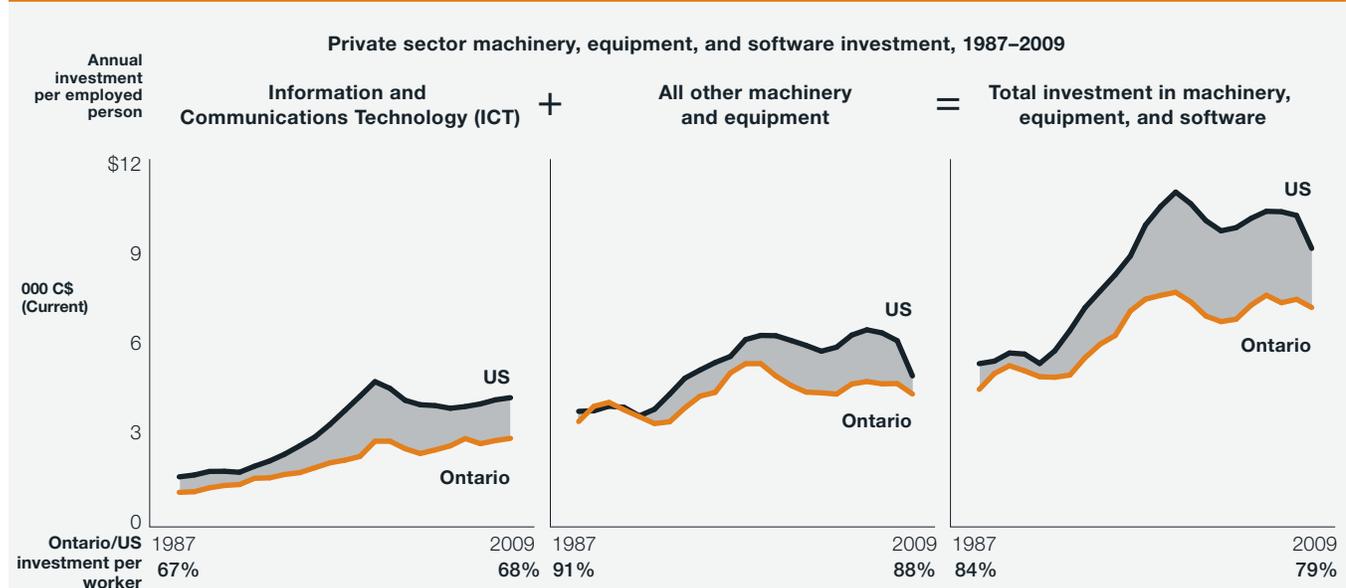
Such investments that are made are typically allocated to ICT and to all other categories, such as transportation equipment and traditional factory equipment. ICT accounts for about 40 percent of investment in machinery, equipment, and software.

On a per worker basis, US businesses out invest Ontario businesses in machinery and equipment overall with the gap being larger in ICT (Exhibit 15). 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 Ontario and US investment per worker began to narrow in 2005. In 1987, our businesses invested 16 percent less per worker in all machinery, equipment, and software; in 2003, this gap had grown to 31 percent; in 2009, it had fallen to 21 percent.

In 2009, the Ontario-US gap in ICT investment per worker was \$1,350 or 32 percent, while in other machinery and equipment the gap was \$600 or 12 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.⁴⁹ 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. But the most significant benefit of ICT adoption can

Exhibit 15 Ontario businesses lag their US counterparts in ICT investments



Note: US dollars converted to Canadian dollars using PPP for M&E.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada (special tabulations); Labour Force Survey (CANSIM Table 282-0002); US Department of Commerce, Bureau of Economic Analysis; US Bureau of Labor Statistics, Current Population Survey; CSLS Database of Information and Communication Technology (ICT) Investment and Capital Stock Trends: Canada vs. United States, available online: <http://www.csls.ca/data/ict.asp>.

⁴⁸ *Idem.*, Working Paper 9, *Time on the job*, September 2006, pp. 25-26.
⁴⁹ 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

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, less adequate management capabilities to discern the benefits of technology and to capitalize on them, and higher taxation on business investment.

Ontario's significant tax reform will eliminate the tax disadvantage. And opening up trade with Europe and developing economies will increase the support and pressure for investment.

Business R&D investment lags peers' spending

Ontario's R&D investment gap with its US peers has largely been in the business sector. As a percentage of GDP, Ontario's R&D investment over the last two decades is behind the rate achieved by the peer states, and it trails leading

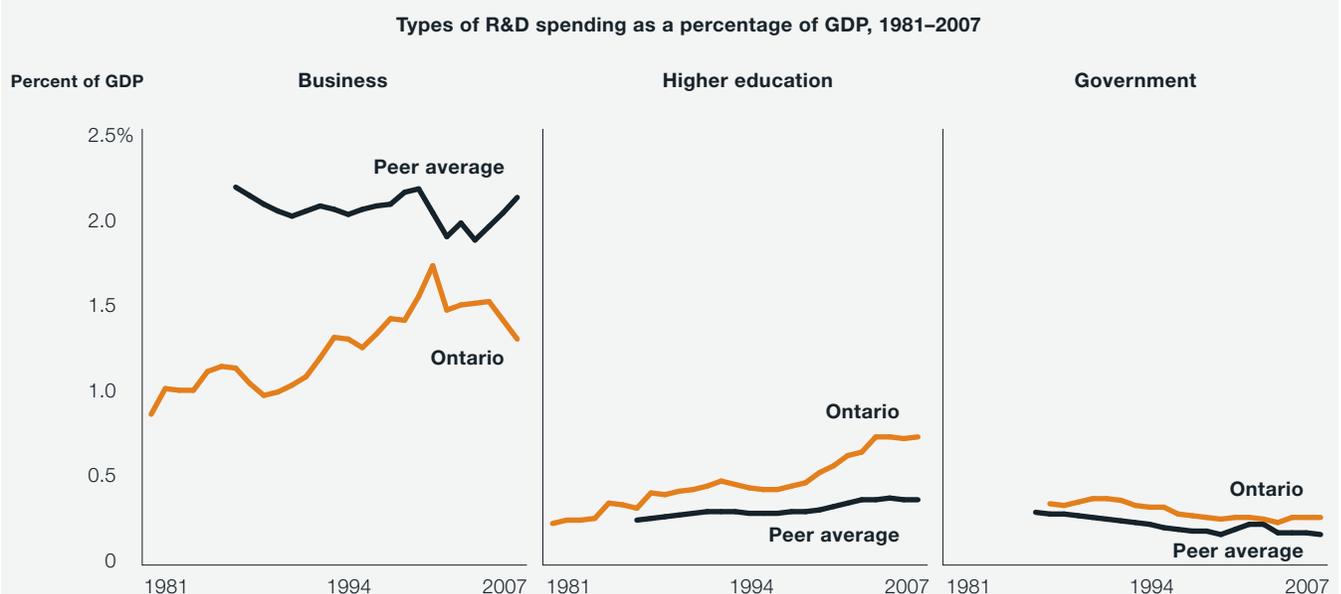
states like California and Massachusetts by a significant margin (*Exhibit 16*). A closer examination of Ontario's R&D spending indicates that our gap is in the area of private sector business research and development, not in publicly funded higher education and government research and development. We 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.”⁵⁰ 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.⁵¹ Statistical tests also show a positive relationship between the change in average intensity of business R&D and the change in multifactor productivity growth.⁵² 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.⁵³

Overall R&D expenditure in Ontario lags peers, because of shortfalls in business R&D. Gross expenditure in R&D (GERD) is typically assessed for three main performers: business, higher education, and government. In the area

Exhibit 16 Ontario trails its peers in business R&D



Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; National Science Foundation, Division of Science Resources Statistics; and US Bureau of Economic Analysis.

⁵⁰ OECD, *Frascati Manual*, 1993, p. 29.

⁵¹ Zvi Griliches, “Introduction,” in NBER, *R&D, Patents, and Productivity*, 1984, p. 18.

⁵² OECD, *The New Economy: Beyond the Hype*, 2001, p. 43.

⁵³ Zvi Griliches, Ariel Pakes and Bronwyn Hall, *The Value of Patents as Indicators of Inventive Activity*, NBER Working Paper No. 2083, 1988, p. 3.

of business R&D, Ontario lags its peers 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 Ontario increased by 50 percent from \$4.8 billion in 1997 to \$7.6 billion in 2007. As a percentage of GDP, BERD rose from 1.3 percent in 1997 to a peak of 1.7 percent in 2001 before falling again to 1.3 percent in 2007. Comparing Ontario’s performance with our 14 peer states and Québec, we find that Ontario significantly underperformed several jurisdictions, notably Massachusetts, Michigan, New Jersey, and California in terms of BERD per GDP dollar.

• Higher education expenditure on R&D (HERD)

has increased steadily in Ontario over the past 20 years. During

the late 1990s, HERD rose in response to increases in funding by the provincial and federal governments. In comparison to its peers, Ontario performed well in higher education R&D both as a percentage of GDP and per capita. By 2007, Ontario stood second in HERD per GDP dollar (trailing Québec).

• Government expenditure on R&D (GOVERD)

makes up a small proportion of total R&D performed in Ontario, at just 12 percent in 2007. In Canada and the United States, government R&D as a percentage of GDP is in long-term decline.

In summary, by the mid-1990s, Ontario approached average performance 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.

Ontario businesses produce fewer patents

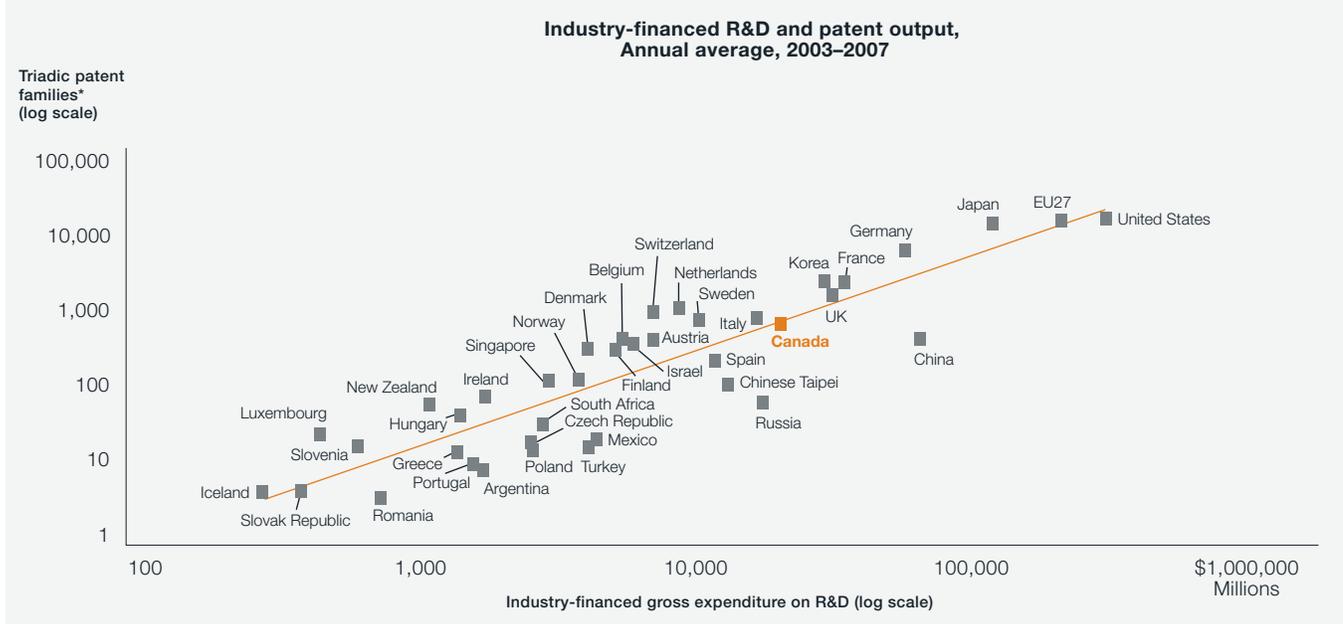
A key measure of innovative capacity and processes is patenting. While it is

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.⁵⁴ R&D and patent output are closely linked – more dollars spent by businesses on R&D lead to more patents (*Exhibit 17*).

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.”⁵⁵

To measure Ontario’s innovative capacity, we gathered information on patents by Canadians at the US Patent and Trademark Office. US patent information is a good indicator for Canadians because “patents are often sought first

Exhibit 17 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.

⁵⁴ 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.
⁵⁵ Manuel Trajtenberg, “Is Canada Missing the ‘Technology Boat’?” Centre for the Study of Living Standards, 1999, p. 5.

and foremost in the US where the standards for patentability are more stringent than in most European countries.”⁵⁶ In addition, because of its size and economic strength, the United States represents a significant potential market for a typical patent.

As we have observed with the wage and productivity performance of our traded clusters, Ontario has a good mix of traded clusters, but they are less effective in productivity and wage performance. In a 2004 report, the Institute found that Ontario's traded clusters trailed US peers by fully 55 percent in patent output per 10,000 employees. Our mix of clusters was such that if they matched US patent results, Ontario patents would be only 2 percent behind the peer states' patents. So, nearly all Ontario's disadvantage (53 percent of the 55 percent) is because of lower effectiveness.⁵⁷

More recent patent data across all industries for the years 2005 to 2007 from the Martin Prosperity Institute indicate a 40 percent lag for Ontario

versus the median performance of its peer states. Of the sixteen peer jurisdictions, Ontario ranked fifteenth, ahead of Québec only (*Exhibit 18*).

Large incentive packages to attract businesses are often not wise investments

Ontario should avoid large incentive packages to attract new businesses to the province. Like other states and provinces, Ontario has drawn on specially targeted incentives to attract new businesses or to assist in expansions of existing ones. Research by academics shows that such incentives do not produce economic results that justify the expense.

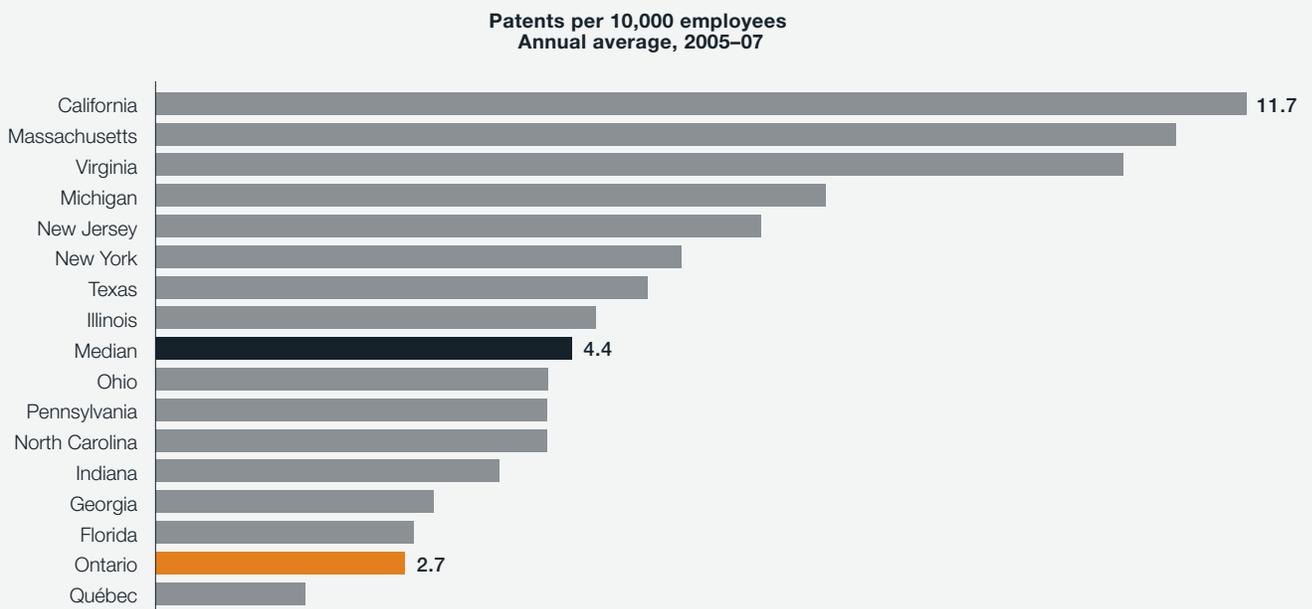
Among the empirical research, we found the following.

- 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

Exhibit 18 Ontario businesses trail their US peers significantly in patent output



Source: Martin Prosperity Institute analysis of US Patent and Trademark Office results.

⁵⁶ *Ibid.*, p. 4.

⁵⁷ Institute for Competitiveness & Prosperity, Working Paper 6, *Reinventing innovation and commercialization policy in Ontario*, October 2004, pp. 15-16.

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

credit went to firms that would have hired these workers anyway, and that each job was subsidized at the rate of \$5,270 to \$11,581 created.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 investment in rebated taxes was much less 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 of the state's film tax credit on the development of a film cluster 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?

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

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

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) 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. University of Massachusetts Boston.

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.

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 19*).⁶⁷

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.

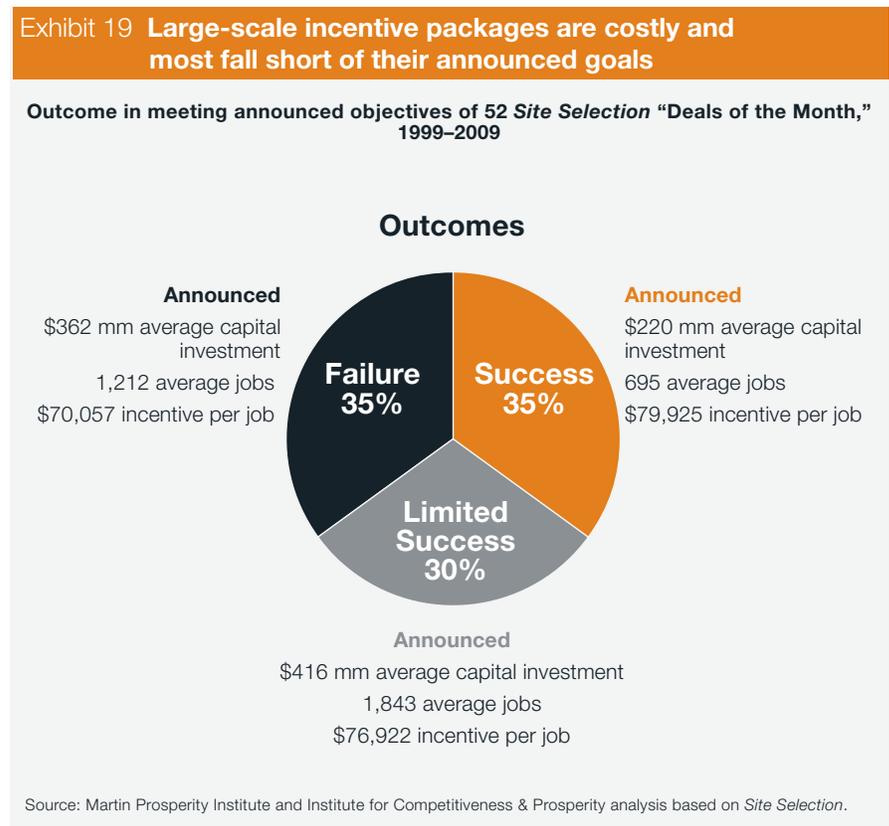
Did any of these large-scale incentive packages help create or significantly expand industry clusters? The researchers identified the state and industry for each weekly deal and compared the results against the fastest growing state clustered industries as measured by Michael Porter's Institute

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 (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 Ontario wants 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, the Ontario and federal 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.



⁶⁷ The researchers followed up on six deals of the week achieved by Ontario – five in the auto industry and one in high technology, Mitel. In their assessment, four of these achieved all or most of the objectives set out at the announcement, one was partially successful, and one failed to achieve its objectives.

Motivations: Ensure tax changes remain in place

Tax reform in Ontario will provide a boost to businesses' investments, which in turn will improve our innovation and prosperity

BY CONVERTING our provincial sales tax to a value added tax and harmonizing it with the federal goods and services tax and by reducing corporate income tax rates, Ontario's provincial government has put the province on a path to have lower than average tax rates on new business investment.

Ontario's tax changes benefit the average citizen

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

In 2009, the difference Ontario businesses invested was \$1,900 per worker – or 21 percent less than their competitors in the United States. This matters, because our workers 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 de-motivate 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.⁶⁸

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. 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. This paradoxical result comes about because more business investment drives higher wages and more job creation.

Unfortunately, Ontario has 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 Ontario has been one of the highest among the world's advanced economies. But thanks to the new tax policy announced in the 2009 provincial budget, Ontario will move to have lower than OECD average taxes by 2013 in two ways.

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. In its 2009 budget, Ontario announced reductions in the provincial rate over the coming three years. As well, Ontario's capital tax was eliminated this year. These changes should encourage businesses to invest.

Second, until Ontario changed its sales tax, it was charged on business investments. The retail sales tax applied not just to people buying clothing or appliances; it also applied to businesses when they invested. To be sure, there were many exemptions, as the provincial government had recognized the problem with charging sales taxes on business investments. But still, more than a third of Ontario's "retail" sales tax was paid by businesses making investments in or purchasing goods for their operations. By changing their provincial sales tax to a value added tax, Ontario has 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.⁶⁹

⁶⁸ Task Force on Competitiveness, Productivity and Economic Progress, Seventh Annual Report, *Leaning into the wind*, November 2008, pp. 39-41.

⁶⁹ 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.

The harmonized sales tax is not a tax grab

The introduction of the harmonized sales tax in Ontario does not mean that consumers pay more taxes in total. Reductions in individual income tax rates were part of the same 2009 budget that introduced the harmonized sales tax. There will be no tax change at retail for goods that already bore the provincial 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. 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.⁷⁰

It is fair to say that converting the provincial sales tax on goods to a value added tax on goods and services

affects people with lower incomes more than others. But the Ontario government has exempted items like books and children's clothing from the new tax. And it introduced tax credits for those with lower income to help alleviate the tax on services. For many families, these measures compensate for the higher sales tax.

Taken together, these tax improvements move Ontario from being above the OECD average in tax rates for new business investment to being better than average (*Exhibit 20*).

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 significantly. Mintz estimated that, within ten years, the tax change will stimulate increased capital investment by \$47 billion. This business expansion will create an estimated 591,000 net new jobs, 103,000 of which will be in manufacturing. The new investment and the new jobs will lead to a combined

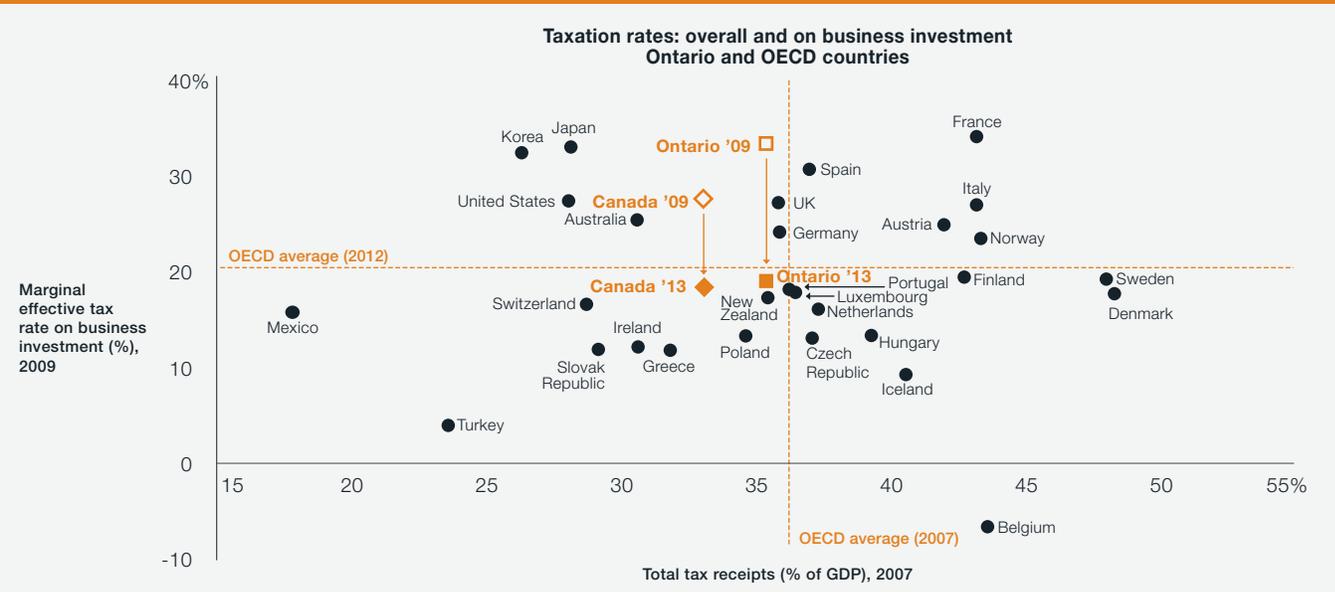
increase in labour and investment income of \$29 billion or 8.8 percent of 2008 labour income.⁷¹

A carbon tax is still a better way to deal with carbon emissions and create an innovative green sector

Many argue that promoting green renewable energy is a win-win approach. It helps reduce greenhouse gas (GHG) emissions and spurs innovation and prosperity.

In May 2009, the Ontario legislature passed the Green Energy Act (GEA), a sweeping piece of legislation without peer in North America. The GEA combines extensive conservation measures with new programs and rules intended to spur the rapid development and connection of renewable energy generation projects in Ontario. In addition to its environmental merits, the Act's framers claim it will add 50,000 new green jobs to the province in its first three years.⁷²

Exhibit 20 Ontario's tax changes will lower its marginal effective tax rates



Source: Institute for Competitiveness & Prosperity analysis based on data from OECD, OECD Revenue Statistics 1965–2008, 2009 edition; Statistics Canada, Provincial Economic Accounts (CANSIM Table 384–0002 and Table 384–0004); Ontario Ministry of Finance; Duanjie Chen and Jack Mintz, "Canada's Tax Competitiveness After a Decade of Reforms" *SPP Briefing Papers* Vol. 3, Iss. 5, May 2010; Jack Mintz, "Ontario's Bold Move to Create Jobs and Growth" *SPP Communiqué*, Vol. 1, Iss. 4, November 2009.

⁷⁰ TD Economics, "The Impact of a Sales Tax Harmonization in Ontario and B.C. on Canadian Inflation," September 18, 2009.

⁷¹ Jack Mintz, "Ontario's Bold Move to Create Jobs and Growth," *SPP Communiqué*, School of Public Policy, University of Alberta, November 2009.

⁷² http://www.ontla.on.ca/web/house-proceedings/house_detail.do?Date=2009-02-23&Parl=39&Sess=1&locale=en#PARA343

The centrepiece of the new legislation is a Feed-in Tariff (FIT) program. Modeled after similar programs in Europe, Ontario's FIT provides renewable energy developers with guaranteed pricing over a twenty-year contract term.⁷³ The rates offered depend on the energy source (solar, wind, hydro, or bioenergy), the generator capacity (projects below 10 kW qualify for higher rates), and the manner in which the generation facility is deployed (rooftop/ground-mounted solar, onshore/offshore wind, etc.). Guaranteed prices range from 10.3 ¢/kWh for power from landfill gas to 80.2 ¢/kWh for rooftop solar. Since the average spot price for electricity in Ontario is only about 5.1 ¢/kWh, the FIT rates are essentially subsidies to renewable energy generators for the electricity they produce.⁷⁴

Although Ontario's FIT is currently the most generous of its kind in North America, the province is not alone in attempting to capture a share of the renewable energy market. All fifty US states have financial incentives to encourage the development of renewable energy, thirty-six of them have some kind of renewable portfolio standard (mandating that a certain percentage of electricity come from renewable sources), and more than a dozen other jurisdictions in the United States and Canada are using some form of FIT or are considering one.⁷⁵

The GEA has succeeded in stimulating investments in green energy. Already, the Ontario Power Authority has received 23,000 applications and has publicly announced the approval of 694 FIT (>10kW) and 700 microFIT (<10kW) contracts, with the majority of projects concentrated in wind and solar.

Ontario households and businesses that use electricity will ultimately pay

for the higher rates afforded to these projects. The difference between the spot rate for electricity and the FIT rates – known as the Provincial Benefit – is embedded by retailers and distributors in the electricity price appearing on our energy bills. More electricity from renewable sources means a higher Provincial Benefit and thus higher energy costs for all Ontarians.

The government has said that the program's price tag will manifest itself as a 1 percent annual increase in consumers' electricity bills. But other estimates put the cost much higher. London Economics International (LEI), a global economic consultancy, estimated the GEA's cost at between \$247 and \$631 per household per year, equivalent to paying between two and six additional monthly electricity bills.⁷⁶ Aegent Energy Advisors Inc, an energy consulting group, estimated that partly because of GEA-related expenses, residential electricity costs are expected to increase at an annual rate of between 6.7 to 8 percent over the next five years. The outlook may be even grimmer for non-residential electricity users, who may see annual rate increases of between 8 to 10 percent over the same period.⁷⁷

Certainly, the GEA is still in its infancy, and rising rates reflect many factors, such as the legacy costs of nuclear energy and new provincial investments in the transmission grid. But as the program expands, its effect on rates will become more pronounced, which needs to be matched by economic benefits.

The GEA's economic benefit may be overstated.

The government has estimated that the GEA will help create 50,000 new jobs. It is unclear, however, what these estimates entail, as it has not offered a

definition of green jobs or transparent calculation of the 50,000 result. Nor is it clear whether this estimate is a gross or net result. While the GEA may create 50,000 new jobs, the higher energy costs may result in employment losses elsewhere in the economy, particularly in industries that are intensive energy users.

A report from a German think tank found that Germany's feed-in-tariff regime, which ours is modelled after, initially produced impressive gross job growth, but that other effects of the policy, such as rising electricity costs and the crowding out of conventional energy generation, meant net job gains were negligible or even negative. Moreover, the cost of the program on a per worker basis ran up to US \$240,000.⁷⁸ Our estimates indicate that the GEA's cost per new job created is about \$42,000.⁷⁹

GEA may not be the best way to achieve innovation.

Guaranteed FITs can inhibit innovation by encouraging producers to lock into existing technologies, regardless of whether these technologies will, in the long run, prove to reduce GHG emissions at least cost. Solar power and wind power are being highly subsidized through the FIT program – but it is by no means clear that these technologies will turn out to be the best solutions for addressing carbon emissions cost effectively. In the end, ratepayers may end up paying a higher cost for electricity without a commensurate benefit in emissions reductions.⁸⁰

Instead of trying to pick winning technologies, we should adopt winner-neutral policies, such as carbon pricing. Such policies do not discriminate among technologies; instead, they allow households and firms to choose the solutions that work best for them.

⁷³ Forty years for hydro.

⁷⁴ This figure is a simple average of weighted average prices from 2002-2010, drawn from the IESO. Available online: http://www.ieso.ca/imoweb/siteShared/monthly_prices.asp?sid=ic

⁷⁵ Paul Gipe, "Grading North American Feed-in Tariffs" World Future Council, 2010.

⁷⁶ Note: this estimate by London Economics represents the cumulative non-discounted cost, and excludes additional costs related to energy audits and energy conservation plans for prescribed consumers.

⁷⁷ "Electric Rates will Soar for Five Years, Manufacturers Say," *Toronto Star*, Sept. 1, 2010.

⁷⁸ Rheinisch-Westfälisches Institut für Wirtschaftsforschung "Economic impacts from the promotion of renewable energies: The German Experience," 2010.

⁷⁹ This calculation assumes: that 11 percent of energy demand will be delivered through FIT projects, the average of LEI's upper and lower estimates. This cost to consumers of \$32 billion spread over fifteen years means an annual average increase of \$2.1 billion or \$42,000 annually per job.

⁸⁰ Jan Carr, "A rational framework for electricity policy," *The Journal of Policy Engagement*: Vol. 2, No. 2, April 2010.

Some have argued that FITs can promote innovation, since making otherwise uncompetitive renewable energy technologies cost-competitive expands their use and production. This allows users and producers to accumulate experience that can, in the long run, lead to technological breakthroughs and cost reductions.⁸¹ Though this may be true, FITs only apply to those technologies that have been selected for subsidy. A winner-neutral policy, such as carbon pricing, would have much the same effect, since it implicitly makes less emissions-intensive technologies more cost-competitive by making electricity generation from fossil fuels more expensive. It would also be a more efficient approach, since it does not preclude any possible emissions reduction technologies and strategies.

One of the motivations behind the GEA is the hope that it will seed the generation of a green manufacturing cluster in Ontario. To promote this objective, the Act requires renewable energy developers to source up to 60 percent of their project costs from local suppliers. Japan, the European Union, and the United States are formally petitioning this requirement with the World Trade Organization, claiming that it is protectionist.⁸²

Consider a carbon tax

FITs are capable of rapidly deploying significant quantities of renewable energy. But they do so at an unnecessarily high cost to households and businesses. They price one input – electricity from renewable sources – but not the outcome we desire: reductions in GHG emissions.

To reduce GHG emissions and promote innovation in Ontario, we continue to recommend that Ontario and the federal government consider a carbon tax

instead.⁸³ 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 reduce emissions more at less 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.

Lowering taxes on business investment is not just favourable for businesses; it is favourable for people. The Ontario government took bold action 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. Ontario's experience shows that to be the view of defeatists. The government should be congratulated for believing that it is possible to do both.

⁸¹ Sustainable Prosperity, "Ontario's Feed-in Tariff for Renewable Energy: Lessons from Europe," *Policy Brief*, September 2010.

⁸² "US, EU join fight over Ontario's green energy plan," *The Globe and Mail*, October 1, 2010, available online: <http://www.theglobeandmail.com/news/politics/us-eu-join-fight-over-ontarios-green-energy-plan/article1736573/>

⁸³ Task Force on Competitiveness, Productivity, and Economic Progress, Seventh Annual Report, *Leaning into the wind*, November 2008, pp. 42-43.

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

Government policies and market structures are important determinants of innovation in our economy, and 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 21*).

- *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 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 Ontario and Canada.

Public policies should be geared more toward innovation

Current public policy is directed toward invention, not to 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 and our prosperity. Though invention is important for human progress, it should not be confused with innovation, which improves products or processes to enhance economic value. (See *What is innovation – really?*)

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 businesses.

At the federal level, we see an ongoing orientation toward the hard sciences in the granting councils related to innovation. Research grants for business school academics represent an insignificant portion of funding overall and within the Social Sciences and Humanities Research Council (SSHRC). To be sure, this imbalance has been reduced somewhat in the past five years, but the vast proportion of federal innovation funding continues to be directed at invention and the hard sciences.

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.⁸⁴

- 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.⁸⁵
- 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.⁸⁶ SSHRC's funding has increased more than NSERC's and CIHR's in the last five years.

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.⁸⁷

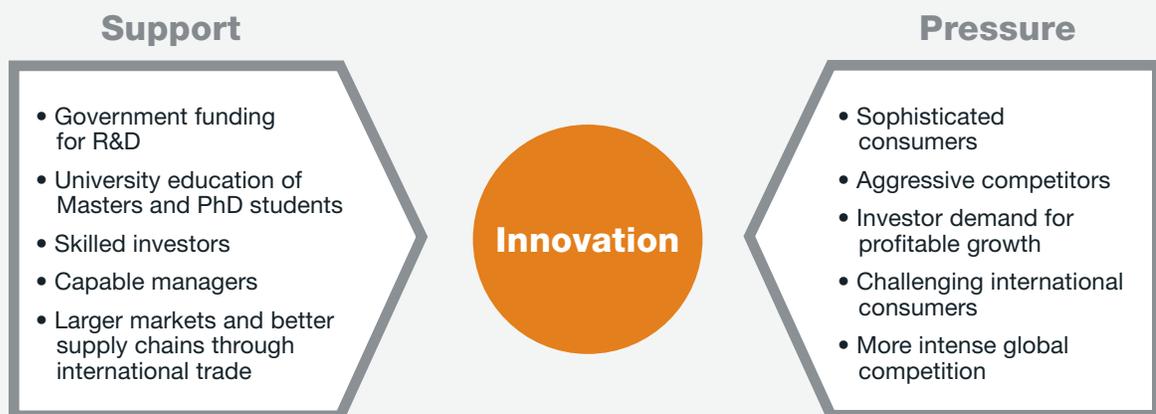
Another key player in Canada's research support is the *National Research Council* (NRC) – Canada's oldest federal research institution. With an annual budget in 2010–11 of \$749 million, it supports more than 20 research institutes and national programs. Its key disciplines are physical sciences, engineering, and life sciences; in addition, the NRC provides technology support to industry.⁸⁸ 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.⁸⁹

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 minuscule in comparison. 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.⁹⁰ 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.

Exhibit 21 Support and pressure drive innovation



Source: Institute for Competitiveness & Prosperity.

⁸⁴ Treasury Board of Canada Secretariat, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/nse/nse01-eng.asp>

⁸⁵ *Idem.*, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/cr/cri01-eng.asp>

⁸⁶ *Idem.*, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/ssh/ssh01-eng.asp>

⁸⁷ Canada Research Chairs, details available online: <http://www.chairs-chaires.gc.ca/program-programme/allocation-attribution-eng.aspx>

⁸⁸ Treasury Board of Canada Secretariat, available online: <http://www.tbs-sct.gc.ca/rpp/2010-2011/inst/nrc/nrc01-eng.asp>

⁸⁹ Canada Foundation for Innovation, details available online: <http://www.innovation.ca/docs/projects/CFIawards230410.xls>

⁹⁰ SSHRC funding allocations, available online: <http://www.outil.ost.uqam.ca/CRSH/RechProj.aspx?vLangue=Anglais>

What is innovation – really?

by ROGER MARTIN

PUBLIC POLICY to increase innovation is not working. A major part of the problem is that our governments have developed policies to drive invention, not innovation. The two are not the same (*Exhibit E*), and we must recognize this to achieve effective public policy for the twenty-first century.

What is the difference between invention and innovation?

Invention can be defined as the creation or discovery of something new to the world. Inventions are often producer-driven, following an inventor's curiosity or area of expertise. While they are new, inventions in scientific institutes or corporate labs may or may not have any use in the world.

Innovation is customer-driven, providing a new product or process that adds value to somebody's life. Innovations can improve economic, health, or social well being.

Innovations are often built from inventions. Mobile telephony required new findings in cellular technology; the internet became widespread after the invention of fibre optic technology. But we should not just assume that inventions naturally lead to innovation. And even if they do, that often takes a long time. The US National Research Council found that, in the communications and computer technologies sector, the average time from

invention to market was more than twenty years. As scientist and designer, William Buxton put it, "innovation is far more about prospecting, mining, refining, and adding value to gold than it is about alchemy."^a

Innovation creates value in several ways:

- » It can make it possible for consumers to do something that they could not have done at all or as well before, or
- » It can reduce the cost of doing what consumers were previously doing – in two ways:
 - Delivering the same benefits as existing offerings, but at a lower price,
 - Maintaining the price of the product or service, but reducing overall costs of use.

Canada's global leaders provide examples of these sources of innovation.

Innovation enables a superior consumer experience

Four Seasons, the world's leading luxury hotel chain, has succeeded by offering a different guest service model than its competitors. From research, it concluded that luxury for guests meant not grand architecture and décor, the prevailing approach in the luxury hotels business, but rather service that made them feel like they were special. Acting on that insight, the Four Seasons has achieved the highest guest ratings and the best customer loyalty in the industry.

In a similar way, Cirque du Soleil, the world's leading circus, recognized that traditional circus acts did not fulfill consumers' desires for exciting entertainment. It reinvented the whole concept of a "circus" and appealed to a wider and more affluent audience.

Innovation reduces costs and consumer prices

Harlequin, the world's leading publisher of romance fiction, realized that if each of its books had exactly the same number of pages and that this number equaled one sheet on the printing press, it could print its books at a lower cost than its competitors. The books could also be shipped in identical cube-efficient boxes and more easily displayed on uniform retailers' shelves. Harlequin also developed mail order book clubs for their most loyal readers, lowering distribution costs and eliminating the hassle of going to book stores.

Exhibit E Invention and innovation: What's the difference?

INVENTION	INNOVATION
A new-to-the-world discovery/creation	A product, service, or process that creates net new value for customers
Driven primarily by inventor curiosity or research interest	Driven primarily by desire to add customer value
Merit defined by uniqueness	Merit defined by profitable deployment
Based primarily on scientific skills	Based on a broad set of strategic, marketing, operational and technical skills

^a William Buxton, "Innovation vs. Invention," *Rotman Magazine*, Fall 2005, p. 52.

Innovation reduce customers' costs

McCain is the leading producer and seller of frozen potato products in many parts of the world. Most of us would likely expect that its main business is in branded consumer products. But it's not. Its biggest business by far is selling frozen french fries to restaurants and other food-service organizations. Food-service operators save considerable labour costs because they no longer have to peel, cut, and fry potatoes from scratch.

Manulife, one of the world's five largest life insurance companies, provides another example of innovation to reduce customer costs. It assembled the technology and developed business processes to create the Manulife One account, enabling home owners to optimize their use of any excess cash to pay down their mortgage or to pay off their credit card debt, thus allowing significant savings on interest costs. In addition, it used its experience with individual and group RRSPs in Canada to become a global leader in more consumer-friendly retirement savings products across the globe.

Does our innovation policy support invention or innovation?

Federal and provincial innovation policies have done little to fuel the consumer-driven innovations that made these companies global leaders. Current public policy assumes that if a scientist working in a laboratory or an R&D department comes up with something new, that is innovation. And anything else is not. But that is invention – which should not be confused with innovation.

Obviously, invention is important. But little that our governments do in their current innovation policies helps inventors better understand consumers. Without intimate understanding of consumers or without the pressure of a competitor trying to win them away, it is very unlikely that an inventor will be an innovator. Unless policy changes, we will continue to spend billions of dollars funding invention and get little innovation to show for it.

Of course, there are notable examples of success in our governments' innovation policy. R&D support helped Nortel create the world's first Class 5 fully digital network communications switch, the DMS 100. This was an example of consumer-driven innovation. Existing analog switches were not up to the task of carrying growing telephone traffic speedily and reliably; carriers needed something better. Nortel sales and marketing people saw this opportunity and collaborated with their research colleagues at Bell Northern Research to produce the digital innovation. Even though AT&T Network Systems (later Lucent) dominated the US telecommunications

market at the time, Nortel was more customer-focused and won.

Certainly, too, R&D support helped RIM to invent and improve the BlackBerry, now Canada's most important technology product. But the BlackBerry success story is much to do with innovative distribution agreements with telecommunications carriers.

So what?

We will not progress on innovation in Canada, until our policies focus broadly on innovation rather than narrowly on invention. It is important to support a higher education system, where curiosity-based research is funded. But we should not assume that much of this will lead to innovation. Inventions searching for a use have never been a high-payoff endeavour.

If we want more innovation, public policy can help in four ways.

- » Design innovative educational programs that connect inventors, who care about innovation, with business people, who want to pull inventions to consumer-relevant innovations. These programs would be more than coursework; instead, they would match up people to create real innovations and involve innovation financiers. Public funding could be available for winning innovations.
- » Ensure that our innovation policy is balanced between developing the hard science skills and the softer skills that enhance communication, consumer understanding, and team building.
- » Recognize that necessity is the mother of invention – as well as innovation – and ensure that our markets are intensely competitive to pressure our firms to look for ways to add consumer value to their products and processes.
- » Think more broadly about how we finance innovation within existing companies. If we really want to promote more innovation, we should loosen the definition of fundable R&D. Currently the definition is far too tight. None of Four Seasons, Cirque du Soleil, Harlequin, McCain, or Manulife, would have qualified for funding for the innovations that made them world leaders.

With these innovation initiatives, public policy will help us have a vibrant twenty-first century economy.

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.⁹¹ If business education received a share of these chairs in proportion to undergraduate degrees awarded, instead of the 21 chairs, there would be 312; if 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 the 2010 federal budget, Ottawa highlighted its innovation initiatives, but it continued its misdirected focus on invention through the hard sciences. As one example, the 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 social sciences and humanities through SSHRC.⁹²

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

In **Ontario**, innovation policy also focuses largely on invention, with the follow-on need to “commercialize” our research excellence. We have been, and continue to be, critical of this model.

In our innovation model, pressure and support create a system that generates innovation. Individuals and organizations drive each other to meet consumer needs and competitive challenges. Innovation is the product of an ongoing interaction between those who supply innovation and those who demand it.

The concept of “commercialization,” popular in government policies, is a linear one – if we fund enough invention-focused research, we will be able to move it to the market place through “technology transfer” and commercialization programs. Given our dismal record of business innovation in the province, it is fair to say that this researcher-driven innovation approach has not worked. As the Ontario government renews its innovation agenda, we encourage it to examine the basic approach to the invention-innovation process.

Currently, the Ministry of Research and Innovation has two major programs, “science and research” and “innovation and commercialization.”

- **Science and research** receives \$197.3 million, or 55 percent of the Ministry’s \$360 million program budget. These funds are squarely aimed at the hard sciences through programs like the Ontario Research Fund, the Ontario Institute for Cancer Research, and research talent awards. These programs account for 92 percent of science and research funding.

- **Innovation and commercialization** receives the balance of program funding. Its main programs are commercialization and innovation network support; the next generation of jobs fund; the Biopharmaceutical Investment Program, an innovation demonstration fund focused on bio-based environmental and alternative energy technologies; and a business ecosystem support fund

for “sophisticated industry-academic partnerships that will accelerate product development in emerging global markets.”

Ministry documents do acknowledge the value of business and management skills, but they are conceived as ancillary to other disciplines, rather than valued for their own capabilities. For example, in *Seizing Global Opportunities: Ontario Innovation Agenda*, the Ministry acknowledges the importance of “building commerce skills,” and states that it “supports the development and teaching of commerce skills across sectors and disciplines,”⁹³ and that “students in all programs who are interested in business careers should be given a better understanding of how successful innovative companies operate. The innovation agenda supports more cross-fertilization between business education and other fields of study to give graduates the full range of skills needed for innovation.”⁹⁴

The provincial innovation agenda has been moving to recognize that innovation is most effective when the process is customer or market driven, and that management skills are important. Yet it can go further to recognize the difference between invention and innovation and to focus on the importance of strong management as a stand alone capability.

Lean startups offer a new innovation approach

As the Institute has shown in past reports, Ontario’s venture capital industry invests far fewer dollars per company than their peers in the United States.⁹⁵ As lamented by many in the venture capital industry, the amount of available funds has shrunk considerably. But this is not unique to Ontario. Available venture capital funds are now also at a much lower level in the United States – declining by more than a third from 2008 to 2009.

⁹¹ Canada Research Chairs, details available online: <http://www.chairs-chaires.gc.ca/chairholders-titulaires/index-eng.aspx>

⁹² Finance Canada, Budget 2010, *Leading the way on jobs and growth*.

⁹³ Ontario Ministry of Research and Innovation, *Seizing Global Opportunities: Ontario Innovation Agenda*, p. 16.

⁹⁴ *Ibid.*, p. 19.

⁹⁵ Institute for Competitiveness & Prosperity, Report on Canada, *Beyond the recovery*, June 2010, pp. 45, 48, and “The Activity of American Venture Capital Funds in the Ontario Market: Issues, Trends and Prospects,” a report prepared for the Institute for Competitiveness & Prosperity, Thomson Macdonald, 2005.

We do not recommend resuscitating the special tax treatment for Labour Sponsored Investment Funds (LSIFs), which is scheduled to expire in Ontario in 2012. These funds with their focus on small investors are poorly matched with the requirements for sophisticated financiers of high risk startups. As investors realize excellent tax benefits from LSIFs, they are not as oriented to great returns from the LSIFs' investments. Nor do these small "retail" investors have the expertise and time to oversee their investment and add experience and knowledge to the management teams in their invested companies.

There may be an opportunity to turn our sub-scale investments to an advantage. Observers of the venture capital industry have noted that venture capital has become too capital intensive and in some sense has lost its traditional position as a "no-frills" funder of startups. In a time when available venture capital is much less plentiful, traditional approaches that are aimed at creating large pools of funds with significant investments per company may not be appropriate.

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.⁹⁶

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 the 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."⁹⁷

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

started 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 financial stress, 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. Ontario's business schools and organizations like MaRS 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 government to help the lean startup approach gain traction here in Ontario.

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.

⁹⁶ 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>

⁹⁷ 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>

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.⁹⁸ 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. (See *Management matters in retail*.)

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*.) 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 versus 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. This year, the Institute released new research on the impact of international trade for our innovation capabilities.⁹⁹

International trade has been an important contributor to prosperity here in Canada and Ontario 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 and generally colder climate 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.¹⁰⁰ When trade is carried out across several economies, the result is a much greater availability of goods and services to consumers. In sum, businesses are more successful, employees earn higher wages, and consumers see 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 maneuver 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.

As we have seen, Canada and Ontario are under performers in innovation, as evidenced by our low productivity, limited patent output, under investment in technology, and under performance of our clustered industries – recurring themes in the Task Force's previous reports. Expanded trade has to be a key element of our innovation agenda – and our Prosperity Agenda.

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

⁹⁸ Institute for Competitiveness & Prosperity, Working Paper 13, *Management matters*, March 2009.

⁹⁹ *Idem.*, Working Paper 14, *Trade, innovation, and prosperity*, September 2010.

¹⁰⁰ 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.

Management matters in retail

STRONG MANAGEMENT is a critical element in the innovativeness of our economy, and hence its productivity and prosperity. Strong management affects the ongoing support of high quality innovation by setting research priorities and orchestrating technical resources; it drives the pressure for innovation through well developed and ably executed business strategies that create urgency and eliminate complacency; and it is key to the financing of innovation by assembling resources and allocating them wisely to promising investments. In building an innovative firm or an innovative economy, management talent matters.

The Institute partnered with Stanford professor Nick Bloom to extend his pioneering global research in measuring management practices in Canada, first with the manufacturing sector in 2008, and then again with the retail industry in 2009. The Institute published the complete results of this work in two Working Papers.^a

The research measures management practices, based on an interview evaluation tool that rates firms on a scale from worst practice to best practice across eighteen management practices.^b The method was developed originally by McKinsey & Company, a leading international management consulting firm. The management practices cover three distinct, but related areas of management:

- » **Adopting effective operations management approaches.** How well have firms implemented management systems that are generally described by academics and consultants as best practice? “Lean” practices, generally regarded as the most effective management system, achieve highly efficient operations through a relentless drive to reduce the waste of time and resources. They are characterized by an ethos of continuous improvement, backed by close tracking of operations to identify problems and improvement opportunities.
- » **Managing performance effectively.** Does a firm’s management set realistic stretch targets, monitor performance against these targets, and take corrective action when necessary? Effective management in this area means that companies are finding the right balance of targets to aspire to for maximum achievable performance. Setting targets too low means under

performance; setting them too high will discourage improvements by workers and managers. Effective management also means determining how to measure performance and to follow through with actions when targets are not met.

- » **Managing people well.** Are companies promoting and rewarding employees based on performance, and systematically trying to hire and keep their best employees? The cliché that people are a firm’s most important asset is true. Skilled workers and effective people management together are an important element of productivity in firms and across the economy. Well managed firms are able to attract and retain their top talent through effective reward and incentive programs. They also deal effectively with problem performers.

From our work in the manufacturing sector, the Institute concluded that management in manufacturing companies in Canada is among the best in the world. Our production management teams are leaders in specific techniques in the area of lean manufacturing. They are solid performers in effecting good performance management, though with room for improvement. But, in people management, while they match management teams in other leading economies, Canadian firms trail US practices significantly.

In Ontario, our results indicated that the quality of manufacturing management is higher here than in the other regions of Canada, and that the province’s results are within the statistical range of US results overall. Nevertheless, against the fourteen US peer states, Ontario 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.

In the research on the retail sector, the Institute found that Canada’s retail management practices score well, too. Compared with the United States and United Kingdom, Canada ranks second, though statistically there is no difference with the United States, which is the leader in retail management performance. However, results vary across the three sub-indices that make up the overall measure. In operations management, we stand statistically behind the United States, but ahead of the United Kingdom. In performance management, we tie with the

^a Institute for Competitiveness & Prosperity, Working Paper 12, *Management matters*, March 2009 and Working Paper 13, *Management matters in retail*, April 2010.

^b For more information on the research methodology, see Professor Nick Bloom’s website: http://www.stanford.edu/~nbloom/index_files/Page371.htm

United States for the top spot and stay statistically ahead of the United Kingdom. In people management, though our score is lower than the US result, it is not statistically different, and we stand statistically ahead of the UK score here as well.

Meanwhile, Ontario retail managers fare worse than their counterparts in the US peer states. And across the three elements of good management, Ontario retail managers perform significantly worse than those in the US peer states. Out of the three sub-indices, Ontario does best in operations management practices, but scores statistically worse than its US counterparts. Although Ontario retail managers score less well in performance and people management, the results are not statistically different from those of its US peers (*Exhibit F*).

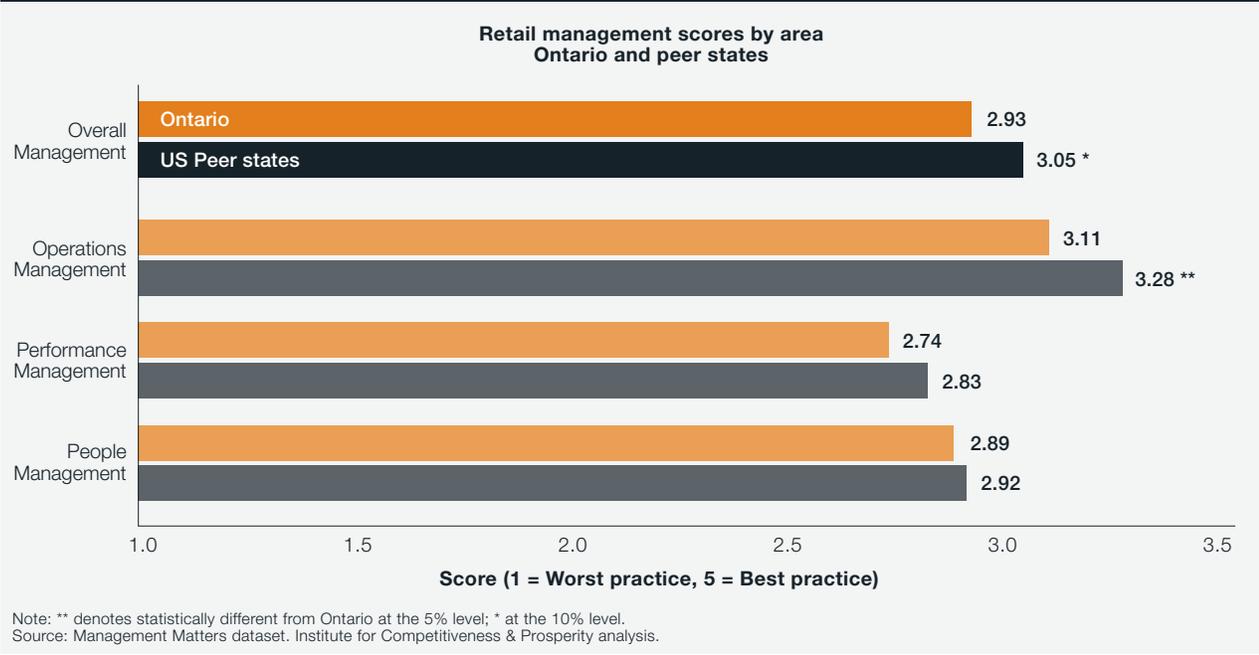
Our results also indicated that some of the key variables that drive – or are at least correlated with – better management are: education, ownership, and winning global strategies. More highly educated management teams outperform other retail managers, and retailers that have successfully expanded beyond their borders are much better managed than those that are still domestic competitors only. We also found that firm size and scale are important in explaining better management – larger

retail firms are better managed. Our findings for the retail sector are also consistent with the research on manufacturing management – better educated managers perform better. For manufacturers and retailers, in Canada and internationally, the link between managers’ education and business performance is powerful.

To achieve our full economic potential in Ontario and Canada, we need strong management talent to drive innovation and develop world-beating strategies. The implications for Ontario and Canada are clear – to achieve an economy built on innovation, we have to include managerial education in our policy development. Developing our scientific and technical skills is important to our prosperity – but not building the capabilities of our managers is an oversight that holds back our prosperity.

In addition, we recommend that innovation strategies become more sophisticated and balanced. Continuing the development of new management techniques, such as just-in-time logistics and lean manufacturing and retailing, can lead to economy-wide growth in productivity and prosperity.

Exhibit F Ontario retail management trails counterparts in US peer states, particularly in operations management



Robertson, Vice President and Fellow, 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 the 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.¹⁰¹

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 nearly 70 percent of Ontario's 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.¹⁰²

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.¹⁰³ 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 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.

China is approaching the innovation tipping point

While several countries are emerging economically, China's remarkable progress is probably the most important development in these early years of the twenty-first century. Through sweeping reforms in its economic structures, China has leapt forward in its prosperity and its presence in international markets.

But has China reached the innovation tipping point – the point at which it competes on world class innovation capabilities instead of low cost labour? We conclude that it has not yet reached this milestone. Its manufactured goods seem to be everywhere, and they are becoming more and more high-tech; yet China is still assembling the technology of others and is not creating high value in its own operations. It is investing significantly in research and development; yet its patents tend to be more imitative than inventive. China is producing many engineers; yet many of these are lower skilled than their counterparts in other countries. The country is booming with opportunity; yet there has not been a mass return of Chinese students educated abroad, as seen in other innovative economies. Its institutions are being reformed to support

innovation; yet much needs to be done to resolve internal conflicts between a market economy and an authoritarian regime.

We are by no means suggesting that we can be complacent in Canada. To date, China has expanded its economy and competed on the world stage as a low-cost competitor. So far, China's trade has not had a significant negative effect on Canada's economy. However, in time, its innovation capacity will develop further, and China will become a more sophisticated competitor to our businesses and people. So Canada needs to step up its innovation capabilities now.

China's impact on our economy is still minimal

How has China's emergence as an economic power house played out in Canada and Ontario? Has our trade relationship benefited or harmed our businesses and workers? The Institute's research indicates that China is not the primary cause of our current weakness in manufacturing employment; instead, our appreciating exchange rate is a more important factor.

Many of us perceive an impact of China on our economy that is greater than the reality. In our view, this perception is due largely to the seeming ubiquity of the “Made in China” label, because China's highest volume exports to Canada tend to be consumer goods – toys and games, electronic goods, and clothing. While we see these items daily in our homes and in stores, many other items are as important in our lives and our economy. These include commodities and intermediate goods, like machinery, which are used in our manufactured goods; and services, which make up a high percentage of our economic lives and affect employment.

¹⁰¹ Colin Robertson, “Gulf widens between Wall St. and Main St.” *Financial Post*, October 20, 2010.

¹⁰² Institute for Competitiveness & Prosperity, Working Paper 14, *Trade, innovation, and prosperity*, September 2010, pp. 23-24.

¹⁰³ *Ibid.*, p. 21.

Coincident with the dramatic and visible growth of imports to Canada from China, manufacturing employment in Canada has been in steep decline – over 300,000 jobs were lost between 2002 and 2008. Yet the causal connection between these two trends is not as high as some would think. The strengthening of the Canadian dollar over that period has been much more of a factor in the decline in manufacturing employment. As our dollar strengthened, our exports became more expensive and imports less expensive, thus hurting firms that compete internationally. In addition, while we have had periods of growth in the past decades, manufacturing's share of employment has been falling over the long run – as it has in all other advanced economies (*Exhibit 22*).

Where we do see a connection between imports from China and losses in Canadian manufacturing employment, it has been in low value added industries like textiles. In fact, parts of Canada's manufacturing sector are growing, and these tend to be the higher value, more sophisticated industries like produc-

tion machinery and medical devices (*Exhibit 23*). And, while employment has been declining in the past few years in Canada, productivity in the sector has been increasing.

The solution for those worried about import inroads from China and elsewhere is not trade barriers or a higher value yuan. It is, instead, the relentless pursuit of innovation and creativity by our manufacturers.

Across the breadth of our economy, it is very difficult to conclude that China's growth has hurt our overall employment results. Imports from China have been growing in Canada in this decade, but until the current recession our employment performance has been robust. Our recent slowdown is more the result of global factors, particularly in the United States and not China.

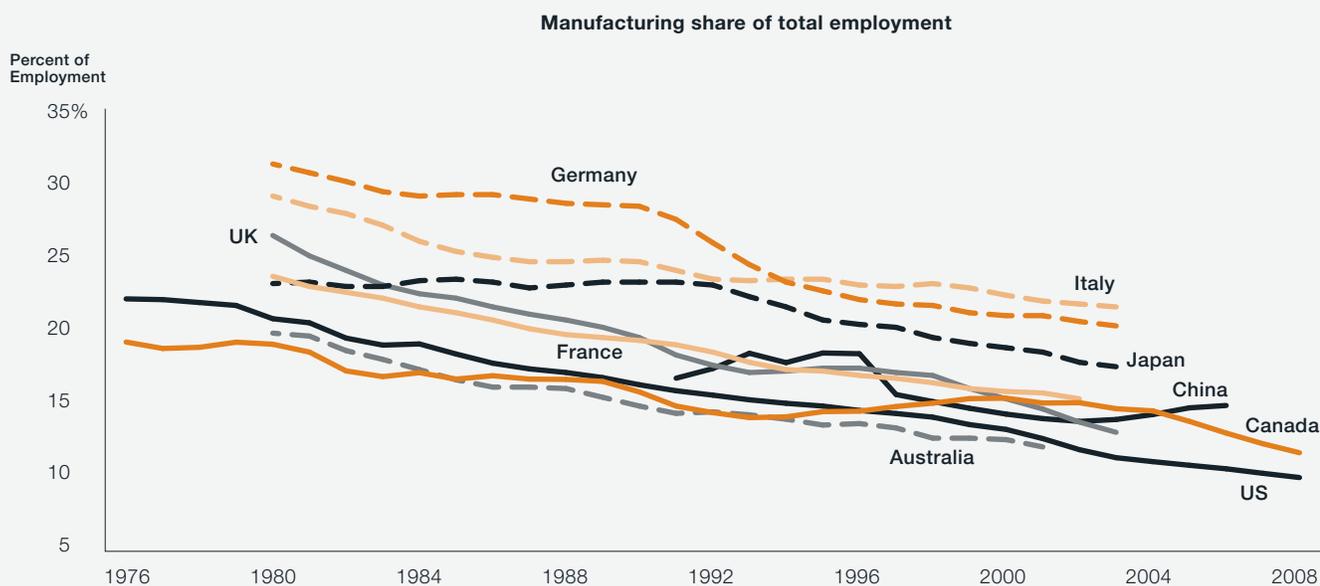
The European Union offers opportunity for Canadian trade

The European Union (EU) is our second most important trading partner after the United States, and this relationship has been growing. While China represents

opportunities for increased trade as it becomes more developed, the EU is already a large and sophisticated trade partner. Expanding our trade with this innovation-based economic region can also increase the support and competitive pressure for our businesses, as consumer preferences and institutions are more familiar to us, while offering us the support of well-developed market opportunities. The sophisticated European consumer can provide beneficial pressure on our businesses to strengthen their product and service offerings even more. The competitive pressure from European imports can also stimulate more innovation here in Canada.

The EU's importance as a trade partner has increased in recent years, both in terms of the share of total Canadian imports and as a share of total exports. With the United States still reeling from the current recession, the case for an expanded EU trade relationship is stronger – not only for its immediate economic benefits, but also as a means of expanding and diversifying our trade.

Exhibit 22 Across the developed economies, manufacturing has declined as a share of total employment



Note: For US, it is manufacturing employment share out of total non-farm employees.
 Source: Institute for Competitiveness & Prosperity analysis based on data from Statistics Canada; US Bureau of Labor Statistics; OECD STAN Indicators database, 2006; China Statistical Yearbook 2008, available online: <http://www.bls.gov/fls/chinareport.pdf>.

Negotiations for expanded trade between Canada and the EU are underway. While it is unfortunate that harmful barriers in our two economies' agricultural sectors will not be dismantled in these negotiations, it is quite encouraging that we are pursuing this important initiative for strengthening our innovation capabilities. Our federal and provincial government leaders should be congratulated. Our businesses must pursue the resulting opportunities available to them.

Expanding trade will strengthen innovation

Trade is a critical element of our prosperity. The traditional reason is that it creates advantage through specializa-

tion 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 EU. We need to move purposefully to deepen our relationship with China, India, and other developing economies.

- **Invest in infrastructure.** Our infrastructure needs to be upgraded at our borders, our seaports, and our airports.

- **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 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.

Exhibit 23 Most manufacturing industries lost jobs, 2002–2008; growing industries had higher value added and more creativity-oriented jobs

NAICS4	Share of net change in jobs (2002–2008)	Value added per employee, weighted by employment change	Occupational mix, 2002
Manufacturing industries losing jobs			Mix of jobs
Cut and Sew Clothing	-13%	\$88,400	Creativity-oriented 16%
Sawmills and Wood Preservation	-8		Routine-oriented, physical 68%
Motor Vehicle Parts	-7		
Pulp, Paper and Paperboard Mills	-6		
Household and Institutional Furniture and Kitchen Cabinets	-5		
Rubber Products	-4		
Motor Vehicles	-4		
Semiconductor and Other Electronic Components	-4		
Printing and Related Support Activities	-4		
Clothing Knitting Mills	-3		
Foundries	-3		
Iron and Steel Mills and Ferro-Alloys	-3		Routine-oriented, service 16%
Other 56 industries	-50		
Manufacturing industries gaining jobs			Mix of jobs
Agricultural, Construction and Mining Machinery	2	\$110,000	Creativity-oriented 25%
Other Foods	2		Routine-oriented, physical 53%
Architectural and Structural Metals	2		
Pharmaceuticals and Medicines	1		
Cement and Concrete Products	1		
Other General-Purpose Machinery	1		
Petroleum and Coal Products	1		Routine-oriented, service 22%
Medical Equipment and Supplies	1		
Other 10 industries	3		
Total manufacturing jobs lost			315,000

Note: Our analysis by NAICS4 is based on the Survey of Employment, Payroll and Hours (SEPH) dataset, which is Canada's only source of detailed information at the industry level. SEPH data provides information related to jobs based on a census of administration data from businesses. Source: Institute for Competitiveness & Prosperity analysis based on data from Industry Canada.

- **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 help 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 help 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 helping. We need to develop better tools and policies for helping displaced workers.
- **Explore the benefits of wage insurance.** 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.

Canada's and Ontario'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.

Our global leaders have relied on innovation and benefited from competition

PUBLIC POLICY must continue to bolster an innovative environment for Canada's and Ontario's competitive businesses. Our global leaders have been pathfinders on several innovative fronts: they are effectively operated by better management; are more productive than non-globally competitive companies; and are, in turn, major wealth creators for Canadians and Ontarians.

There are 89 Canadian global leaders in 2010 (*Exhibit G*). It is heartening to note that the number of global leaders

has been growing over time - in 1985, we had 33 global leaders and we held at 90 in 2003, 2008 and 2009.^a All of these companies have revenues greater than \$100 million and rank in the top five in their industry based on revenue or market share world wide.

There have been four new additions to our global leaders list since last year's Annual Report. Three companies attained global leadership by acquisitions, and Russel Metals rejoined the top five in their industry:

Exhibit G Canada has 89 global leaders in 2010

AbitibiBowater	Fortress Paper	Royal Bank of Canada
Ag Growth	Garda World Security	Russel Metals
Agrium	Gildan	Samuel, Son & Co.
Alimentation Couche-Tard	Harlequin (Torstar)	Scotia Mocatta
Allen-Vanguard	Héroux-Devtek	ShawCor
Alliance Grain Traders	Husky Injection Molding (Onex)	Sierra Wireless
Arctic Glacier	IMAX	SMART Technologies
ATCO	Lallemand	SNC-Lavalin
ATS	Linamar (Skyjack)	Spectra Premium
Barrick Gold	MAAX (Tricap)	Student Transportation
Bombardier	Magna	SunGro Horticulture
Brookfield Asset Management	Major Drilling	Superior Plus (ERCO)
CAE	Manulife Financial	Targray Technology
Cameco	McCain	TD Waterhouse
Canadian National Railway	MDS Nordion	Teck Resources
Canam	MEGA Brands	Tembec
Canfor	Methanex	The ALDO Group
Catalyst Paper	Mitel	The Jim Pattison Group
CCL Industries	Neo Material Technologies	Thomson Corporation
Celestica	Norbord	TLC Vision
Chemtrade Logistics	North American Fur Auctions	Transat A.T.
Cinram	Open Text	Trimac
Cirque du Soleil	Pan American Silver	Velan
Coastal Contacts	Pason Systems	Village Farms
Cott	Peerless Clothing	Viterra
DALSA	Pollard	Wescast
Dorel Industries	PotashCorp	West Fraser Timber
EXFO Electro-Optical Engineering	Premier Tech	Zarlink
Finning International	Research in Motion	ZCL Composites
FirstService (Colliers)	Ritchie Bros. Auctioneers	

Note: **Bold** denotes Ontario head office.
Source: Institute for Competitiveness & Prosperity analysis.

^a The Institute for Competitiveness & Prosperity continuously updates the global leaders lists based on additional research. Two global leaders were subsequently added to the 2003 list (Targray Technology and West Fraser Timber) and six were added to both the 2008 and 2009 lists (Brookfield Asset Management, Pan American Silver, Student Transportation, Targray Technology, The ALDO Group, and West Fraser Timber). We subtracted Thompson Creek Metals (Blue Pearl) from our 2008 and 2009 lists. For more information on global leaders visit http://www.competeprosper.ca/index.php/canada_global_leaders

- » Alliance Grain Traders, the largest lentil and pea splitting company in the world
- » Dorel Industries, the world's largest juvenile products company
- » Héroux-Devtek, the third largest landing gear manufacturer in the world
- » Russel Metals, the fifth largest metal service centre.

However, we also lost five global leaders since last year:

- » Gennum is below the \$100 million revenue benchmark
- » Goldcorp no longer ranks among the top five gold mining companies
- » NOVA Chemicals was acquired by the Abu Dhabi state enterprise IPIC (International Petroleum Investment Company)
- » Timminco merged its magnesium extrusion business with China's Winca Tech and now retains only a minority stake
- » World Color Press was acquired by an American firm, Quad/Graphics.

Out of the current 89 global leaders, 37 are based in Ontario, off slightly from 38 in 2009. Almost half of all our global leaders had revenues over one billion dollars.^b

Ontario global leaders succeed through innovation

This year the Institute studied how Ontario-headquartered global leaders attained leadership of their industry – through invention, innovation, or both. Only a small number of companies became leaders through pure invention. In fact, the majority of these corporations relied on product, service, or strategy innovations to become leaders in their markets (*Exhibit H*).

A small number, only three, of our global leaders attained leadership primarily through invention. These were DALSA, a scientific digital imaging expert with numerous patents; MDS Nordion, which partners with academics and institutions to develop new technologies for the health sciences industry; and Neo Materials Technologies (Magnequench), which boasts of the world's best in-house magnet scientists and engineers.

Nine of our global leaders drew on both invention and innovation to achieve global leadership. Several popular corporations are in this category. IMAX is a classic case where entrepreneurs took various individual inventions and combined them to add value to the marketplace with a new innovation (over one billion people have had the "IMAX experience" in theatres worldwide). Open Text has been at the forefront of many internet and corporate intranet inventions and innovations. And Research in Motion led in wireless technology inventions and innovated through strategic partnerships with telecommunication carriers.

By the Institute's count, 25 of Ontario's 37 global leaders drew on innovations to create a product, service, or process that created new value for customers. Eight corporations employed merger and acquisition strategies. Examples include Barrick Gold, which hedged 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.

Some companies introduced new products based on a broad set of strategic, marketing, operational, and technical skills, such as Cott which launched more than 100 new products in 2009 alone, and MAAX, which prides itself on designing and manufacturing award-winning upscale bathroom products. 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. These are just a few detailed examples of how innovation has spurred our global leaders.

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 originate in such industries, and for many of these, the protection offered to them was not critical in their achieving global leadership.

^b Institute for Competitiveness & Prosperity, Report on Canada, *Beyond the recovery*, June 2010, pp. 54-55.

Exhibit H Invention versus innovation: What propelled Ontario-based global leaders to achieve leadership in their niche industry?

37 Ontario-headquartered global leaders achieved leadership from...	Global leader	Global leadership from...	
		Innovation	Invention
Innovation 25	ATS	Automation technology	
	Barrick Gold	Merger & acquisition, financing & hedging strategy	
	Brookfield Asset Management	Merger & acquisition strategy	
	Celestica	Innovative services: manufacturing, product development & testing	
	Chemtrade Logistics	Business strategy: partnerships and contractual agreements	
	Cinram	Supply chain management & process innovation	
	Cott	Design, new flavour drinks, marketing & distribution	
	FirstService (Colliers)	Merger & acquisition strategy	
	Harlequin (Torstar)	Publishing process, marketing & strategy	
	Husky Injection Molding (Onex)	Cost savings from high investment in machinery	
	Linamar (Skyjack)	Product innovation and differentiation	
	MAAX (Tricap)	Product design and innovation	
	Magna	Integration of parts design and manufacturing, cost savings	
	Manulife Financial	Business strategy and product differentiation	
	Norbord	Product development and process innovation, sales and marketing	
	North American Fur Auctions	Marketing & strategy	
	Royal Bank of Canada	Business strategy	
	Russel Metals	Merger & acquisition strategy	
	Samuel, Son & Co.	Merger & acquisition strategy	
	Scotia Mocatta	Merger & acquisition strategy	
	Student Transportation	Merger & acquisition strategy	
	TD Waterhouse	Marketing & strategy	
	Thomson Corporation	Merger & acquisition strategy, marketing & strategy	
	TLC Vision	Marketing & strategy	
	Wecast	Product design, manufacturing process	
Both invention and innovation 9	Allen-Vanguard	Customized solutions for customers	Bomb disposal foam, protective clothing and gear
	CCL Industries	New applications	Label technology
	IMAX	New products, marketing & strategy	Large format film
	Lallemand	R&D strategy, new products, distribution	Yeasts and bacteria
	Mitel	Computer telephony integration	New telecommunication technology
	Open Text	Enterprise Content Management	Search and indexing technology
	Research in Motion	New product (BlackBerry) and distribution strategy	Wireless technology
	ShawCor	Product development	Pipeline protection technology
	Zarlink	Communication and medical applications	New semiconductor technology
Invention 3	DALSA		Digital imaging products
	MDS Nordion		Sterilization technologies
	Neo Material Technologies (Magnequench)		Patented Neo powder

Source: Institute for Competitiveness & Prosperity analysis.

Our financial services industries are regulated quite closely. While there are no formal limitations on foreign ownership, foreign interests are limited by rules regarding 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, Scotia Mocatta, 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.
- » Bombardier is helped in numerous ways through aerospace subsidies and Canadian-content requirements for transportation bids.
- » Transat A.T., a leading tour operator, 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. Our Canadian icons like Rogers and BCE have competed quite successfully inside Canada, but have not ventured successfully out of our protected domestic market. 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.



Through innovation to prosperity

We recommend actions to realize Ontario's innovation imperative

WHETHER OR NOT THE RECESSION is truly behind us, we need to keep our focus on increasing innovation and productivity in our businesses, our government programs and policies, and our daily lives. We have to have our eyes firmly fixed on the future so that we can avoid the temptation to stay fixed on short-term considerations and achieve our prosperity potential.

We encourage stakeholders in Ontario'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.

Attitudes

Encourage innovation for Ontario to win in an ever competitive world

Remain determined to close the prosperity gap through aggressive attitudes toward making innovation happen. Ontarians do not have an attitude deficit in our will to win, our desire for innovation, and 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 derail the fragile recovery and take us down the path toward economic depression. Instead, Ontarians need to be open to innovation as a way of life in our businesses and governments.

Investments

Invest in the human and physical capital critical for innovation and prosperity

Continue investing in people for Ontario'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 masters 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 Ontario 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 set of experiences to 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 in information and communication 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 has helped 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 recently announced Expert Panel to examine the federal government's research and development support for private sector innovation. 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.

Review provincial policies and programs on incentives to attract businesses to Ontario. We want more world-class firms investing in Ontario. However, the research indicates that targeted government incentives to attract such investments are not often successful in increasing prosperity in a jurisdiction. As the provincial government looks to reduce spending, this is one area that may prove fruitful; at the very least, it ought to understand more deeply how well previous targeted incentives have delivered long-term prosperity to Ontario.

Motivations

Ensure tax changes remain in place

Build on changes in Ontario's sales and corporate tax structures. The Ontario government took a major step forward for our prosperity in improving our tax regime. By converting the provincial sales tax into a value added tax and harmonizing it with the federal goods and services tax, by reducing our corporate tax rates, and eliminating capital taxes, it improved the motivations for investing in innovation and productivity. The challenge now is to fine tune tax policy to eliminate some of the unintentional frictions created in various industries and settings.

Ensure special tax treatment for Labour Sponsored Investment Funds is ended. The government should continue on its plan to end special tax incentives for Labour Sponsored Investment Funds. The government revenue lost as a result of these incentives stands in the way of deficit reductions. Currently, the special tax treatment is scheduled to end after the 2011 tax year. No doubt there will be pleas to keep the special tax treatment in place in the current weak venture capital market. But bad policy is bad policy. If anything, the government should consider ending it sooner than announced. One way to boost Ontario's venture capital results is for stakeholders to explore ways of making the province a leader in lean startups, a promising approach that uses fewer dollars to launch innovative companies.

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.

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 from the added pressure of 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 to 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.

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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