WHAT'S NEEDED NOW: AN ONTARIO AGENDA TO BOOST ADVANCED INDUSTRIES AND INTANGIBLES

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Issue

Ontario needs to cultivate advanced industries and greater investment in intangible assets (such as intellectual property) if it is to drive more economic growth and higher living standards in the province. This will require, among other things, adjusting how the provincial government thinks about its innovation infrastructure and ecosystem.

Overview

Ontario generates about 40% of Canada's GDP. It is also the country's immigration powerhouse. In 2021, Ontario received about half of all new Canadian permanent residents. But immigration has not been enough to solve the province's aging demographics challenge. Ontario's labour participation rate has been trending down due to the rising share of older workers (aged 55 and over) in the labour force, who tend to have lower participation rates compared to other working-age cohorts.

Ontario's labour force is projected to grow by an average of 0.9 per cent annually over the long term, slower than its historical average pace of 1.4 per cent. In the coming decades, the province will face a rapid expansion of seniors. Furthermore, aging baby boomers enjoy entitlement programs generally indexed to inflation.

Ontario labour productivity growth averaged 1.1 per cent per year from 1998 to 2018. During this period, productivity growth has experienced significant variations, with a period of relatively fast average annual growth of 2.3 per cent between 1998 and 2002, followed by an extended period of slower growth between 2003 and 2011, averaging 0.5 per cent annually. Since 2012, productivity growth has averaged 1.0 per cent annually.

To boost Ontario labour productivity, output per worker will need to climb. This is crucial to deal with the labour market issues outlined above as well as to boost Ontarians' living standards. On the second point, it is worth recognizing that slow productivity growth is one of the principal reasons that the province's GDP per capita is now roughly $16,000 less than the average in the neighbouring states of New York, Ohio, Pennsylvania, Michigan, Minnesota, Wisconsin, and Illinois.

The question of course is: how can Ontario's economy boost output per worker? The answer will need to come in the form of capital investments, labour force development, and technological progress. Thus, the importance of adopting a deliberate, intentional and well-designed modern industrial strategy focussed on innovation. And if innovation is the big factor in growth—and therefore for much of national well-being—the province has only one choice: It must innovate its way to a competitive advantage in the national economy and around the world.

This will require a more targeted policy focus on what are referred to as "advanced industries." Research by McKinsey defines advanced industries as being characterized by deep involvement with technological innovation and STEM (science, technology, engineering, and math) workers and creating good jobs in dozens of high-value, high-technology fields. These fields range from manufacturing industries such as ag-tech, clean tech, and bio-tech to fast-growing service industries such as fin-tech, computer software, telecommunications and e-commerce.

According to the Brookings Institution, advanced industries can be defined by two key metrics:

1. R&D spending above the 80th percentile of Canadian industry intensity
2. STEM worker share of industry that exceeds the Canadian average

Advanced industries are the core of Canada's high-value economy. From a relatively small share of jobs, advanced industries generated 17 percent of Canada's GDP, 61 percent of exports, and 78 percent of research and development in 2015. The average value added per employee in advanced industries was 34 percent higher than in the economy overall.

The positive impact of these industries permeates across the rest of the economy in two different ways. First, advanced industries tend to have long supply chains. Capital-intensive sectors like automotive and aerospace require second and third-tier suppliers that provide the components and equipment needed to make these industries function. Second, advanced industries seed new technologies and innovations that help drive productivity growth throughout the rest of the economy.

A separate yet related priority must be boosting investment in intangible assets such as intellectual property, data, software, and so forth. These assets are a major source of economic value. Ontario's intangibles economy is mainly a function of its digital economy, the largest and fastest growing in Canada. The digital economy is broadly defined as production of digital goods and services (most often delivered through e-commerce) and digital infrastructure such as computer software and hardware and telecommunications. In 2017, the nominal added value of the digital economy for Ontario GDP was 7.1%, compared to 5.2% for British Columbia and 5.6% for Quebec.

Boosting investment and growth in advanced industries and intangible assets can help to raise Ontario's economic growth, its labour productivity, and ultimately its living standards.

Two areas of focus to boost Ontario long-term economic growth

1. Ensuring Ontario's labour supply will support economic growth in advanced industries

Nobel-Prize winner economist Paul Romer has long argued that talent is essential for growth. Talent must be understood as a dynamic factor in innovation. A nation or region should not try to match its talent base to what it estimates will be the size of its economy. Instead, its talent base, because of its critical role in innovation, will determine the size of the economy.

Given the STEM intensity and focus of advanced industries, Ontario's education system must do more to encourage STEM pathways at all levels, starting at elementary and high-school all the way through colleges, polytechnics and universities. The focus Ontario has given to reforming curriculum and enhancing apprenticeship training is a step in the right direction.

Ontario is already well-positioned by his ability to attract high-skilled immigrants. But integrating them into its workforce will become paramount given the demographic trends and the declining labour force participation rate noted earlier. The recently announced Alberta Accelerated Tech Pathway is exactly the kind of initiative that must be undertaken.

But attracting foreign talent does not equate to taking full advantage of the talent pool it provides. More needs to be done to integrate high-skilled immigrants and fully leverage their STEM credentials and talents. And there are further policy steps that can be taken to encourage more foreign students to stay in Ontario and increase their retention in the province's innovation ecosystem.

Organizations focussed on public-private partnerships in integrated work-learning and re-skilling such as Palette Skills and the Business Higher Education Roundtable must also be fully leveraged and scaled. Maximizing talent potential requires focus and action on multiple fronts.

2. Strengthening Ontario's innovation infrastructure and ecosystem

Innovation policy works in a continuum and requires healthy and robust elements across different phases. Canadian policymakers have believed for too long that funding basic research was the only ingredient necessary to produce innovation outcomes. But the organization of science and technology is a complex undertaking that requires a greater level of policy sophistication.

Research progress must be coupled with an effective infrastructure to hasten the pace of innovation. Research into greener energy systems will yield the desired benefits only if the underlying power and transportation infrastructure is able to integrate the new technologies. Infrastructure includes technology standards for new products and technology transition systems that will smooth the introduction of revolutionary new inventions into a wide array of applications.

Much of the economic story of the past two centuries revolves around government support of transportation infrastructure, from railroads to highways. The technological opportunities of the coming century will require a different type of infrastructure, and government needs again to play a role. More generally, if intangibles are the main driver of the emerging data-driven economy, then it follows that to remain competitive Ontario must rethink how to facilitate innovation and enable ecosystems that drive innovation and build greater capacity in the intangibles economy. This has considerable implications for public policy.

Key elements that will require the next Ontario government's attention include:

Patent creation: In an intangibles economy, intellectual capital and data are the engines of growth. As economist Philippe Aghion has rightly suggested, innovation relies on incentives and protection of property rights. Innovation comes from the decision to invest, especially in R&D by entrepreneurs motivated by potential returns in the form of innovation rents. Canada's patent creation record remains low in key advanced industries.

Technologies transfer (commercialization) and Intellectual property (IP) retention: The goal of innovation economics is to amass innovation assets — IP, data and the talent that creates it — and then to exploit those assets when they are commercialized. Innovation policy fails when innovation assets are created and then divested before commercialization. Protecting, marketing and licensing IP is an expertise in itself, and this should become a deliberate policy objective with corresponding implementation mechanisms.

Ontario has made great progress over the last few years by creating Intellectual Property Ontario, a new agency that will help the postsecondary education and research and innovation sectors to generate, protect, manage and commercialize intellectual property (IP). High-performance innovation clusters such as those at MIT/Harvard and at Stanford University have developed sophisticated tech transfer offices where key participants of innovation (researchers, VC funders and IP experts) are integrated. More must be done to develop these synergies at Ontario research-intensive universities, especially in key advanced industries such as ag-tech, bio-tech and clean-tech.

Public procurement: Governments are big buyers of products and services. Most countries have procurement policies designed to help their own companies. The procurement system can be a powerful tool for innovation, investing and keeping in Canada IP and a skilled labour force -- and they wealth they bring.

Conclusion

Ontario has had a significant productivity challenge in recent decades. With an aging labour force and a declining labour participation rate, it needs to raise its productive capacity even more to compensate. Given their deep involvement with technological innovation and STEM workers, advanced industries create high-quality jobs in many high-value, high-technology fields with the potential to raise Ontario productivity.

A relentless focus on innovation is needed by increasing Ontario's talent pool both quantitatively and qualitatively, and by systematically improving Ontario's innovation infrastructure and ecosystem. The benefits for long-term growth would be significant.

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