

The Other One Per Cent Problem: Using Innovation to Spur Growth

Kevin Lynch

The new normal of moribund global economic growth has provoked an international debate among economists and politicians on how governments should respond. BMO Financial Group Vice Chair Kevin Lynch argues that innovation is the key, and offers policy prescriptions for Canada's new government.

Most of the public attention to the 2016 Budget was focused on the size of the deficit and the weakness of the economy in the near term. Too little attention was paid to where Canadian growth is headed in the decade ahead and what this means for our future living standards and our long-run fiscal stability.

The 2016 Budget projects 1.9 per cent average real GDP growth over the next five years. Looking at our declining productivity and labour force growth rates, sustained growth under 2 per cent is the most likely prospect for Canada in the decades ahead in the absence of policy change. To put this in context, our average growth rate over the 25 years prior to the global finance crisis was 3 per cent. This loss of at least 1 per cent in annual potential growth has enormous consequences if allowed to compound into the future.

This poses the “1 per cent growth problem”: How can we re-invigorate growth through some combination of innovation, immigration, skills upgrading and strategic infrastructure policies to raise Canadian potential growth by 1 per cent annually. Put more concretely, in a \$2 trillion economy, can we design policies capable of raising Canadian GDP by an

additional \$20 billion, not once but each and every year.

One of the potentially transformative policy commitments in this year's budget will not come to fruition until the 2017 budget, and that is the intent to at least partly address our structural growth weaknesses with a comprehensive Innovation Strategy, the quantitative measure of success for which should be a significant contribution to a reduction in our 1 per cent growth gap.

Numbers aside, the latest OECD report, “The Innovation Imperative,” states unequivocally that: “Innovation is a key driver of productivity, growth and wellbeing, and plays an important role in helping address core public policy challenges like health, the environment, food security, education and public sector efficiency. Innovation-led productivity growth will become even more important in the future to address key challenges like ageing populations and climate.” So, certainly for the OECD, it's clear: innovation matters, greatly, for both economic and societal success.

And yet, how well do we understand what drives innovation in Canada, why are we so innovation and productivity challenged, and what can be done to put innovation on steroids

in Canada to seriously help meet the 1 per cent growth challenge?

Someone once quipped that “research is turning money into knowledge, and innovation is turning knowledge back into money.” In other words, research and innovation are not the same thing, and we need to be excellent at both. Moreover, by this somewhat off-beat definition, innovation is all about solving problems that matter to customers, and this requires processes, the “secret sauce of innovation”, that bring “problem identifiers” together with “problem solvers, the innovators.”

Walter Isaacson, drawing on his research for *The Innovators*, argues that most innovation comes out of collaborative processes and teams. Harvard's Clayton Christensen worries that our economies are too orientated to efficiency and sustaining innovations whereas the jackpot is found in disruptive innovations. Bill Sahlman, another Harvard thought leader on innovation, stresses the crucial role of entrepreneurship in the innovation process.

What all innovation experts agree on is that addressing the innovation challenges and opportunities in dynamic, young start-ups is different than how we stimulate more research and innovation in larger, established firms. Again, both are important to overall innovation success. And the solutions may be distant cousins.

A third avenue to greater innovation propensity is attracting innovation-intensive foreign companies to set up research centres in Canada with global product mandates. Google Canada, which has established a research centre in Waterloo with

global mandates, and GM Canada's recent pivot to attract more of the design, development and production of the "smart parts" of the next GM cars to Canada are examples that we should multiply.

The scale and scope of disruptive innovation today is remarkable—it is the combinatorial of multiple new technologies, rather than the diffusion of a single new technology; it is their platform nature, extending across the physical, digital and biological worlds. But the pace of innovation and diffusion is equally incredible. Reaching 50 million consumers—the definition of a mature breakthrough technology or product—took the telephone 75 years, radio 38 years, television 13 years, the internet 4 years, Facebook 3.5 years and Angry Birds 35 days. The challenging question for business, government and educators is: Are we equipped for working, managing, governing, educating and living in an Angry Birds pace-of-change world?

How is Canadian performance on in-

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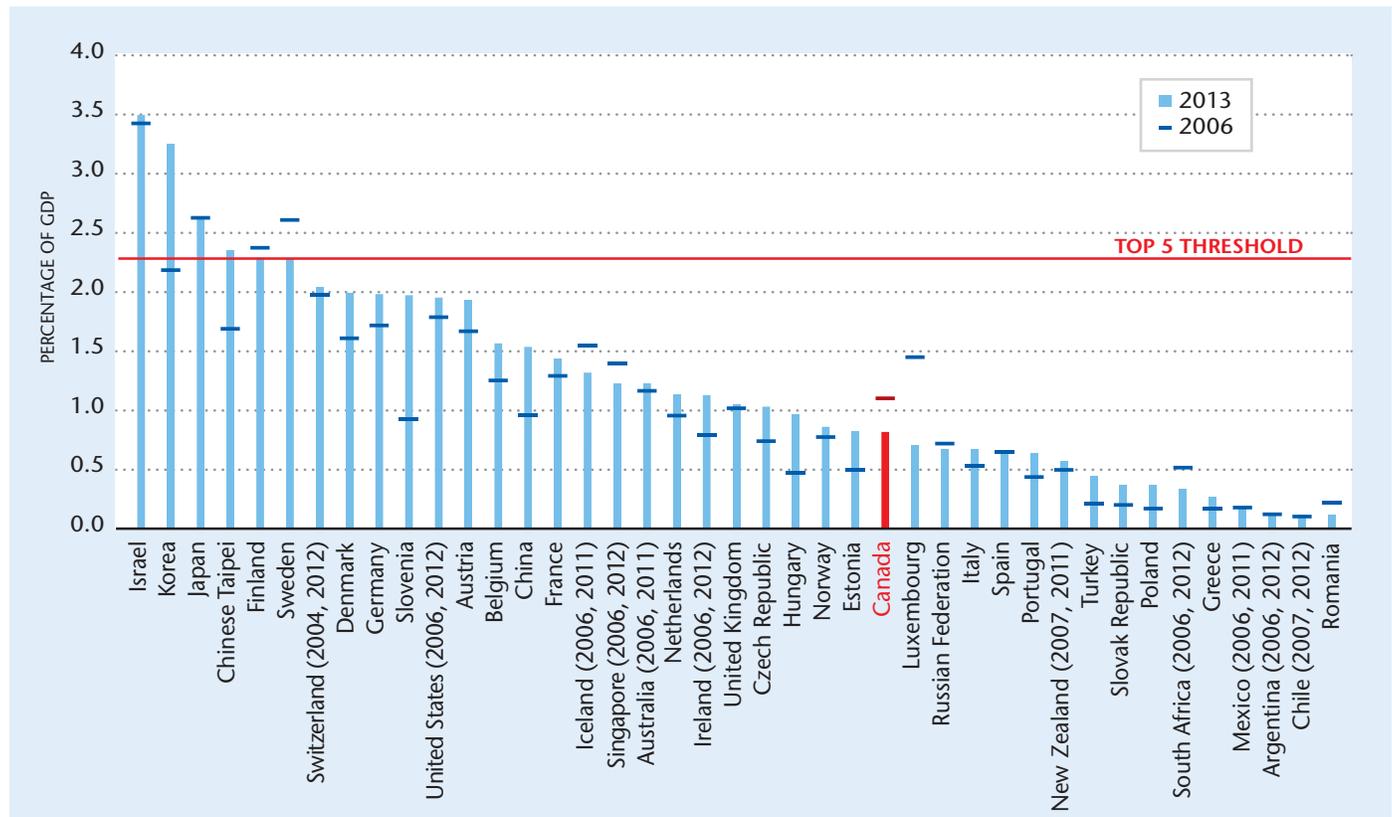
novation and productivity faring in this new environment? The magnitude of our challenge is evident in a cursory examination (see Figure 1) of Canada's ranking on private sector innovation capacity (26th), private sector spending on R&D (26th), science and technology occupations in the workforce (22nd), private sector investment intensity in ICT (13th) and business productivity performance (17th). And, the Canadian results for business spending on research and development are worsening, not strengthening. To state the obvious: we have an innovation problem.

This is despite having a number of strong innovation precursors—a highly educated general population, public investment in R&D in higher edu-

cation (HERD) in the top 10 of OECD countries, very generous research and development tax incentives, competitive corporate taxes (well below the US) and relatively low capital gains taxes (slightly above the US), Canada is an innovation laggard, not a leader among OECD countries.

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Figure 1: Canada's Business Spending on R&D (BERD)



Source: OECD, Main Science and Technology Indicators, January 2015.

In creating innovation ecosystems, while Canada appears to do “the macro” reasonably well, we come up well short on “the micro.” According to the OECD, as important as it is to get the “macro conditions” right, it is not a sufficient condition for sustained innovation success. To be clear: there is no silver bullet for innovation, no elusive tax incentive, no reclusive venture capitalist, no single government program that can turn on the innovation spigot.

But there is much that is missing in our innovation ecosystems: there is no national innovation strategy; there is inadequate competition in many sectors; there is a lack of a global orientation in most SMEs; there is little focus on entrepreneurship in our education institutions; and, there is a large and static gap in most sectors between the best-in-class innovation-intensive firms and the class average.

So what can be done? Let’s start with government. According to the OECD, based on extensive cross-country and cross-sector research, government should concentrate its innovation support in four areas:

1. **Sound governance and an open and competitive business environment**—One that encourages investments in new technologies, one that does not favour incumbents as this reduces innovation, one that encourages experimentation with new business models, and one that supports risk management, not risk aversion. This means getting the business environment and its incentives right for an economy that requires innovation to grow.
2. **Effective skills strategies**—Innovation depends on human talent with the technical knowledge, the flexible skills and the entrepreneurship culture to generate new ideas—new ways of doing old things. This means rethinking our traditional educational models to prepare people for the jobs of tomorrow,

and rethinking our approach to attracting the world’s best talent as part of becoming an innovation nation.

3. **Public investment in an efficient system of both knowledge creation and its diffusion**—

Publicly financed basic research has been at the root of most of today’s disruptive technologies and, if Canada wants to play, it has to pay for basic research. But, as research by the U.S. National Academies demonstrates, knowledge diffusion also requires business investments in applied research and innovation. This means a public toolkit where government provides support to basic research and also assists applied research-diffusion in the private sector.

The current Canadian innovation support model relies more on passive, tax-based assistance than almost any other country, with very disappointing results (Figure 1). In contrast, the OECD recommends that: “Support for business innovation should be well-balanced and not overly rely on tax incentives,” where “well designed, competitive grants complement tax incentives, can be better suited to the needs of young innovative firms, and can also be focused on areas that have the highest impact.”

4. **Access to, and participation in, the digital economy**—Innovation and digital technologies go hand in hand, whether it is big data or machine learning or cloud computing. Algorithms have been described as the weapons of the digital age, and data the ammunition. This means an open Internet, high-speed networks, modern data infrastructure and structures to address privacy and security risks.

The pivotal question to help meet the 1 per cent growth problem through innovation is: can we build Canadian ecosystems of the density found in Silicon Valley or Boston and at the

same time move well up the value-added curve through innovation in what we manufacture, what we harvest and what we extract rather than being a commodity producer?

The answer is that we have most of the ingredients for innovation success in Canada but we seemingly lack the recipe and the chefs. We also suffer from a measure of complacency, partly a hangover from the commodity super-cycle, and a tinge of short-termism, neither of which breeds a culture of long-term investment and innovation.

Building upon the OECD core prescriptions, what more must we do to stimulate innovation in Canada in a non-linear rather than incremental fashion, and do so consistent with the speed of change inherent in the Fourth Industrial Revolution? While recognizing that the impediments to innovation do not lie solely or even predominantly within the purview of governments, government can play a key role in shaping an innovation strategy for Canada, in convening and aligning the private sector, investors, capital markets and educational institutions around this strategy, and in catalyzing change.

Elsewhere, Communitech CEO Iain Klugman and I have written about the importance of building one or several Canadian innovation ecosystems that have the density capable of driving our national growth and productivity. It requires an incredibly intensive interplay among world-class university research, targeted government support for technology development, industry-led R&D, venture capital and astute early adapters of the new technologies and innovative products and services.

Perhaps most importantly, it requires the political will to concentrate resources to build world-class and world-scale innovation centres for the national interest, rather than sprinkle subscale resources hither and yon. Features of such an innovation ecosystem (Figure 2) would include:

Figure 2: Innovation Super Ecosystems

REALITY: SILOS	OPPORTUNITY: SUPER-CONNECTIVITY
<ul style="list-style-type: none"> ✗ Under-connected research universities ✗ Inadequate connectivity (speed of networks, data infrastructure, transport links) ✗ Subscale ecosystems, poorly linked ✗ Missing critical mass ✗ Access to risk capital limited, few IPOs, exits ✗ Local market not global orientation 	<ul style="list-style-type: none"> ✓ Networked research universities in key faculties ✓ High speed connectivity (high speed networks, excellent data infrastructure, good transport links) ✓ Critical mass of tech talent and population ✓ First mover supports: more risk capital, more IPOs, more exits, more strategic procurement ✓ Global mindset, global networks, global competition, global talent

- Innovation supercentres with the critical mass, depth of talent, richness of ideas and access to markets with discerning customers to compete for global talent, global venture capital and global research facilities. The Toronto-Waterloo Innovation Corridor concept is Canada's best opportunity to compete with the likes of Silicon Valley, New York, Boston, London-Cambridge and Tel Aviv-Haifa to name a few.
- A civilian DARPA (Defense Advanced Research Projects Agency) technology vehicle to support the applied research and development of new transformative technologies with possible commercial applications as part of the rebalancing of our business assistance for research and innovation away from an excessive reliance on passive tax support.
- A strategic innovation procurement program by governments that would break through the inherent risk aversion in government procurement that both penalizes young innovative firms and saddles governments with mediocre technologies. Without early markets for their new products at home, start-ups and their investors will relocate elsewhere. Without the capacity to scale-up quickly, start-ups will sell out early and Canada misses

out on spawning “unicorns”. The same challenge of risk aversion in procurement exists in large established firms and institutions throughout Canada, and these private sector behaviours equally make Canada a less attractive spot to scale up an innovative start up.

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- A re-orienting of government support to SMEs towards firms that are trade-focused, invested in technology and innovation, and engaged in ongoing worker re-skilling. These filters were suggested by the Jobs and Prosperity Council of Ontario to prioritize limited government support to firms with the greatest chance of sustained growth. We need new SMEs to develop new products and new markets. IRAP would be a good candidate for

these filters at the federal level.

- A data-driven innovation initiative that recognizes the crucial role that the “platform” aspect of big data and data analytics plays in driving innovation, new products and productivity in many sectors. A possible area of Canadian focus could be “Govtech”, which would utilize many of the same platform technologies and big data smart analytics as Fintech but applied to government operations, and would have a global market.
- A specific focus on new markets through trade agreements and trade promotion, and on attracting global leaders in high tech to establish research centres and talent hubs in Canada with global mandates.

Finally, all of this has to be anchored in the reality of a world facing disruptive change: across countries, sectors and traditional business models and skill sets.

Innovation must play a major role in meeting our growth challenge, but can only do so if we are willing to go big in ambition, go bold in measures and go deep in critical mass.

Go big. Go bold. Go deep. Go innovation, Canada. **P**

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