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Innovate or perish



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The world has emerged from the global financial crisis, but just as it was not a typical recession, it will not be a typical recovery. There is no gently winding path back to the pre-recession status quo; the world has changed and is moving on. That world is now flatter, more interconnected, more wired and more competitive than was imaginable just a decade ago.

Pervasive globalization has created global capital markets, global supply chains, global information markets, and global labour markets for highly qualified personnel. The internationalization of science and technology means OECD countries are

losing their monopoly on creating new products and developing innovative technologies. In this global, knowledge-based economy, the Internet is reshaping how we work, how we communicate, how we socialize, and how we learn. The "national" university is going global, with online learning, virtual campuses, transborder research networks, and international student bodies and faculties.

As labour markets go global -- and they are -- the demographics of aging is tilting the "wealth of nations" to those with younger, better-educated populations. The global hunt for talent will become a strategic preoccupation of companies, universities and countries.

All of this brings us back to the transformative power of innovation. The modern wealth of nations will be driven not only by physical capital and resources, but also by human and intellectual capital, and the dynamic interaction among them called innovation.

Innovation: The ability to create new products, develop new markets, or to produce existing products in new ways, lies at the heart of modern competitiveness, and our future living standards.

What follows are six elements to frame a science and technology (S&T) agenda for a knowledge-based economy in today's global marketplace. It reflects our experience in Canada over the past decade: what we have done, what we have learned, and what we have to do better.

1. The paradigm matters There has to be a broadly accepted belief system that S&T is a core driver of increases in a country's productivity growth and improvements in its standard of living. This cannot be either assumed or

presumed by the research community; it must be continually explained to, and understood by, the public. It provides an essential element of the "social contract" for governments to support public investments in S&T.

2. The macroeconomic framework matters A low inflation, low debt and fiscally balanced macroeconomic environment complements and leverages good microeconomic policies. The choice is not one or the other but both for sustained societal success. In Canada, achieving sustained fiscal balance in the late 1990s allowed Canada to reinvest strongly in public sector R&D that is now the highest in the G-7 as a proportion of GDP, as is our university research spending. This remains the case going forward.

3. Excellence matters There must be a test of excellence, not entitlement, when investing in S&T and innovation. Indeed, the pursuit of excellence must be relentless; being average is simply not good enough. To best achieve this, we need competition in the allocation of research funding, with rigorous peer review processes anchored on global benchmarks of success.

4. Globalization matters One implication of pervasive globalization is the need to think globally as we develop our research collaborations, recruit the world's best students and researchers, and set our goals. Canada recently established 20 Canada Global Excellence research chairs to attract the world's best scholars to drive research excellence and anchor technology clusters in Canada. The new Vanier Canada Scholarships and Banting Post-Doctoral Fellowships are open to international students to pursue advanced study in Canada and, in conjunction with new visa and immigration systems, it makes it easier to obtain residency status after graduation. Canadian universities are beginning to establish research partnerships with leading institutions in other countries.

5. Prioritization matters As countries, research institutions and firms, we need clear S&T priorities and alignment between our objectives and comparative advantages. One of the most difficult aspects of public policymaking is positively discriminating among worthy opportunities to choose a discrete set of priorities. To create strategic cohesion, build critical research mass, leverage matching investments and introduce competitively driven excellence into our publicly funded research endeavours, Canada has created a new research-funding architecture that includes the Canada Foundation for Innovation, Genome Canada, Canada Research Chairs, Networks of Centres of Excellence and Commercialization, and the Canada Graduate Scholarships.

6. Commercialization of S&T matters This is the bookend of the "social contract"; it creates the virtuous circle for taxpayers of publicly supported S&T leading to wealth creation, dynamic growth, new jobs and higher living standards. It requires a more sophisticated venture-capital sector, a more entrepreneurial culture in our universities and research labs, and a culture of innovation in Canadian business. We have to break down the silos between university researchers and business managers.

In short, we live in an era of pervasive globalization and persistent change. The constant opportunity is ever-bigger markets, and the constant challenge is ever-more competitors.

In this world, innovation is the oxygen that fuels the star runners. To win, we need a clear Canadian S&T strategy for our knowledge-based economy competing in this changing world order. Our living standards tomorrow will be shaped by how well we establish our innovation architecture today.

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