

---

## Executive Summary

---

### *Innovation drives growth and helps address social challenges*

---

The past two years have seen reduced potential output growth, increased unemployment and soaring public debt. To recover and move towards a more sustainable growth path, new sources of growth are urgently needed.

At the same time, some traditional sources of growth are declining in importance. Many countries have stagnating or declining populations, and this reduces the role of labour input in long-term economic growth. Moreover, investments in physical capital face diminishing returns and may be insufficient to strengthen long-term growth, especially in advanced economies. Innovation, which involves the introduction of a new or significantly improved product, process or method, will increasingly be needed to drive growth and employment and improve living standards. This is true as well for emerging economies that look to innovation as a way to enhance competitiveness, diversify their economy and move towards more high value added activities.

Innovation is already an important driver of growth in some countries. Firms in several OECD countries now invest as much in intangible assets, such as research and development (R&D), software, databases and skills, as in physical capital, such as equipment or structures. Much multifactor productivity (MFP) growth is linked to innovation and improvements in efficiency. Preliminary estimates indicate that in Austria, Finland, Sweden, the United Kingdom and the United States, investment in intangible assets and MFP growth together accounted for between two-thirds and three-quarters of labour productivity growth between 1995 and 2006, thereby making innovation the main driver of growth. Differences in MFP also account for much of the gap between advanced and emerging countries. This suggests that innovation is also a key source of future growth for emerging economies.

This economic challenge coincides with increasing political pressure to meet various social challenges, such as climate change, health, food security, or access to clean water, many of which are global in nature or require global action. These challenges cannot be dealt with by any single country and require better co-ordination of effort by countries and through both supply- and demand-side interventions. Innovation is crucial for solving such problems in an affordable and timely manner. In the absence of innovation, addressing climate change, for example, will be considerably more costly. Moreover, innovation-driven growth makes it easier for governments to make the necessary investments and undertake the policy interventions to address these challenges.

---

*Action on innovation must be a priority  
for emerging from the crisis*

---

The crisis has only served to underscore the need for innovation as a way to provide new solutions. While expenditure cuts are needed, governments must continue to invest in future sources of growth, such as education, infrastructure and research. Cutting back public investment in support of innovation may provide short-term fiscal relief, but will damage the foundations of long-term growth. Public investment in basic research, in particular, provides the seeds for future innovation, as it did in the past for the Internet and the Human Genome Project. It will also be needed to foster the breakthrough technologies for dealing with climate change and other global challenges.

At the same time, there is considerable scope to improve the efficiency of government spending and innovate in the delivery of public services. Reforms of education and training systems and public research institutions, for example, can help increase returns from public investment in innovation. Moreover, many policy actions that can help strengthen innovation do not require additional or significant public investment. Structural policy reforms of the framework conditions that support innovation, such as the removal of regulatory barriers to innovation and entrepreneurship, including administrative regulations, as well pro-growth tax reforms, can do much to strengthen innovation and growth.

In most countries, markets can also be strengthened to unleash demand for innovative products and services that meet social and global needs. Getting prices right, opening markets for competition and devising innovation-inducing standards and smart regulations are among the approaches that governments can use to unleash innovation in areas such as health and the environment. Better use of public procurement can also be effective, in particular when government is a large consumer. Well-designed demand-side policies are less expensive than direct support measures; they are also not directed at specific firms, but reward innovation and efficiency. Demand is closely linked to supply, however, and supply-side policies are necessary to create the conditions for business to innovate.

---

*Policies need to reflect innovation as  
it occurs today*

---

If policies to promote innovation are to be effective, they need to reflect the ways in which innovation takes place today. To transform invention successfully into innovation requires a range of complementary activities, including organisational changes, firm-level training, testing, marketing and design. Science continues to be an essential ingredient of innovation, even though innovation now encompasses much more than R&D. Innovation also rarely occurs in isolation; it is a highly interactive and multidisciplinary process and increasingly involves collaboration by a growing and diverse network of stakeholders, institutions and users. Moreover, the emergence of new and important players has added to the complexity of the multifaceted international landscape of innovation.

These and other changes in the innovation process present a challenge to existing national policy frameworks. Policy will need to move beyond supply-side policies focused on R&D and specific technologies to a more systemic approach that takes account of the many factors and actors that influence innovation performance. The objective of policy should not be innovation as such, but the application of innovation to make life better for individuals and society at large. This is no easy task, especially as the scope for policies for innovation broadens. The objective of the OECD's Innovation Strategy is to support this process of policy development, recognising that "one size does not fit all". It is built around five priorities for government action, which together form a coherent and comprehensive approach to policies for innovation that can help underpin an innovation-led recovery and strengthen the role of innovation in the long run.

---

*People should be empowered to innovate*

---

Human capital is the essence of innovation. Empowering people to innovate relies on broad and relevant education as well as on the development of wide-ranging skills that complement formal education. Curricula and pedagogies need to be adapted to equip students with the capacity to learn and apply new skills throughout their lives. At the same time, education and skills development systems require reform to ensure they are efficient and meet the requirements of society today. Improving teacher quality is particularly important for enhancing outcomes; this might include better initial selection of teachers, ongoing evaluation to identify areas for improvement, and recognising and rewarding effective teaching.

Universities, colleges and vocational training centres are essential nodes in the innovation system, both producing and attracting the human capital needed for innovation. These institutions act as essential bridges between players – businesses, governments and countries – in broader and more open systems of innovation. The major policy challenge is to recognise the essential role of universities in the innovation enterprise rather view them, as is all too commonly the case, simply as providers of essential public goods. This requires a greater focus of policy makers on ensuring independence, competition, excellence, entrepreneurial spirit and flexibility in universities.

Entrepreneurs are particularly important actors in innovation, as they help to turn ideas into commercial applications. In the United States in 2007, firms less than five years old accounted for nearly two-thirds of net new jobs. Successful entrepreneurship often comes with practice, hence the importance of experimentation, entry and exit. Yet, only a small part of the population receives entrepreneurial education. Education and training policies should help foster an entrepreneurial culture by instilling the skills and attitudes needed for creative enterprise.

Internationally mobile talent contributes to the creation and diffusion of knowledge, particularly tacit knowledge. To encourage this circulation of knowledge, governments should build absorptive capacity, open labour markets to foreign students, and ensure that the tax regime does not penalise mobile skilled workers. For their part, sending countries can put into place policies that provide opportunities for expatriate researchers to re-enter the domestic labour market. Migration regimes for the highly skilled should be efficient, transparent and simple and enable movement on a short-term or circular basis. Related policies need to be coherent with the wider migration agenda, and with development and aid policies, so as to contribute to the effective management of migration.

People participate in innovation not only by creating, diffusing or adapting technologies in the workplace, but also as consumers. Consumer policy regimes and consumer education should improve the functioning of markets by helping to equip consumers to become active participants in the innovation process and enable them to make informed choices. This has the added benefit of strengthening competition between businesses. It is essential to ensure that the information provided to consumers is easily understandable and takes account of how people process information.

---

*Innovation in firms must be unleashed*

---

Firms are essential for translating good ideas into jobs and wealth. New and young firms are particularly important, as they often exploit technological or commercial opportunities that have been neglected by more established companies. Both market entry and exit are indispensable for the experimentation that leads to the development of new technologies and markets. Simplifying and reducing start-up regulations and administrative burdens can reduce barriers to entry. Bankruptcy laws should be less punitive for entrepreneurs and should offer more favourable conditions for the restructuring of ailing businesses, with due regard to risk management and the need to avoid moral hazard.

Between 20% and 40% of entering firms fail within the first two years. Reallocation of resources to more efficient and innovative firms is crucial to innovation and economic growth. Labour market policies should provide the flexibility needed to reallocate resources from declining to innovative firms, along with support for lifelong learning and re-skilling of workers.

The tax climate for entrepreneurs should be made more neutral; potential entrepreneurs may also be discouraged from leaving their current employment by the financial and health costs associated with losing employer-based health insurance and social security contributions. Where possible, barriers to the transferability of such benefits should be lowered.

The growth of firms is a particular challenge in many countries. Low regulatory barriers can help ensure that high-growth firms do not spend the capital they need to support their growth on overcoming bureaucratic obstacles. Administrative, social and tax requirements that rise with the size of the company should be reviewed as they increase the cost of growth. Policy can also help existing small and medium-sized firms enhance their capacity to innovate, *e.g.* in supporting the formation of relevant skills.

Access to finance is a key constraint for business-led innovation, which is inherently risky and may require a long-term horizon. Restoring the health of the financial system should therefore be a priority. Well-functioning venture capital markets and the securitisation of innovation-related assets (*e.g.* intellectual property) are key sources of finance for many innovative start-ups and need to be developed further. Financial markets should continue to provide sufficient room for healthy risk taking, long-term investment and entrepreneurship, all key drivers of innovation, while ensuring safeguards in case of failure. When public funds are deployed to ease access to finance, they should be channelled through existing market-based systems, and take a clear market approach.

---

*The creation, diffusion and application of knowledge is critical*

---

The creation, diffusion and application of knowledge are essential to the ability of firms and countries to innovate and thrive in an increasingly competitive global economy. Science continues to be at the heart of innovation and public research institutions in many OECD countries require reform in order to maintain excellence and improve collaboration with the business sector.

Today, high-speed communication networks support innovation throughout the economy much as electricity and transport networks spurred innovation in the past. Governments should also foster ICTs, in particular broadband networks, as platforms for innovation by upholding the open, free, decentralised and dynamic nature of the Internet.

In addition to hardware and software, ICT infrastructure includes information that is publicly generated or funded. Provision of this information at no or low cost can stimulate innovation and improve the transparency and efficiency of government. Obstacles that impede the commercial and non-commercial re-use of public-sector information should be addressed including restrictive or unclear rules governing access and conditions of re-use; unclear and inconsistent pricing of information when re-use is chargeable; and complex and lengthy licensing procedures. In general, public information should remain open so as to eliminate exclusive arrangements and allow innovative commercial and non-commercial re-use.

Intellectual property rights (IPRs) provide an important incentive to invest in innovation by enabling firms to recover their investment costs. IPRs should be well protected and appropriately enforced. They contribute to the creation of innovation and are important for diffusing knowledge and creating value. A variety of collaborative mechanisms, such as licensing markets or pools and clearing houses, can facilitate access to and use of knowledge. Patent systems need to be properly tailored to ensure a proper balance between incentives for innovation and the public benefit that flows from dissemination of the knowledge in the marketplace.

In an economy increasingly based on knowledge and innovation, the development of fully functioning knowledge networks and markets could have a significant impact on the efficiency and effectiveness of the innovation effort. Some good practices exist but significant scale-up is required. Governments can first, underpin the development of a knowledge networking infrastructure; second, implement measures, such as the OECD Guidelines on Access to Research Data from Public Funding, to share public-sector knowledge and data; and third, foster the development of collaborative mechanisms and brokerages to encourage the exchange of knowledge and ensure a fair return on investments made.

---

*Innovation can be applied to address global and social challenges*

---

Innovation is a means of dealing with global and social challenges. Global challenges need to be addressed collectively through global solutions and bilateral and multilateral international co-operation. However, current global challenges require more concerted approaches to accelerate technology development and diffusion and bring innovative products to the market. A new model for the governance of multilateral co-operation on international science, technology and innovation should be explored. It could focus on setting priorities, funding and institutional arrangements, procedures to ensure access to knowledge and transfer of technology, capacity building, and the delivery of new innovations into widespread use.

For many of these challenges, market failures – including the simple absence of a market – limit investment and the development and deployment of innovations. Pricing of environmental externalities, such as carbon emissions, will be an important trigger for innovation. Tax policies or other economic instruments can provide the necessary signal and thus foster a market for innovations, as can the removal of environmentally harmful subsidies. Policies should allow the private sector to identify the most promising means of addressing global problems through innovation. Governments will need to take the lead in areas that firms find too risky and uncertain through investment in public research and well-designed support for pre-competitive research in the private sector.

Low-income countries face specific challenges for making innovation the engine of economic development, including poor framework conditions and low human and social capital. In these countries, policies should focus on enhancing educational attainment and strengthening framework conditions. Modernising agriculture through a locally adapted approach in which entrepreneurship, agricultural productivity, and value addition drive poverty reduction and green growth is particularly important.

---

*The governance and measurement of policies for innovation should be improved*

---

Given the increasingly central role of innovation in delivering a wide range of economic and social objectives, a whole-of-government approach to policies for innovation is needed. This requires stable platforms for co-ordinating actions, a focus on policies with a medium- and long-term perspective, and leadership by policy makers at the highest level. Involving stakeholders in policy development can help develop a shared vision and make policies more effective in meeting social goals. This also involves coherence and complementarities between the local, regional, national and international levels.

Evaluation is essential to enhance the effectiveness and efficiency of policies to foster innovation and deliver social welfare. Improved means of evaluation are needed to capture the broadening of innovation, along with better feedback of evaluation into the policy-making process. This also calls for improved measurement of innovation, including its outcomes and impacts.

---

*The way forward – changing the emphasis in policies for innovation*

---

The broad concept of innovation embraced by the OECD Innovation Strategy emphasises the need for a better match between supply-side inputs and the demand side, including the role of markets. Moreover, policy actions need to reflect the changing nature of innovation. This implies an emphasis on the following areas:

- A more strategic focus on the role of policies for innovation in delivering stronger, cleaner and fairer growth.
- Broadening policies to foster innovation beyond science and technology in recognition of the fact that innovation involves a wide range of investments in intangible assets and of actors.
- Education and training policies adapted to the needs of society today to empower people throughout society to be creative, engage in innovation and benefit from its outcomes.
- Greater policy attention to the creation and growth of new firms and their role in creating breakthrough innovations and new jobs.
- Sufficient attention for the fundamental role of scientific research in enabling radical innovation and providing the foundation for future innovation.
- Improved mechanisms to foster the diffusion and application of knowledge through well-functioning networks and markets.
- Attention for the role of government in creating new platforms for innovation, *e.g.* through the development of high-speed broadband networks.
- New approaches and governance mechanisms for international co-operation in science and technology to help address global challenges and share costs and risks.
- Frameworks for measuring the broader, more networked concept of innovation and its impacts to guide policy making.

The OECD stands ready to help governments and international instances to use the Innovation Strategy in designing their approaches to finding national and global solutions. Implementing the Innovation Strategy will be an ongoing and evolving process, which will benefit from monitoring, peer review and the exchange of experience and good policy practices.