EXECUTIVE SUMMARY

Chapter 2: Expanding Frontiers: Fiscal Policies for Innovation and Technology Diffusion

Innovation—defined as the invention and introduction of new or improved products and processes—is a key driver of productivity growth and better living standards. Yet despite rapid advances in digital technologies and artificial intelligence (AI), productivity growth has fallen over the past two decades and global growth prospects for the medium term are weak. The pace of innovation is unbalanced across sectors and increasingly driven by applied research that does not generate wide-ranging knowledge spillovers. Moreover, the diffusion of innovation across countries and firms has slowed, particularly the adoption of low-carbon and digital technologies.

Improving growth prospects is essential amid high government debt, population aging, climate change, and large convergence gaps across countries. But promoting long-term growth can be challenging in a more fiscally constrained world. This *Fiscal Monitor* shows that well-designed fiscal policies to stimulate innovation and the diffusion of technology can deliver faster productivity and economic growth across countries.

Directing Innovation to Specific Sectors: When and How

Industrial policy that steers innovation toward specific sectors such as "green" (low-carbon) technologies and AI is experiencing a resurgence in many major economies amid concerns about economic and national security, often at a hefty fiscal expense. History shows that industrial policy is prone to policy mistakes. Even when projects transform industries, they often entail high fiscal costs and negative cross-border spillovers.

This chapter presents a novel model-based framework to assess when and how fiscal support to innovation should be targeted to specific sectors. Industrial policy for innovation only generates productivity and welfare gains under restrictive conditions. Targeted sectors must generate measurable social benefits (such as lower carbon emissions or higher knowledge spillovers to other sectors), and implementation capacity must be strong. Welfare gains from industrial policy easily turn negative if subsidies are misdirected (for example, toward politically connected sectors) instead of being driven by social returns. Policies discriminating against foreign firms can prove particularly self-defeating, as a large share of knowledge is imported even in major advanced economies, and such policies can trigger costly retaliation.

The case for subsidizing innovation in AI is unclear, since the technology has already matured to the commercial adoption phase. Priority should be given to technologies that expand human capabilities and to facilitating the adoption of AI in sectors with greater social benefits.

A Pro-Innovation Fiscal Policy Mix

Advanced and emerging market economies need a policy mix that supports innovation more broadly at the global technology frontier, especially because fundamental research with broad applications is underfunded in many countries. But the efficiency of the innovation policy toolkit matters, particularly when fiscal space is limited. This chapter presents a cost-effective mix of complementary policies, focusing on design features. This mix entails a combination of public funding for fundamental research, research and development (R&D) grants for innovative start-ups, and R&D tax incentives to encourage applied innovation across firms. Close public–private cooperation can create positive synergies at a lower cost to public finances.

Analyses show that a well-designed innovation policy mix can yield substantial growth and fiscal dividends, raising long-term GDP by $3 to $4 for each dollar of fiscal cost. This implies that increasing R&D support by 0.5 percentage point of GDP annually, or about 50 percent of the current level in Organisation for Economic Co-operation and Development economies, could raise GDP by up to 2 percent and

reduce the debt-to-GDP ratio for an average advanced economy over an eight-year horizon. Economies with ample fiscal space could accommodate this approach, but funding for innovation may be problematic for countries with immediate fiscal constraints.

Careful design and targeting of fiscal incentives across firms and along the innovation lifecycle is crucial to minimize fiscal costs and avoid capture by large established firms that could stymie innovation. To foster innovation, it is critical to develop a coherent and simple tax system with broad bases and low rates while instituting systematic evaluation. Complementary structural, competition, trade, and financial policies need to ensure a level playing field, reap gains from cooperation, and provide innovative firms with adequate access to financing.

Facilitating the Diffusion and Adoption of Technology

Countries below the technology frontier (primarily emerging market and developing economies) can reap larger productivity dividends by prioritizing policies that promote the diffusion of technologies developed elsewhere.

Strategic public investments in human capital and infrastructure, especially in digital infrastructure and skills, facilitate the adoption of cross-border technology. A 1 percent increase in education spending can boost medium-term GDP by as much as 1.9 percent in emerging market and developing economies, on average, by increasing technology diffusion. Similarly, improving the quality of trade and transport infrastructure in an average low-income country to bridge one-third of the gap with emerging market economies could lift GDP by 0.6 percent over the medium term. Public investment and financing are particularly beneficial to overcome barriers to green diffusion, as many of the technologies needed to cut carbon emissions already exist.

Investments in digital skills and infrastructure can also accelerate the diffusion of technology from frontier (high-productivity) firms to laggard firms. Targeted fiscal incentives for technology upgrades (such as revenue-neutral investment tax credits for firms acquiring frontier technology) can further speed up green and digital technology diffusion, raising aggregate productivity.

To pay for such priority spending and reap its dividends for growth, countries need to improve the efficiency of expenditure and upgrade tax systems. A broad-based value-added tax with a simplified collection mechanism for services trade facilitates diffusion and can help raise revenue. Scaling back ineffective corporate tax incentives and effectively addressing international tax avoidance by multinationals would also help, increasing annual tax revenue by up to 1 percent of GDP in some developing economies.

Reaching the world's full innovative potential and accelerating the diffusion of technology requires maintaining and deepening international collaboration. Economies farther away from the technological frontier could lose the most from inward-looking policies, given their reliance on foreign technology. Coordinating innovation policies is critical to catalyze cross-border knowledge spillovers, harness the potential of ongoing green and digital transformations, and expand the frontier for all.