



Italian G20 Presidency

G20 Menu of Policy Options Digital Transformation and Productivity Recovery

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G20 Menu of Policy Options

Digital Transformation and Productivity Recovery

Executive summary

The rise in digitalization, the increased diffusion of digital platforms and the adoption of innovative capital offer key potentials for emerging from the pandemic crisis. Boosting productivity growth and distributing their benefits in an inclusive manner are the two crucial challenges of our recovery, and the G20 economies are in the position to leverage on a broad set of policies to efficiently target these objectives.

In the recent years countries have been implementing different policies to boost productivity, as well as tackling the digital transformation, including expanding intangible investments. Their efforts embody a strong component of path-dependency and country-specificity, namely the efficacy and implementation level of policies in the field strongly depend on the initial conditions with respect to the digital transition, and the country-specific economic situation.

Against this background, together with the important synergies coming from complementary investments in digital infrastructures and financial inclusion, the *G20 Menu of Policy Options on Digital Transformation and Productivity Recovery* takes stock of already implemented as well as proposed policies and seeks to identify areas where benefits of international cooperation appear to be the strongest.

Policies to foster productivity through digitalization include sustaining innovation and the knowledge economy, establishing fair and well-functioning market conditions, and enhancing lifelong learning and training schemes. Innovation can be crucially supported also through the complementary benefits arising from investments in intangibles, guaranteeing equal access to technologies for firms, citizens and countries. Platform markets need to be open and competitive, labour market regulations should ensure social protection, while facilitating access to training and workers' re-skilling opportunities, especially for Small and Medium Enterprises.. The relevance of sources of financing varies among countries, although equity market seems to have the highest potential to foster investments in intangible assets.



Background

The rise of digitalization

Digital technologies offer a vast potential to enhance welfare and living standards by raising product and service quality and variety, and productivity growth. Despite its benefits, the diffusion of digital technologies is incomplete and heterogeneous across sectors and countries, and most G20 economies experienced a prolonged productivity slowdown already prior to the pandemic. Among possible causes for such asymmetric outcomes, there may be slow and difficult technology adoption and low investments following the Global Financial Crisis¹ thereby leading to a drag on productivity growth. Compounded with the shock from the pandemic on investment, labour, education and supply chains among others, the long-lasting impact on productivity growth is not to be underestimated.

Therefore, the G20 has developed a Menu of policy options aimed at maximizing the potential benefits of digitalization on productivity. By looking at both productivity drivers (i.e. infrastructure, innovation, human capital, digitalization, business environment) and productivity-enhancing policy options (e.g. fostering public and private investment; promoting business dynamism and resource re-allocation), the Menu focuses on actions needed to revive productivity growth, with a particular focus on digital platforms, digital skills and investment in intangible assets.

One of the defining features of the digital economy is the shift from the physical capital towards intangible capital. Research shows that to realize productivity-enhancing effects and equally share its benefits across countries, digitalization could be complemented by investment in innovation, mainly intangible assets (e.g. R&D, training, management skills and organizational capital), and by better access to communication networks within and across countries². Effective education and training developing the relevant skills are needed to adapt to the technological transition. The spread of digital platforms can also contribute to productivity growth. Intangible assets also present synergies and complementarities among them and with tangible assets. Therefore, a well-balanced mix of both tangibles and intangibles is needed, ideally in a way that they complement each other and reinforce their productivity-enhancing effects³.

Investment in intangible assets has risen substantially in recent decades and this growth has been mainly concentrated in a limited group of countries and companies. However, it is widely acknowledged that the economic potential of certain technologies (i.e.: artificial intelligence) is yet to be fully realized. Investment in intangibles may be hampered by poor access to financing options, given the lack of pledgeability of some intangible assets, increasing the sensitivity of intangible financing to economic conditions.

Despite its broad-based benefits, digitalization may be contributing to widen performance and income gaps across sectors, firms, workers and countries. Even prior to the pandemic, broad adoption of information technology (IT) and labour-saving automation rendered some jobs obsolete—particularly those involving low and middle-skill routine tasks. At the same time, transformative technologies can also

¹ The full set of drivers of the productivity slowdown are not fully understood yet. See IMF, 2021.

² See OECD (2021), “Bridging the gap in the financing of intangibles to support productivity”.

³ See OECD (2021), “Spurring growth and closing gaps through digitalization policies to LIFT all boats”, OECD Publishing, Paris; and IMF (2021) “G20 Background note: Boosting productivity in the aftermath of COVID 19”.



bring new and better jobs, as discussed in the *G20 Menu of Policy Options on The Future of Work*⁴ developed under the Argentinean Presidency in 2018, and the related G20 Note.

Impact of COVID-19 pandemic

The COVID-19 shock has accelerated the digital transformation; allowing households, firms and societies to better cope with the pandemic in the short term, and, as far as this transformation is permanent, creating new opportunities and challenges for reviving productivity growth and reducing income gaps over the medium term. Productivity may be affected in several ways: directly as new technology makes firms more productive, and indirectly through reallocation of labour and capital within and across firms and sectors. With sectors impacted very differently by the pandemic, resource reallocation is inevitable. This could occur for at least two (possibly related) reasons: (i) the churn of businesses entering and exiting the market and (ii) changes in consumer demand. The impact of reallocation on productivity is often positive on aggregate but depends on the relative productivity of the exiting and growing firms, and of shrinking and expanding sectors. So far, preliminary evidence hints to a positive impact on productivity but at the cost of job losses and job dislocations across sectors in the G20 economies⁵. The Menu puts forward policies for making this reallocation as smooth as possible so as to minimize the socio-economic effects of the pandemics while still allowing for efficient use of resources.

On the other hand, the accelerated adoption of digital platforms, that increases efficiency and is generally associated with firm- and sector-wide productivity gains, and as a consequence is also partly related to rising market concentration. Indeed, entrenched market power could adversely impact innovation and eventually productivity.

The COVID-19 crisis is also changing the way we work and consume. The need to reduce in-person interaction has boosted remote working and put a premium on digitalization and automation. Consumer spending has shifted from in-person to digital services and durable goods. The users of online platforms have jumped among both consumers and firms, and digital firms have been more resilient, in general, to the adverse effect of the crisis. Preliminary evidence shows that these trends will continue, and that technology adoption may accelerate further.⁶

However, the COVID-19 crisis has also intensified the concerns associated with digital divide particularly by heightening inequality and dislocation concerns across and within countries. The capacity to adapt to and benefit from the acceleration in the digital transformation caused by the pandemic also varies across firms, individuals and countries.

In the short term, firms and households who were less able to leverage digital technologies have been less resilient during the crisis.

- Despite signs of faster technology adoption by Small and Medium Enterprises (SMEs), already dominant firms in digital sectors have generally performed better, and small firms and those with no or low intangible capital face higher risks of distress and failure.
- Initial data also show that young people, low-skilled, non-standard workers (i.e. informal, self-employed and part-time workers) and self-employed have experienced starker income losses. Historically, workers suffer a lasting negative impact on earnings after spells of unemployment, and transitions through unemployment tend to be more prevalent for lower-skilled workers and

⁴ [G20 Menu of Policy Options for the Future of Work - July 2018 \(utoronto.ca\)](#)

⁵ See IMF (2021), “G20 background note: boosting productivity in the after math of COVID-19”.

⁶ See OECD (2021), “Harnessing productivity benefits of online platforms”.



increase the likelihood of needing to switch occupations—which may require new skills. Moreover, many of the jobs that could be displaced by technology in the future are also those that have been hit hardest by the pandemic, meaning that the most vulnerable workers may remain vulnerable.

In the longer-term, the fall in investment and the lower mobility of workers across sectors and firms, the erosion of unemployed workers' human capital and students' educational losses because of school closures has the potential to jeopardize growth prospects and inclusiveness.

Policy responses so far and recommendations

The COVID-19 shock has triggered a strong policy response by G20 countries. The aim of policies has been not only to help firms and households cope with the crisis, but also to promote the digitalization of public and private-sector activities, laying the grounds for future productivity growth.

The attention is now gradually shifting towards facilitating the smooth reallocation of resources to the most productive activities where appropriate, while strengthening social protection safety nets and helping workers to adjust and upgrade (wherever needed) in the transition process. For many countries, this starts with efforts to close the digital divide for firms and households. To this end, the role of training and reskilling is paramount. Resource reallocation is facilitated by efficient corporate insolvency and restructuring procedures, but also by pro-competitive market reforms. Supporting investment in intangible capital is crucial, including through well-targeted fiscal incentives for innovation, product market reforms and improved access to finance.

This G20 Menu of Policy Options provides an overview of the measures adopted by G20 countries in their efforts to boost productivity through digitalization, including in response to the pandemic and highlights where further international cooperation in this area might be possible. It benefits from background work from the OECD, the IMF, the ILO and UNCTAD, and discussions held within the G20 Framework Working Group (FWG). In particular, the proceedings of the FWG Focus Groups on digital inclusion, digital platforms, and financing intangibles, comprised of interested FWG members, informed the related sections of the document. It should, however, be interpreted as an overview of the ongoing efforts of policymakers of G20 economies to harness opportunities from digitalization to spur future productivity growth.

Promoting digitalization and productivity

Key challenge: Policies need to ensure that the digital transformation speeds up the recovery and result in a sustainable and inclusive growth while contributing to closing income and productivity gaps. G20 countries are at different stages in implementing policies aiming at accelerating and regulating the digitalisation of public and private-sector activities. These include improving broadband connectivity, helping firms to adopt online business models, promoting online payments and digital government services, and enhancing digital skills. Building synergies among this wide range of policies and interventions requires careful coordination across government entities. National and international coordination efforts would help make the most of limited resources, accelerate the international diffusion of best practices and reduce the risk of international regulatory arbitrage. Importantly, the relationship between technological innovations and productivity growth is neither simple nor linear. Productivity growth has generally accelerated not following major inventions or innovations, but rather as these inventions became mainstream and enjoyed widespread diffusion. Moreover, the uneven diffusion of innovation and intangible investments is a driver of the productivity gap between frontier and laggard



firms. These gaps have widened especially in digital-intensive sectors suggesting that the muted effect of digitalisation on aggregate productivity reflects the inability of laggards to adopt the best practices and technologies of the frontier.

A fair access to markets and a competitive environment is crucial for a broad-based digital transformation. Digitalisation has been concomitant with a widespread decline in business dynamism and increasing market concentration.⁷

Digital preparedness helps firms and citizens to access innovative services. This includes not only access to communication infrastructure but also to e-government services as they are essential to reap the productivity benefits connected with digitalization. In this regard, there is need to create a comprehensive digital government strategy able to grant stable and inclusive access to digital services with positive effects on firm-level productivity growth.

Policy Options

Sustaining innovation and the knowledge economy. Harnessing the productivity benefits connected with innovation requires upfront complementary innovative investments, including intangible assets, which in turn needs adequate financing, involving all available sources of finance such as crowdfunding and venture capital. Countries could consider promoting public-private partnerships to catalyse private investments and establish a favourable environment to attract foreign investors while taking steps to ensure the productivity benefits from foreign investment to the domestic economy; improving links between academia, industry and citizens, to foster science-industry interaction; implement tax, public expenditure and non-financial measures that encourage entrepreneurship, firm experimentation and scaling up such as technology/business incubators; improving labour matching of highly skilled human capital, physical capital and financial services for firms especially for SMEs.

Establishing fair market conditions for the digital age. Policies need to ensure that digital markets including digital platforms, remain competitive, open non-discriminatory and contestable to promote competition and innovation, thus boosting productivity growth. To secure a level playing field and ensure market openness, countries could point to upgrading competition law and strengthening enforcement by adopting new analytical tools including well-calibrated intellectual property rights system that considers each country specific situation and starting point; reduce the costs of starting or exiting a business, including administrative burdens; and improve the design of insolvency regimes to facilitate restructuring and limit the loss of intangible assets associated with liquidation procedures.

Increasing technology access for firms and citizens. Governments could improve the digital provision of services to firms and households in addition to developing enabling conditions to promote innovation such as digital infrastructure. This includes ensuring the affordability for firms and citizens to adopt such accessible services.

Countries may explore policy options such as enhancing public investment to support e-government services; introducing new simplified procedures for the purchase of IT goods and service in the public administration while ensuring resilience against risks of network disruptions and develop new tools such as digital identity. Moreover, countries could consider fiscal incentives to encourage investment in stable and reliable digital infrastructure or direct public support where it is not commercially viable and develop and implement broadband development plans and usage targets.

⁷See OECD (2021) “Harnessing productivity benefits of online platforms”.



How are G20 and guest countries favouring the digital transformation?

- **Argentina** launched the *SME Digital Transformation Policy 2020-2023*, to increase the competitiveness and productivity of SMEs and entrepreneurs by contributing to the technological and productive development of companies, institutions, value chains and regions. In particular, the programme aims to improve the technological, productive, organizational and management capacities of SMEs, to strengthen the 4.0 technology infrastructure, as well as to train 4.0 experts, workers and entrepreneurs.
- **Australia** has launched its *Digital Economy Strategy* to map the pathways to achieving its goal of being a leading digital economy and society by 2030. This strategy puts in place the foundations to grow Australia's digital economy, builds capabilities in emerging technologies and identifies the key areas for collaboration and strategic investment to support digital growth, jobs and investment
- **Brazil** is implementing a set of public-private partnerships by boosting skills development, connectivity, industry 4.0, the Internet of Things and cybersecurity and supporting health institutions to facilitate remote care. Moreover, Brazil supports private-public partnerships aimed at promoting the digitalization of the public sector.
- **Canada** created the Universal Broadband Fund, which provides funding to support broadband projects across Canada. This program supports high-speed internet access for all Canadians, especially in rural and remote communities. Access to better, more reliable broadband allows Canadians to participate in the digital economy and take advantage of advances in telehealth, e-learning and remote access to government services.
- **China** launched the *Cloud Services, Big Data and Intellectualized Reconstruction' initiative*, with the goal of implementing the digital transformation and supporting the construction of the digital transformation promotion center. Moreover, the Initiative aims to address the difficulties faced by enterprises in the digitalization, while enhancing public service capabilities.
- The **European Union** more than 670 billion euro Recovery and Resilience Facility includes a 20% target for expenditures into digital investments. Moreover, the EU has launched the *2030 Digital Compass: the European Way for the Digital Decade*, setting out a vision for Europe's digital transformation by 2030. The initiative aims at enhancing digital skills, building up reliable and sustainable digital infrastructures, promoting the digitalization of businesses and public services.
- **France** is adopting the *Building the Digital State* initiative, aimed to digitalize public services. The goal of the programme is to support both individuals and firms by facilitating administrative procedures and therefore alleviating bureaucratic red tape for SMEs.
- **Germany** launched in 2020 the *Digital Jetzt* initiative, an investment support action for SMEs to incentivize investments in digital technologies and know-how and contributing to the further development of the *Mittelstand 4.0 Centres of Excellence* maximizing network benefits and enhancing the focus on support on key future challenges, notably including digitalization. Additionally, Germany has launched a 5G-innovation program, which funds concrete application-oriented pioneer projects like smart farming, industry 4.0 or digital health care.
- **Indonesia** has launched the *Making Indonesia 4.0 Roadmap*, with the goal of making the manufacturing industry more competitive by accelerating the implementation of Industry 4.0 and digital technologies. In particular, the programme aims at modernizing the automotive, food and drinks, textile, electronics and chemical manufacturing sectors.
- **India** has adopted the programme *Digital India*, aimed at transforming the country into a digitally empowered society and knowledge economy. The goal is to make government



services digitally accessible to citizens and to ensure efficiency, transparency and reliability of such services at affordable costs.

- **Italy** has recently launched the *National Plan for Resilience and Recovery*, which allocates significant resources in support of the digital transition. In particular, the plan aims at improving connectivity, favoring the digitalization of public administration, schools, firms and citizens currently operating remotely.
- **Japan** will introduce a tax credit to facilitate companies' investments in digital technologies. Eligible companies are required to submit a business plan to achieve digital transformation on a company-wide level.
- **Mexico** developed CoDi a request-to-pay scheme, built on Banco de México's RTGS infrastructure. CoDi has promoted the use of accounts that can be opened remotely using an ID and a smartphone, putting the entry to the financial system pathway, in the user's hand.
- **The Netherlands** is implementing an agenda to accelerate the digitalization of SMEs, by contributing to improving necessary skills and capabilities. To that end, a subsidy arrangement was put in place to facilitate the setting up of regional workplaces in collaboration with educational institutions for small and medium enterprises that should contribute to their digital transition.
- **Russia** has launched the *Digital Economy of the Russian Federation Program*, aimed at improving the quality of life and jobs, developing the economic potential based on Information and Communication Technologies (ICT). The agenda includes access to e-government services, fair and widespread access to communication services, internet and media, development of personnel training system for a digital economy, ensuring cybersecurity.
- **Saudi Arabia** has designed a *Regulatory Sandbox* which welcomes domestics and international firms wishing to test new digital solutions in a live environment to deploy them in the market in the future.
- **Singapore** is implementing the *Smart Nation Initiative*, a comprehensive strategy involving government agencies, industry and citizens, to lay the foundation infrastructure and help driving pervasive adoption of digital and smart technologies throughout the economy and society.
- **Spain** has launched the *Digital Spain 2025 Strategy*, which includes a set of actions, reforms, and investment measures, organized around ten strategic axes. The measures included in the agenda aim at promoting a more sustainable and inclusive growth, driven by synergies between digital and green transitions, and protecting the individual and collective rights.
- **Turkey** has recently started the *National Technology Move* to increase global competitiveness. The strategy aims at fostering the digital transformation by creating an innovative and digitalized business environment, focusing on artificial intelligence and machine learning, robotics and autonomy, internet of things, big data and data analytics, thus aiming at increasing technological competence of the economy.
- **UK** will launch a new online platform where businesses can access advice on software that could help them save time and money while running their businesses, and a voucher to discount software. The new platform will help businesses to understand the benefits of different types of software and identify which could help deliver their business goals. Support will be provided through interactive tools and technology-specific guides. The UK Biobank and Transport for London (TFL) are good examples of data sharing between public and private sector.
- **US** has invested in the *American Rescue Plan* to provide funding for public investment in digital infrastructures. The Plan also establishes an Emergency Broadband Benefit



programme to help provide broadband services and certain devices to low-income households during the COVID-19 pandemic.

Fostering digital inclusion

Key challenge: Digitalization generates productivity enhancing effects but, if not supported with appropriate social protection and labour market policies can incur potentially in large costs in terms of jobs losses and skills obsolescence also impairing convergence of emerging economies. To achieve our shared goal of a Strong Sustainable Balanced and Inclusive Growth, managing the disruptive consequences of digital innovation and making sure that none is excluded from reaping the productivity-enhancing benefits of digitalization is essential.

Adequate skills are crucial to adopt and effectively use digital technologies; building effective and inclusive lifelong learning programmes is key to ensuring everybody has the opportunity to acquire and upgrade the skills needed to thrive in a digital world. In addition, ensuring that individuals and firms have a broader access to broadband connection and enabling technology is also crucial to foster digital inclusion.

The surge in digital adoption might be especially beneficial to SMEs who traditionally lack resources for elaborating adequate digital strategies and tend to lag behind on digital innovation. For instance, online platforms offer simple pathways to digitalisation for all firms, while providing digital services that can be especially beneficial to micro enterprises and SMEs.

Digitalization may also worsen regional disparities leaving behind those who live in remote and rural areas. Due to both geographic isolation and features of economic development, they face enormous challenges regarding access to digital networks, technologies, and services. At the same time digital technologies have the potential to revolutionize remote and rural areas development by helping local communities and SMEs. Data-driven insights and new business models enabled by digitalization could improve their decision-making capabilities and help to enhance their performance.

Policy Options

Enhancing lifelong learning for all. This hinges on boosting adult learning programmes and on-the-job training schemes, through awareness campaigns and targeted financial incentives, and better integrating digital tools into school curricula aimed at developing cognitive and non-cognitive skills.

Countries could consider supporting students in attaining an adequate level of proficiency in baseline academic skills, also addressing the below-average participation in schooling for some vulnerable groups, including through development of online learning portals in collaboration with educational institutes; equipping schools with digital learning devices and internet access while investing in the development of traditional academic skills; adapting schools' curricula to strengthen non-cognitive skills and students' ability to learn continuously and enhance teacher training in the use of information and communication technologies. Moreover, countries could encourage initiatives to increase awareness of the importance and availability of adult learning courses, strengthening online training and establishing standardized certification schemes to monitor evaluation systems and ensure value for money and promote the development of training providers. Finally, linking part of the financial incentives or fees private-sector training providers receive with the occupational outcomes of training participants should also be considered.

Promoting adaptability of SMEs to digital transition. Targeted policies to support digitalisation of micro enterprises and SMEs and to address financial constraints and skill needs can contribute to narrow digitalisation gaps between small and large firms.



Countries may explore policy options to support the digital transformation of SMEs, this includes: promote advanced ICT and managerial skills and cognitive capacities in the workforce; reduce barriers to entry; improve access to highly skilled human capital, physical capital and financial services; implement programmes to reduce financial constraints; increase access to broadband connectivity and promoting financial literacy and familiarity with digital technologies raising awareness of its opportunities and risks for managers and owners of SMEs, in synergy with the provisions resulting from the works of Global Partnership for Financial Inclusion.

Ensuring consistency with financial inclusion. Digital inclusion policies and financial inclusion interventions have to be designed coherently and with a gender prospective. As financial inclusion is often pursued by means of digital innovation in the fields of digital payments and online banking, measures to facilitate the diffusion of transparent and accessible digital financial services should be implemented in the context of policy actions fostering Digital Inclusion. Enhancing consumer protection and digital financial literacy would help the development of transparent and fair online financial services and build trust in digital financial services and payment methods, also by taking inspirations from the effective approaches for digital financial inclusion and financial consumer protection resulting from the work of the Global Partnership for Financial Inclusion. To ensure the broad adoption of digital services, particularly in areas like finance, end users must be able to trust these services. This is especially the case of new technologies.

Promoting solid digital infrastructures. Inclusiveness of digital opportunities increases with the level of digital investment, such as digital infrastructures. Besides making the digital transition feasible, by boosting productivity and enabling innovation, digital infrastructures enhance the efficiency and strengthen the resilience of service provision, allowing governments to grant effective and widespread access to public services by means, for instance, of public digital platforms. Enhancing digital infrastructure means both improving infrastructure in those areas that are already connected and bringing connectivity to unconnected areas, particularly rural areas. The latter has become a challenge for some countries and addressing this would require close cooperation between the government, at the national and local level, and related authorities and private institutions, including the private sector. As public finances are even more constrained by support to the economies and economic stabilizers triggered by the crisis, public investments that foster an inclusive digitalization should be implemented in a way that does not crowd out but rather paves the way to private investment, intervening in those cases where market failures need to be addressed.

What policies G20 and guest countries are adopting to foster digital inclusion?

- **Argentina** implemented *Knowledge-driven economy and Technical, Vocational Education and Training (TVET)* programmes to reduce the digital divide of broad sectors of the population, particularly youth. This policy offers unemployed and workers the possibility of learning opportunities in three main areas: Immersion in technological environments; Skills in transformation; 4.0 Training.
- **Australia** launched the *Digital Skill Finder Platform (DSFP)*, an easy-to-use portal aggregating free and paid private sector digital training, enabling workers and SMEs to upskill in web design, AI, business analytics and agile project management. The Platform aims to increase the digital capabilities of Australian SMEs and workers and increase their international competitiveness and resilience in the post-COVID economy.
- **Canada** created *CanCode*, a program to support opportunities for Canadian students from kindergarten to grade 12, to learn digital skills including coding, data analytics, and digital content development. It also supports initiatives that provide K-12 teachers with the training and professional development they need to introduce digital skills and coding related concepts into the classroom



- **China** encouraged online companies organizing “online class”, which helps people in poverty-stricken areas learn how to create and operate online store. Millions of people from poverty-stricken areas have benefited from this program, promoted the development of E-commerce in rural area and contributed to China’s poverty reduction.
- **France** implemented *Pix*, a public project for online digital skills assessment and certification platforms. It is aimed at fighting the digital divide by providing the means to citizens for improving their digital skills throughout life. Moreover, within the recovery plan, France implemented additional top ups to individual training accounts related to a number of digitally intensive occupations. France also dedicated more than 300 M€ to digitalize the lifelong learning system.
- **India** promoted *PM e Vidya Programs* to enhanced multi-mode access to e-learning opportunities providing e-content and QR coded energised textbooks to students and liberalizing open, distance, and online education regulatory frameworks
- **Indonesia** established *Payment System Blueprint 2025*, which supports digital inclusion, including through FinTech and promoting balance among innovation and customer protection.
- **Italy** invested in optical fibre internet (Ultra-Broad Band) for a better connectivity to allow students, especially in remote areas to access distance learning.
- **Japan** implemented a job-training programme for workers to improve their productivity, tailored to the needs of respective companies. The programmes cover practical digital skills such as utilization of IT or cloud computing and marketing and data utilization.
- **Korea** is fostering digital inclusion operating “digital schools” to provide training to the elderly and vulnerable groups on how to utilize digital devices, reserve train tickets online and learn coding.
- **Mexico** launched a training programme to promote women participation in productive sectors through the development of digital and financial skills in entrepreneurs and businesswomen, fostering the use of digital commerce.
- **The Netherlands** set up the Human Capital Agenda ICT (*HCA ICT*), an action plan to meet the growing demand for ICT professionals for example reducing the mismatch of ICT skilled workforce on the labour market and speeding up the uptake of digital technologies to address the shortages of ICT professionals in some sectors
- In **Russia**, the key digital technology-based infrastructure projects for the Bank of Russia were as follows: Digital Biometric Identification, Faster Payments System, Marketplace, Digital Customer Profile. The Bank of Russia also worked on reducing possible risks of unequal access to digital financial services, especially for vulnerable groups of population. In particular, the Bank of Russia issued recommendations for financial institutions on the accessibility of different offline and online channels for people with disabilities and other low-mobile groups of the population, annually monitoring the progress in this respect.
- **Saudi Arabia** extended the Doroob platforms to companies and business owners to match workers’ skills with the Saudi labour market needs with a specific focus on-line training. It helps in cutting the cost of training and development for business owners specially SMEs and micro-scale businesses.
- **Singapore**. established the SG Digital Office in June 2020 and trained 1,000 Digital Ambassadors to provide targeted support for less digitally savvy segments. The nationwide Digital for Life Movement was also launched in 2021 to foster partnerships across the people, private and public sectors and increase the reach of digital readiness efforts.
- **Spain** has launched the *Digital Skills National Plan*, which includes measures aimed at fostering the acquisition of digital skills by citizens, public employees and SMEs, measures



aimed at closing the digital gender gap, and providing training for workers to better meet market demand

- **Turkey** implemented measures aimed at developing the quality of distance education services by improving teachers' digital skills. Also, with the "Digital Transformation in Higher Education Project", a "digital literacy" course was added to the curriculum of pilot universities. In addition, in line with the objective of training 500 thousand software developers stated in Turkey's 2023 Industry and Technology Strategy, the Turkey Open-Source Platform was established to support capabilities and software-based products in both national and international area. Two qualified software developer schools are working on three open-source software projects, including natural language processing.
- **UK** fostered digital inclusion supporting the development of people's basic digital skills also financing access to education and training services for young people.
- **US**, via the *American Rescue plan*, provides funding for states, territories and Tribes to cover the costs of capital projects like broadband infrastructure, helping with a view towards to closing racial and socioeconomic gaps in accessing to ensure that all communities have access to the high-quality, modern infrastructure including internet access.

Harnessing digital platforms

Key challenge: Digital platforms⁸ are strong drivers of innovation and productivity and can play an important role stimulating consumer demand, improving firms' efficiency and competitiveness, allowing for new business models, modernizing traditional business models, and reducing transaction costs and information asymmetries. Digital platforms potentially affect productivity growth of incumbent firms through many channels: encouraging innovation and forcing the exit of lower productivity firms, increasing market transparency, and offering innovative services especially for small and medium companies. Nevertheless, consideration should also be given to the potential pitfalls of a rapid diffusion of digital platforms including possible negative effects on competition, social and consumer protection, employment levels, health and working conditions. Adequate policy and regulatory responses, including international cooperation, are needed to benefit from the increased diffusion of digital platforms while addressing its potential costs and risks.

Flexibility of workers in digital platforms may be beneficial but, if these benefits are not shared between platforms and workers' flexibility could lessen the overall productivity benefits encouraging rent extraction and discouraging the accumulation of productive assets and human capital and could be detrimental to the living and working conditions of platform workers. The challenge for policymakers is to preserve sufficient flexibility in working arrangements to allow innovative business models to succeed while ensuring good working conditions and skill-upgrading opportunities for platform workers, especially for the most vulnerable groups.

Data-privacy regulations are strictly country-specific, however a more coordinated action to limit the risk of fragmenting the international regulatory landscape, could be beneficial to avoid raising costs for companies, generating uncertainty, undermining trust in the digital economy and reducing productivity benefits of digital platforms with due consideration of country specific circumstances. This is particularly relevant for SMEs, which often lack the skills to cope with different data frameworks.

⁸ Digital platforms are defined as multisided online platforms connecting two or more sets of users for the purpose of exchanging goods or services (for example online marketplaces) regardless of the sector in which they operate.



Policy Options

Ensuring online platform markets remain open and competitive. Specific characteristics of digital platforms, such as network effects, can increase concentration, therefore, to create market-entry opportunities and contribute to a stronger and sustainable growth is essential to ensure online-platform markets' contestability. Digital platform market dynamism would enhance productivity gains of incumbent companies as, more concentration can lead dominant platforms to take advantage of their market power rent extraction potentially lowering productivity growth. Policies in this area should find the right balance between the welfare gains arising from network effects, generated by activity concentrating in few large platforms, and those arising from vigorous competition among platforms, also by encouraging the entry of new players in the markets.

Countries need to consider reviewing antitrust policies and enforcement mechanisms to address the "winner takes all" effect where appropriate; evaluate user data portability and interoperability to allow customer mobility between digital service providers while ensuring consumers privacy protection and security within the domestically applicable legal frameworks; reduce contractual clauses limiting multihoming (i.e. the possibility to provide services on competing platforms at the same time); and ensure a level-playing field between online platforms and their users. Moreover, countries should encourage closer cooperation among competition authorities to tackle the challenges posed by the rising role of digital platforms.

Strengthening social protection and labour market regulations. Countries may explore policy options such as limit to the power of platforms to change unilaterally the terms and conditions of work; raise the effective coverage of social insurance and benefit schemes; boost the portability of entitlements between different labour market groups; complement social protection measures with more universal support such as health insurance. In addition, facilitating access to training and re-skilling opportunities for platform workers and encouraging lifelong learning opportunities, especially for low-skilled workers regardless of employment status would be useful for promoting inclusiveness.

Enhance data collection on digital platforms balancing between data privacy and protection and data access while facilitating data free flows with trust and cross border data flows on the condition of data security. Countries should try to find the right balance between data protection and data access while facilitate a safe and order data free flows with trust and cross boarder data flow within the domestically applicable legal frameworks. In this respect, it is very important to further progress, among the G20 members, in sharing experiences on data policies, especially in identifying commonalities between existing approaches and instruments used to enable data to flow across borders, and to enhance data portability while ensuring consumers privacy protection and security without altering national policies. Countries, under their own legislation could encourage the creation of established mutually agreed trusted and voluntary protocols that allow governments to use platforms' data while meeting strict requirements on data confidentiality and the protection of commercial sensitive information. Countries could also enhance the collection of cross-country comparable data to better assess the economic impact of digital platforms, for analysis and policymaking.

How are the G20 and guest countries supporting a well-regulated diffusion of digital platforms?

- **Australia** is implementing the *Consumer Data Right (CDR)* to give consumers greater access to and control over their data, support more informed consumer choice and give access to better deals through encouraging innovation in products and services and competition between service providers. CDR is an economy-wide initiative rolled out on a sector-by-sector



basis, starting with the banking sector in July 2020, and will be followed by the energy and telecommunication sectors.

- **Brazil** has an online platform for technological solutions aimed at meeting the needs of the Brazilian semi-arid region. It includes several functionalities such as dataset of public notice, relationship channels and useful tools for companies and start-ups.
- **Canada** proposed the *Digital Charter Implementation Act* to modernize its framework for the protection of personal information in the private sector. The legislation aims at increasing control and transparency of personal information handled by companies and ensure the freedom to move and eventually destroy information from one organization to another in a secure manner.
- **China** promulgated the *Anti-Monopoly Guidelines for the Platform Economy*, which aims at improving antitrust policies and enforcement mechanism. The guidelines include regulations of prominent problems such as ‘operation platform monopoly’, ‘collusion through algorithms’ or ‘varied prices for same products based on different consumers’, clarifying criteria of monopolistic behaviours.
- **Germany** updated its competition law to allow early stage intervention in cases where competition is threatened by large digital companies with a dominant market position. As a preventive measure the antitrust authorities can prohibit certain types of conduct by companies. Prohibited conduct includes amongst others self-preferencing, the obstruction on procurement and sales markets, increasing market entry barriers by processing competitively sensitive data and hindering the interoperability of products and the portability of data.
- The **European Union** has put forward a set of new rules: the *Digital Services Act* and the *Digital Markets Act*. The proposed package aims at two overarching goals: (i) creating a safer digital space where fundamental rights of all users of digital services are protected; (ii) establishing a level playing field to foster innovation, growth, and competitiveness. Moreover, the *General Data Protection Regulation (GDPR)* introduced the data portability right for individuals in the European Union.
- **India** launched in 2016 *Unified Payments Interface (UPI)* to offer a framework and API-based protocols to facilitate interoperable retail payments. UPI supports any source of funds (bank account, prepaid wallet, etc.) and can handle P2P and P2M payments in both push and pull scenarios.
- **Korea** lunched *Policy for fair digital* to facilitate market competition and innovation while ensuring consumer rights and interest. It reinforced the law against competition restrictions by online platform operators while designing a balanced system that does not hamper market innovation. It enhances the transparency of the online platform market through voluntary participation of the private sector providing autonomous dispute resolution and incentives for win-win cooperation.
- In **Russia** as part of an experiment with the financial sector and other organizations in pursuance of the Decree of the Government of the Russian Federation No. 710, *Integrated Identification and Authentication System – IIAS* – has been refined in terms of creating a digital platform for the exchange of data between citizens and organizations in electronic form with their consent, including for the provision of financial services and services, which makes it possible to save information in the user profile of the IIAS, as well as with the user's consent to provide this information to third parties, including financial institutions. Currently, the digital platform is being developed in terms of expanding its functionality and adding new information



- **Singapore** created *APIX*, a secure digital platform for FinTech innovation. It enables market players and regulators to co-create and build new prototypes rapidly in a Secure Sandbox and connect and engage with global financial system.
- **Turkey** established a regulation for protecting privacy. The Law on the Protection of Personal Data was entered into force in 2016. Under the same Law, the Turkish Data Protection Authority has been established as an independent regulatory authority with organisational and financial autonomy and a public legal entity. It concerns processing of personal data and to setting obligations, principles, and procedure to process personal data.
- **UK** announced a new, pro-competition regime for digital markets focused on a new Digital Markets Unit (DMU) in the Competition and Markets Authority. The DMU will introduce an enforceable code of conduct for firms with substantial market power to protect competition in digital markets.
- In **US**, the *American Rescue Plan* will build high-speed broadband infrastructure to reach 100 percent coverage, reduce the cost of broadband internet service and promote more widespread adoption.

Promoting the financing of intangibles

Key challenge: Ensuring proper financing of intangibles is an important avenue to achieve and complement the benefits of digital transformation fostering growth in a sustainable and inclusive manner. However, intangibles are difficult to be financed⁹. They have specific characteristics, including uncertain returns, non-rivalry, large synergies, low re-deployability, and measurement issues in accounting frameworks. These attributes tend to increase information asymmetries and make their use as collateral difficult especially for SMEs and startups. Promoting their financing is, therefore, more complex than for tangibles and requires deploying a broad set of complementary policies to improve countries' technology-adoption capacity (i.e., digital technologies, innovation, human capital, infrastructure). In the G20 context, policies will need to be calibrated considering country-specific financial architectures, institutional settings, and asymmetric levels of economic development.

Policy Options

Recognizing the differences across G20 economies with respect to their financial structure and the lack of one-size-fits-all solutions, there are three main sources of external finance available to firms that can be considered: governments, equity markets and banks.

Enhancing government financing. Governments can provide the most direct support, usually targeting R&D investment and knowledge-intensive sectors and promoting skill formation, both technical and managerial. Tools include R&D tax credits and tax allowances for education or training expenditures, among others. Carefully designing such policies is key, for example, to avoid favoring tax credits for incumbent firms over start-ups. The public sector plays a pivotal role, among others, to help reducing the financing gap implied by costly investment in intangibles, especially for those economies where market-based policies meet the challenge of building on missing markets. Also, governments have the power to swiftly intervene with emergency measures in crisis times, by preventing liquidity shortages.

⁹ See OECD (2021), "Bridging the gap in the financing of intangibles to support productivity".



Government support can be relevant to develop not only the supply of intangible financing, but also its demand via public procurement. This may be especially helpful for SMEs and start-ups, when they are looking for their first costumers.

Governments could play a crucial role to address private underinvestment in intangibles, correcting for market inefficiencies and excessive concentration, and supporting the emergence of a domestic knowledge-intensive sector. Ensuring a solid development of digital infrastructure and marketplace frameworks (e.g. competition policy, protection of well-calibrated intellectual property rights, cybersecurity, accessible patent and networking system, etc.), taking SMEs difficulties into account, are key in this context. However, while government intervention can be important to support intangible financing in certain countries and conditions, enabling market fundamentals to provide financing options for intangibles is a robust solution in the way forward, for all economies.

Deeping and expanding equity markets. Equity finance has the highest potential to finance intangibles, as equity owners are more willing to take risk and tend to evaluate firms according to their return profiles. In this context, deepening equity markets and expanding venture capital are two key avenues to foster investments in intangible assets. However, it is critical to establish the appropriate set of framework conditions allowing the deepening of equity markets where they are still underdeveloped and difficult to access (as for Emerging and Developing Economies - EMDEs), and ensuring that the structure of equity markets is supportive of the provision of patient and engaged capital. It is hence necessary to deepen venture capital markets, for example by promoting public-private partnerships to co-finance venture capital investments in intangible assets or initiatives that combine financing opportunities with specialized industry knowledge and mentorship to support inexperienced startups. Establishing joint ventures with foreign partners is a policy option, but foreign investments might be too volatile to provide “patient capital”.

Stimulating access to bank financing. Banks provide an alternative financing route, especially in countries where capital markets are less developed, but its features remain generally less apt to intangible assets. Policies in this area can help bank financing becoming more “intangible friendly”, by improving the information available on intangibles (better financial reporting by firms, better credit monitoring and risk assessment by banks), thus their pledgeability as collateral. However, in many EMDEs commercial bank financing is even less readily available, especially for intangible assets that involve greater uncertainty. In this regard, multilateral development banks can play a key role in providing finance to otherwise credit-constrained but commercially and technologically viable projects; or to domestic financial systems. In addition, global coordination is crucial to promote international banking norms and accounting standards (especially for the big international banks) tailored to the specific features of intangibles and their evaluation.

Notwithstanding the broad spectrum of envisaged policies, there is no one-fits-all optimal solution for unlocking intangibles’ financing and its associated growth potential. Rather a menu of tools that can be implemented in combination may include: *i)* direct public investments; *ii)* tax incentives; *iii)* technical and managerial training; *iv)* equity finance; *v)* bank finance. Tailoring initiatives by country, sector and type of intangible asset will be important. All of these programs need to be well contextualized in efficient and effective marketplace frameworks.



How are the G20 and guest countries supporting intangibles investments?

- **Argentina** established a tax regime, through the *Knowledge Economy Law (2020)*, to promote new technologies, generate innovative value, foster quality employment, facilitate the development of SMEs and increase exports of companies engaged in knowledge-based services.
- **Australia** is investing an additional \$2 billion through the Research and Development Tax Incentive, which provides tax incentives for R&D expenditure in the form of refundable and non-refundable tax offsets.
- **Brazil** implemented the *Credit Line for Services 4.0 (2020)* to subsidize loans for intangibles financing in SMEs, such as advanced manufacturing, digitalization, internet of things (IoT), Big Data, energy efficiency, among others.
- **Canada** invested into a *National Intellectual Property Strategy (2018)*, helping entrepreneurs better understand and protect intellectual property and get better access to shared IP. Building off the Strategy, the Government recently proposed to create programs to provide access to expert intellectual property services. And the Business Development Bank of Canada, a federal Crown corporation, launched a \$160 million *Intellectual Property-Backed Financing solution (2020)* to provide patient capital in the form of debt, quasi-equity and equity to scaling companies in knowledge-based industries.
- **China**, through the *Strengthening Intellectual Property Right Pledged Financing (2019)*, has put forward policies to facilitate financing pledged by intellectual property right from banks and insurers to support the development of innovative enterprises, ease their capital shortage and, in turn, accelerate IPR market transformation. Commercial banks are encouraged to establish separate credit programmes and specific in-house performance appraisal and incentive mechanisms to support IP pledge financing under the premise of having risks under control. Solutions involve the training of IP pledge financing specialists, the establishment of a sound in-house evaluation mechanism, improving pledge registration services, strengthening the dynamic management of collaterals and tightly monitoring borrowers' business operations.
- The **EU** invests in digital research, innovation and green transition, through the *Horizon Europe 2021-2027 Programme*, with the European Innovation Council supporting innovators to develop and scale up breakthrough technologies and game-changing innovations.
- **France** has introduced the *Investments for the Future Programme (PIA4, 2021)* to provide a stable funding to higher education and training, research, industry and SMEs, including technology transfer offices, as well as research labs gathering both private and public actors to develop technology transfer. The national initiative called 'France Num', launched two years ago to fill the digital divide between companies, include guaranteed 'digitalization' loans to SMEs up to 50 employees through their banks for digitalization projects (for example: software acquisition, product or service innovation or marketing expenses).
- **Germany** designed the *Research Allowance Act (2020)*, as a non-wasteable tax credit for PIT and CIT to grant the implementation of R&D projects from the fields of basic research, industrial research and experimental development. Additionally, the government developed a 10 billion EUR equity fund for investment in technologies of the future (*Future Fund*) aims to improve financing opportunities in venture capital during the capital-intensive scale-up stage and attract capital to diversify the venture capital market by including insurance companies, family offices and other risk averse institutional investors.
- **Italy** has designed the *National Recovery and Resilience Plan (NRRP, 2021)*, within the NextGenerationEU, to support R&D investments, innovation and technology transfer, and the transition to a knowledge-based economy. In 2017, the *Industria 4.0 National Plan (I4.0)* deployed short and long run investments in innovation, competitiveness and skills formation for companies.



- **Japan** introduced a subsidy to finance the cost of employers to provide vocational training to employees (the *Human Resources Development Support Subsidy*, 2001).
- **Korea**, through the *Digital innovation technology Programme*, supports feasibility projects for fields of Next-generation AI, blockchain, hologram, smart manufacturing, self-driving and developing specialized contactless technologies. An *AI Semiconductor industry development strategy (2020)* has been released to support empirical tests for AI semiconductors at public and private data centres, and foster convergence between experts in the area.
- The **Netherlands** established a *National Growth Fund (NGF, 2020)* to be allocated during the period 2021-2025, with the aim to boost the structural earnings capacity of the economy. The fund will facilitate sizeable additional public investment in intangibles, such as R&D&I and knowledge development as well as infrastructure.
- **Russia** provides public grants for R&D expenditures in priority sectors, soft loans for SMEs and participation in equity through the Russian Venture Company, as well as different tax benefits for IT sector, including super tax deduction, reduced social security contributions and VAT exemption.
- **Saudi Arabia** through the *Research Capital Funding* supports maintenance of existing research facilities, and investments in new capital equipment in universities and educational institutions.
- **Singapore** has encouraged loans collateralised by IP are part of the *Intellectual Property Financing Scheme (IPFS, 2014)* and helped SMEs to be more productive through the adoption of e-payments, personalised training and cash incentives.
- **Spain**, through the *SME Digitization Plan (2021)*, is promoting the integration of innovative management and digital entrepreneurship into SMEs models and the reduction of the gender gap in digitalization.
- **Turkey** has been providing RDI supports for the AI projects of academia and industry by several support mechanisms. In the last 10 years, 1,7 billion TRY has been provided to 1.715 RDI projects. %25 of the RDI support provided to the academy, while the private sector received approximately %75. Large companies received %41.2 of the RDI supports, SMEs received %31.6 and technology-based individual entrepreneurs got %2.3.
- **UK**, through the *Government's Future Fund (2020)*, issues convertible loans to innovative early-stage companies, providing a public-private emergency support to recover from the COVID-19 crisis. They also created the Productive Finance Working Group which is an industry-led group, designed to prevent the regulatory, operational and demand-based barriers to investment in long-term assets, and to facilitate the successful launch of the Long Term Asset Fund to allow a wider access to assets such as infrastructure and private companies which are not regularly traded. *Future Fund: Breakthrough* will be a co-investment fund aiming to increase the supply of growth-stage venture capital to UK based companies working in capital and R&D intensive areas (such as quantum, AI, life sciences and clean tech).

Conclusion: The role of international cooperation

Digitalization allows households, firms and governments to transcend geographical barriers and boost the innovative potential of our economies worldwide. However, several challenges emerge and constrain its diffusion at the global scale. In line with what the *G20 Menu of Policy Options for the Future of Work* highlighted, **international cooperation is crucial to harness the benefits of digitalization towards higher productivity and a strong, sustainable, balanced, and inclusive growth with due consideration of national circumstances and frameworks.**



Under the Italian G20 Presidency, the *G20 Menu of Policy Options on Digital Transformation and Productivity Recovery* is intended for members to learn from each other's experience with policy measures to enhance productivity by harnessing digital technologies and fostering the diffusion of best and effective practices. Productivity-enhancing reforms have a strong country dimension but, given the international economic integration and the borderless nature of technological progress, there are significant benefits from knowledge sharing and international cooperation.

Starting by examples of policies implemented by members, the Menu identifies some emerging common traits and challenges. Members' experience, corroborated by background work by International Organizations, shows that, while single measures are important, adopting a comprehensive, whole-of-government strategy to tackle broad issues – such as the increasing development of digital platforms, digital inclusion and financing intangibles – may yield the highest benefits.

The Menu sheds light on areas where improved policy coordination among members could amplify country-level benefits and induce positive international spillovers. Examples include trade and intellectual property rights, data frameworks and competition and tax policies. The benefits of international cooperation are particularly evident when digitalization is driven by few trans-national companies or digital platforms leading to increased market concentration and emergence of anti-competitive practices. Policy dialogue on digitalization need to be nuanced, inclusive and inter-sectional reflecting the concerns, aspirations and circumstances of all countries. International digital co-operation can play a key role in this area thereby creating a safer and equitable digital world.

Other identified cases for international cooperation emerge in the following policy areas: sustaining innovation and the knowledge economy; establishing fair market conditions; mitigating risks associated to the fragmentation of international regulatory landscape, filling data gaps and harmonizing standards; enhancing lifelong learning and training schemes; and promoting international banking norms and accounting standards for intangibles evaluation.

Finally, as digitalization is one form of fast-paced innovation, sustaining its diffusion to foster higher productivity during the recovery will require continuous policy adaptation by considering the divergences prevalent both within and across countries. This Menu provides a snapshot of good policies as of 2021.