

1 **Setting the scene**

The Republic of Moldova (Moldova) has made digitalisation a priority, making significant efforts over the past years to accelerate the digital transformation. However, SMEs have not yet fully reaped the benefits offered by digitalisation due to numerous factors, and notably skills shortages. This chapter outlines the latest economic developments in Moldova and in its SME sector, assesses the main achievements and remaining gaps in Moldova's digitalisation journey, and introduces the topic of digital business skills and their importance.

Moldova's economy has been significantly affected by successive crises

Economic growth is hampered by persisting vulnerabilities

Moldova recorded steady if unspectacular growth in 2016-19, with annual GDP growth averaging 4% (International Monetary Fund, 2022^[1]). However, it has been hit hard by the COVID-19 pandemic and Russia's large-scale aggression against Ukraine, which have exacerbated pre-existing vulnerabilities. The pandemic and a severe drought in 2020 further highlighted the fragility of Moldova's growth paradigm. It was one of the European countries hit most severely by COVID-19, which had a substantial impact on people and firms across the country. Aggregate mortality jumped 13.8% in 2020-21, while real GDP contracted 8.3% in 2020; it rebounded strongly, rising by 13.9% in 2021, but this was followed by the shock of Russia's invasion of Ukraine. Growth slowed sharply in the first quarter and appears to have turned negative in the second.

In 2021, wages, remittances, and social payments all increased significantly, contributing to a solid growth in private spending. Nonetheless, strong domestic demand and restocking following the shutdown weighed heavily on net export growth, although all sectors of the economy showed promising gains following the steep drop in 2020. After infections reached an all-time high in January 2022, Moldova began lifting restrictions in February 2022, and the number of cases has remained low since, despite the vaccination rate stalling at only 38.9% of the population (Center for Systems Science and Engineering, 2022^[2]). Since then, the economic shock of the war in Ukraine has taken its toll.

Moldova's growth paradigm is still based on remittance-induced spending, which, despite having fostered growth and poverty reduction, has become less sustainable. The drop in remittances, along with a diminishing and ageing population, has resulted in sluggish productivity growth, and a sizable portion of the lower-income population has grown reliant on pensions and social assistance (World Bank, 2022^[3]). The country is also heavily reliant on exports of basic agricultural products, which makes it vulnerable to weather conditions as well as food-price fluctuations in key export markets, chiefly the European Union (EU) and the Commonwealth of Independent States (CIS), which account for roughly 65 and 15% of Moldovan exports, respectively (International Trade Administration, 2021^[4]). These vulnerabilities were further enhanced this year as Moldova was adversely affected by more frequent and severe droughts, subsequent water shortages, rising prices for fertilisers, and trade disruptions due to Russia's full-scale invasion of Ukraine (Economist Intelligence Unit, 2022^[5]).

Additionally, shocks from Russia's invasion are reverberating across the region, posing a serious threat to Moldova's stability. While the economy is not expected to experience severe recession, growth stalled in 2022 (see 'Key economic indicators' above); the downward revision between pre- and post-war growth forecasts has been substantial, on the order of about 4.4% of GDP. As a result of the war, the country has received the greatest number of refugees per capita (over 479,500 Ukrainians crossed into Moldova by July 2022, i.e. 19% of Moldova's population), and a the equivalent of 3.3% of Moldova's population has settled permanently in Moldova (UNHCR, 2022^[6]) (OECD, 2023^[7]). This puts a significant strain on the economy and creates a significant need for humanitarian aid, including for housing facilities, food and medical products in the short-term. All of this will put extra strain on Moldova's state finances and intensify the country's need for external assistance. At the same time, Ukrainian refugees are often highly qualified, young professionals with high incomes and various professional backgrounds (OECD, 2022^[8]; Bank, Council of Europe Development, 2022^[9]). Thus, when successfully integrated, they have great potential to generate long-term return, contribute to growth in shared economic and social prosperity as well as to consumer demand (OECD, 2022^[8]).

Not surprisingly, the war has put pressure on prices and the exchange rate. The inflation rate reached 31.8% year/year in June 2022, and the lei fell against the dollar, though by around 6.6% to mid-June (National Bank of Moldova, 2022^[10]). The general government deficit is expected to widen significantly to 6.2% of GDP, as the government raises public spending to offset the public cost of the conflict in Ukraine.

The National Bank of Moldova intervened to limit the impact of the conflict on the lei by selling foreign currency, and it is expected to continue intervening in the currency market, as geopolitical tensions stay high.

Moldova imports around 67% of its energy needs (net). For gas for instance, which provides more than 90% of Moldova's power and heating, the country had only one supplier before the war, making it 100% reliant on Russia, and it faced significant hurdles because of the sharp increase in gas import prices from October 2021. Moldova's sole substantial domestic energy source is biomass, whose output has increased over the previous decade and provides for roughly 20% of primary energy. Moldova now suffers from disruptions to its traditional import networks for gas, via Ukraine and the Black Sea. Alternative methods and suppliers are more expensive, exacerbating growing expenses caused by an energy supply crisis that began in the winter of 2021/22.

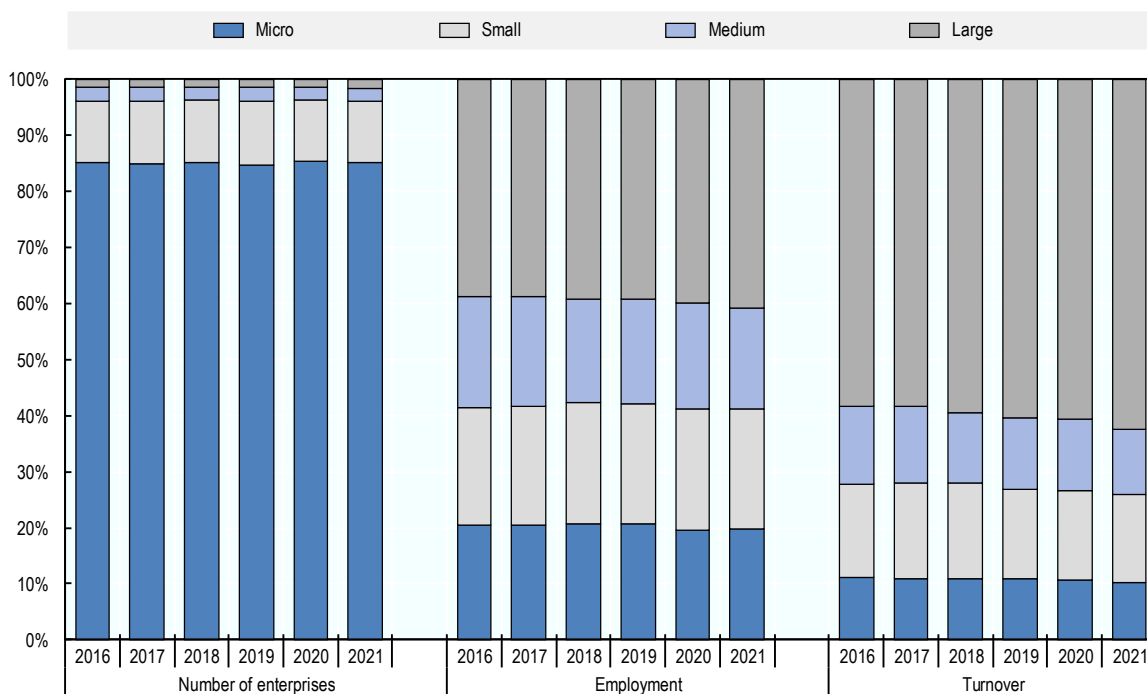
The ongoing conflict is also taking a toll on trade: Moldovan exports are expected to fall by USD 190 million (1.6% of GDP). This is largely due to disruptions in exports to Russia, which amounted to USD 276 million in 2021 (8.8% of total exports and 2.3% of GDP). Apples and pharmaceuticals, two of the main commodities exported to Russia (35% and 12% of exports, respectively), will be difficult to redirect to other markets: Russia took 98% of Moldovan apple exports, and there is little short-term opportunity for reorientation. As for pharmaceuticals, Russia accounted for half of all exports; other destinations are mostly CIS and Baltic countries, but trade routes might suffer from war-related disruptions (Movchan, Giucci and Busch, 2022^[11]). Particularly the closure of the Odesa port, a linchpin of Moldova's trade with both Ukraine and Russia, complicated Moldova's trade relations. It caused a shift of transport routes from the Moldova-Ukrainian to the Moldova-Romanian corridor, and Moldova's new reliance on the port of Constanța in Romania led to congestions at the border between the two countries, which might increase transportation cost (International Finance Corporation, 2023^[12]).

Since August 2021, a new government, led by the pro-EU Action and Solidarity Party (PAS), has embarked in an ambitious reform agenda, aimed at tackling corruption and improving transparency in governance (Economist Intelligence Unit, 2022^[13]). The country also benefits from a new USD 558 million IMF programme and should receive an additional EUR 150 million in EU macro-financial support (IMF, 2022^[14]) (European Parliament, 2022^[15]). However, as public spending increases to tackle the effects of the war, lack of fiscal space may hinder the government's capacity to pursue its reform agenda.

Despite considerable policy efforts, the potential of Moldovan SMEs remains untapped

In 2021, small and medium-sized enterprises (SMEs)¹ accounted for 99% of all businesses in Moldova – a share similar to that of EaP and EU peers –, with micro enterprises representing 85% of all firms, and 60% of total employment. However, while SMEs create over half of the value added in the EU and neighbouring countries like Armenia, Georgia, and Ukraine, in Moldova they only generate 39% of turnover (Figure 1.1). While the number of SMEs and their turnover have increased in absolute values over the past years, their shares in total enterprises, employment and turnover have declined slightly due to large firms' stronger growth – SMEs' turnover grew by 26% in 2015-2020, whereas large firms' registered a 42% increase. A persistent productivity gap between SMEs and large businesses can also be observed (with SMEs' average output per worker stalling at 42-45% of the large-firm average between 2015 and 2021), although micro, small and medium-sized firms have all increased their productivity since 2015. This productivity gap appears to be similar to Ukrainian values (45% in 2020), but wider than that of South Caucasian peers, with Armenian and Georgian SMEs' output reaching 75% and 69% in 2021, respectively. Moldovan SMEs are concentrated in the Municipality of Chișinău, which accounts for 61% of all SMEs, 62% of their turnover, and 55% of SME employment (Figure 1.2).

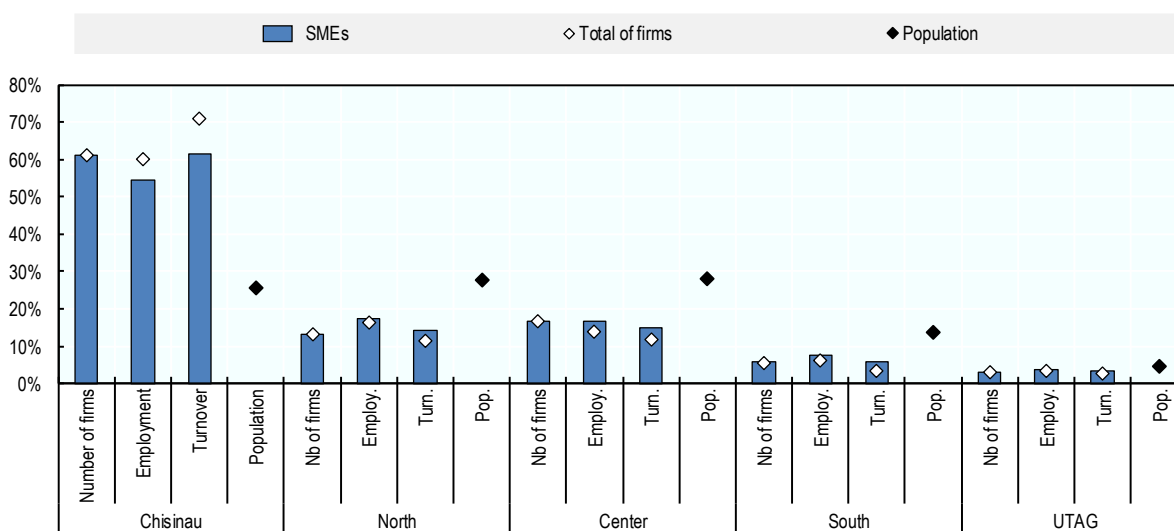
Figure 1.1. Overview of enterprise population in Moldova, 2016-2021



Note: Employment refers to the number of employees, as data on persons employed is not available.
Source: National Bureau of Statistics of the Republic of Moldova.

Figure 1.2. Regional breakdown of firms

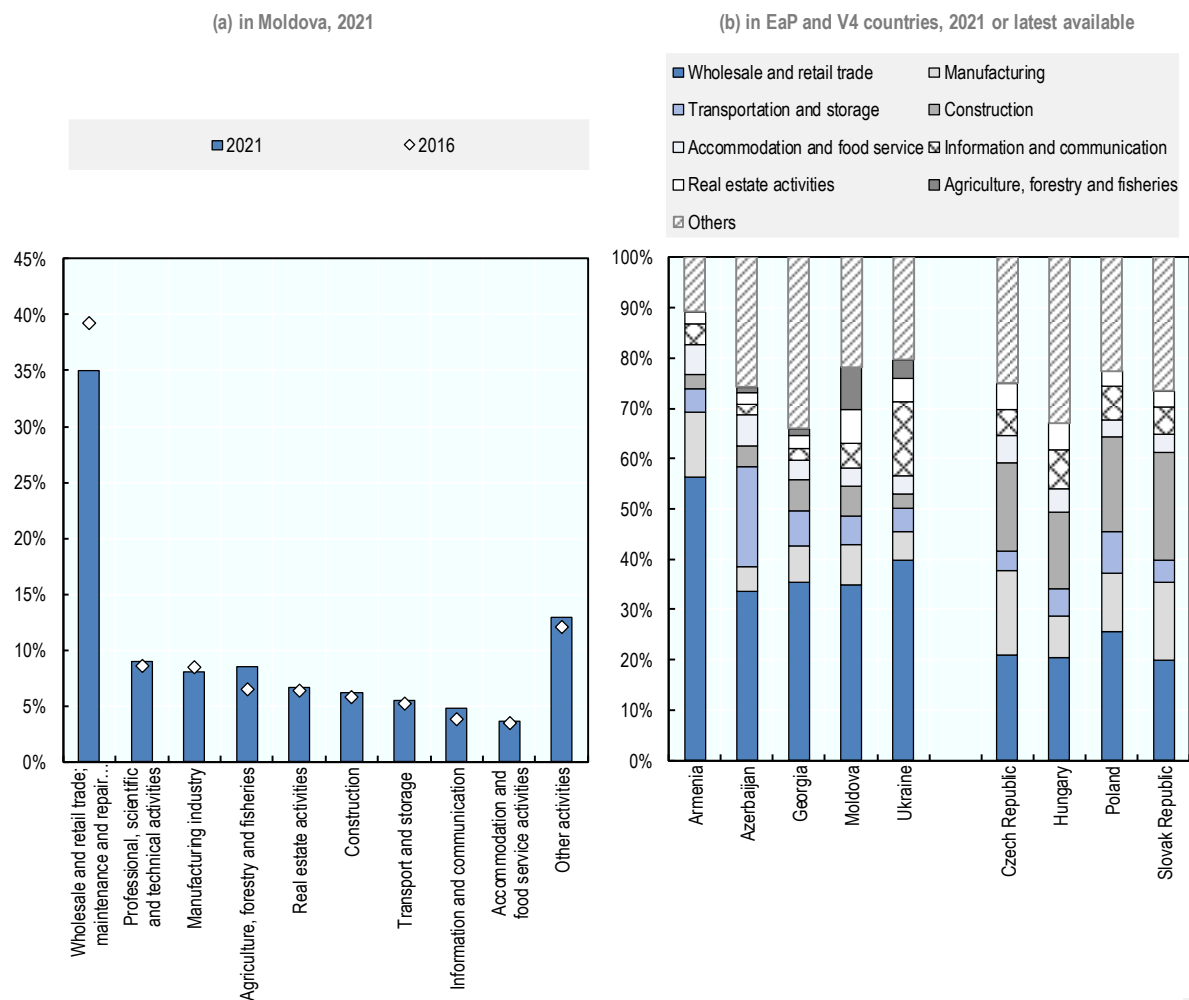
Percentage of total, 2021



Note: Employment refers to the number of employees, as data on persons employed is not available. UTAG = Autonomous Territorial Unit of Gagauzia.
Source: OECD calculation based on data from the National Bureau of Statistics of the Republic of Moldova.

Despite encouraging growth, the potential of Moldovan SMEs remains untapped. They are still concentrated in low-value-added sectors such as retail and wholesale trade (including repair of vehicles) – which accounted for 35% of Moldovan SMEs in 2021, a number similar to the EaP median value, but higher than EU levels. However, their share in this sector has declined slightly since 2016 (-4 p.p.) in favour of higher value-added sectors such as ICT (+1 p.p.) (Figure 1.3).

Figure 1.3. Sectoral Distribution of SMEs



Note: **Left chart:** maintenance and repair correspond to that of motor vehicles and motorcycles. Other activities include administrative and support service activities, human health and social work, financial activities, education, arts, entertainment and recreation, water supply, sanitation, waste management, remediation, electricity, gas, steam, hot water and air conditioning supply, mining and quarrying, and public administration and defence. **Right chart:** 2021 data for EaP countries, 2020 data for Visegrád countries. Other activities include other activities cited in the left chart, and professional, scientific and technical activities. They also include agriculture, forestry and fisheries for Armenia and V4 countries, as the breakdown for that category is not available. Wholesale and retail trade also include maintenance and repair of motor vehicles and motorcycles.

Source: OECD calculation based on data from National Bureau of Statistics of Eastern Partner countries; Eurostat for V4 countries.

These transformations in the SME population have resulted in part from considerable policy effort over the past decade. Moldova has worked to create a strong institutional and policy framework for SMEs, drawing on its SME Development Strategy 2012-2020 and its highly active SME agency ODA². The successful implementation of the Strategy (82% of the last Action Plan in 2020) led to progress in the business

environment, with a reduction in burdensome regulation, and a facilitated access to financing through the 2018 law on non-bank credit institutions (Ministry of Economy and Infrastructure of the Republic of Moldova, 2021^[16]). Moreover, SMEs now benefit from a wider range of services: several initiatives have been implemented to support women's entrepreneurship such as the dedicated "Women in Business Programme" implemented by ODA, while a national agency for research and development has been established to foster innovation. More generally, ODA is implementing a wide range of programmes such as PARE 1+1 for returning migrants, a greening initiative, Start for Youth, Re-technologisation programme, and Growth and Internationalisation. These achievements are reflected in Moldova's progress in the latest SME Policy Index (SMEPI) (see Box 1.1).

Furthermore, the EU4Business initiative, assisting SMEs in Eastern Partner (EaP) countries³, has had a significant impact in Moldova. In 2019 alone, the EU supported 19 531 SMEs in Moldova, helping them to generate over EUR 1.99 billion in total turnover (EU4Business, 2020^[17]). The EU provides support under three main pillars: access to finance (A2F), business development services (BDS), and business enabling environment (BEE). A2F consists of services such as small grants or concessionary loans from national banks to SMEs. BDS include the establishment of business incubators for start-ups, as well as provision of direct advice and training to SMEs. BEE encompasses regulatory reforms and practices and encourages dialogue between public-private institutions, among others (EU4Business, 2020^[17]).

Box 1.1. SME Policy Index: Eastern Partner Countries 2020

The Small Business Act for Europe and the SME Policy Index

The SME Policy Index is a tool for analysing and tracking progress in the design and implementation of SME policies in comparison to EU and international best practices. It was developed by the OECD, the EU, the EBRD, and the ETF to assess the business environment for SMEs and provide relevant recommendations to address remaining challenges.

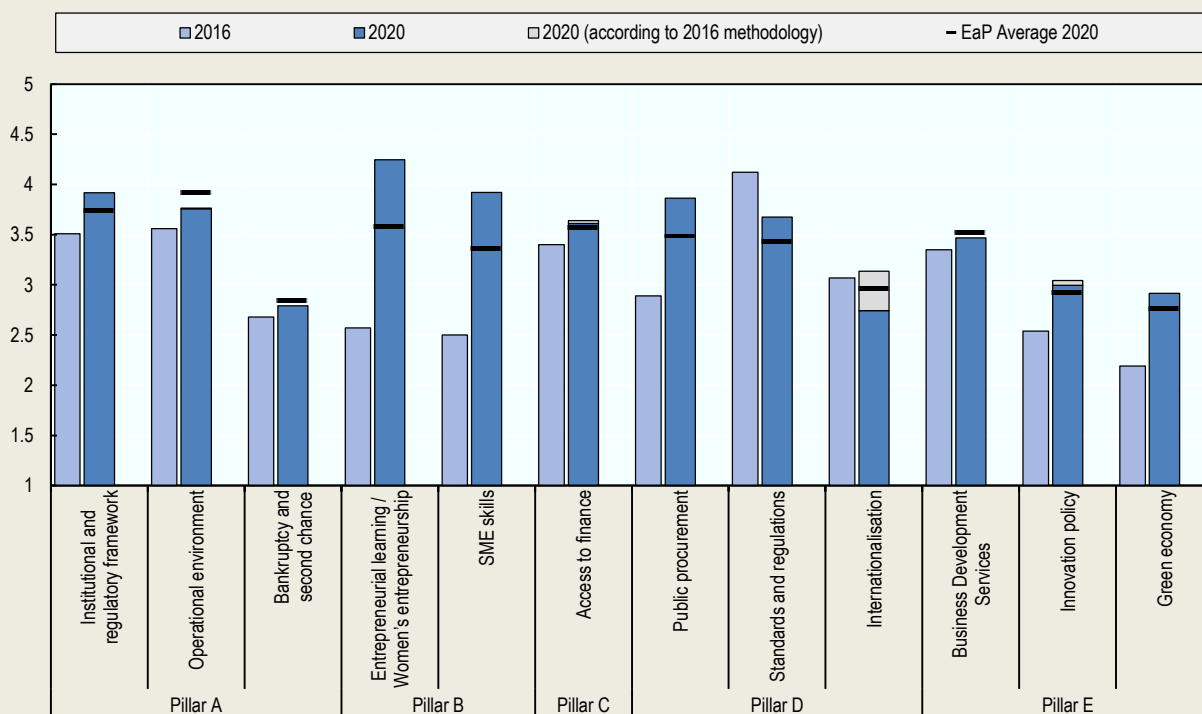
The Index is organised around five thematic pillars, which are subdivided into 12 aspects based on the 10 principles of the EU's *Small Business Act for Europe*. The Index's 3rd edition (released in 2020, following evaluations in 2012 and 2016) included a crosscutting level playing field pillar. A 4th edition is under preparation and will be based on a revised methodology, with a number of new questions on digitalisation.

2020 findings on Moldova

Moldova has made significant progress since the previous assessment in 2016. For instance, in 2016 the country scored only on 2 out of 12 dimensions a value above the EaP average, while in 2020 it performed better than the EaP average in 7 out of 12 dimensions. Its attempts to follow prior OECD recommendations particularly stand out in terms of entrepreneurial learning and women's entrepreneurship (+65.4% score increase), and SME skills (+56.8% score increase). Moldova's performance remains poor in standards and regulations as well as internationalisation, where more efforts should be made moving forward.

Figure 1.4. SME Policy Index scores for Moldova

Country scores by dimension, 2020 vs. 2016

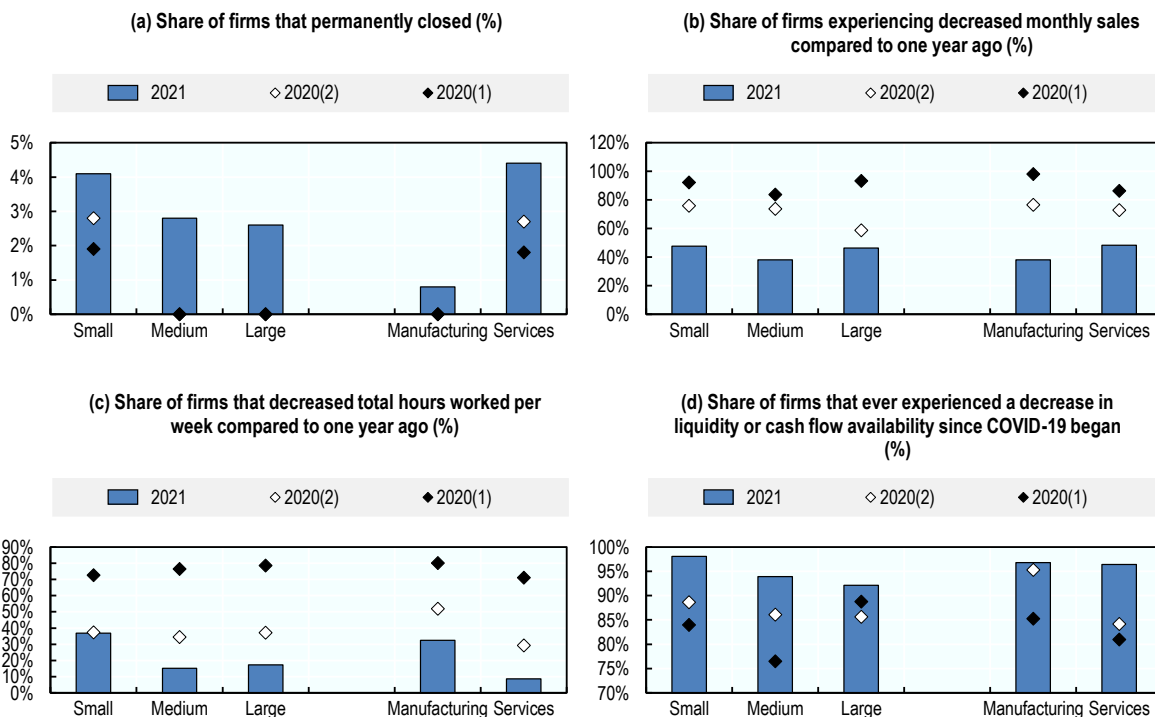


Source: (OECD et al., 2020^[18]).

However, Moldovan SMEs face additional challenges due to recent crises. In 2020-21, the COVID-19 pandemic took a significant toll. In a survey by the country's Labour Market Observatory in 2020, 70% of small and medium-sized enterprises reported being affected by the COVID-19 pandemic, and survey data from the World Bank on the impact on business operations by size class show the disproportionate impact borne by SMEs (Figure 1.5). This is partially explained by the over-representation of SMEs in the sectors hit hardest (wholesale and retail commerce and agriculture).

Figure 1.5. Impact of COVID-19 crisis on Moldovan SMEs

2020-2021



Note: 2020(1) corresponds to data from surveys conducted in June 2020; 2020(2) to surveys conducted October/November 2020; and 2021 to surveys conducted in May/June 2021.

Source: (World Bank, 2021_[19]).

Furthermore, the economic shocks generated by Russia's invasion of Ukraine are posing additional threats to Moldovan SMEs. Shipments to Russia, Ukraine, and Belarus have become significantly more difficult, owing to both reduced demand and logistical obstacles. The difficulties in securing payment particularly affect SMEs, as they may not have the same degree of financial reserves and credit as larger enterprises. Export-oriented SMEs in industry and agriculture, which account for a sizable share of Moldova's SME population (16%), are among the most vulnerable to trade disruptions. Moldovan fruit and nut producers seem to be amongst those most severely hit, as they mostly sell to Russia and Ukraine. However, the challenges for exporting SMEs go beyond commerce with Russia, Ukraine, and Belarus: more generally, firms also encounter issues in delivering goods, notably due to increasing prices of all major forms of transport, as well as soaring commodity and energy prices.

The structure of financing for SMEs triggers additional difficulties. External finance is a vital step for most businesses in order to invest, expand, and flourish. In emerging economies, a substantial proportion of loans are provided in foreign currency, especially US dollars and euros. This implies that the principal and

repayments for these loans are denominated in foreign currencies and must be paid in them. Lenders, particularly international lenders, prefer to lend in foreign currencies rather than local ones, as the latter are seen as less stable than the dollar and the euro, and local-currency lending rates are therefore higher (OECD, 2023^[7]). However, in times of exchange-rate volatility, dollarisation can make loan repayment problematic for borrowers. A sizable share of loans in the EaP area are in foreign currency – the OECD estimates that around 42% of Moldovan loans are in foreign currencies (National Bank of Moldova, 2022^[20]) (OECD, 2023^[7]).

Moldova has made digitalisation a policy priority

Digitalisation acts as a driver for structural transformation, economic diversification and recovery

The advent of digital technologies since the 1990s has triggered profound changes in economies and societies around the globe. “Digitalisation” refers to the process of using “digital technologies, data and interconnections, resulting in new activities or changes to existing ones”, while the term “digital transformation” encompasses the ensuing economic and social effects (OECD, 2019^[21]). Business adoption of digital tools varies widely, ranging from basic, established ones (e.g. broadband access, having a website) to more advanced and still emerging technologies such as artificial intelligence (AI), 5G networks and big data analytics.

Digitalisation offers numerous opportunities and benefits to businesses and individuals alike. In the case of Moldova, the emergence of the ICT (information, communication and technologies) sector has led to the creation of an estimated 22 000 jobs (World Bank, 2018^[22]). The sector now appears as the country’s most dynamic, representing 7.6% of GDP, with steadily increasing exports of IT and IT-enabled products and services reaching USD 397 million in 2021 according to the National Bureau of Statistics. This rapid growth of the IT industry in Moldova was facilitated by the development of Moldova’s IT Park, which offers a special fiscal regime to its residents. Beyond the ICT industry, digitalisation can foster structural transformation for firms in non-IT sectors, notably by creating new market opportunities and by fostering productivity growth and innovation. For instance, one recent study of firms in EU countries estimated that a 10-percentage point increase in the share of businesses using cloud computing was associated with a 2.3% increase in productivity after 3 years (Gal et al., 2019^[23]). Digitalised firms also tend to export and invest more and offer higher wages than non-digitalised ones (European Investment Bank, 2022^[24]).

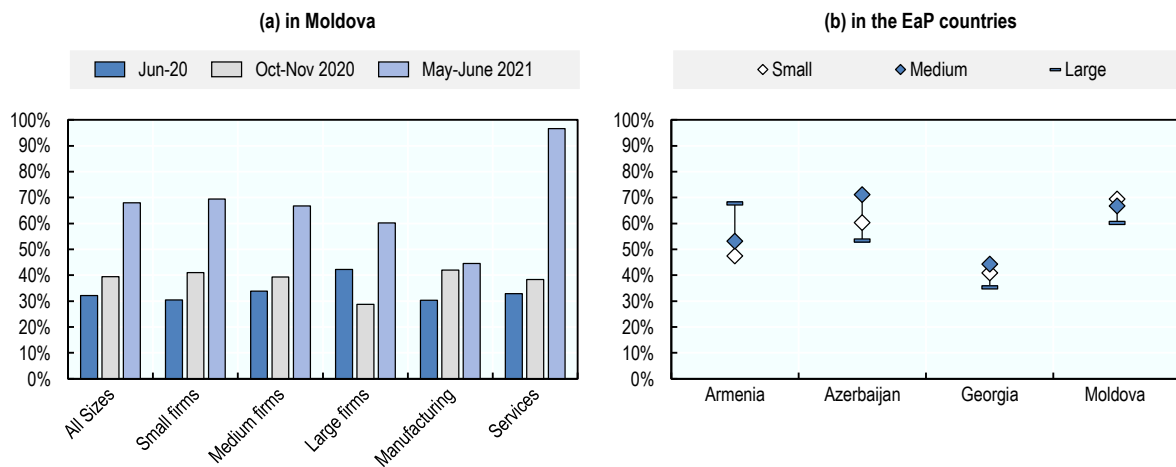
The ways firms can benefit from digitalisation are manifold: digital tools can help firms improve processes and lower costs by adopting Enterprise Resource Planning (ERP) and/or Customer Relationship Management (CRM) systems, for instance, while the use of social media or websites, combined with big data analytics, enables businesses to reach new markets and gain better insights into customer needs. The advantages firms derive from new technologies can vary considerably depending on the sector of activity – 3-D printing and robotics can be particularly relevant for manufacturing and construction, while the services sector will be more likely to benefit from platforms, big data and AI.

Recent crises have further highlighted the importance of the digital transformation. The COVID-19 pandemic has shown that digitalised firms have coped better with disruptions: they proved to be less likely to experience lower sales and more capable of organising work remotely and maintaining communications with staff, customers and suppliers (European Investment Bank, 2022^[24]). On the other hand, sanitary restrictions have provided additional incentives to accelerate the digital transformation, as governments, firms and individuals were forced to move operations online: by spring 2021, 68% of Moldovan firms had started or increased online business activity, with this share rising to 97% in the services sector – the highest shares reported in the surveyed EaP countries (Figure 1.6). This trend appeared stronger among smaller firms. Many firms switched to remote work and, even if figures decreased as containment

measures were lifted, about 13% of small firms in Moldova still operated remotely in Q2 2021 (World Bank, 2021_[19]).

Figure 1.6. COVID-19 impact on firms' online activity

Percentage of firms that started or increased online business activity in response to COVID-19 outbreak



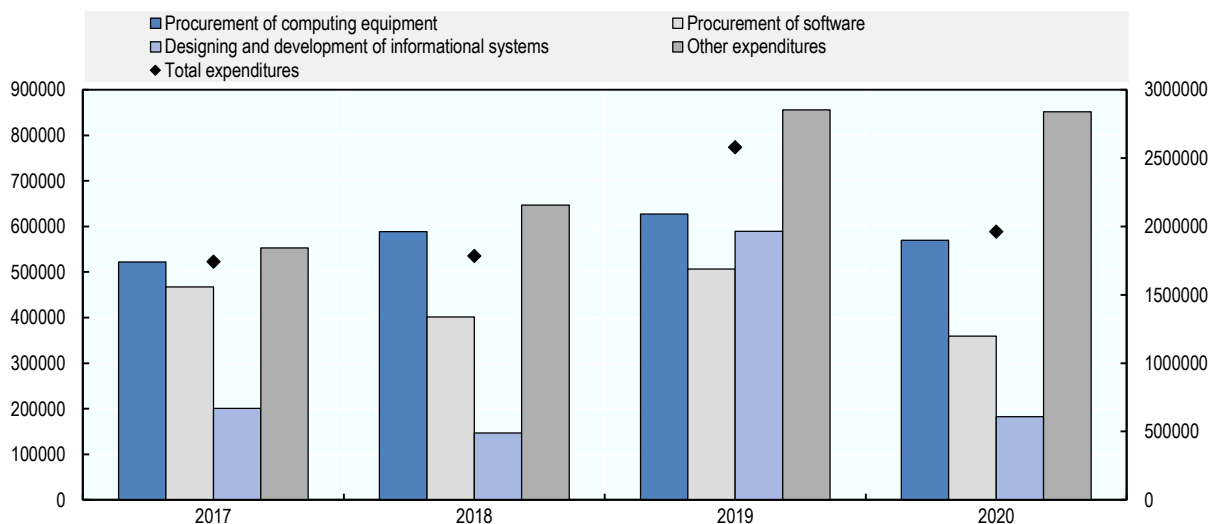
Note: **Right chart:** data from May-June 2021.

Source: (World Bank, 2021_[19]).

However, while COVID-19 emphasised the relevance of digitalisation for non-IT sectors and encouraged firms to engage in online operations, most companies are still at the very beginning of their digitalisation journey. This is reflected in the level of adoption of advanced digital technologies: surveys of EU countries reveal that, although firms made greater use of advanced digital technologies in 2020, figures have stalled since. The share of businesses implementing new advanced technologies even decreased in 2020 due to businesses delaying complex investment projects to focus on immediate needs (European Investment Bank, 2022_[24]). Similar data on businesses' adoption of advanced digital tools is not available for Moldova, but the country still reported a drop in IT expenditures in 2020 (Figure 1.7).

Figure 1.7. IT expenditures of legal entities in Moldova, by category

Thousand lei, 2015-2020



Note: Data include enterprises with 10 employees or more and public administrations.

Source: National Bureau of Statistics of Moldova.

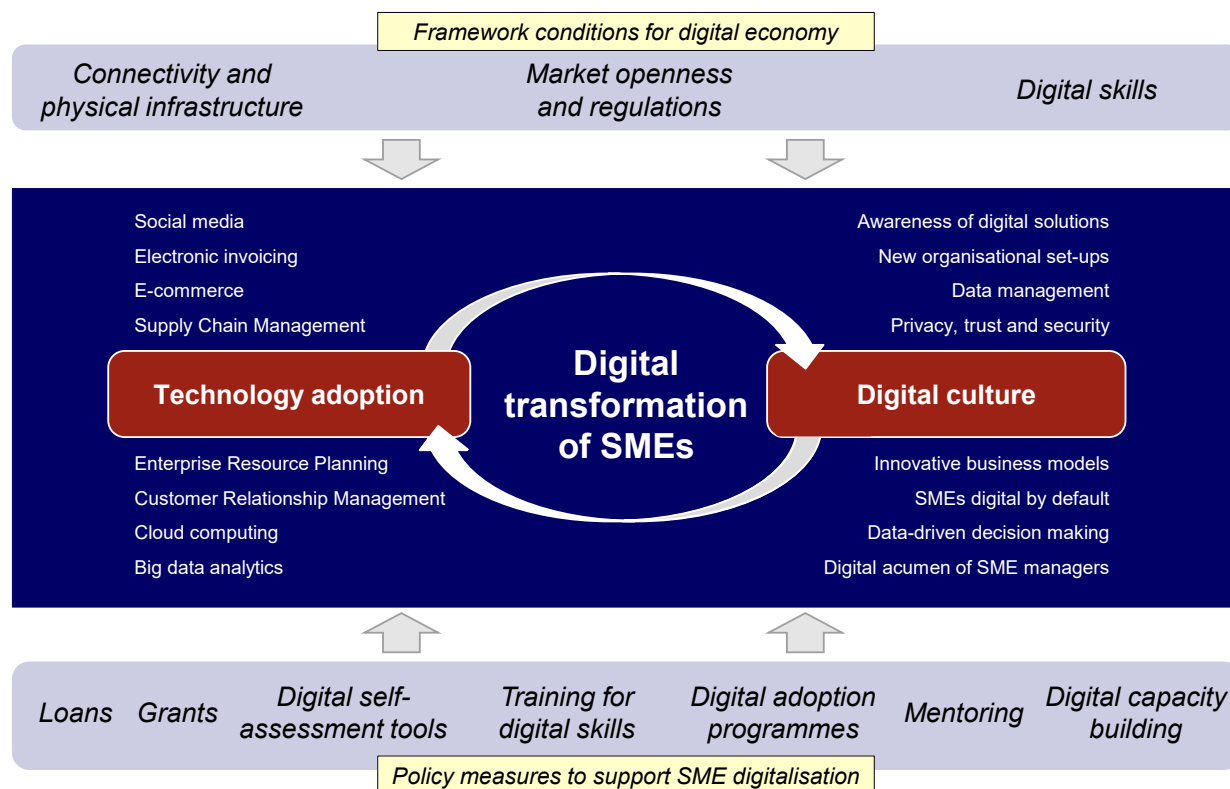
The COVID-19 pandemic has stimulated digitalisation but also widened digital divides: businesses that were already using advanced digital technologies were more likely to accelerate their digitalisation in response to the crisis, while non-digitalised firms appeared less able to transform and/or adapt (Rückert et al., 2021^[25]). This might have exacerbated the pre-existing gaps between SMEs and large firms: indeed, even prior to the pandemic, SMEs lagged behind in the digital transformation, being less likely to adopt digital tools than larger firms. These gaps between enterprise size classes become more evident as technologies are more advanced: larger businesses are about four times more likely than smaller ones to use big data analytics or AI for instance, but just twice as likely to resort to online bookings or orders (OECD, 2021^[26]). Such digital divides impede economic growth and risk increasing inequalities, as SMEs' lower levels of technology adoption prevent them from taking advantage of digitalisation's gains in productivity, competitiveness, wages, investment and innovation.

The impact of the COVID-19 pandemic will be long-lasting, and, as countries progressively move out of the sanitary crisis, digital tools should move from being an emergency solution to becoming a long-term investment to help businesses recover and increase both their productivity and resilience.

Moldova has worked to build sound framework conditions for the digital transformation

Policy makers have a major role to play to create a level playing field and foster an inclusive digital transformation. Well-designed policies can help individuals and firms tap into the potential of digitalisation and counter widening of inequalities. The OECD developed a framework for governments to support the digital transformation of SMEs, considering it as the combined process of technology adoption and development of a digital mind-set (OECD, 2021^[26]). This means that policy efforts should be directed both at improving framework conditions for a digital economy, as well as at developing dedicated support measures for SMEs (Figure 1.8). Skills are a crosscutting element: digital literacy among the population is a pre-requisite for a successful transformation, while measures to support training and retraining on digital skills should be a major component of SME digitalisation programmes.

Figure 1.8. Framework for supporting the digital transformation of SMEs in the EaP



Source: (OECD, 2021^[26]).

Well aware of the importance of digitalisation, the Government of Moldova has been working to create favourable framework conditions over the past decade through various strategies and regulations involving a range of stakeholders, including the Ministry of Economy and the Ministry of Education and Research. The appointment of a Deputy Prime Minister for Digitalisation since 2021 was a welcome step to develop an overarching approach to digitalisation and ensure co-ordination. This role has been merged in February 2023 with the Ministry of Economy, renamed Ministry of Economic Development and Digitalisation, thereby emphasizing the importance of digitalisation for Moldova's economy. In 2013, the country adopted a dedicated National Digital Strategy (NDS), *Digital Moldova 2020*, organised around three pillars – 1) expanding broadband connectivity; 2) fostering the development of digital content and e-services; and 3) strengthening ICT usage capabilities. The measures implemented enabled considerable improvements with regard to access to broadband, e-government services, and digital skills development in education systems. These efforts have been further supported by additional policy documents on specific aspects such as broadband, with the successful implementation of the *Broadband Development Programme 2018-2020*, and digital security, with the current *Information Security Strategy 2019-2024* that followed the *National Cybersecurity Program 2016-2020*. Table 1.1 below summarises progress and remaining challenges for each of the framework conditions – except digital literacy, for which the situation is detailed in the following chapters of this report.

Table 1.1. Overview of framework conditions for the digital transformation in Moldova

Policy aspect	Key policy achievements	Remaining issues
Broadband connectivity	<p>Improvements in broadband uptake:</p> <ul style="list-style-type: none"> - 17.8 fixed-broadband subscriptions and 58.8 mobile-broadband subscriptions per 100 inhabitants (+4.7 and +14.9 since 2015, respectively) - 64.6% of households having Internet at home (+17.7pp since 2015) <p>Moldova has the highest number of high-speed fixed broadband connections of the EaP region</p> <ul style="list-style-type: none"> - > 97% of subscriptions are above 10 Mbit/s, vs. 70% in the EaP on average) - 99% of the territory is covered by 4G <p>Broadband has become more affordable</p> <ul style="list-style-type: none"> - Fixed broadband prices per capita almost halved (from 4.78% GNI per capita in 2018 to 2.25% in 2020) - Mobile broadband prices per capita were divided by 4 (2.15% GNI per capita in 2018 to 0.48% in 2020) <p>Dynamic and competitive telecommunication market</p> <ul style="list-style-type: none"> - The sector is open to foreign direct investment: Moldova scores below the OECD in the OECD FDI Restrictiveness Index <p>Increased regional/international co-operation to reduce roaming tariffs</p> <ul style="list-style-type: none"> - e.g. MoU with Romania and Regional Roaming Agreement with EaP countries under the EU4Digital initiative 	<p>Levels of Internet penetration remain well below EaP and OECD values</p> <p>Persistent urban-rural gap despite improvements over the past years</p> <ul style="list-style-type: none"> - Only 56% of households in rural areas have access to the Internet (vs. 77% in urban areas) - This gap is among the widest of the EaP countries <p>Fixed broadband affordability is still an issue</p> <ul style="list-style-type: none"> - Despite being among the cheapest in Europe in absolute values, prices remain above the ITU's affordability target of 2% GNI per capita
Regulatory environment	<p>Independent National Regulatory Authority in place (ANRCETI – National Regulatory Agency for Electronic Communications and Information Technology), in line with EU standards</p> <ul style="list-style-type: none"> - Good performance in the ITU ICT Regulatory Tracker, ranked among top EaP performers <p>Legal framework for e-signatures; updated to harmonise standards to be compatible with EU eIDAS regulation recommendations</p> <p>Development of e-payment services</p> <p>Set of legislative amendments adopted in 2021 under the “Digitalisation Packages” to strengthen online interactions and services between government, businesses and consumers</p>	<p>Low level of e-signature usage</p> <p>Low level of uptake of online payments, partially explained by the lack of trust</p> <ul style="list-style-type: none"> - Less than one Moldovan out of 5 used the Internet to buy something online (2017) <p>Potential of the EU digital markets remains untapped</p>
Digital Security	<p>Efforts to build a legal framework for digital security</p> <ul style="list-style-type: none"> - Ratified the Budapest Convention on Cybercrime - Further efforts foreseen in the Information Security Strategy 2019-2024, notably to transpose the EU directive on security of network and information systems (NIS directive) <p>Increased co-operation between authorities and the civil society, as well as bilateral and regional co-operation initiatives</p> <ul style="list-style-type: none"> - E.g. dedicated working group within the GUAM (Organisation for Democracy and Economy Development) <p>Good performance in the ITU's Global Cybersecurity Index</p> <ul style="list-style-type: none"> - Moldova scores above the EaP average in all pillars - However, the breakdown by pillar shows disparities: good 	<p>Lack of a public authority responsible for digital security incidents and empowered with sufficient prerogatives, human and financial means</p> <ul style="list-style-type: none"> - A CERT exists (CERT-GOVMD) but has no special obligations towards individuals and businesses and only addresses threats directed at government services and structures <p>Legislation on digital security issues still at a very nascent stage</p> <ul style="list-style-type: none"> - 2009 <i>Law on Preventing and Combating cybercrime</i> should be updated - No legal obligation to report digital security incidents <p>More could be done in terms of awareness-raising</p>

Policy aspect	Key policy achievements	Remaining issues
	performance in terms of legal and co-operative measures, but weaknesses regarding the co-ordination institutions, policies and strategies; and capacity development (i.e. research and development, education and training programmes)	- Essential aspect to build citizens' trust in the digital age

Note: Data/indicators refer to 2020 unless specified otherwise.

Source: (ITU, 2022^[27]), (OECD, 2021^[26]), (ITU, 2020^[28]), (EU4Digital, 2020^[29]), (ITU, 2021^[30]), (World Bank, 2017^[31]), (United Nations Institute for Disarmament Research, 2021^[32]), fact-finding exercises conducted in Q2 2022.

In parallel, Moldova has been building an enabling environment for IT sector growth through both policy actions (embedded in the *Strategy for the development of the information technology industry and the ecosystem for digital innovation for the years 2018-2023*) and a very active private sector. The country now benefits from advanced infrastructure such as the IT Park launched in 2018, which offers a preferential fiscal and administrative regime for residents, but also FabLabs, incubators and accelerators (e.g. Dreamups, XY Partners) that foster innovation, including digital innovation. Although these mostly remain concentrated in Chişinău for now, regional incubators and innovation centres are being developed in the regions. These noteworthy developments largely rest on a growing public-private co-operation: the Association of Information and Communications Technology Companies (ATIC) has been actively involved in policymaking and contributes significantly to the sector's expansion, one of the most successful examples thereof being Tekwill, a public-private partnership providing – among other things – education and training facilities, business development assistance, and training programs⁴. More generally, these actions to foster digital business creation and support IT graduates fall within overall efforts provided to tackle Moldova's out-migration and loss of skilled human capital.

However, Moldova's digitalisation potential is still largely untapped. In 2020, less than 17% of SMEs reported having successfully integrated digital tools in their activity (ITU, 2021^[33]), but SME digitalisation – and the digital transformation of non-IT sectors in general – remains overlooked in policy documents. The above mentioned NDS, while acknowledging the lack of digital business skills⁵, did not include specific measures to support SME digitalisation, and the topic was not covered in the SME Strategy 2016-2020 either. Sector-specific measures have been taken to foster the digitalisation of agriculture, a field that has been growing sharply over the past years (see Figure 1.3), within the e-Agriculture Programme approved in 2013 and the Digital Map of Agriculture launched in 2015. ODA (formerly ODIMM) has also started implementing support programmes for SME digitalisation since 2020 (see Chapter 4). While these steps are very much welcome, a more comprehensive policy approach to overall business digitalisation is needed. A *Digital Transformation Strategy 2023-2030* is currently under preparation, along with the National Development Strategy Moldova 2030, which is to include ICT as a cross-cutting issue and is expected to set new objectives, e.g. on broadband connectivity. This new *Digital Transformation Strategy* will emphasise the topic of digital literacy but also digital business skills, with a view to improving firms' competitiveness.

Digital skills are a pre-requisite for a successful digital transformation

Digital skills offer numerous opportunities to individuals

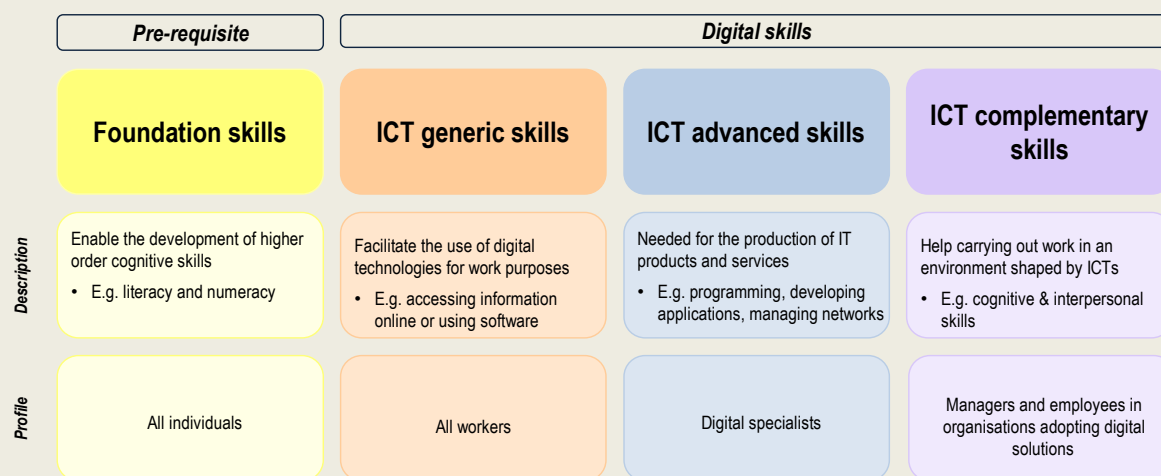
Digital skills are a cornerstone of the digital transformation. They are a precondition for the effective adoption of digital technologies, as they not only enable the use of the new features present in many digital tools but also enable individuals to understand where and why a particular technology or data could be most relevant. They can be broken down in four main categories, as explained in Box 1.2.

Box 1.2. Taxonomy of digital skills

The notion of digital skills encompasses a broad range of competences, and understanding them is the first step to designing adequate policies. *Foundation skills*, such as literacy and numeracy, are the prerequisite to acquiring knowledge about digital tools. Digital skills, in essence, can be broken down in three main categories, as outlined in Figure 1.9.

Generic skills designate the ability to make use of digital technologies and can be useful for the entire working-age population, enabling them to make the most of new technologies, in both work and daily life. The use of advanced technologies and the production and development of IT products and services require *advanced skills*, i.e. the competences developed by IT specialists. In order to ensure a successful technology adoption and fully reap the benefits thereof, these hard skills need to be combined with softer ones – so-called *complementary skills*, such as information processing, the ability to adapt and solve problems, and interpersonal skills.

Figure 1.9. Taxonomy of digital skills



Source: Adapted from (OECD, 2016^[34]) and (Grundke et al., 2018^[35]).

The EU also developed a more granular framework for digital competences, called DigComp, structured around five areas – information and data literacy, communication and collaboration, digital content creation, safety, and problem solving.

Fostering the development of this skillset requires a comprehensive approach, encompassing the formal education system, on-the-job training for generic and advanced skills, and life-long learning opportunities to help reskilling and up-skilling of workers.

The gradual introduction of digital tools throughout economies and societies has been affecting the labour market, providing strong incentives for individuals to equip themselves with digital skills and stay abreast of the changing nature of work. Automation is gradually making some jobs redundant: in Moldova, for instance, an estimated 22% of workers are at high risk of losing their jobs because of automation (ETF, 2021^[36]). This is partially due to the high concentration of the labour force in sectors most at risk, such as agriculture, fisheries and mining – a field where the number of SMEs grew by almost 50% between 2016 and 2021 – and manufacturing (19% of total employment in 2021).

In parallel, the demand for digital skills is increasing sharply, as the digital era creates new job opportunities: the number of employees in computer programming in Moldova has almost doubled in six years⁶, and 39% of new jobs created in EU countries between 2011 and 2017 were for ICT-specialists or ICT task-intensive occupations (Gierten et al., 2021^[37]). Digital literacy is also increasingly sought in non-IT firms, including skills complementary to technology adoption, such as creative thinking and problem solving. Digitally literate individuals will therefore adapt more easily to job market requirements. Moreover, the ability to use ICT grants access to higher wages: not only do employees in the IT sector benefit from attractive salaries (EUR 1600 for a software developer vs. the average monthly earnings of EUR 400 in 2020 in Moldova), but in the labour force at large, wage returns to ICT skills are twice as high as those to numeracy, management and communication skills (Grundke et al., 2018^[38]).

Skills shortages remain a major barrier to SME digitalisation

From the firm's point of view, digital skills development brings significant benefits to businesses as well. Several studies have shown that the availability of a digitally literate workforce and investment in skills training are associated with higher levels of digital technology adoption. The presence of employees with above-average skills in a firm increases its likelihood of adopting digital tools and making investments in that direction. For instance, good management practices, ICT skills, life-long learning and on-the-job training are positively correlated with the adoption of CRM and cloud computing (Andrews, Nicoletti and Timiliotis, 2018^[39]). Conversely, skills shortages may hinder technology adoption and prevent firms from tapping into the benefits of digitalisation (Gal et al., 2019^[23]).

Moreover, skills shortages in firms that lack the means and attractiveness to recruit high-skilled workers often result in lower profitability (Sorbe et al., 2019^[40]). This issue particularly affects SMEs, which encounter more difficulties in attracting and retaining skilled workers, as well as up-skilling or reskilling their workforces. In Moldova, almost one firm in five cites the lack of adequately educated workforce as the main obstacle to doing business, against 11% in Europe and Central Asia on average (World Bank, 2019^[41]). Businesses also report the lack of qualified and experienced applicants as the main cause of labour shortages (Labour Market Observatory, 2022^[42]). This skills shortage is further aggravated by SMEs' limited capacity to provide training to their staff. Indeed, smaller firms face a certain number of barriers to training compared to larger firms: they often lack financial and human resources as well as time and awareness of the skills needed and/or of the support programmes and tools available. They might also suffer from higher opportunity costs of training, notably because of their smaller number of employees (OECD, 2021^[43]). Finally, the increased relevance of digital technologies in the wake of the pandemic might exacerbate the skills shortage. The lack of appropriate skills and training undermines SME competitiveness, which in turn risks further widening the productivity gap between SMEs and larger, more digitally advanced companies.

Although Moldova has little data on the level of digital skills among its population and businesses, reports and policy documents have underlined the increasing ICT skills gap and low level of digital literacy in the country. This partly explains the limited uptake of digital tools mentioned above (Government of Moldova, 2013^[44]) (World Economic Forum, 2019^[45]) (World Economic Forum, 2020^[46]). As part of policy effort to accelerate the digital transformation, the Government seeks to address this issue in future policy plans and initiatives.

This report aims at supporting this endeavour by reviewing existing policy approaches to digital business skills in Moldova, with a particular focus on SMEs, looking at 1) the current institutional and policy framework; 2) the tools to measure and anticipate digital skills needs; and 3) the provision of specific support for SMEs, it then provides country-tailored recommendations in each of these directions.

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Notes

¹ SMEs refer to micro-, small-, and medium-sized enterprises. The basis for size classification is the total number of persons employed, which includes the self-employed. Micro-enterprises are defined as firms with 1-9 persons employed; small enterprises: 10-49; medium enterprises: 50-249; and large enterprises: 250 and more.

² Formerly ODIMM, Organisation for the Development of Small and Medium Enterprises Sector – the latter has been reorganised and renamed ODA, Organisation for Entrepreneurship Development, in July 2022. The reform mostly aims at improving corporate governance, in line with OECD principles.

³ Eastern Partner countries refer to the six countries of the EU Eastern Partnership: Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova, and Ukraine. Belarus has however suspended its participation on 28 June 2021, and OECD co-operation with the country is suspended since 8 March 2022.

⁴ This initiative is further detailed in Chapter 2 below – see Box 2.1.

⁵ Digital business skills refer to the skills firms need to successfully undergo a digital transformation. These are further detailed in Box 1.2.

⁶ The annual average number of employees in computer programming reached 9,903 in 2020, up from 5,065 in 2014, according to the National Bureau of Statistics.



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