

# Fintech in Europe and Central Asia: Maximizing Benefits and Managing Risks

FINANCE, COMPETITIVENESS  
& INNOVATION  
GLOBAL PRACTICE

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# Glossary



<b>AI</b>	Artificial Intelligence
<b>AML/CFT</b>	Anti-Money Laundering and Combating the Financing of Terrorism
<b>API</b>	Application Programming Interfaces
<b>ATM</b>	Automated Teller Machine
<b>BCBS</b>	Basel Committee for Banking Supervision
<b>BIS</b>	Bank for International Settlements
<b>CCAF</b>	Cambridge Center for Alternative Finance
<b>CBDC</b>	Central Bank Digital Currency
<b>CDD</b>	Customer Due Diligence
<b>CPMI</b>	Committee on Payments and Market Infrastructures
<b>DLT</b>	Distributed Ledger Technology
<b>EBA</b>	European Banking Authority
<b>EC</b>	European Commission
<b>ECA</b>	Europe and Central Asia
<b>eIDAS</b>	electronic IDentification, Authentication and trust Services
<b>e-KYC</b>	electronic-Know-Your-Customer
<b>EU</b>	European Union
<b>FATF</b>	Financial Action Task Force
<b>FCA</b>	Financial Conduct Authority (UK)
<b>FSB</b>	Financial Stability Board
<b>GDPR</b>	General Data Privacy Regulation
<b>GPSS</b>	Global Payment Systems Survey (World Bank)

<b>ICO</b>	Initial Coin Offering
<b>ICT</b>	Information, Communication and Technology
<b>IT</b>	Information Technology
<b>KYC</b>	Know-Your-Customer
<b>MSME</b>	Micro-, Small-, and Medium-sized Enterprises
<b>MTO</b>	Money Transfer Operator
<b>P2P</b>	Peer-to-Peer
<b>PoC</b>	Proofs of concept
<b>POS</b>	Point of Sale
<b>PSD2</b>	Payments Services Directive 2
<b>RegTech</b>	Regulatory Technology
<b>SupTech</b>	Supervisory Technology
<b>SSB</b>	Standard-Setting Body
<b>UNSGSA</b>	United Nations Secretary General's Special Advocate for Inclusive Finance

# 1.

## Summary of Key Findings



**FinTech has tremendous potential for financial efficiency and inclusion gains in the Europe and Central Asia (ECA) region.** FinTech solutions target existing gaps in user needs not addressed by traditional financial service providers and in some cases address latent needs and new needs arising in connection with the growing digital economy. Given the high mobile phone and internet access levels in the ECA region, new FinTech models offer an opportunity to address the unmet needs for financial services.

**Keeping in line with the global trend, the ECA region has been proactive in adopting FinTech innovations in recent years, however there are regional differences—especially between EU and non-EU countries.** Major regional differences exist regarding the level of digitization, FinTech adoption, and regulatory capacity with non-EU countries (and in some cases, recent EU accession countries) trailing their EU peers. There is a huge diversity in the region on the key drivers for FinTech adoption.

**In addition to high mobile and internet access, several other drivers have propelled FinTech adoption in the region.** Among these are the low costs of computing, ubiquitous and increasingly fast connectivity, mass data storage, the advancements in cloud computing, and changes in consumer expectations. In the era of digital transformation, users expect services to be available when and where they want them, and with a high degree of customization. This has opened the door for FinTech providers to offer tailored products at low costs, therewith transforming the financial system.

**While FinTech can have positive effects across the whole range of financial services, this report focuses on three financial sector challenges that are particularly relevant for the ECA region.** These are: (i) high costs of international remittances, (ii) inefficiencies in the provision of domestic payments, and (iii) low levels of MSME's access to finance. These areas were chosen given the importance of the topics for the region and the simultaneous scope for efficiency and inclusion gains through the application of FinTech solutions.

**FinTech solutions could nearly halve the costs of sending remittances to the ECA region, saving remittance senders US\$1.59 billion annually.** A large percentage of the population in the region relies on remittances from migrant family members as

an important income source. Remittances to the region amounted to US\$59 billion and contributed more than 10 percent of GDP in seven ECA countries in 2018 (Remittance Prices Worldwide Database). However, remittance senders often incur considerable costs when using traditional channels—in the first quarter of 2019, the average cost of remittance services in World Bank client countries in ECA, excluding Russia, was 7.18 percent (6.67 percent including Russia). Leveraging digital technology, advanced data analytics, and in some cases distributed-ledger technology, FinTech players can offer fees that are nearly half of those of traditional players. If remittance costs were indeed halved, remittance senders to ECA recipients could save around US\$1.59 billion annually.

**FinTech solutions can also help reduce the excessive reliance on cash in the ECA region.** The penetration of digital payments continues to be low in non-EU ECA countries. On average, 60 percent of adults in non-EU ECA countries have made digital payments compared to 90 percent in the EU (Global Findex). In addition, a large percentage of the population in several ECA countries still receives government pension payments in cash. In several countries, a majority of the private sector wage recipients also receive their wages in cash (Global Findex). Cash payments for utility bills are high across non-EU countries, but also continue to be high in some recent EU accession countries such as Romania and Bulgaria. A lack of competition in the payments has not provided an incentive to lower costs for electronic payments or offer more customized products. While innovation on the supply side has been limited, a lack of trust in financial institutions remains a barrier in the region. FinTech players can reduce the costs associated with electronic payments and adapt their platforms to user preferences, therewith encouraging the digitization of payments.

**FinTech can contribute to closing the substantial MSME finance gap in the ECA region, estimated at about US\$746 billion or 19 percent of GDP** (IFC MSME Finance Gap 2017). Weakly diversified financial sectors and tight bank lending standards contribute to MSME's financing constraints in the region. By using big data and artificial intelligence technology and new business models, FinTech solutions such as P2P lending and crowdfunding apply new data sources and decision tools to assess creditworthiness, therewith disrupting

the entire lending chain. Traditional requirements for obtaining a loan, such as solid financial accounts and strong collateral, are less relevant for FinTech providers, benefitting particularly MSMEs.

**However, FinTech solutions do not only come with opportunities but also introduce new and exacerbate existing risks.** Examples of risks that are heightened include cyber-attacks, money laundering/terrorist financing, and threats to data privacy and consumer protection. FinTech also increases regulatory and supervisory risk. FinTech players often fall outside the applicable regulatory and supervisory framework, creating an uneven playing field between established financial institutions and new FinTech players. Regulators, especially those with capacity constraints, may be ill-equipped to address this challenge. All these risks can translate into increased financial stability risk, especially as the importance of FinTech grows.

**The level of FinTech development differs widely across the ECA region.** The report introduces a categorization of non-EU ECA countries as well as recent EU accession countries based on their level of FinTech development: Basic, Evolving and Innovating. Findings show that Central European countries along with Russia and Turkey are leading in FinTech innovation within this group while countries of the South Caucasus, Western Balkans and Central Asia still have a long way to go to catch up to their peers. Some of the major challenges to FinTech development in these countries include lack of funding and investment, underdeveloped ICT infrastructure, lack of government and institutional support and enabling regulations for FinTech innovation, small domestic markets, and scarcity of skilled workers in the technology space.

**Authorities in ECA have been proactive in encouraging FinTech, but EU countries are far ahead of non-EU countries in these initiatives.** Regulatory initiatives by the EU, such as the Payment Services Directive 2, the Electronic Identification, Authentication and Trust Services (eIDAS) regulation, and the General Data Protection Regulation, could have an impact on the entire ECA region and other parts of the world. However, these developments are still very recent, and their full impact remains unknown. The ECA region has the highest density of innovation offices of all regions, but the approaches vary greatly. There are

now at least ten established regulatory sandboxes in the region (Denmark, Hungary, Kazakhstan, Lithuania, the Netherlands, Poland, Russia, Serbia, Switzerland, and the UK). The rise of regional FinTech hubs throughout ECA offers a timely opportunity for international collaboration among regulators and other FinTech players alike.

**An enabling legal and regulatory framework will be important for FinTech growth in the non-EU ECA region.** A comprehensive review of the existing legal and regulatory framework (prudential and non-prudential) would need to be conducted, keeping in mind the latest FinTech developments, and country-specific contexts, to make appropriate changes to laws and regulation. This review should firstly evaluate how the various FinTech models and developments would be treated in the country's legal and regulatory framework. Secondly, the review should evaluate how the financial sector authorities could incorporate flexibility and adaptability in their regulatory frameworks, the better to foster innovations. Third, any existing regulatory ambiguity with respect to FinTech services needs to be clarified. Finally, cross-cutting issues like taxation, cloud computing, Artificial Intelligence, big data and crypto-assets would also need to be studied. The legal and regulatory framework needs to be FinTech-enabling while at the same time addressing risks.

**Several other critical reforms are necessary to encourage the growth of FinTech.** These include: (a) upgrading the FinTech-relevant infrastructure and encouraging interoperability, including through the establishment of faster payments infrastructure, allowing for e-KYC and e-invoicing; (b) regularly engaging with industry stakeholders, establishing Innovation Offices or contact points, and monitoring FinTech developments; (c) putting in place enabling regulations to encourage the development of seed, venture, and growth capital as well as accelerators and incubators; (d) addressing emerging risks, for instance

through strengthening cybersecurity, financial integrity, and financial consumer protection frameworks; and (e) education reforms to align skills with the digital economy. These reforms should be underpinned by sustained structural reforms to improve the business climate by fostering a competitive environment that enables non-banks to contribute to financial inclusion alongside incumbents. Regulators and supervisors should also explore options to adopt RegTech and SupTech solutions to monitor and supervise the region's fast-changing FinTech landscape.

**Authorities in the ECA region who responded to the 2019 IMF-World Bank Global Fintech Survey are interested in receiving a variety of capacity building and bilateral advice from international financial institutions, including the World Bank.** The areas of interest include cybersecurity, anti-money laundering and combating the financing of terrorism (AML/CFT), supervisory frameworks, and legal and regulatory frameworks. The WBG is already involved in a variety of FinTech-related engagements with client countries in the region, spanning areas such as payments, regulatory and supervisory issues, cybersecurity, and others. The region's proximity to the EU grants it unique opportunities for intra-regional collaboration, given the general desire among many countries in the region to align with the EU frameworks.

**The remainder of the paper is structured as follows:** Chapter 2 analyzes the opportunities and risks related to FinTech in the ECA region, focusing on the three key financial sector challenges that are particularly relevant for the ECA region. Chapter 3 analyzes the level of FinTech development in the region. Chapter 4 delves into the state of FinTech policy, regulation and supervision in ECA, along with an analysis of reform needs. As a conclusion, Chapter 5 touches upon the role for international public policy coordination related to FinTech generally, with a focus on the ECA region.



# 2.

## FinTech in the ECA Region—Opportunities and Risks



### Why FinTech Matters

**FinTech solutions can address existing gaps in user needs in the financial ecosystem.** Figure 1 provides a stylized road map of the ways user needs for financial services have traditionally been provided, the key gaps in the provision of these services, and the new FinTech solutions that hold the potential to address these shortcomings (see Box 1 for a definition of FinTech). While the positive impact for consumers and businesses is a key focus of FinTech solutions, they can also benefit financial institutions and regulators.

**Efficiency gains are among the most important benefits that can result from FinTech solutions.** Efficiency gains can result from cost reductions and time savings for users, financial institutions and regulators. By leveraging big data and new delivery channels or different business models and processes, customers can be more efficiently served (see Box 2 for examples). In addition, cross-cutting technological developments (for example, DLT and AI) can bring cost-efficiency, expanding production function cost reductions to the back-office. Regulators can also benefit from big data analytics to improve the effectiveness and efficiency of regulatory and compliance requirements.

#### Box 1. What is FinTech?

Definitions of the term FinTech vary, but it can be broadly defined as those advances in technology that have the potential to transform the provision of financial services, spurring the development of new business models, applications, processes, and products (Bali FinTech Agenda). In contrast with previous technological change, it has the potential to be revolutionary rather than evolutionary, affecting financial services across their whole range.

Several technological developments enable FinTech, these include some relatively new developments like: distributed ledger technology (DLT)/blockchain; big data and analytics; and cloud computing. In addition, several other long-standing technological developments and approaches are also being leveraged in new ways, for example: application programming interfaces (APIs); digital identification; and artificial intelligence (AI).

Source: IMF (International Monetary Fund) and WB (World Bank). 2018. "The Bali Fintech Agenda: Chapeau Paper." 11 October 2018, IMF and World Bank: Washington DC.

**Figure 1. Evolution of Financial Services to Suit User Needs<sup>a</sup>**

User Needs	Traditional Model	Gaps <sup>b</sup>	Technological Innovations <sup>c</sup>				Fintech Solutions
			AI/ML	Data/Cloud Platforms	DLT/Crypto	Mobile	
<b>Pay</b>	Cash/ATM Check Wire/MTO's Debit/Credit Centralised Settlement	<b>Speed</b>  <b>Cost</b>  <b>Transparency</b>  <b>Access</b>  <b>Security</b>	L	H	H	H	Virtual currencies Remittances Mobile payments Mobile PoS P2P payments B2B transactions DLT-based settlement
<b>Save</b>	Bank deposits Mutual funds Bonds Equities		L	H	H	L	Virtual currencies Mobile market funds Blockchain bonds
<b>Borrow</b>	Bank loan Bonds Mortgages Trade credit		H	H	H	L	Credit modeling platform lending Crowd-funding Blockchain bonds Auto-underwriting
<b>Manage Risks</b>	Brokerage underwriting Structured products Trading regulatory Compliance KYC Insurance		H	L	H	L	Regtech, Smart contracts Suptech Crypto-asset exchanges eKYC, Digital ID
<b>Get Advice</b>	Financial planner investment advisor		H	M	L	M	Robo-advising Automated wealth management

Source: Fintech: The Experience So Far (World Bank and IMF, 2019) and IMF Staff.

<sup>a</sup> This figure maps users' needs for financial services—explained in IMF (2017a)—to traditional solutions and emerging FinTech solutions. In doing so, it flags the key gaps that technology seeks to fill, and which new technologies are applied in different services.

<sup>b</sup> In gaps, transparency encompasses search and matching frictions, while access encompasses product tailoring needs.

<sup>c</sup> AI/ML refers to Artificial Intelligence and Machine Learning algorithms applied to extract insights from large sets of data. Data/Cloud Platforms are cloud-based technologies that facilitate B2B, C2B, C2C, and B2C exchange of data via Application Programming Interfaces (APIs), across FinTech firms, financial institutions, customers, and governments. Access to digital platforms can be secured with digital identification technologies, such as biometrics. DLT/Crypto captures distributed ledgers, such as smart contracts and related decentralized technologies. Mobile refers to feature phones and smartphones running financial apps. The colors scheme reflects a judgement on whether the specific technology has a low (L), medium (M), or high (H) level of benefit for the corresponding FinTech solutions. Scaling is purely illustrative.



## Box 2. FinTech Can Save Your Time

While it remains to be seen whether FinTech solutions can result in cost savings, it is increasingly clear that FinTech can be a game changer in terms of savings in time. Below are some examples.

### Automation of back office processes:

Automation of back-office processes of financial service providers promises huge gains in work-flow efficiency and time savings by eliminating many manual or paper-based processes, simplifying complicated or error-prone work flows, improving communication channels with offshore operations, and seamlessly integrating existing and new work flows. This can also simplify the process of record keeping for compliance purposes. Another means by which financial institutions can reduce inefficiencies in their systems is the adoption of automated decision-making processes and providing digital payment options, to the extent feasible. However, the extent to which efficiencies can be derived from a more thorough automation and digitization of work flows will depend on the individual circumstances of each financial services provider.

### Digitization of paper-based processes:

- Digital signatures and authentication: The widespread use of digital signatures and authentication methods can lead to significant time savings. Enabling frameworks such as the EU's regulation on electronic identification (eIDAS), which enables banks and financial institutions to assign the same legal status to e-transactions and other e-signed documents as paper-based documents can serve as a strong enabler for migration to digital services and the reduction of paper-based processes.
- Electronic invoicing: Electronic invoicing and factoring are all driving efforts toward more efficient and inclusive financial institutions in Latin America. The governments of Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Mexico, Peru, and Uruguay have all introduced policies to establish mandatory electronic invoicing. The digitalization of invoices leads to increasing efficiency of factoring and reverse factoring using platform approaches, as well as enhancing transaction information for MSMEs, enabling lenders to better assess creditworthiness.

### Time savings for customers:

Several FinTech innovations are designed to substitute mobile phone or online interaction for in-person interaction to help consumers reduce the time spent on searching for new financial products or to avail themselves of financial services. For example, Ping An, one of China's largest non-state insurers has launched a Superfast Online Investigation system, which permits policyholders to submit insurance claims by opening a smartphone application and answering questions. This service uses AI and data processing operations to reduce the time taken to process insurance claims, as well as reduce false claims and human error. In 2018, the company's customers used this application to settle 7.3 million claims (62 percent of the total claims).

Sources: Trust services and electronic identification (eID) <https://ec.europa.eu/digital-single-market/en/trust-services-and-eid>; China's biggest private sector company is betting its future on data <https://fortune.com/longform/ping-an-big-data/>

**FinTech solutions can also improve financial access and inclusion by helping providers adopt different processes and business models that address longstanding inclusion barriers and by offering better-tailored products.** These barriers include physical distance and complex procedures. Further, there are three main business constraints when extending financial services to the unbanked and underbanked: (i) irregularity and/or small value of financial flows; (ii) reluctance (or inability) of this market segment to bear substantial fees or maintain large minimum balances; and (iii) high cost and complexity related to complying with KYC requirements and AML/CFT regulations. Each of these constraints may be eased through technological innovations. For example, the challenges in conducting customer due diligence

can be overcome with technology such as using ID platforms for account opening and complying with KYC requirements. New business models such as mobile money where the pricing model is on a per-transaction basis (rather than revenues from upfront fixed fees and float balances) can ease the requirement to maintain large minimum balances or pay up-front fees. Technology can also help introduce better-tailored products aimed at the underbanked. Big data such as payment platform transactions, mobile phone usage or social media information, combined with the tools to draw out actionable insights, can help provide alternative sources of information for assessing credit worthiness. This can especially help individuals and micro, small and medium enterprises (MSMEs) that are unable to provide the data traditionally required for credit risk underwriting to access financing.

**The increase in competition resulting from FinTech players can have positive impacts on efficiency, inclusion, and transparency.** FinTech can lead to more competition through a new class of players entering the financial sector and disrupting the traditional way of providing financial services, forcing incumbents to reduce prices. Competition can also increase product diversity by encouraging market players to offer more customized products that meet the needs of consumers and businesses. Competition can also bring about transparency gains.

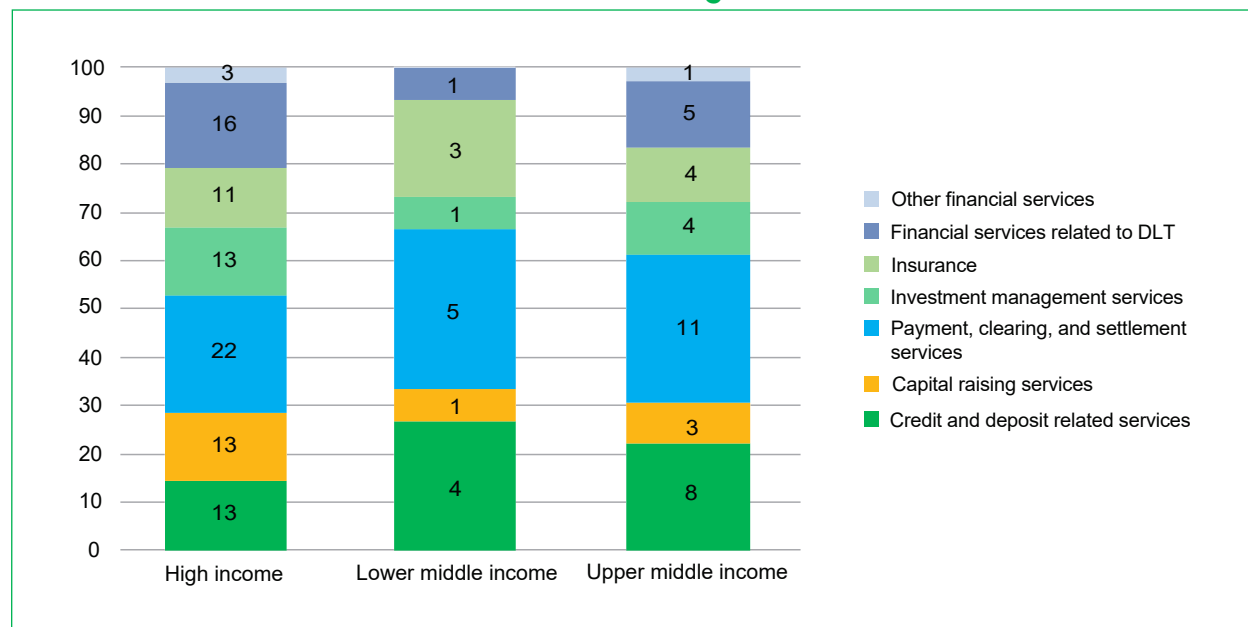
### How FinTech can help address some of ECA's key financial sector challenges

**While FinTech can have positive effects across the whole range of financial services, this section focuses on three financial sector challenges that are**

**particularly relevant for the ECA region.** These are: (i) high costs of international remittances, (ii) inefficiencies in the provision of domestic payments, and (iii) low levels of SME's access to finance. These areas were chosen given the importance of the topics for the region and the simultaneous scope for efficiency and inclusion gains through the application of FinTech solutions.

**The selected topics are also consistent with the most promising areas identified by ECA authorities for Fintech disruption.** Most regulators in the ECA region ranked payments, clearing and settlement as the most promising use case to improve competition and contestability in the financial sector in the next five years, per the IMF-World Bank Global Fintech Survey (Figure 2). This was followed by credit and deposit related services for upper- and lower-middle income countries and DLT-related financial services for high-income countries.

**Figure 2. Financial Services Most Promising for FinTech Disruption in the ECA Region**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Respondents could choose multiple responses. Colored bars represent the relative weighting of each option for a given income group. Numbers in bars refer to number of countries listing that response in the respective income category. Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).

## Improving the efficiency of remittance transfers

A large percentage of the population in the ECA region relies upon remittances as an important income source. Remittances to the region amounted to US\$59 billion in 2018 (World Bank Migration and Development Brief). After posting 22 percent growth in 2017, they grew by an estimated 11 percent in 2018. As many as seven lower middle-income and upper middle-income countries in the region had international remittances contributing to more than 10 percent of

**Table 1. Non-EU ECA Countries and International Remittances as a Percentage of Their GDP**

Country	Remittance volume (2019e)	Remittance as share of GDP (%)
Albania	1,487	9.3
Armenia	1,558	11.9
Azerbaijan	1,277	2.8
Belarus	1,263	2.1
Bosnia and Herzegovina	2,110	10.5
Georgia	2,126	12.3
Kazakhstan	645	0.4
Kosovo	1,223	15.1
Kyrgyz Republic	2,409	29.6
Moldova	1,873	15.6
Montenegro	566	10.4
North Macedonia	317	2.5
Russian Federation	9,064	0.6
Serbia	4,108	7.8
Tajikistan	2,287	29.7
Turkey	865	0.1
Turkmenistan	1	0.0
Ukraine	15,899	11.8
Uzbekistan	2,931	6.0
Uzbekistan	2,931	6.0

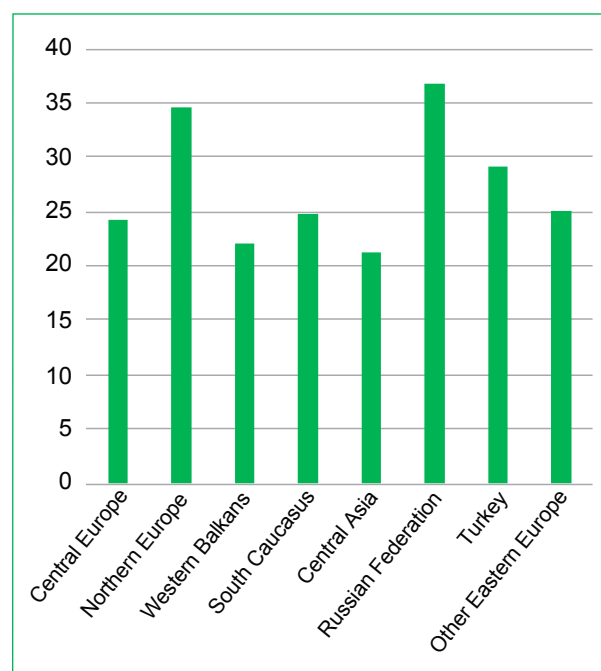
Source: World Bank Migration and Remittances Factbook October 2019.

Note: Remittance volumes expressed in US\$millions.

their GDP, with the Kyrgyz Republic being the highest at around 35 percent, followed by Tajikistan at around 32 percent (Table 1). This indicates the sizeable number of migrants who send money to the region from abroad. Domestic remittances are equally important, with a high share of the population that either sent or received domestic remittances in 2017 (Figure 3).

**Traditional channels for sending remittances often come with high costs and hidden fees.** Traditionally, migrants have either used banks or well-known Money Transfer Operators (MTOs) such as Western Union and Moneygram to make remittance transfers. However, remittance senders from abroad often incur considerable costs when using traditional channels. The average cost of remittance services in ECA countries (excluding Russia as a sending country)<sup>1</sup> was 7.18 percent in Q1 of 2019. This average reduces to 6.67 percent if Russia is included.<sup>2</sup> Differences in

**Figure 3. Adults Who Sent or Received Domestic Remittances in the Past Year (%), 2017**



Source: Global Findex database.

Notes: Data show average percent of adults (aged 15 and above). Averages are weighted by population. Figures exclude data from the following countries: Slovenia (Central Europe), Denmark, Finland, Norway, Sweden (Northern Europe).

costs across corridors in the region are significant with Russia being one of the lowest cost countries to send remittances from—in 2017 and 2018 the highest-cost corridor was Turkey to Bulgaria at nearly 14 percent, while the lowest was Russia to Ukraine at about 1 percent.<sup>3</sup> The need for several intermediaries when making international money transfers coupled with tighter regulations around AML/CFT, raises the costs of using banks. MTOs on the other side need to maintain a costly agent network. The problem is not only the fixed commission for the transfer, but also the hidden fees that are, for example, added through the margin on the exchange rate, which adds to the high costs of remittances transfers. The complex pricing structure with commissions and FX margins also leads to a lack of transparency, making it difficult for consumers to compare prices. Given high remittances cost, some migrants resort to sending the money informally. While this reduces upfront costs, migrants incur high risks when using informal channels.

**If all remittances transfers to the ECA region had been made through FinTech models or companies, consumers could have saved an approximated**

**US\$1.59 billion in 2018.** FinTech players can offer remittance transfers with lower costs and higher transparency in both domestic and international remittances, charging fees that can be about half of what is offered by traditional players (See Box 3 for new FinTech models in remittance services). Hence, if all remittances had been transferred through FinTech based models, costs to consumers could have been lowered from about US\$3.95 billion to US\$2.36 billion.<sup>4</sup> FinTech models/ companies also aim at making pricing more transparent, combining all costs and fees into one charge that is easy for consumers to understand and to compare across providers. Because remittance receivers are often among the poorest and most vulnerable in a society, FinTech can also have important distributional effects.

### **Making domestic payments more efficient**

**A large percentage of the population in the ECA region still rely on cash payments.** The region has room for improvement when it comes to the prevalence of digital payments, especially in non-EU countries (Figure 4). Cash payments are also still important

## **Box 3. FinTech Innovations in Remittance Services**

**“Digital only” new entrants:** These are new entrants who seek to leverage the developments in retail payments infrastructure in sending and receiving countries to change the origination to digital channels [internet and mobile apps], funding the remittances by debit to bank account or mobile money account, and disbursing onto an account or mobile money account in the receiving country. Further, these companies seek to use advanced data analytics to estimate the need for foreign exchange conversions and seek to off-set transactions by matching and offsetting incoming and outgoing remittances for a given currency. Examples of this model include Transferwise and Xoom.

**White-label\* Front-end options:** These are online solutions offered by a company in a white-label mode to banks and smaller Money Transfer Operators (MTOs). This enables banks and smaller MTOs to leverage their existing license to offer remittances to develop online remittance options. Examples of this model include the “times of money” platform covering the USA, Canada and Middle-east to India corridors.

**White-label Back-end platforms:** These companies establish banking partnerships and linkages across several countries and maintain running balances in banks in several countries. This platform is then offered to other banks and smaller MTOs in sending countries to plug into and enable them to disburse funds to countries where they do not have a direct distribution network. Examples of this model include Earthport and HomeSend Hub, which specialize in offering services to mobile money operators.

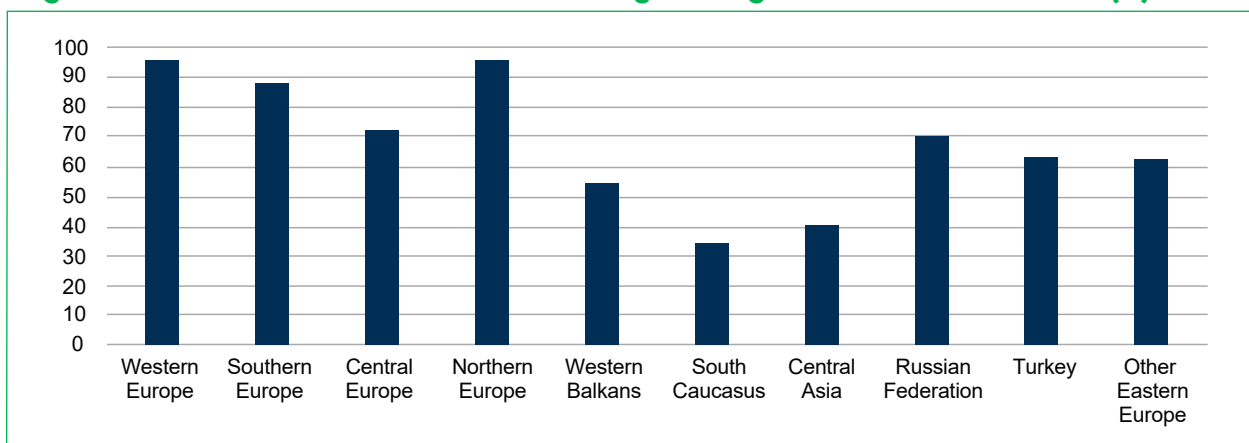
**Blockchain Based models:** There are several players but none have reached any substantial scale except to a limited extent by Circle and BitPesa. These models essentially seek to use cryptocurrencies as the bridge currency and require the senders and recipients to fund and receive disbursement through cryptocurrency exchanges in their respective countries. Traditional MTOs can also partner with such institutions for disbursing funds in some thinly traded currencies. There are also approaches like Ripple xRapid, which seek to allow for real-time cross-border payments. There have been several reports of leading MTOs like Moneygram and Xpress Money partnering with Ripple.

\*“White label” refers to services where a specialized provider provides the service and other licensed entities use their services often under outsourcing arrangement and use their own brand. This dramatically increases the scale for the white-label providers and allows many smaller players to offer remittances and results in lowering the end cost to customers.

for government to person (G2P) payments, including pensions and social benefits (Global Findex 2017). For instance, a large percentage of the population in several ECA countries receives government pension payments in cash, with the highest levels in Turkmenistan (99 percent), Albania (64 percent), and Moldova (63 percent) (Figure 5). Cash payments for utility bills are also still prevalent, with high levels in Albania (70 percent), Romania (68 percent), and Bulgaria (65

percent). Some of the countries where a majority of private sector wages recipients received their wages solely in cash include Uzbekistan (79 percent), Azerbaijan (63 percent), Turkmenistan (60 percent), Kosovo (57 percent) and Moldova (50 percent) (Figure 6). Some of the countries where sizeable percentages of public sector wage recipients received their wages only in cash include Romania (19 percent), Uzbekistan (14 percent), and Kazakhstan (12 percent).

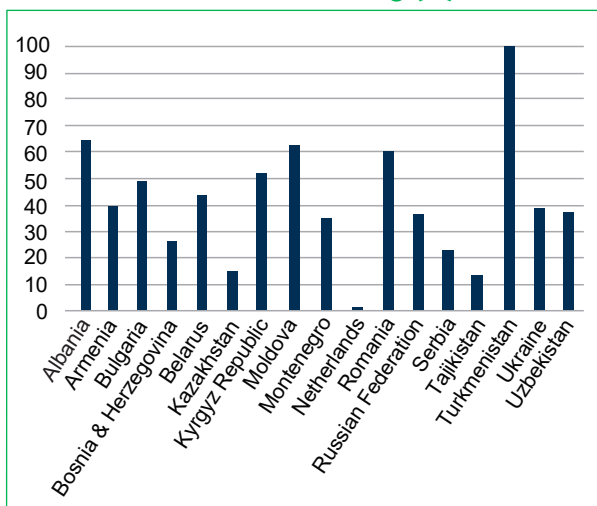
**Figure 4. Adults Who Made or Received Digital Payments in the Past Year (%), 2017**



Source: Global Findex database.

Notes: Data show average percent of adults (aged 15 and above). Averages are weighted by population.

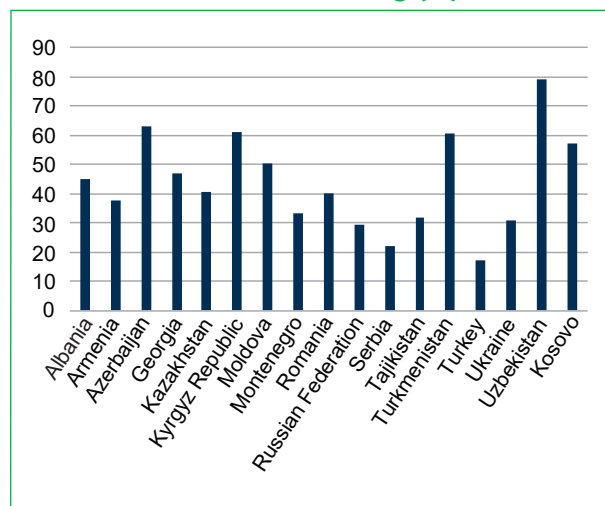
**Figure 5. Pension Recipients Who Received Public Sector Pension in the Past Year in Cash Only (%), 2017**



Source: Global Findex database.

Notes: Data show average percent of adults (aged 15 and above).

**Figure 6. Wage Recipients Who Received Private Sector Wages in the Past Year in Cash Only (%), 2017**



Source: Global Findex database.

Notes: Data show average percent of adults (aged 15 and above).

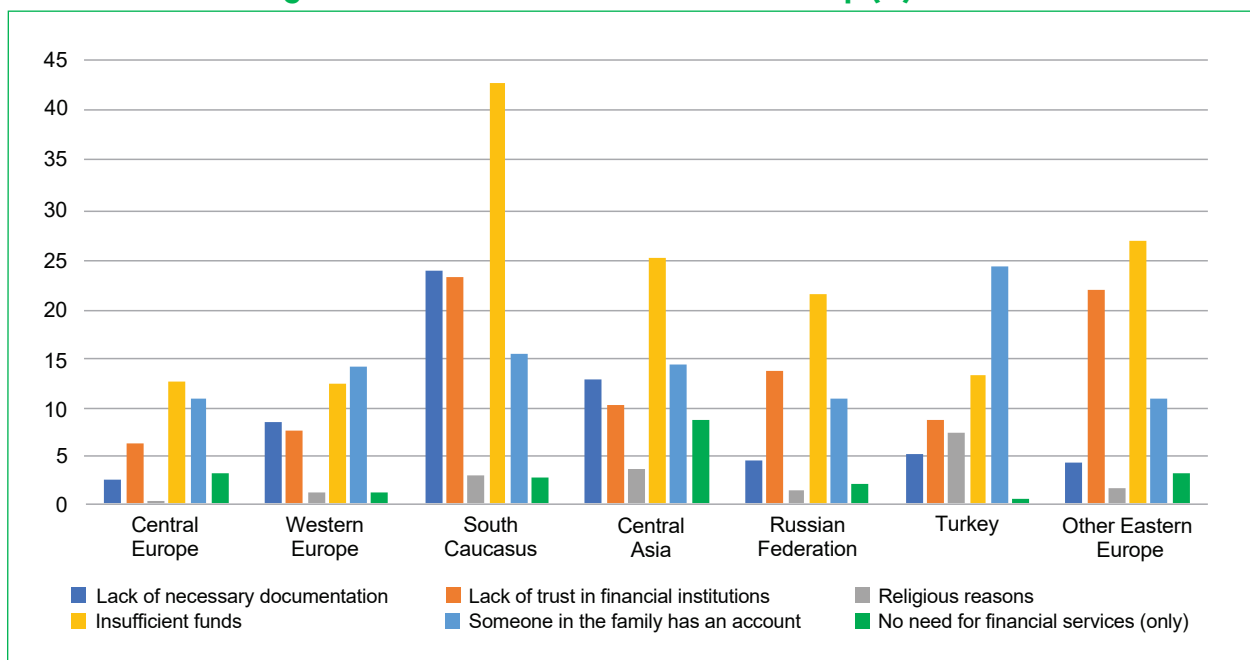
The prevalence of cash payments can be partly explained by the continued high costs of electronic payments, their limited customization to user needs, and a lack of trust in financial institutions. Banks are the most commonly used channel for electronic domestic payments. A lack of competition in the payments space has not provided an incentive to lower costs or offer more customized products. One reason for low competition is, for example, that non-banks are not allowed to offer payment services in many ECA countries<sup>5</sup> (Global Payment Systems Survey). While innovation on the supply side has been limited, a lack of trust in financial institutions is also a barrier in the region (Figure 7).

**FinTech can help bring more unbanked and underbanked individuals into the payments fold, thereby expanding the supply of payments services targeted at the poor.** A promising business case has been built by using FinTech to increase uptake of electronic payments by combining three main developments: (i) special bank accounts and/or prepaid e-money accounts; (ii) the use of business correspondents/ agents and aggregators—enabling

providers to move the fixed costs associated with traditional branch networks and ATMs and dedicated sales staff to a variable cost structure; and (iii) new means of initiating and authenticating transactions—by leveraging mobile phones that individuals and businesses already have rather than deploying POS terminals and issuing debit cards. Unlike in traditional banking services, users typically incur minimal cost for maintaining an account and are charged on a per transaction basis, thereby creating a greater demand for digital financial services.

**FinTech players can adapt their platforms to user preferences, and potentially increase the take-up of electronic channels in the payments space.** For instance, the cost of accepting in-person mobile payments by merchants is widely accepted as being lower in comparison to payment cards—instead of dedicated POS terminals, a merchant’s mobile phone can double as a payment acceptance device. Further, in countries with sufficient smartphone penetration, QR code-based payments can serve as a useful innovation—for which even a QR code sticker will suffice. FinTech can also provide customizable platform solutions to

**Figure 7. Barriers to Account Ownership (%), 2017**



Source: Global Findex database.

Notes: Data show average percent of adults (aged 15 and above). Averages are weighted by population.

governments to meet various needs, thus making the switch to electronic transfers more efficient and less costly. Most importantly, FinTech approaches often embed payment services into common economic interactions like ride hailing services, bill payments and P2P transfers—increasing convenience and thereby creating a strong demand for digital financial services.

**It is unclear whether FinTech will be successful in overcoming the region’s pervasive lack of trust in traditional financial institutions.** On the one hand, inexpensive, interactive and user-friendly platforms provided by new non-traditional institutions might assuage distrust, while on the other hand, biased

algorithms or incorrectly tailored products, which are “black boxes” even to their creators, might further exacerbate the lack of trust in financial institutions.

### Increasing access to finance for MSMEs

**Access to appropriate financing remains a constraint for a large share of MSMEs in ECA.** The MSME finance gap in the ECA region is estimated at US\$746 billion or about 19 percent of GDP (IFC MSME Finance Gap 2017). The gap is particularly high in Ukraine and Belarus with over 30 percent of GDP (Table 2). Figure 8 shows the percentage of firms being credit constrained based on Enterprise Survey data. Constraints appear to be highest in Ukraine followed by Azerbaijan and Russia.<sup>6</sup>

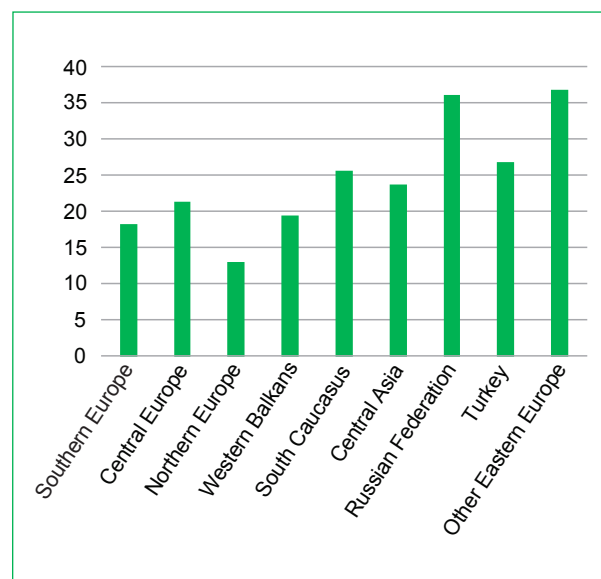
**Weakly diversified financial sectors and tight bank lending standards contribute to financing constraints.** Financial sectors in the non-EU ECA region are largely dominated by banks, with negligible

**Table 2. Non-EU ECA Countries and Their MSME Finance Gap**

Country	MSME finance gap (US\$bn)	MSME finance gap/ GDP (%)
Albania	1.1	9.4
Armenia	1.1	10.8
Azerbaijan	6.8	12.8
Belarus	18.4	33.7
Bosnia and Herzegovina	0.8	4.8
Georgia	2.5	17.8
Kazakhstan	42.3	23.0
Kosovo	0.3	5.4
Kyrgyz Republic	1.4	21.4
Moldova	0.9	13.7
Montenegro	0.6	15.8
North Macedonia	N/A	N/A
Russian Federation	222.0	16.7
Serbia	10.1	27.6
Tajikistan	1.5	18.5
Turkey	80.2	11.2
Turkmenistan	N/A	N/A
Ukraine	33.1	36.5
Uzbekistan	11.8	17.7
Uzbekistan	2,931	6.0

Source: IFC MSME Finance Gap, 2017.

**Figure 8. Percentage of Credit Constrained Firms**



Source: Enterprise Surveys.

Notes: (1) Credit constrained firms are defined as firms that either had their loan application rejected or firms that did not apply for a loan because of either complex application procedures, interest rates, collateral requirements, insufficient loan size or maturity, or because they thought it would not be approved. (2) Data are not available for Western Europe as well as Denmark, Finland, Italy, Portugal, Spain, and Turkmenistan. (3) Data are weighted by number of SMEs surveyed.

non-bank sectors that could be potential financing sources for MSMEs, such as leasing or factoring. Capital markets are also rather shallow. In addition, banks tightened their lending standards considerably after the global financial crisis, making it more difficult for MSMEs to access fit-for-purpose financing. Offering loans to MSMEs may also be too costly for banks given that loan sizes tend to be small and that assessing MSMEs' creditworthiness takes more time and resources compared to corporate or retail loans. Banks tend to perceive MSMEs as risky, partly because of opaque information on their businesses and a lack of credible financial accounts. Providing collateral can also be a challenge for MSMEs, especially for those that are small and for start-ups. Lengthy loan approval due to cumbersome processes and thorough risk assessments also deter MSMEs from seeking bank loans. As a result, informal borrowing is common among developing countries in the region, with only Armenia, Croatia, and Turkey being exceptions.<sup>7</sup>

**FinTech solutions can disrupt the entire lending chain and offer opportunities for increasing efficiency at different steps of the lending process.** P2P lending and crowdfunding are examples of disruptive FinTech business models targeted at segments that do not have access to credit such as MSMEs. In fact, these solutions emerged as a response to the tightened lending standards after the global financial crisis and the consequent need for alternative credit sources. Using big data and

artificial intelligence, these business models address issues such as lack of credit history and collateral by using new data sources and decision tools (for example, data gleaned from apps on users' mobile phones or from e-commerce transactions). The loans are also provided much faster than what banks can offer and can also come with lower interest rates if low-cost structures are passed on to consumers. Many of these platforms have developed outside the financial sector, including from technology companies and new investor groups.<sup>8</sup> As a prominent example, China's MYBank has provided loans to about 16 million small enterprises since 2015, using payments data from its largest shareholder, Ant Financial, to assess creditworthiness. In the UK, it was estimated that peer-to-peer lending amounted to about 30 percent of all SME lending in 2017 (Cambridge Center for Alternative Finance). Short of disrupting the entire lending chain, FinTech can also help create efficiencies at different steps of the lending process (see Box 4). At the same time, there is a risk that FinTech may introduce algorithmic biases and therefore exclude certain consumers.

#### **FinTech also comes with new and increased risks**

**While FinTech can have many benefits, it also creates new risks and heightens existing ones.** Figure 9 provides a stylized overview of FinTech risks. While not all risks are new, they can be exacerbated

### **Box 4. FinTech Innovations in Lending**

**Loan origination:** FinTech can reduce loan origination costs for banks by using platform approaches. For instance, an aggregator's platform or an online loan comparison platform can be used as alternate channels for customer origination. Sophisticated e-KYC solutions can be embedded for digital on-boarding and verification of customers. Examples include Quickcash (Georgia), Nordigen (Latvia), Mintos (Latvia), Prodengi (Kazakhstan), FinBee (Lithuania), and Kabbage (US).

**Underwriting:** FinTech providers use alternative data (such as utility bill payments, social network data, mobile phone data, or psychometric information) to determine the creditworthiness of potential borrowers through alternate credit scoring solutions. Manual intensive tasks such as analyzing bank statements, financial statements and tax documents can be automated through FinTech solutions using AI/ML, reducing the time needed to underwrite a loan. Examples include Better Mortgage (US), and Fundbox (US).

**Disbursements and Collections:** FinTech solutions can be used to automate installment collection through automatic pull payments that require minimal manual input. Examples include InDebted (Australia), and TrueAccord (US).

**Service & Monitoring:** Early warning systems that use multiple structured and unstructured data points and AI/ML can assist financial institutions in loan monitoring. Examples include Fenargo (Ireland), Onfido (US), and Trulioo (Canada).



by innovations or potentially spread more quickly. Examples include cyber-attacks, money laundering/terrorist financing, and threats to data privacy and consumer protection. Annex 2 provides an overview of the main challenges and risks related to FinTech for countries in the non-EU ECA region, including recent EU accession countries.

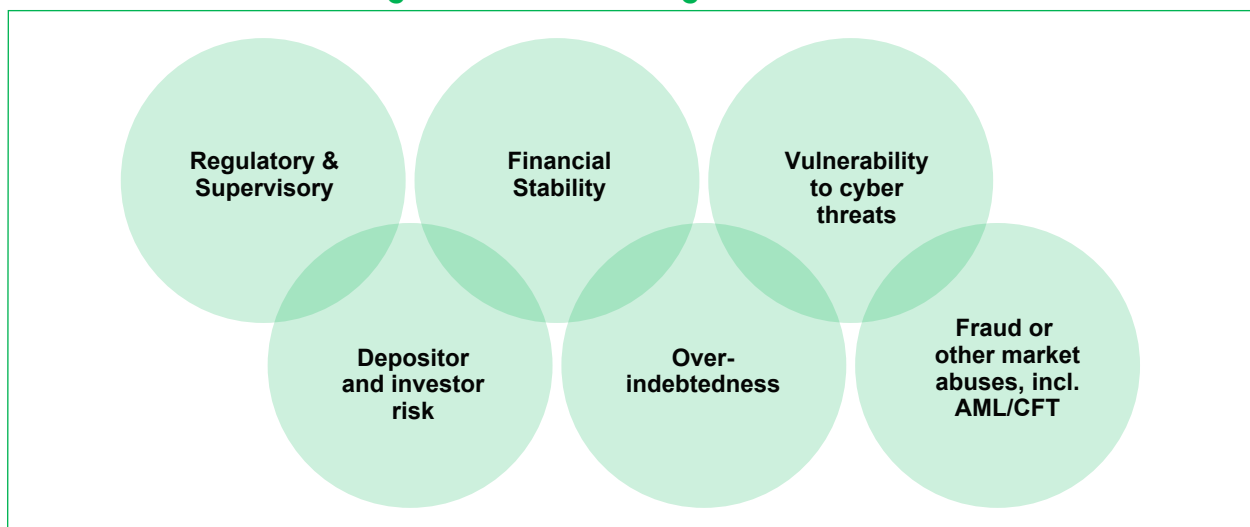
**Risks can increase for consumers and businesses, especially if consumer protection standards are weak or not uniformly applied.** Insufficient disclosure and transparency by new providers such as P2P lenders may put depositors and investors at higher risk. This risk is exacerbated if FinTech players operate outside of the regulatory and supervisory perimeter or if standards are not uniformly applied. An example concerning the development of P2P lending in Georgia (Box 5, below) illustrates this case. Another example is the introduction of FX risks through the cross-border offering of FinTech lenders. P2P lenders and crowdfunding platforms operating, for instance, in the Baltics are active in the non-EU ECA region, offering loans largely in euros. This exposes borrowers to FX risks, which can translate into domestic financial stability risks if FX volatility should lead to debt repayment challenges that spill over to domestic financial institutions. Because supervisors are typically not aware of these exposures, the risks are difficult for them to quantify. A related risk is that of over-indebtedness which can increase given the new and easier access to alternative forms of credit,

especially if consumer protection standards are weak and financial education is low.

**An increased interest in cryptocurrencies has given rise to Ponzi schemes designed to defraud vulnerable populations of their savings.** ECA being one of the most active locations for crypto-mining and trading activity, consumers in the region are especially vulnerable to exploitation through such fraudulent schemes—especially in the developing countries (see Box 6).<sup>9</sup>

**AML/CFT concerns are increasing from both the introduction of new players and new technologies in the financial sector.** On the one hand, an increase in the number of financial players who can conduct cross-border financial transactions with relative ease, has made monitoring of transactions challenging. Many FinTech players falling outside the scope of the traditional financial sector regulation are subject to less stringent AML/CFT regulation, in comparison with traditional banks. On the other hand, new technologies, such as blockchain-based platforms have opened new avenues for money laundering and terrorist financing, beyond the plain sight of regulators and supervisors. The decentralized nature of governance along with the anonymity offered by these platforms has created additional vulnerabilities that require regulatory responses. Cryptocurrencies, crowdfunding/marketplace lending, P2P lending, prepaid cards, ICOs,

**Figure 9. Risks Arising from FinTech**



## Box 5. P2P Lending and Alternative Lending in Georgia

In 2018, the Georgian authorities responded to growing consumer complaints related to the proliferation of unregulated financial services. Until then, hundreds of lenders, including online pay-day lenders, gambling houses, pawnshops, and cross-border P2P lending platforms from Estonia and Latvia, were marketing easy access to loans at rates of 2 percent per day and up to 800 percent per year. One of the P2P lenders had a portfolio of around 100 million Georgian lari (GEL), disbursing over 4,000 loans per day. Lending platforms started off with short-term loans, but gradually offered 2-3-year loans with APRs up to 1,000 percent. Low financial capability and income of borrowers coupled with the devaluation of the local currency resulted in rapid growth of household debt and growing financial distress of lower-income borrowers. Based on findings of the World Bank Household Indebtedness Survey conducted in 2017/18, the authorities developed a comprehensive response, comprising three main sets of reforms: (i) legal amendments to enhance the financial consumer protection framework and regulation of financial services, streamline debt restructuring and the personal insolvency framework, and establish caps on penalties and foreign currency lending to households; (ii) enforcing responsible lending practices and establishing new parameters for lending to consumers focusing on their ability to repay and DTI ratios; and (iii) establishing new registration, reporting and disclosure requirements for previously unregulated institutions, including non-bank lenders and credit bureaus.

More specifically, amendments to the Civil Code prohibited lending to households in foreign currency for loans below GEL 100,000 (recently increased to GEL 200,000) and established a 100 percent (later reduced to 50 percent) interest rate margin cap for consumer lending. NBG also issued five new rules related to the prudential regulation of non-bank lenders and from January 1, 2019 mandated all loan-issuing entities with more than 20 borrowers to disclose their activities and register with NBG. In parallel, NBG introduced regulatory requirements for the operations of credit bureaus in order to increase the quality and reliability of credit reporting and analysis. These measures slowed the growth of consumer lending to 3.9 percent in 2018 compared to 35.6 percent in 2017. An interest margin cap introduced in 2018 along with new NBG regulatory requirements made lending less attractive and profitable for payday lenders and pawnshops, requiring them to close, consolidate or change their business model.

Source: Inputs from WBG staff.

and DLT-based cross-border payment platforms have been acknowledged as being potential channels for money laundering and/or terrorist financing.<sup>10, 11</sup>

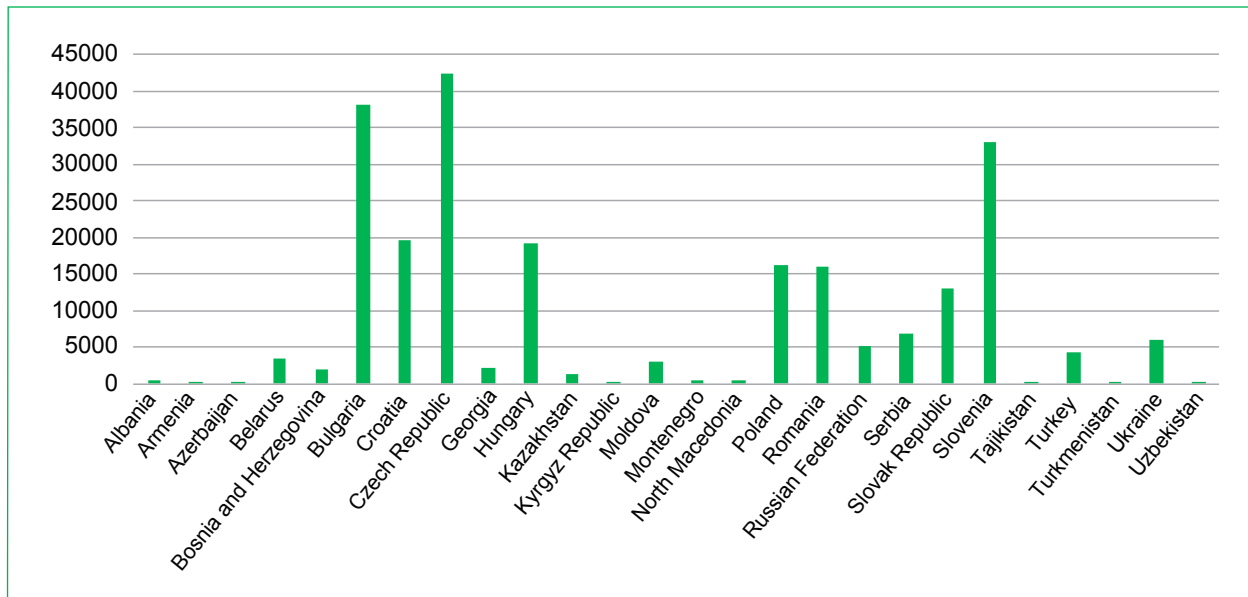
**Cybersecurity is another area that presents concerns in the region.** Cyber-attacks are becoming more prevalent and new technologies are not immune. Attacks have taken place at the regulator, institutional, infrastructure, and consumer level. As an example, in August 2019, the European Central Bank confirmed that it suffered a breach in security that involved the injection of malware and a potential loss of data while multiple commercial banks in ECA have been subject to cyberattacks with Malta's Bank of Valletta as a recent case.<sup>12</sup> Cryptocurrency is often used in cyberattacks with the 2017 WannaCry ransomware attack demanding payments in Bitcoin currency, for example. On the other hand, cloud computing technology, a technology applied in the FinTech space, may also be used to enhance cyber-resilience. 2018 research by Kaspersky Lab showed that the Kyrgyz Republic ranked among the top five countries for cryptocurrency attacks and hacking incidents, while Georgia, the Kyrgyz Republic and Russia featured among the top five countries with

phishing scams.<sup>13</sup> Figure 10 shows that there is a large disparity in the number of secure internet servers per one million people across the ECA region.

**Importantly, FinTech also increases complexity in regulation and supervision, with implications for the capacity to address new risks.** FinTech players often fall outside the applicable regulatory and supervisory framework. This is true for prudential as well as consumer protection supervision. Regulators with capacity constraints may be ill-equipped to address this challenge. An important implication of this is the lack of a level playing field between established financial institutions, highly regulated and stringently supervised, and new FinTech players.

**The protection of customer data in the era of FinTech is a particularly serious concern.** FinTech providers rely heavily on consumer data, creating concerns about data privacy and consumer protection. How FinTechs use and treat sensitive customer data is an issue for FinTech start-ups with limited experience and capacity to address these risks, but also for large companies, especially in an era of increasing cyber-attacks. There are concerns by some groups that customer data may

**Figure 10. Secure Internet Servers (Per 1 Million People), 2018**



Source: World Development Indicators (2017-18).

be used to discriminate against certain population groups, that data may be sold for profit, and whether information is stored securely (National Consumer Law Center, 2019). FinTech companies often have access not only to a customer’s personal information, but also their bank accounts and other financial data that is both sensitive and valuable. While approaches on data protection will vary according to national priorities, it is a priority issue to safeguard the rights and obligations of various stakeholders.

**Macro-financial risks can be heightened through all these channels, especially as the importance of FinTech grows.** While the relationship between incumbent financial institutions and FinTech firms has been largely complementary to date and some incumbents have indeed tried to embrace FinTech (for example, Barclays and Sberbank), this may change as FinTech companies grow.<sup>14</sup> Apprehensions exist that an increase in competition could lead to macro-financial risks if FinTech companies begin undermining the profitability of incumbents by offering financial services at lower costs and with potentially higher user appeal. Additionally, the low interest rate environment in the region and the reliance by financial institutions on fee-based income over interest income to remain profitable could make such low-fee financial services

unsustainable for financial institutions. The entrance of BigTech players (for example, Alibaba, Google, and Amazon) into financial services can accelerate effects of competition.<sup>15</sup> By building on existing platforms, using cross-selling and potentially cross-subsidizing from other business segments, BigTechs can potentially reach scale quickly and therewith impact incumbents and financial systems much faster than other FinTech firms. Incumbents may also be encouraged to loosen lending standards and increase risk-taking as a result, further exacerbating these effects. Initiatives like the EBA’s FinTech Knowledge Hub are aimed at monitoring these risks and increasing knowledge sharing between incumbents and new market entrants.<sup>16</sup>

**FinTech also creates potential exclusion risks that may need to be mitigated.** By moving more services and transactions to digital channels, there is a chance that more marginalized population groups will be left behind. Biased algorithms connected with FinTech products might also lead to further exclusion of marginalized groups. The poor and those in rural areas already show lower take up of digital finance and their access to internet is lower in parts of the ECA region, especially in the developing economies.<sup>17</sup> However, mobile phones are prevalent across population groups with over 80 percent of the

region's unbanked having access to mobile phones (Gallup World Poll, 2017; Global Findex, 2017). In the end, the question of whether FinTech will lead to greater inclusion or exclusion will depend on whether FinTech providers and traditional financial service providers can make digital products and FinTech

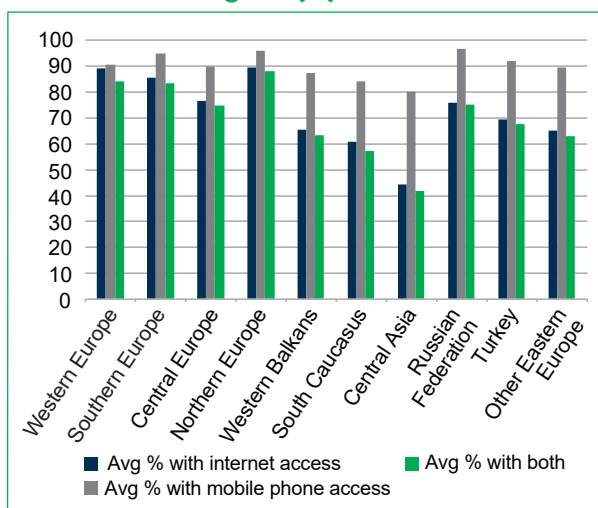
solutions relevant and appealing to these population groups. Financial services need to be tailored to the needs of disadvantaged groups, such as women, low-income families, and first-time users of financial services, who may lack literacy and numeracy skills.<sup>18</sup>

# 3. What is the Level of FinTech Development in the ECA Region?



While FinTech has tremendous potential in the ECA region, non-EU countries trail their peers in terms of digitization. Mobile phone and internet access are high across the entire ECA region,<sup>19</sup> showing that there is good potential for FinTech from the user side (Figure 11). However, the uptake of digital finance is more varied. Using mobile phones or the internet to access accounts is common in EU countries, but less so in the remainder of the ECA region, with particularly low levels in the Western Balkans, the South Caucasus and Central Asia (Figure 12). In addition, the level of adoption of digital technologies in general, a key enabler for FinTech, varies widely across the region with non-EU countries trailing their peers. Based on the Digitization Index (DiGiX)<sup>20</sup> compiled by BBVA Research, the level of digitization in the region is heterogenous, ranging from the

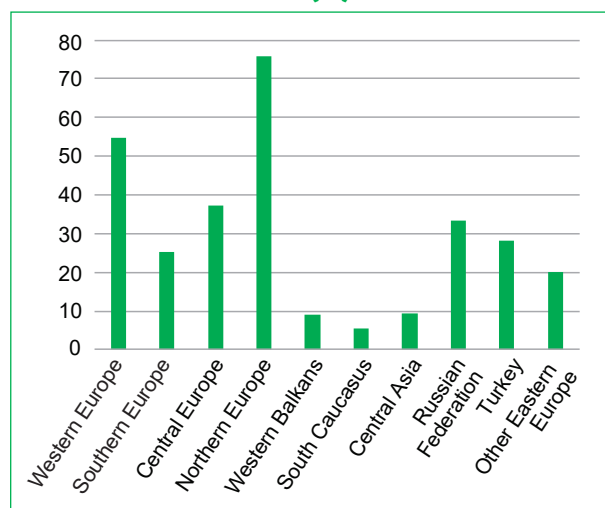
**Figure 11. Adults with Mobile Phone and Internet Access Across the ECA Region (%), 2017**



Source: Gallup World Poll 2017.

Notes: Data show average percent of adults (aged 15 and above). Averages are weighted by population. Countries not included: Romania (Central Europe), Kosovo (Western Balkans), Turkmenistan (Central Asia).

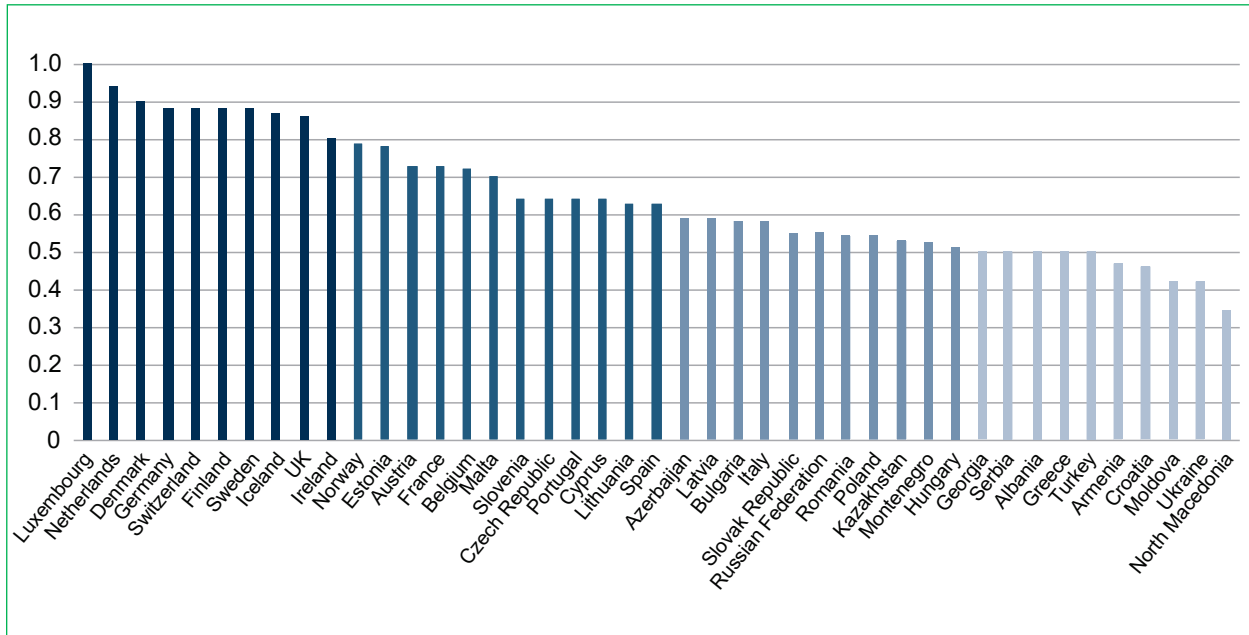
**Figure 12. Adults Who Used a Mobile Phone or the Internet to Access an Account (%), 2017**



Source: Global Index database.

Notes: Data show average percent of adults (aged 15 and above). Averages are weighted by population.

**Figure 13. Digitization in the ECA Region**



Source: Digitization Index (DiGiX), BBVA Research (2017).

best-performing country in the index, Luxembourg, to North Macedonia with about a third of the score (Figure 13). None of the non-EU ECA countries rank above the average of 0.64, with the best performer of that group being Azerbaijan.

**The FinTech market in the ECA region is growing rapidly but is also unevenly distributed.** Non-EU countries trail EU peers in FinTech innovation. Prominent FinTech providers in the region include payments services companies, crowdfunding platforms, P2P lending platforms, mobile banks and insurance companies, in the form of start-ups and established companies. Annex 3 contains a detailed discussion of the supply side landscape and prominent FinTech players in the ECA region. Cryptocurrency mining and initial coin offerings (ICO) are also very popular across the ECA region (see Box 6 for details). Some of the key drivers of FinTech development in the region are IT infrastructure, availability of technical talent, availability of funding, government support and enabling regulations and existence of a FinTech-friendly ecosystem.

**Among EU countries, Western Europe is home to the largest number of FinTech companies.** These

range from start-ups like Funding Circle, Revolut and Transferwise, to well established banking companies like Barclays, which have recently made a foray into the use of disruptive technologies. Several of these FinTech start-ups have become ‘unicorns’, the industry term-of-art for having reached a valuation of US\$1 billion. Within Western Europe, the UK is significantly ahead of the rest both in terms of FinTech innovation and investment. The full impact of a possible Brexit on these developments remains unclear. In Northern Europe, the Baltic region has been working to establish itself as a FinTech startup hub, providing various payment and lending solutions. Estonia, in particular, leads the way in welcoming FinTech startups in the region.<sup>21</sup> Lithuania’s FinTech-friendly regulator has also been attracting new FinTech players into the country.<sup>22</sup> In the Nordic region, Sweden has established itself as a FinTech hub. The Nordic region has also seen a rapid increase in both equity and debt crowdfunding in recent years. In Southern Europe, smaller countries like Malta and Cyprus have been pro-active in attracting FinTech investments into their respective jurisdictions. Additionally, with the uncertainty over Brexit, several FinTech companies have begun considering FinTech destinations within the EU other than London.

## Box 6. Cryptocurrency Activities in the ECA Region

Cryptocurrency and blockchain activities are widespread in the ECA region. Massive mining of cryptocurrencies takes place in Iceland, Sweden, and Georgia. Many Russians own digital wallets, and experiments are ongoing in Serbia and Tajikistan to use blockchain technology to make the sending of remittances more efficient (UNDP 2018). Startups in many countries in ECA are contributing to these technologies, attracting finance for their activities via initial coin offerings. Household investments in cryptocurrencies are not insignificant. Switzerland aims to become a cryptocurrency and blockchain hub and is leading in adjusting regulations to these new technologies. While comprehensive, global information on cryptocurrency and blockchain activities is not available, anecdotal evidence suggests that ECA is more active than many other parts of the world, likely due to a combination of factors. Governments of many countries—from Estonia to Georgia and Slovenia—are experimenting with blockchain technologies. In many countries in the region, a supportive business climate encourages start-ups. And, especially in the eastern part of the region, the relatively new financial sector provides fertile ground for experiments. The lack of legacy technologies in the financial sector—and the lack of trusted intermediaries—makes exploring new financial instruments attractive. Cryptocurrencies are also used to sidestep oversight of cross-border transfers. Cheap electricity (in Iceland and Georgia, for example) encourages the mining of cryptocurrencies.

Source: Europe and Central Asia Economic Update—May 2018 (Office of the Chief Economist for ECA, World Bank Group).

**FinTech in the Central and Eastern Europe region<sup>23</sup> is growing rapidly.** Russia, Turkey, and Bulgaria have the largest numbers of FinTech companies in the region as of mid-2018.<sup>24</sup> As of 2018, 70 FinTech companies were registered in Bulgaria, many of which work in the transaction, resource management, and investment space.<sup>25</sup> The Czech Republic and Romania follow Bulgaria in the top 5 FinTech destinations, while Slovenia has established itself as the Bitcoin hub in the region. Countries like Ukraine and Belarus have also seen a growth in the number of FinTech startups, aided by several FinTech-friendly government initiatives. FinTech in the Western Balkans remains underdeveloped in comparison with other sub-regions, however there is potential for growth. Serbia, in particular, shows potential for FinTech innovation, given that the development of IT infrastructure has been a long-standing priority of the Serbian government.<sup>26</sup>

**Countries in the South Caucasus have adopted innovations in the use of blockchain technology and have become the cryptocurrency mining centers of the region.** Georgia has taken initiatives to explore the use of blockchain for government functions—notably for land records and customs documents. Georgia also saw significant activity on crypto-mining and P2P lending. The P2P lending market in Georgia however faced several market conduct issues and has since collapsed (See Box 5, above). The South Caucasus region has one of the highest volumes of cryptocurrency mining (See Box 6 for details on cryptocurrency mining in the ECA region).

In Central Asia, Kazakhstan is the most prominent FinTech destination, seeking to become a prominent FinTech hub, with FinTech innovation and investment being a primary focus-area for the government-supported Asthana International Finance Centre in the country's capital. FinTech in the rest of the Central Asia region remains underdeveloped.

**Table 3 aims to categorize countries in the Western Balkans, South Caucasus, Russia, Turkey, Central Asia, Central Europe (including EU) and Other Eastern Europe regions based on their level of FinTech development.** Countries are divided into three categories: Basic, Evolving and Innovating (See Annex 4 for a detailed methodology). The categorization is a subjective analysis of FinTech development in each country based on three criteria:

- **Digital Readiness Index**—based on the Digital Readiness Index, which is meant to be a rough approximation of a country's readiness to adopt FinTech technologies relative to other countries in the middle-and-high income categories (see Annex 5 for a detailed methodology);
- **Existence of FinTech-friendly policy and regulatory initiatives**—based on a subjective assessment of various relevant regulatory and policy initiatives related to FinTech at the country level; and
- **Supply landscape of FinTech providers, existence of major FinTech hubs/incubators/ accelerators,**

and investments in each country—based on various qualitative assessments and commentaries by industry players and commentators in relation to each of these countries.

Based on the categorization, about half of the countries can be characterized as having a level of FinTech development that is ‘Innovating’ or ‘Evolving’ while the other half falls into the

‘Basic’ category. The level of FinTech development in recent EU accession countries is higher than in non-EU countries, with all countries falling into the categories ‘Innovating’ or ‘Evolving’. The Russian Federation as well as Turkey are also comparatively advanced in their level of FinTech development with a level of ‘Innovating’. Of the other non-EU countries, Kazakhstan, Belarus, Serbia and Ukraine can be characterized as having an ‘Evolving’ level of

**Table 3. Level of FinTech Development by Country**

Country	FinTech Development**
Czech Republic*	Innovating
Slovenia*	Innovating
Poland*	Innovating
Russian Federation	Innovating
Hungary*	Innovating
Turkey	Innovating
Bulgaria*	Innovating
Croatia*	Evolving
Slovak Republic*	Evolving
Kazakhstan	Evolving
Belarus	Evolving
Romania*	Evolving
Serbia	Evolving
Ukraine	Evolving
Montenegro	Basic
Armenia	Basic
Georgia	Basic
Moldova	Basic
Republic of North Macedonia	Basic
Bosnia and Herzegovina	Basic
Albania	Basic
Azerbaijan	Basic
Kyrgyz Republic	Basic
Uzbekistan	Basic
Kosovo	Basic
Tajikistan	Basic
Turkmenistan	Basic

\*Member of the European Union, \*\* See Annex 4 for details.

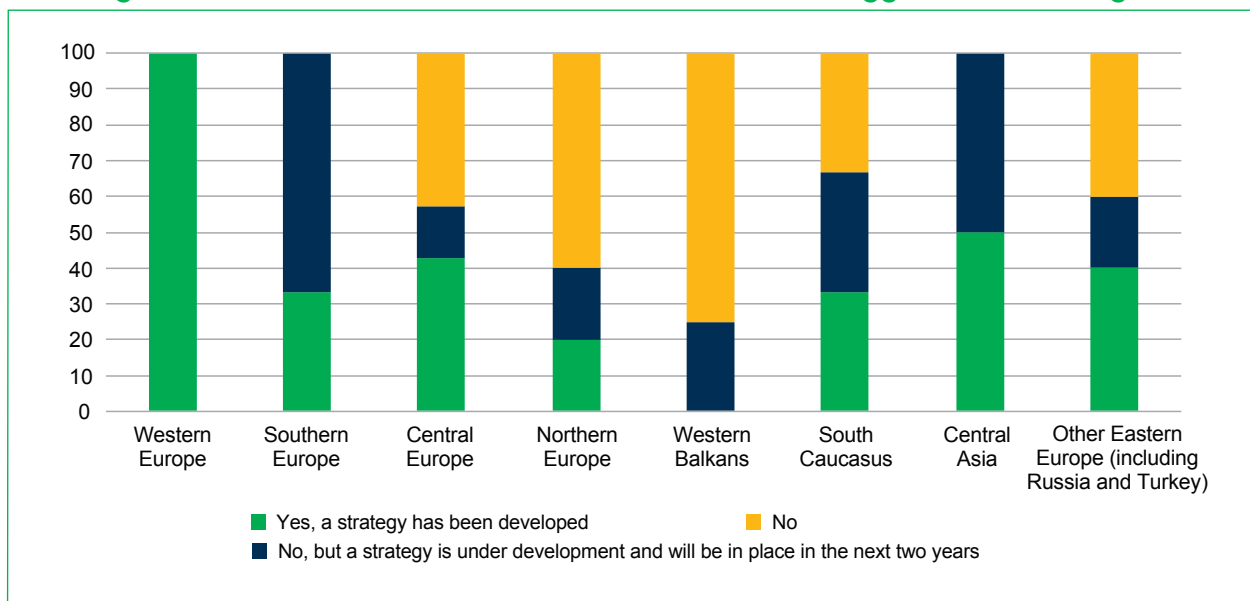


FinTech development, while the remainder is in the category of ‘Basic’.

**The ECA region’s proactivity towards enabling FinTech development is also evident in responses to the 2019 IMF-World Bank Global Fintech Survey.** Based on the IMF-World Bank Global Fintech Survey, 17 of the ECA countries that responded

to the survey have a national strategy to promote responsible innovation and adoption of FinTech in place, and eight countries are currently developing one (Figure 14).<sup>27</sup> Strategies are more likely to be in place in high-income countries (about 60 percent), followed by upper middle-income countries (about 40 percent). No lower middle-income country has a FinTech strategy in place.

**Figure 14. Countries with a National FinTech Strategy in the ECA Region**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).



# 4. FinTech Laws, Policy, Regulation and Supervision Across ECA

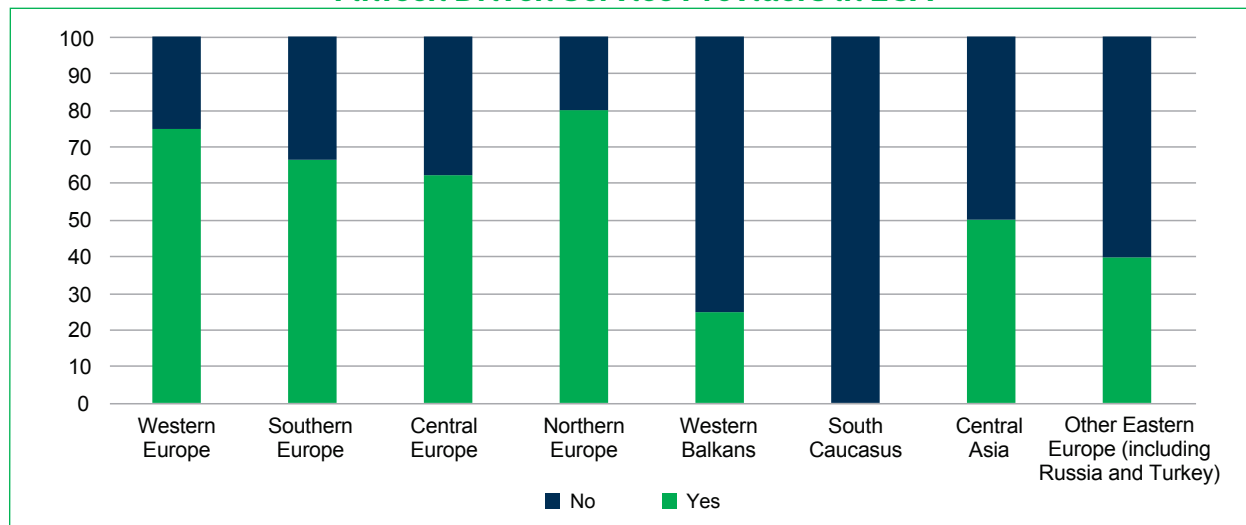


## Existing Policy, Legal and Regulatory Responses to FinTech

Authorities in the ECA region have been proactive in encouraging FinTech innovation through legal and regulatory means. For instance, the Swiss Financial Market Supervisory Authority (FINMA) issued new FinTech licensing guidelines. Most countries that responded to the IMF-World Bank Global Fintech Survey indicated that they have a framework for registering and/or licensing new FinTech-driven service providers, though such frameworks are more common in EU countries (see Figure 15).

Regulatory proactivity has been particularly evident with respect to crypto-assets, ICOs, and digital currencies. Malta became the first jurisdiction to legally recognize cryptocurrencies and passed laws that govern crypto-assets.

**Figure 15. Frameworks for Registering and/or Licensing New FinTech Driven Service Providers in ECA**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).

Belarus also launched its own crypto-framework. The Swiss authorities have been proactive in ascertaining the legal status of various crypto-assets and in clarifying rules applicable to ICOs.<sup>28</sup> Other countries that have taken steps to regulate or clarify the legal status of crypto-assets include Czech Republic, Hungary, Poland, Romania, Slovakia, Slovenia, Ukraine, Kazakhstan and Uzbekistan. While authorities in some countries (such as Armenia and Uzbekistan) have adopted a positive attitude towards cryptocurrencies, authorities in Russia have been cautious while Russian legislators work to enact laws to govern cryptocurrencies.<sup>29</sup> Kazakhstan has witnessed differing stances: the state-run Asthana International Financial Center announced its intentions to launch its own cryptocurrency ecosystem in 2017, and the central bank having considered imposing a ban on cryptocurrencies in 2018.<sup>30</sup>

**Innovative policy initiatives in the FinTech space include the introduction of innovation offices.**

Innovation offices facilitate an early engagement between authorities and innovators and support an innovation-friendly environment. They also help address issues of regulatory uncertainty for FinTech companies and start-ups. Regulators can also use innovation offices to collect evidence for regulatory reform. The ECA region has the highest density of innovation offices of all regions (23 offices across the region). As an example, the Estonian Financial Supervision Authority directly connects innovators with specialists that offer guidance on relevant legal frameworks and a connection to licensing functions. In the Netherlands, the financial services regulator (AFM) and the central bank (DNB) have formed a joint Innovation Hub. The AFM has used interactions with the Innovation Hub to amend its interpretation of some rules and provided clearer guidance on others.<sup>31</sup>

**One of the highlights of regulatory innovation in the ECA FinTech space has been the introduction of regulatory sandboxes.** Regulatory sandboxes are more formal than innovation offices and offer a live testing environment for financial services and business models under a special framework for oversight and regulation. Sandboxes offer benefits, especially in countries with an active FinTech market, but can also be complex to set up and costly to run (UNSGSA

FinTech Working Group and CCAF, 2019). The UK's Financial Conduct Authority (FCA) set up one of the first regulatory sandboxes in 2016. There are at least ten established regulatory sandboxes in the ECA region (Denmark, Hungary, Kazakhstan,<sup>32</sup> Lithuania, the Netherlands, Poland, Russia, Serbia, Switzerland, and the UK), one in progress (Norway) and two proposed (EU, Malta) per the UNSGSA FinTech Working Group and CCAF (2019) and the IMF-World Bank Global Fintech Survey (see Map 1). Responses from the IMF-World Bank Global Fintech Survey also show that countries across the region have put in place special contact points for FinTech questions (Map 1). However, these developments are largely concentrated in EU countries. Map 1 also shows the distribution of innovation offices across the ECA region.

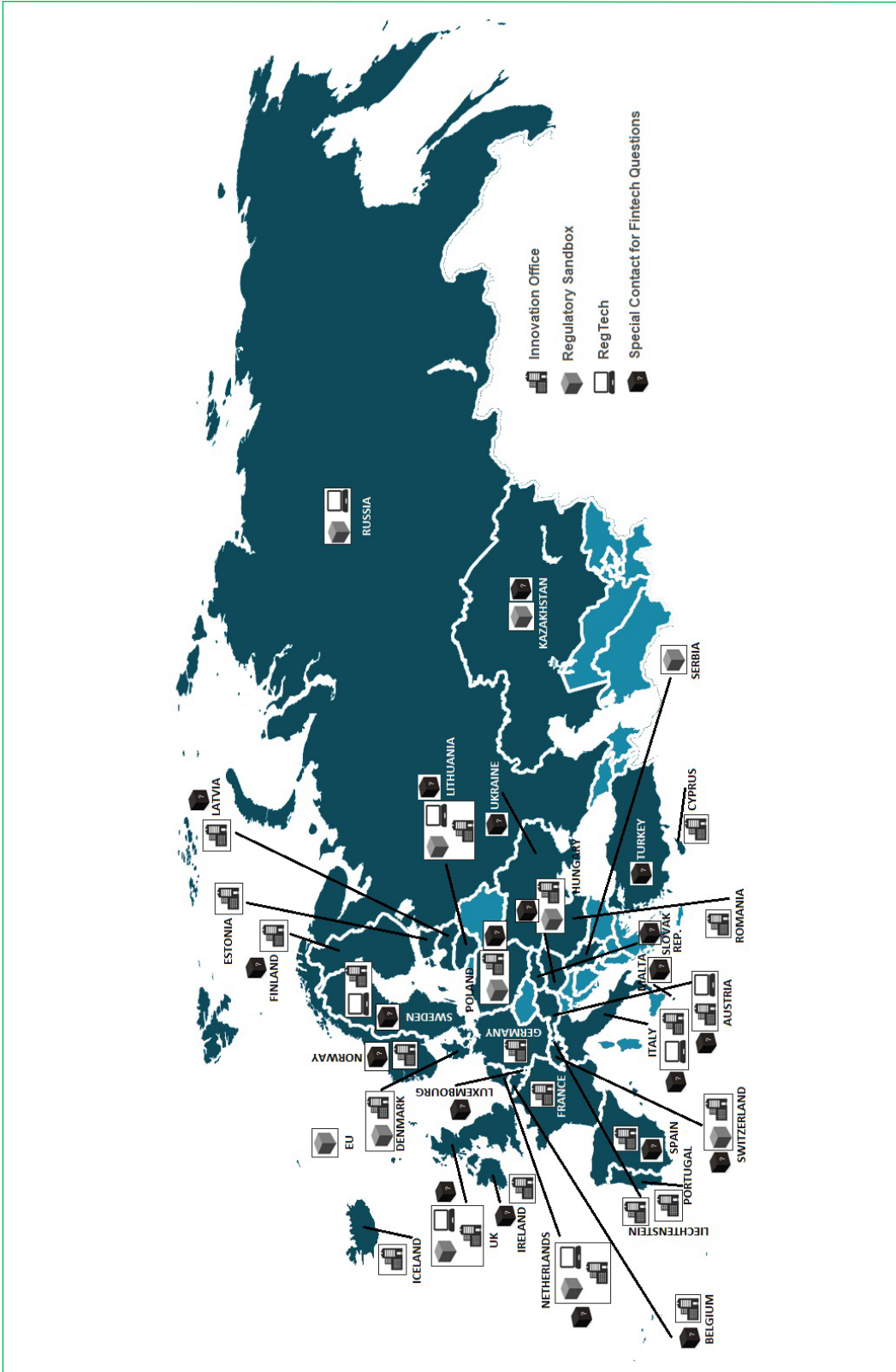
**Authorities in the region have also been addressing potential risks resulting from FinTech innovation through modifications to regulatory frameworks.**

Figure 16 shows that authorities in the ECA region have already responded to FinTech developments by modifying their regulatory framework (for example by expanding the perimeter or introducing a new regulation) to address emerging risks.

**Many central banks in the region are actively examining the possibility of issuing CBDCs.** For instance, the Swedish central bank has announced the intention to launch its own CBDC, the e-krona, to bring the country closer to being completely cashless. The main reasons to consider CBDC are lowering costs, increasing efficiency of monetary policy implementation, countering competition from cryptocurrencies, ensuring contestability of the payment market, and offering a risk-free payment instrument to the public. However, several policy and technical hurdles need to be addressed, and a clear case for issuing CBDC has not yet emerged. Digital currencies remain volatile and unlikely to be considered, at least at present, as stable monies.<sup>33</sup>

**Another side to regulatory innovation is the development of RegTech and SupTech.** RegTech is a tool to help regulators make oversight and the enforcement of compliance more effective and efficient, using the technologies applied by FinTech companies. As an example, the Bank of Lithuania recently introduced an electronic solution to complaints handling and dispute resolution. Half

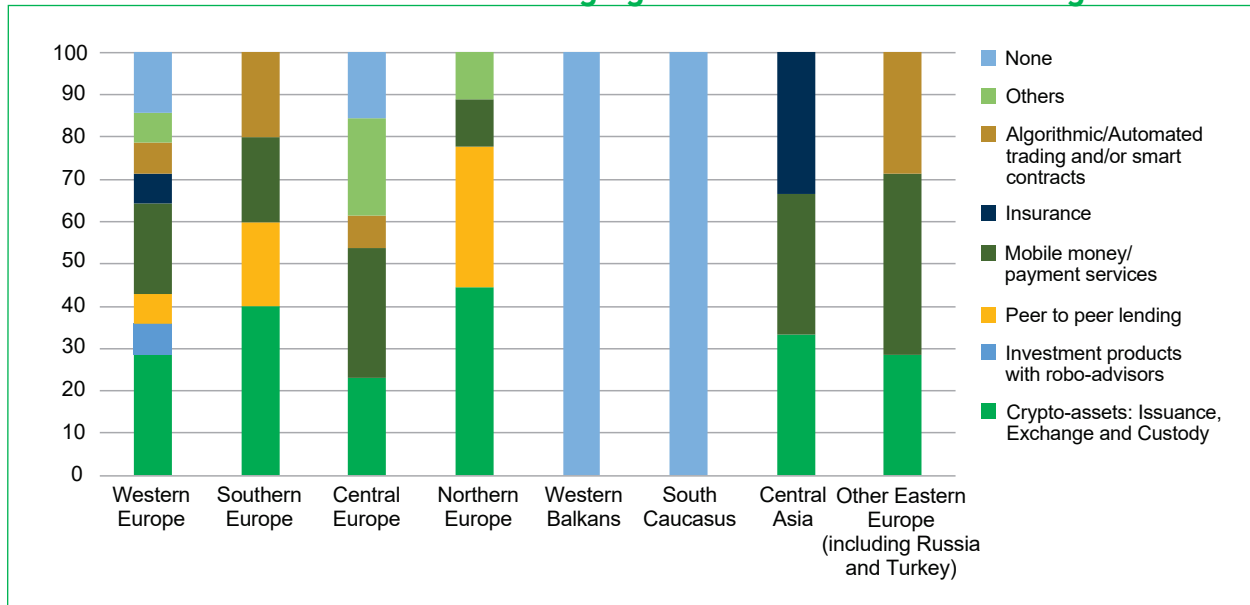
**Map 1. Innovative Regulatory Initiatives Related to FinTech by Jurisdiction**



Source: UNSGSA FinTech Working Group and CCAF, 2019 and IMF-World Bank Global Fintech Survey, 2019.

Note: Responses from the IMF-World Bank Global Fintech Survey on special contacts for FinTech questions are reported as submitted by country authorities, without independent verification.

**Figure 16. Areas in Which Authorities Have Modified Their Regulatory Frameworks to Address Emerging FinTech Risks in the ECA Region**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Respondents could choose multiple responses. Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).

of the ECA countries who responded to the IMF-World Bank Global Fintech Survey indicated that they actively use RegTech for transaction monitoring, determining and monitoring investor/ customer profiles, or streamlining compliance workflows. SupTech—enhanced technology supporting supervisory activities—is used mostly for regulatory reporting (25 ECA countries who responded to the IMF-World Bank Global Fintech Survey) and market surveillance (18 countries). Not surprisingly, the application of RegTech and SupTech is most prevalent in high-income ECA countries. RegTech and SupTech can help facilitate more cross-sectoral and cross-jurisdictional cooperation for improved compliance.

**New technologies can help regulators and supervisors promote a safe and secure digital environment in the ECA region.** For instance, big data analytics and AI/machine learning can potentially ease the process of monitoring, while securing transactions and mitigating fraud and AML/CFT risks. Though non-face-to-face relationships are

usually considered as a “high risk” for AML/CFT, the use of biometry, video, chatbots or AI may help financial service providers offer secure and efficient customer identification, authentication and onboarding processes, while maintaining a value-added remote customer relationship, and thereby mitigating these risks (BCBS, 2018). For example, the UK government has introduced the Verify, as a means of authenticating identities online to access government services.<sup>34</sup> In 2019, Azerbaijan’s Financial Market Supervisory Authority passed the Rules for Opening, Maintaining, and Closing Bank Accounts to set out procedures for opening bank accounts remotely and for the onboarding of new customers. Further, some jurisdictions in the ECA region are exploring options to set up e-KYC to foster information sharing and increase efficiencies in conducting customer due diligence (CDD) (see Box 7 on the state of enabling infrastructure for FinTech in the region). Machine learning can be useful in detecting fraud through creation of algorithms to find correlations between user behavior and the likelihood of fraudulent action.

## Box 7. State of eKYC and Interoperability for FinTech in the ECA Region

**Electronic KYC (or e-KYC):** Several countries in the ECA region (Albania, Azerbaijan, Montenegro, North Macedonia, Serbia, and Uzbekistan) have taken steps to facilitate remote KYC and CDD, and others such as Kyrgyz Republic, Tajikistan, and Uzbekistan are working on the same. One of the most prominent examples in the region is Azerbaijan, which issued guidelines in 2019 permitting remote account opening and digital onboarding. Authorities in the Kyrgyz Republic and Ukraine have also been promoting the use of e-signatures.

However, in general, the region has seen challenges to the implementation of e-KYC. The responses to the World Bank's Global Payments Systems Survey 2018 (GPSS 2018) revealed that only 7 out of 14 of the central banks in the region that had responded permitted KYC and CDD to be conducted remotely by agents of financial institutions and e-money issuers. At least 5 central banks considered the issue of remote KYC and CDD to be a key concern when regulating FinTech companies.

**ATM and POS interoperability:** Full interoperability of ATMs is described as all payment and cash withdrawal cards being used seamlessly in all ATMs in the country. Similarly, full interoperability of POS terminals means all payment cards can be used seamlessly in any POS terminal. Interoperability in the context of payment cards makes it possible for cardholders to use their (locally-issued) payment/ cash cards seamlessly (though probably at a cost) at any acceptance device. Both these constitute essential financial market infrastructure. As per the GPSS 2018 data, 12 out of 17 participating central banks in the region said that their countries had full ATM interoperability, while 3 of them said that the interoperability levels were good, though not complete. The results for POS interoperability were similar with 12 of the 17 central banks stating that their countries had full POS interoperability, with 5 of them saying that the POS terminal interoperability was good, though not complete.

Sources: Global Payment Systems Survey, World Bank (2018). Country FSAPs and inputs from WBG Staff.

**Though the ECA region has been slow in its uptake of e-money or mobile money—which has been a key innovation for increasing financial inclusion—regulators in the region are finally catching up.** The GSMA's Mobile Money Regulation Index (2018),<sup>35</sup> which aims to assess the enabling regulatory framework for mobile money across countries, assigns moderate scores (out of 100) to the ECA countries included in the dataset—Armenia (72.93), Georgia (80.66), Kyrgyzstan (74.61), Romania (80.53) and Russia (76.10). While several countries in the ECA region appear to permit non-bank financial service providers to issue e-money,<sup>36</sup> some countries have taken a clear position, while the position is more ambiguous in others. The legal position is unclear in countries like Bosnia and Herzegovina and Azerbaijan due to lack of regulation. In Azerbaijan, a proposed new law on payment systems might soon provide clarity on the subject. In Kazakhstan, the Kyrgyz Republic, Tajikistan and Uzbekistan, non-bank e-money providers are not permitted to operate. However, in some cases, they may be allowed to operate through agency agreements or similar arrangements with banks. None of the participating central banks from the ECA region allow interoperability between mobile money or e-money services. Almost all respondents to the World Bank's Global Payment Systems Survey

2018 (GPSS 2018)<sup>37</sup> also stated that protection of customer's funds was a key concern while regulating FinTech activities, and this becomes especially relevant in the context of mobile money. The most common regulatory response to address this concern is to require the e-money or mobile money operators to keep all or a fraction of the customer funds separate from the issuer's own funds in accounts with prudentially regulated financial institutions, or the central bank itself.<sup>38</sup>

**Globally, European authorities have been leading the way in enacting FinTech policy frameworks, and engagement with the private sector—however, there are regional differences between EU and non-EU countries.** In 2018, the European Commission (EC) unveiled a FinTech Action Plan and proposed new rules to help crowdfunding platforms expand across the EU's single market. The European Banking Authority (EBA) launched its own FinTech Knowledge Hub, to support the EBA's initiatives on FinTech. Finally, the European Parliament adopted a resolution on distributed ledger technologies and blockchains later that year. In 2019, the EC launched the European Forum for Innovation Facilitators with a view to improve cooperation and coordination of national regulatory bodies in support of the

region's growing FinTech economy. The European Crowdfunding Network was launched in 2012 with the goal of creating a regulatory model for Europe.

**On the legal and regulatory front, the EU has taken the lead in strengthening foundational frameworks by introducing new regulations for cross-cutting topics.** Those include Data Protection (GDPR) and ID services (eIDAS) as well as enabling new business models like open banking through updating the existing Payment Systems Directive (PSD2) (see Box 8). While PSD2 is expected to create further differences between EU and non-EU countries, several EU neighborhood countries such as Georgia, Serbia, Montenegro, Bosnia and

Herzegovina, Republic of North Macedonia, Albania and Kosovo are at various stages of aligning their national legislation with PSD2. Legal and regulatory frameworks related to crowdfunding and P2P lending are still not common in the region. Work is ongoing at the EU level to establish an EU-wide regulatory framework for crowdfunding. As with PSD2, such a framework could provide useful guidance to non-EU ECA countries as they consider introducing bespoke legal or regulatory frameworks for crowdfunding. The transposition of key features of GDPR into national legislation is more advanced with most non-EU ECA countries having data protection frameworks in place that resemble GDPR or are fully aligned.

### Box 8. Latest Developments to Strengthen Foundational Legal Frameworks in the EU

#### GDPR:

With the new General Data Privacy Regulation (GDPR), the EU is taking the lead internationally on protecting individual privacy. The new GDPR, in effect since May 2018, introduced sweeping privacy rules aimed at regulating the processing and transfer of personal data. GDPR not only applies to firms located in the EU, but also those that offer goods or services to EU citizens or monitor the behaviors of EU citizens. With the new rules in effect, GDPR may set the global standard for data protection in the FinTech era. While GDPR is expected to help alleviate data protection concerns in EU countries, it will further increase the differences between EU and non-EU countries. The main aim of GDPR is to protect customer data and by doing so it imposes a complex set of rules on FinTech companies. Those rules include, among others:

- A requirement to clearly document processes and policies;
- Transparent and easily accessible privacy notices and data policies;
- The need to appoint Data Protection officers;
- The rights of consumers to access, request correction, and delete their data; and
- The need to provide notice of data breaches within 72 hours to the relevant EU authorities.

The right of consumers to delete their information is a particular challenge in the blockchain space, given that one of this technology's core attributes is immutability. The potential penalties for non-compliance with the GDPR are severe. It allows for fines of up to €20 million or 4 percent of annual group global turnover.

While GDPR provides clarity about and protections for the use of data, it also imposes significant compliance costs. Those costs are particularly severe for smaller firms. GDPR could either be helpful or harmful to competition depending on the impact it has on incumbent firms and the burden of compliance costs, particularly on new and smaller entrants. At the same time, the new rules may give consumers confidence that transacting online is safe, therefore further spurring FinTech development.

#### Payment Services Directive 2:

The EU's Payment Services Directive 2 (PSD 2), which came into effect in 2018, is expected to 'revolutionize' the financial sector in the region. The stated goals of the directive include creating a single market for payments in the EU, increasing customer safety, increasing accountability of payment services providers in the event of unauthorized transactions, improving customer experience, and opening the financial market to new companies by creating a level-playing field. The directive puts pressure on banks to ensure that they have the necessary system of open APIs to facilitate open banking. It obliges banks to give third-party providers access to customers' bank accounts, if requested by the customer. This is expected to increase competition in the financial sector, could lead to more innovation in financial services, and promote the integration of financial services within the EU.



PSD2 will help create more of a level playing field in terms of regulation and supervision and is expected to generate several benefits for financial consumers. The new directive is expected to ensure that all third-party service providers are subjected to uniform supervision and guidelines. The directive is also expected to remove hidden fees in customer transactions and increase transparency in the payments sector, thereby contributing to consumer protection. By enabling merchants and financial institutions to communicate directly, PSD2 aims to eliminate third-party facilitators, thereby reducing transaction costs in online transactions. Customers are also expected to benefit from this directive by having access to consolidated information on their payments and spending patterns, resulting in better-informed customers. The success of PSD2, however, will depend on a variety of factors, including how effectively the data sharing obligations under this directive are implemented, and the extent to which banks seek legal means to meet the letter of the directive without effectively opening up access to FinTech firms.

#### **eIDAS:**

The electronic IDentification, Authentication and trust Services (eIDAS) (which was established under EU Regulation 910/2014 of 23 July 2014 on electronic identification) is expected to provide an impetus to cross-border digital transactions. It is a set of EU standards established to oversee electronic identification and trust services for electronic transactions in the EU's single internal market. eIDAS has created standards under which electronic signatures, qualified digital certificates, electronic seals, timestamps, and authentication mechanisms to enable electronic transactions would have the same legal standing as paper transactions. eIDAS also contains standards to provide a safe way for users to perform online transactions including transactions with public services and electronic funds transfers. Identity verification performed in one state would be valid in all member states. The system is aimed at helping EU member states build trust in each other's electronic identification systems. Cross-border transactions can now be performed without relying on paper-based methods, facsimile or appearance in person. This is expected to help the growth of FinTech services across borders within the EU.

Sources: EC. n.d. "EU data protection rules." (web page), EC. [https://ec.europa.eu/commission/priorities/justice-and-fundamental-rights/data-protection/2018-reform-eu-data-protection-rules\\_en](https://ec.europa.eu/commission/priorities/justice-and-fundamental-rights/data-protection/2018-reform-eu-data-protection-rules_en); McMullon, K. and Ornstein, D. 2016. "An overview of the New General Data Protection Regulation." (blog post) Proskauer Privacy Law Blog. <https://privacylaw.proskauer.com/2016/08/articles/european-union/an-overview-of-the-new-general-data-protection-regulation>.

## **Reform Needs to Encourage Fintech Growth While Properly Addressing New and Increased Risks**

**National authorities across the world are reviewing existing regulatory frameworks<sup>39</sup> to:** (i) allow new approaches and processes; (ii) extend the regulatory perimeter to handle a new class of players; and (iii) improve coordination with other sectoral regulators and among other financial sector regulators. Government authorities, regulators and supervisors need to: (i) balance competing priorities of maintaining stability in the financial system and encouraging innovation; (ii) address foundational legal, regulatory and infrastructure constraints; (iii) increase the capacity of supervisors and regulators to effectively regulate FinTech players and meet capacity constraints; (iv) manage data, consumer protection and cybersecurity risks; and (v) keep pace with technological developments to monitor and manage risks.

**Several critical reforms are necessary to encourage the growth of FinTech in the non-EU**

**countries.** Legal and regulatory frameworks need to be reviewed to identify gaps and restrictions that may impede the growth of FinTech. This is necessary because the (non-EU) ECA region's financial systems remain bank centric with limited regulatory space for nonbank payment and financial service providers. Other needed critical reforms include: (a) upgrading the FinTech-relevant infrastructure and encouraging interoperability; (b) putting in place enabling regulations to encourage the development of seed, venture, and growth capital; (c) strengthening the region's cybersecurity and financial integrity frameworks; and (d) education reforms to align skills with the digital economy. These reforms should be underpinned by sustained structural reforms to improve the business environment and a competitive environment that enables nonbanks to contribute to financial inclusion. Below is an overview of some of the key reforms and changes required in the region:

- **Legal and regulatory framework:** A comprehensive review of the existing legal and regulatory framework (prudential and non-prudential) would need to be conducted, keeping

in mind the latest FinTech developments and the specific country context to make appropriate changes to laws and regulation. This review should firstly evaluate how the various FinTech models and developments would be treated in the country's legal and regulatory framework. Secondly, the review should evaluate how the financial sector authorities could incorporate flexibility and adaptability in their regulatory framework to respond to innovations. Third, any existing regulatory ambiguity with respect to FinTech services needs to be addressed. Finally, cross-cutting issues like taxation, cloud computing, AI, big data and crypto-assets would also need to be studied. The legal and regulatory framework needs to be FinTech-enabling while at the same time addressing new and elevated risks. Box 9 discusses some of the most common regulatory approaches to FinTech.

- **Infrastructure:** This would include upgrading the FinTech-relevant infrastructure and encouraging interoperability, including through establishing faster payments infrastructure (for example, Fast payments), open APIs, enabling e-KYC and digital onboarding of customers, allowing for e-invoicing, and improving access to payments infrastructure to non-bank entities. In several countries of Central Asia, development of ICT infrastructure should also be a key priority area. In many countries in the region, rural areas are still lagging in terms of broadband access or fast mobile internet networks.<sup>40</sup>
- **Industry Engagement:** This would involve regulators and policy makers engaging with industry stakeholders (both new players and incumbents), adopting a FinTech-enabling approach to encourage innovation, and collaborating with the industry to encourage technology adoption (such as widespread use of open APIs). Establishing Innovation Offices or special contacts within Central Banks would support FinTech development. Formation of FinTech associations or other similar industry groups to liaise with authorities should also be encouraged.
- **Monitoring:** Regulators and supervisors should enhance their monitoring and regulatory tools to look more deeply within and outside the regulatory

perimeter to achieve their respective public policy objectives. FinTech developments are bringing more players into the financial sector value chain, leading to the development of new business models. These developments may not necessarily all fall within the current regulatory perimeter of any financial sector regulator. Hence, the financial sector regulators need to develop mechanisms to better monitor the developments—these could include for example: (i) periodic engagements with the industry and start-ups; (ii) market research to better understand new developments; and (iii) establishing a mechanism to collect information pertaining to FinTech developments and products from both incumbents and entities outside the regulatory perimeter. The financial sector authorities and other public sector agencies should establish a regulatory co-ordination mechanism among themselves. This would also include developing internal capacity to critically examine FinTech developments and continuously assess the appropriateness of existing regulatory and policy frameworks.

- **Funding:** FinTech start-ups need access to seed, venture, and growth capital to develop and expand. Authorities can support this area by putting in place enabling regulations to encourage the development of these funding mechanisms, for example through the transposition of the EU Alternative Investment Fund Managers Directive into local law. Creating an innovation-friendly environment through supporting accelerators and incubators would also be beneficial.
- **Addressing emerging risks:** Regulators need to continuously monitor for the emergence of new or increased risks. New risks include data protection and privacy related challenges, especially in the context of AI and data analytics (see discussion in Box 10). Increased risks would include effects on competition, threats to cybersecurity, exclusion risks, or consumer protection challenges. Addressing competition risks would involve taking active steps to ensure that the FinTech sector is not dominated by incumbents and the financial market is not concentrated in favor of the larger players. The financial sector authorities would also need to collaborate with competition authorities and apply the competition lens to their existing policies. Regarding cybersecurity and AML/CFT,

it is imperative that countries strengthen their cybersecurity and financial integrity frameworks. To mitigate exclusion risks, authorities should ensure that products are tailored to needs of the unbanked, underserved and those lacking in financial literacy such as women, low-income families, and first-timer users of financial services, who may lack literacy and numeracy skills. Related to consumer protection, authorities should aim to provide a level playing field between incumbents and new FinTech

providers and ensure that consumer protection risks are adequately addressed.

- **Education and skills:** Several of the ECA countries are suffering from a lack of talented and skilled workers on account of their education system and/or on account of the emigration of skilled workers to other countries. Addressing this challenge would include education reforms and upskilling to align skills with the digital economy.

### Box 9. Regulatory Interventions to FinTech Around the World (FSB, 2017)

A recent study by the FSB notes that regulatory approaches seen across jurisdictions can be broadly grouped into:

applying existing regulatory frameworks to new business models by focusing on the underlying economic function—for example regulating digital currency exchanges as money services business and payment systems;

tweaking existing regulatory frameworks to accommodate re-engineering of existing processes and allow adoption of new technologies—for example allowing usage of digital forms of ID to open accounts and allowing adoption of cloud computing for banking services along the lines of existing rules for outsourcing;

creating new regulations to extend regulatory perimeters and introduce specific requirements for new a class of players in the ecosystem—for example creating a new class of regulated entities for e-money, aggregators and platform operators; and requiring banks and other payment service providers to offer APIs to allow other institutions to directly access information and provide services to customers;

exploring new frameworks to promote innovation and experimentation in areas where the regulatory framework is either unclear or not present. These frameworks include developments like regulatory sandboxes, innovation hubs and accelerators.

Regulatory interventions to FinTech have been mostly focused on payment and settlement systems, credit, and capital raising. In addition, there are also regulatory interventions for specific technological developments like big data and cloud computing. The policy objectives of FinTech-related regulatory interventions encompass: consumer protection, promoting financial inclusion, financial market integrity, and promoting competition and innovation.

Sources: Financial Stability implications of FinTech, FSB, 2017.

### Box 10. Principles for Ethical Use of AI and Data Analytics

Various principles are being developed to ensure the ethical use of AI and data analytics. The EC's guidelines on the ethical use of AI, which were issued in 2019, aim to maintain ethics in the use of technology, as government authorities and private companies explore opportunities and risks of this new technology. The seven key principles listed by the EU for ethical development of AI include ensuring human agency and oversight, privacy and data governance, non-discriminatory and non-biased algorithms, accountability in the systems, robustness and traceability of AI systems. Privacy and data governance are listed by the EU among the key principles for the ethical development of AI. The principles state that besides ensuring full respect for privacy and data protection, adequate data governance mechanisms must also be ensured, considering the quality and integrity of the data, and ensuring legitimized access to data. It must be ensured that data collected about individuals will not be used to unlawfully or unfairly discriminate against them. It also requires that AI systems be protected against vulnerabilities that may lead to data poisoning and influence the data or the system's behavior. The document also states that considering the principle of proportionality between means and ends, AI developers should always prefer public sector data to personal data.

The Monetary Authority of Singapore's fairness, ethics, accountability and transparency (FEAT) principles to promote responsible use of AI and data analytics is another useful framework to govern the use of data. Some of the key principles include fairness, accountability (both internal and external) and transparency—specifically, data-driven models be regularly evaluated and validated to minimize data-driven biases, people be informed of the data being used to make decisions and how the data affect them, and taking into account verified relevant supplementary data provided by data subjects.

Sources: EC. 2019., MAS (Monetary Authority of Singapore). 2019.



# 5.

## The Role for International Public Policy Coordination



**One of the primary challenges for FinTech in the ECA region is to ensure international regulatory and public policy coordination**, especially between EU and non-EU countries. Except for the EU, which has taken steps to introduce policy actions covering the entire EU region, financial sector regulation predominantly remains localized. The pace of reforms to close legislative and policy gaps due to new FinTech innovations has been uneven throughout the region, but in many cases, authorities in non-EU countries have started exploring changes to regulatory frameworks. For instance, EU candidate countries and countries aspiring to join the EU such as Albania, Serbia, Montenegro, Kosovo, Bosnia and Herzegovina and the Republic of North Macedonia are at various stages of aligning their legal and regulatory frameworks with the EU’s PSD2—in many cases with the assistance of the World Bank. In 2015, the EBA has also signed a Memorandum of Cooperation with supervisors and central banks of Bosnia and Herzegovina, Republic of North Macedonia, Montenegro, Serbia, Albania—Kosovo and Moldova acceded to this memorandum in 2017 and 2019 respectively. Countries that are aiming to become members of the EU and/or regional FinTech hubs have been more proactive in reworking their legal and regulatory frameworks to address emerging issues.

**Efforts are already underway to strengthen cross-border cooperation and harmonization for FinTech at the global level** (IMF 2017). Most of the authorities that responded to the IMF-World Bank Global Fintech Survey noted that they have shared information about specific policy responses to FinTech developments with international financial institutions (IMF, WB, and so on), standard setting bodies or SSBs (FATF, FSB, CPMI, and so on), or with other countries’ authorities. Some of the top priority areas of greater international cooperation for regulators and central banks in the ECA region include: cybersecurity (76 percent), AML/CFT (76 percent), legal, regulatory and supervisory frameworks (70 percent), and cross-border payments (36 percent) (Figure 17).

**As FinTech activities increase in the region, internal cooperation between competent authorities will be key to monitoring macro financial risks.** While there are no immediate financial stability risks from crypto assets or other FinTech products, such risks can emerge quickly from unsupervised and unchecked financial sector activity. As evidenced during the global financial crisis of 2007-09, a financial crisis in one country could have ripple effects in other countries, making it imperative for regulators to coordinate and closely monitor these stability risks.

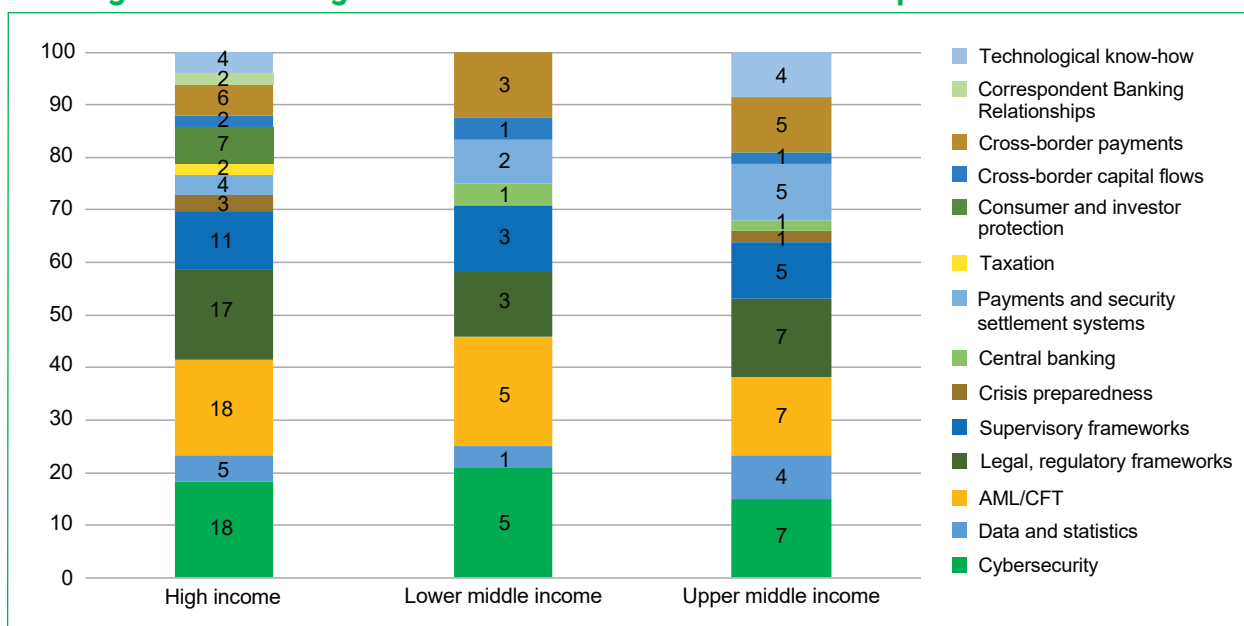
**Close international cooperation is needed to balance the efficiency and risk effects of new forms of global financial flows and avoid unnecessary frictions in international transactions.** International collaboration can be used, for example, to improve interactions between private FinTech firms and domestic regulators, such as facilitating the entry of FinTech firms into other jurisdictions’ regulatory sandboxes and hence benefiting both private firms and regulatory authorities.<sup>41</sup>

**Regulatory and supervisory gaps could emerge that create opportunities for cross-sector and cross-border regulatory arbitrage.** Non-bank service providers, such as technology companies and third-party service providers to whom services are outsourced do not always fit clearly into the jurisdiction of any specific regulatory authority, or there may be ambiguity as to which authority is responsible for such a company. Additionally, these institutions might have cross-border operations, while being licensed in a different country. Collaboration

arrangements between the home and host regulatory authorities would become essential in such cases. Countries that are aiming to become regional FinTech hubs should be particularly instrumental in initiating collaborative measures with neighboring countries.

**Cross-sector and cross-border collaboration mechanisms to cover FinTech firms and third-party service providers need to be developed in the region.** The rise of multi-national FinTech firms working across borders requires collaboration across regulatory bodies. Many FinTech firms also rely on third party service providers located in a different country for technical services. These service providers may not be subjected to financial sector regulation in either their home country or the countries where their clients reside, leading to operational and financial stability risks. Cooperation between financial authorities is essential to address these risks. Additionally, regulatory perimeters will need to be adjusted and coordination across financial and nonfinancial regulators and supervisors heightened.

**Figure 17. Priority Areas for Greater International Cooperation in FinTech**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Respondents could choose multiple responses. Colored bars represent the relative weighting of each option for a given income group. Numbers in bars refer to number of countries listing that response in the respective income category. Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).

**Different data protection regimes across jurisdictions can hinder the potential of firms to expand internationally.** GDPR imposes its rules on all firms offering goods or services to EU citizens or monitoring the behaviors of EU citizens, irrespective of where they are located. This means in practice that a firm based in the US, Asia, or anywhere else that targets the EU market may face entirely different rules and compliance costs than a firm working in the same space and country, but not targeting that market. For most firms, this will be an important factor influencing their decision of whether to expand to the EU region. This is particularly relevant for the ECA region given the geographic proximity to the EU region.

**Countries across the ECA region have adopted widely differing approaches in their treatment of crypto currencies, crypto-exchanges and crypto mining activity.** In most countries, crypto currencies are unregulated either in terms of there being no legal framework in place, or the use of cryptocurrencies has been deregulated with no or very few legal restrictions. The anonymity and increased transaction speeds render crypto assets especially vulnerable to money laundering and other illicit activity. While regulators such as the European Securities and Market Authority have issued statements highlighting the risks associated with cryptocurrencies (Golstein, 2017), legal authorities in Uzbekistan have issued decrees recognizing and legalizing cryptocurrency trading activity in the country.<sup>42</sup> A uniform or coordinated regional approach in the treatment of crypto assets might be helpful in monitoring and detecting these activities and mitigating any impacts on financial stability in the region.

**Cybersecurity is another area that presents cross-border threats.** Increased use of technology calls for greater cyber resilience in the region. Cyber risk preparedness throughout the region is patchy and there is scope for international cooperation in the surveillance of FinTech activities across jurisdictions. One of the key priorities under the EBA's FinTech Roadmap includes promoting best supervisory practices on assessing cybersecurity and promoting a common cyber threat testing framework (EBA Fintech Roadmap, 2018).

**A harmonized policy approach will be useful in tackling AML/CFT concerns in the region,** in line with existing Financial Action Task Force (FATF) recommendation 40, which requires countries to empower their competent authorities to rapidly, constructively and effectively provide the widest range of international cooperation to tackle money laundering and the financing of terrorism.<sup>43</sup> The EBA also recognizes the need to have a coordinated approach to identify and assess AML/ CFT risks associated with regulated FinTech firms, technology providers and FinTech solutions.<sup>44</sup>

**The regulatory sandbox concept is being explored to promote cross-border regulatory harmonization and enable innovators to scale more rapidly on a regional or global basis** (UNSGSA FinTech Working Group and CCAF, 2019). The Global Financial Innovation Network (GFIN) is an example of such a proposed global sandbox that aims at encouraging knowledge transfer and learning across stakeholders. A model under which trials will be conducted in multiple jurisdictions is likely to substantially increase the amount of data available to both regulators and to FinTech firms about the market dynamics and the regulatory environments in the participating countries.

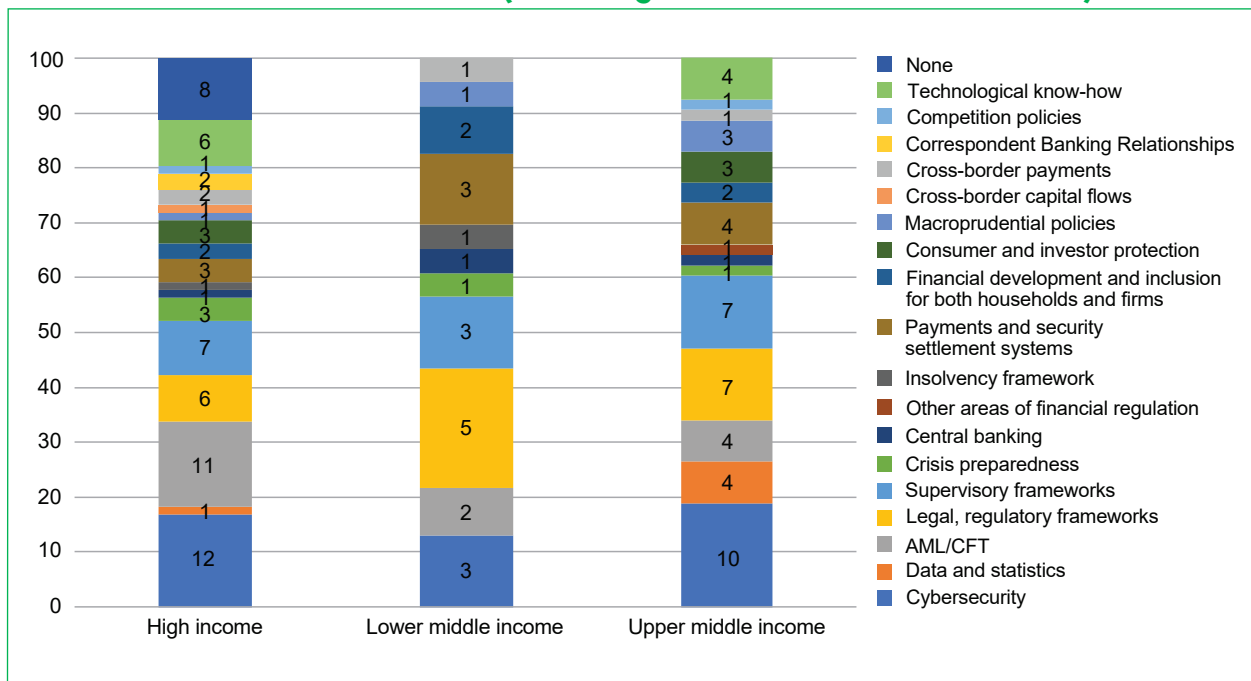
**Regulators and supervisors in the more advanced jurisdictions must take a lead in assisting their counterparts in other jurisdictions** in training their staff and building regulatory and supervisory capacity to deal with new challenges faced by the financial sector from disruptive technologies. Several of the central banks and financial supervisory authorities from the ECA region that responded to the IMF-World Bank Global Fintech Survey expressed their willingness to assist other countries by sharing specialized technical knowledge and assisting in capacity building exercises. Organizations like the World Bank can play an important role in facilitating such exercises.

**Finally, there is a need to revise or develop international standards by SSBs.** Sixty-eight percent of responses (worldwide) to the IMF-World Bank Global Fintech Survey indicated that there

is a need for international standards for crypto-assets, especially among high income countries.<sup>45</sup> Authorities in the ECA region highlighted the need for international standards related to crypto-assets, exchange and custody (84 percent), P2P lending (28 percent), algorithmic trading using smart contracts (25 percent) and mobile money payment services (23 percent).

Organizations like the World Bank and IMF can take the lead in enhancing international cooperation and information sharing among national authorities. The survey results (Figure 18) demonstrate further scope for engagement with non-client countries in the region (especially EU countries) in areas such as cybersecurity, AML/CFT, and supervisory frameworks.

**Figure 18. Areas Where Authorities in ECA Would Consider Receiving Capacity Building and Bilateral Advice from International Financial Institutions (Including the IMF and the World Bank)**



Source: IMF-World Bank Global Fintech Survey, 2019.

Notes: Respondents could choose multiple responses. Colored bars represent the relative weighting of each option for a given income group. Numbers in bars refer to number of countries listing that response in the respective income category. Countries not included in the survey responses: Tajikistan, Turkmenistan, Uzbekistan (Central Asia); Denmark, Estonia (Northern Europe); Greece, Portugal, Cyprus (Southern Europe); Republic of North Macedonia, Bosnia and Herzegovina (Western Balkans); France (Western Europe). Additional countries included in the survey responses: Norway (Northern Europe); Switzerland (Western Europe).



# Annex 1.

## Regional Country Classification



		European Union (EU)				Western Balkans
		Western Europe	Southern Europe	Central Europe	Northern Europe	
Europe and Central Asia	European Union and Western Balkans	Austria	Greece	Bulgaria	Denmark	Albania
		Belgium	Italy	Croatia	Finland	Bosnia and Herzegovina
		France	Portugal	Czech Republic	Sweden	Kosovo
		Germany	Spain	Hungary	Estonia	Republic of North Macedonia
		Ireland	Cyprus	Poland	Latvia	Montenegro
		Luxembourg	Malta	Romania	Lithuania	Serbia
		The Netherlands		Slovak Republic		
		United Kingdom		Slovenia		
	Eastern Europe and Central Asia	South Caucasus	Central Asia	Russian Federation	Turkey	Other Eastern Europe
		Armenia	Kazakhstan			Belarus
		Azerbaijan	Kyrgyz Republic			Moldova
		Georgia	Tajikistan			Ukraine
			Turkmenistan			
			Uzbekistan			



# Annex 2.

## Key Risks and Challenges to FinTech Development by Country in the ECA Region



**Table A1. Key Risks and Challenges to FinTech Development by Country**

Country	Most commonly cited challenges to FinTech development	Major risks arising from FinTech
<b>Western Balkans</b>		
<b>Albania</b>	<ul style="list-style-type: none"> <li>• Lack of financing and capital</li> <li>• Lack of support system for FinTech innovation</li> <li>• Lack of a clear FinTech strategy by regulators and policy makers</li> <li>• Underdeveloped ICT infrastructure in several parts of the country</li> <li>• Emigration of local talent or “brain drain”</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Bosnia and Herzegovina</b>	<ul style="list-style-type: none"> <li>• Lack of government support for FinTech; lack of enabling policies such as the absence of an electronic signature law and laws on eID and trust services; Challenges in implementing uniform laws and regulations to the entire country, given the unique political system</li> <li>• Lack of investment in research and development of new and innovative products by local IT companies (which mainly focused on small, outsourced projects)</li> <li>• Emigration of local talent or “brain drain”</li> <li>• Lack of financing and investments</li> <li>• Official statistics for many business-related metrics are missing, eroding investor confidence in the overall business environment</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Kosovo</b>	<ul style="list-style-type: none"> <li>• Lack of financing</li> <li>• Poor ICT infrastructure in comparison with peers</li> <li>• Lack of statistics/data on various business-related metrics, eroding investor confidence in the overall business environment</li> <li>• Vital actors of the ecosystem depend highly on international donor funding</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• AML/CFT risks</li> </ul>

<b>Republic of North Macedonia</b>	<ul style="list-style-type: none"> <li>• Lack of financing</li> <li>• Lack of conducive FinTech ecosystem</li> <li>• Emigration of local talent or “brain drain”</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Montenegro</b>	<ul style="list-style-type: none"> <li>• Lack of government support for start-ups and innovative activities</li> <li>• Lack of innovation ecosystem infrastructure with qualified facilitators, fundraisers, mentors</li> <li>• Lack of financing and investors</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Serbia</b>	<ul style="list-style-type: none"> <li>• Lack of financing</li> <li>• Lack of coordination between the government and the startup ecosystem</li> <li>• Lack of angel investors in comparison with many other economies</li> <li>• Cumbersome regulation, particularly as regards Foreign Exchange Law.</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>South Caucasus</b>		
<b>Armenia</b>	<ul style="list-style-type: none"> <li>• High cost of mobile data relative to household income</li> <li>• Access to finance and investment</li> <li>• Lack of stock markets for liquidity events</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Data protection risks</li> <li>• AML/CFT concerns</li> <li>• Potential financial stability risks from crypto-asset activities</li> </ul>
<b>Azerbaijan</b>	<ul style="list-style-type: none"> <li>• Underdeveloped ICT infrastructure, especially in rural and remote areas</li> <li>• Access to finance and investment</li> <li>• Lack of stock markets for liquidity events</li> <li>• Lack of enabling legislation</li> <li>• Unclear business environment for FinTech products, offering by non-traditional players (as MNOs, PSPs, FinTechs and so on)</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Data protection risks</li> <li>• AML/CFT concerns</li> </ul>
<b>Georgia</b>	<ul style="list-style-type: none"> <li>• Access to finance and investments</li> <li>• Lack of a FinTech ecosystem to support new companies</li> <li>• High cost of mobile data relative to household income</li> <li>• Lack of stock markets for liquidity events</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Potential financial stability risks from crypto-asset activities</li> <li>• AML/CFT concerns</li> <li>• Market concentration by incumbents</li> </ul>

Central Asia		
<b>Kazakhstan</b>	<ul style="list-style-type: none"> <li>• Unfavorable government policy</li> <li>• Lack of foreign investments</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Currency risks</li> <li>• Data protection risks</li> <li>• AML/CFT concerns</li> </ul>
<b>Kyrgyz Republic</b>	<ul style="list-style-type: none"> <li>• Low internet penetration compared to regional benchmark;</li> <li>• Low level of ICT infrastructure</li> <li>• Uncertain business environment for innovative products offered by non-traditional players (telecom companies, PSPs, FinTech companies)</li> <li>• Small market with low maturity and low competition; Lack of a 'digital mindset' in the population</li> <li>• Unclear and unstructured government and regulatory strategy on digital financial services as instrument for inclusion;</li> <li>• Lack of targeted and effective promotion of digital channels by financial institutions</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Currency risks</li> <li>• AML/CFT concerns</li> <li>• Data protection risks</li> </ul>
<b>Tajikistan</b>	<ul style="list-style-type: none"> <li>• Poor ICT infrastructure, monopoly of state-owned telecom providers</li> <li>• Uncertain business environment for new players in the FinTech space</li> <li>• Small market with low maturity</li> <li>• Limited access to finance and investments</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Currency risks</li> <li>• AML/CFT concerns</li> </ul>
<b>Turkmenistan</b>	<ul style="list-style-type: none"> <li>• Low mobile phone and internet penetration</li> <li>• Poor ICT infrastructure</li> <li>• Uncertain business environment</li> <li>• Lack of broader institutional support for FinTech</li> <li>• Small market with low maturity</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Currency risks</li> <li>• AML/CFT concerns</li> </ul>
<b>Uzbekistan</b>	<ul style="list-style-type: none"> <li>• Low mobile phone and internet penetration</li> <li>• Poor ICT infrastructure</li> <li>• Lack of a clear FinTech development strategy, lack of broader institutional support for FinTech</li> <li>• Limited access to finance and investments</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Currency risks</li> <li>• AML/CFT concerns</li> </ul>

Central Europe		
<b>Bulgaria</b>	<ul style="list-style-type: none"> <li>• Scarcity of local technical talent/ICT professionals</li> <li>• Lower financial inclusion levels in comparison with other EU countries</li> <li>• Lower levels of internet usage</li> <li>• Smaller domestic market</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Croatia</b>	<ul style="list-style-type: none"> <li>• Lack of support from regulators</li> <li>• Scarcity of local technical talent</li> <li>• Fixed broadband access is still expensive by EU standards</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Poland</b>	<ul style="list-style-type: none"> <li>• Low level of VC and equity funding activity</li> <li>• Lack of a single comprehensive support system for startups.</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Market concentration by incumbents</li> </ul>
<b>Romania</b>	<ul style="list-style-type: none"> <li>• Poor ICT infrastructure and lower levels of internet access in comparison with EU peers</li> <li>• Scarcity of local technical talent</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
Other Eastern Europe		
<b>Belarus</b>	<ul style="list-style-type: none"> <li>• Lack of financing</li> <li>• Lack of tax incentives (other than the High Tech park)</li> <li>• Requirement for companies to have an intermediary represented by a bank in order to have a payment infrastructure and conduct transactions</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Moldova</b>	<ul style="list-style-type: none"> <li>• Lack of financing</li> <li>• The local ICT sector focuses on the international market and not the local market</li> <li>• Scarcity of local skilled talent</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>
<b>Ukraine</b>	<ul style="list-style-type: none"> <li>• Many local FinTechs focus on the international market and not the local market</li> <li>• Underdeveloped ICT infrastructure, low mobile phone and internet penetration</li> <li>• Limited access to finance and investments, low level of venture capital and equity funding activity</li> <li>• Lack of a single comprehensive support system for startups.</li> <li>• Unclear government strategy related on FinTech development</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Financial stability risks from crypto-asset activities</li> <li>• AML/CFT concerns</li> <li>• Currency risk</li> </ul>

<b>Russian Federation</b>	<ul style="list-style-type: none"> <li>• Lack of appeal for foreign investors</li> <li>• Deficiencies in government regulation</li> <li>• Geopolitical risks for investors</li> <li>• Lack of flexibility in the taxation system</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> <li>• Financial stability risks from crypto-asset activities</li> <li>• AML/CFT concerns</li> <li>• Currency risk</li> </ul>
<b>Turkey</b>	<ul style="list-style-type: none"> <li>• High inflation</li> <li>• Turkish banks' preference for developing innovative technologies in-house</li> <li>• Security concerns of individuals and businesses working in the FinTech space</li> <li>• Low ability to attract talent</li> </ul>	<ul style="list-style-type: none"> <li>• Financial consumer protection risks arising from new products and business models</li> <li>• Cybersecurity risks</li> </ul>

Sources: Alliance for Financial Inclusion (2016).  
Raiffeisen Bank International (2017).  
Deloitte CIS Research Center (2018).  
FSB (2017).  
IMF and WB (2019).  
Inputs from WBG Staff (2019).





# Annex 3.

## FinTech Providers in the ECA Region



The FinTech market in the ECA region is growing rapidly but is unevenly distributed between EU and non-EU countries. Prominent FinTech providers in the region include payments services companies, crowdfunding platforms, P2P lending platforms, mobile banks and insurance companies, in the form of start-ups and established companies (see Box A1 on prominent FinTech players in the ECA region). Cryptocurrency mining and initial coin offerings (ICO) are also very popular across the ECA region.

### Box A1. Prominent Financial Institutions and Companies Working in the FinTech Space Across ECA

**Revolut:** This UK-based company provides a variety of banking services through its mobile application, including digital alternatives to traditional banking services, including vaults to save and manage money, insurance, digital currency exchanges to convert fiat currencies to cryptocurrencies, and cross-border money transfer. Revolut currently operates widely in the ECA region. Recently, Revolut has been facing questions from regulators, amid concerns related to its compliance screening systems.

**N26:** This is a German mobile/ direct bank with service across the Euro zone in 22 countries, based on a single European banking license obtained in 2016. N26 customers in several of its markets can use their smartphones for in-store purchases. Payments by Google Pay, Apple Pay and Transfer Wise are supported in various jurisdictions. In early 2019, N26 overtook Revolut as the most valuable mobile bank in Europe. It has also been under regulatory scrutiny for potential fraudulent transactions.

**TransferWise:** This is an international money transfer service developed in Estonia and based out of London operating across the world, supporting more than 750 currency routes. The basic principle on which this company functions is by matching transfers with other people and then charge a small commission while using the inter-bank mid exchange rate. This differs from traditional currency transfers, where there are different buy and sell rates, with the broker taking the difference between the two. The company counts Peter Thiel, Valar ventures and Richard Branson among its investors.

**Monzo:** This UK-based digital, mobile-only bank originally operated through a mobile application and a prepaid debit card. It was one of the earliest of the many app-based banks in the UK. In April 2017, their UK banking license restrictions were lifted, making it possible for them to offer current accounts. They have partnered with TransferWise to enable international payments.

**Klarna:** This is a Swedish bank that provides online financial services such as payment solutions for online store-fronts, direct payments, and post-purchase payments. One of their main services is to assume stores' claims for payments and handle customer payments, thereby eliminating risks for sellers and buyers. Recent reports suggest that Klarna might be facing more complaints of data breach than other Swedish banks.

**Sberbank:** Russia's largest state controlled financial institution has been actively promoting FinTech investments in Russia and neighboring countries such as Kazakhstan. Sberbank is by far Russia's largest financial institution, controlling more than 45 per cent of the deposits and about a third of the nation's loans. The bank services around 110 million customers across the entire country. Moreover, the bank stands on the forefront of Russia's technological revolution, introducing innovative features such as voice/ image-recognition-run-ATM's or drone-delivered-cash.

**Western Europe is home to the largest number of FinTech companies in the ECA region,** ranging from start-ups like Funding Circle, Revolut and Transferwise, to well established banking companies like Barclays, which have recently made a foray into the use of disruptive technologies. Several of these FinTech start-ups have become 'unicorns', the industry term-of-art for having reached a valuation of US\$1 billion. Within Western Europe, the UK is significantly ahead of the rest both in terms of FinTech innovation and investment, despite Brexit concerns. The UK accounted for over half of Europe's venture capital deals in 2018. The full impact of Brexit on these developments remains unclear, however, and an increasing interest in Ireland from UK-based companies looking to establish a European presence has been noted, ostensibly to counter Brexit-related concerns. Paris, Berlin and Amsterdam trail London—in second, third and fourth places, respectively—in the race to become a global FinTech hub, each housing many FinTech companies, including FinTech startups. With the looming uncertainty over Brexit, these cities, along with Brussels are emerging as attractive alternative FinTech destinations within the EU.

**In Northern Europe, the Baltic region has been working to establish itself as a FinTech startup hub, providing various payment and lending solutions.** Estonia leads the way in welcoming FinTech startups<sup>46</sup> through the Estonian government's Startup Estonia<sup>47</sup> policy and Enterprise Estonia agency,<sup>48</sup> which provide funding, networking and advice to local entrepreneurs. One of the most prominent startups in recent times, Transferwise, which is based out of Estonia and London, has been a major disruptor in the world of international money transfer. Fundwise, known as the first equity crowdfunding platform in the Baltic region, is also based out of Estonia.<sup>49</sup> The Estonian

capital city, Tallinn, is home to communications giant Skype and has been described by some as the 'Silicon Valley of the Baltic Sea'<sup>50</sup> Lithuania's FinTech friendly regulator has been attracting new FinTech players into the country.<sup>51</sup> In 2018, Lithuania saw an increasing number of global and UK-based companies applying for electronic money institution (EMI) licenses, with prominent companies like Revolut and Google Payments obtaining EMI licenses.<sup>52</sup> The Bank of Lithuania has also introduced a new regime for crowdfunding, in a move to 'level the playing field' and attract more crowdfunding companies into the region.<sup>53</sup> The Baltic states have also made significant progress in introducing and promoting digital identification solutions, which are expected to further FinTech innovation in the region. (See Box A2)

**Outside of the Baltics, Stockholm, though lagging behind major cities in Western Europe, has established itself as a FinTech hub in Northern Europe.** It is home to prominent start-ups like Klarna, which also became a FinTech unicorn in 2018. Some of 2018's top-ranked deals were based out of the region, including major payments services provider PayPal's acquisition of the Swedish iZettle for US\$2.2 billion, and the merger of Denmark-based payments firm Nets with Germany-based Concardis, valued at US\$5.5 billion. In 2019, Nets also finalized a deal to sell its corporate services business to Mastercard for US\$3.2 billion. The Nordic region has also seen a rapid increase in both equity and debt crowdfunding in recent years.

**The Bulgarian capital, Sofia is striving hard to become the leading FinTech hub for the entire Balkan region.** With its fast internet connectivity, commentators have suggested that Sofia can be a comparatively cheap destination for cash-strapped

FinTech startups in the EU (See Box A2).<sup>54</sup> However, as per a 2018 report of the European Crowdfunding Network, crowdfunding was yet to establish itself as a popular means of fundraising in the country.<sup>55</sup> The Czech Republic and Romania follow Bulgaria in the top 5 FinTech destinations in the Central and Eastern Europe region. The good mobile and online services

penetration, the demographic tendencies and the quick development of digital services have turned the region into a favorable environment for making the most out of digital banking.<sup>56</sup> Slovenia has established itself as the Bitcoin hub of the region. Meanwhile, in Poland, the FinTech scene is dominated by incumbent banks, rather than startups as a result of a coordinated effort by the country's largest banks.<sup>57</sup>

## Box A2. Emerging FinTech Hubs in the ECA Region\*

### Vilnius, Lithuania



Source: Rise Vilnius.

## Talinn, Estonia



Source: Estate Guru

## Sofia, Bulgaria



\*Companies represented in the infographics are only indicative and not exhaustive representations.

**In Southern Europe, smaller countries like Malta and Cyprus have been pro-active in attracting FinTech investments into their respective jurisdictions.** The region is also home to innovative FinTech companies such as Viva Wallet, a cloud-based digital payments factory.<sup>58</sup> Founded in Greece in 2010, the company also has a presence in Cyprus and Romania.<sup>59</sup> In 2017, leading Spanish companies in the banking, energy and telecom sectors established Alastria, a regulated national network based on blockchain.<sup>60</sup> Amid the uncertainty over Brexit, some FinTech companies have begun to consider Lisbon an attractive FinTech destination.<sup>61</sup>

**In the Central and Eastern Europe region, Russia had the largest numbers of FinTech companies in the region as of mid-2018, followed by Turkey and Bulgaria.**<sup>62</sup> In Russia, Sberbank—Russia’s largest state-controlled bank—has been a major player in FinTech investments in the country. As early as 2012, Sberbank had announced setting up a US\$100 million fund to invest in FinTech startups. In late 2018, Russia’s largest e-payments outfit Yandex.Money, along with Sberbank announced the launch of a new B2B payments platform that enables companies to send funds within minutes to their suppliers.<sup>63</sup> In late 2018, Sberbank and international accelerator 500 Startups are launching a joint development program for Russian IT start-ups.<sup>64</sup> The financial institution also reportedly launched a blockchain lab in 2018.<sup>65</sup> Fintech partnership programs designed to help early stage start-ups were also set up in 2018 by Raiffeisenbank, Tinkoff and Alfa Bank. In March 2019, APEXX, the first single marketplace for global payments, announced that its payment solution, with the ability to process payments through the national Mir payment system would be available in Russia.<sup>66</sup>

**Turkey has recently seen some interesting FinTech innovations.** For instance, Tarfin, a digital platform founded in 2017 enables Turkish farmers to access agriculture inputs through instant financing solutions. The company completed a US\$1.3 million seed funding round in late 2018.<sup>67</sup> In late 2018, following the recommendations of the Turkey Islamic Finance Working Group, the UK and Turkey launched a joint initiative to scale Islamic finance through FinTech. The working group is supported by TheCityUK, an industry-led body representing UK-based financial

services, and the stock exchange Borsa Istanbul.<sup>68</sup> Meanwhile, with the growing pressure on the Turkish economy and increased cost of borrowing in late 2018, combined with limited regulatory oversight, crowdfunding rivaled bank mortgages as a source of funds in the Turkish real estate market.<sup>69</sup>

**Other Eastern European countries have also witnessed interesting FinTech developments in the last couple of years.** FinTech companies have been growing in Ukraine following a series of initiatives taken by the National Bank of Ukraine in 2017, including the introduction of electronic signatures, remote identification, support to improve financial literacy, and new rules to facilitate the licensing of payments services providers.<sup>70</sup> Belarus set up a High Tech Park in late 2018, aiming to attract investments from FinTech and blockchain innovators in the region.<sup>71</sup> Back in 2015, the National Bank of the Republic of Belarus had adopted a “Digital Banking Strategy 2016-2020” to expand usage of electronic payments, increase transparency, promote innovation, and boost competition between banks.

**FinTech in the Western Balkans remains underdeveloped in comparison with other sub-regions in the ECA region, with Serbia performing slightly better than the rest.** Serbia shows potential for FinTech innovation, given that development of IT infrastructure has been a long-standing priority of the Serbian government.<sup>72</sup> Belgrade already houses several companies providing innovative solutions in the financial sector, including TradeCore and Penta. Trekandi, Kosovo’s first FinTech provider, helps consumers gain online access to financial services, and helps banks identify prospective clients. Statista reports that the FinTech market in Serbia had an annual growth rate of around 17 percent—its largest portion being digital payments totaling US\$895 million.<sup>73</sup> Though underdeveloped at present, there is considerable potential for P2P lending and crowdfunding to gain popularity in the Western Balkan region. Meanwhile, Montenegro’s Government, International Chamber of Commerce and blockchain development company Perlin have signed a tripartite agreement in a bid to develop blockchain pilot programs and fuel entrepreneurialism for supporting its goal of joining the EU.<sup>74</sup>

**Countries in the South Caucasus region have adopted FinTech innovations along with other innovations in the use of blockchain technology, which could have future applications in FinTech.**

Georgia has begun initiatives to explore the use of blockchain for government functions—notably for land records and customs documents. In 2018, the country’s first fully-digital banking service, named Space, was launched by TBC Bank.<sup>75</sup> Georgia also saw significant activity on crypto-mining and P2P

lending. The P2P lending market in Georgia however faced several market conduct issues and has since collapsed (See Box 5). Armenia, in addition to housing an increasing number of FinTech companies, is also home to a large cryptocurrency mining facility worth US\$50 million as of October 2018.<sup>76</sup> It is also one of the top information technology outsourcing destinations in the region. The South Caucasus region has one of the highest volumes in cryptocurrency mining (See Box 6 for details on cryptocurrency mining in the ECA region).

# Annex 4.

## Methodology for Categorizing Countries Based on Level of FinTech Development



**Table A2 of this paper categorizes countries in the Western Balkans, South Caucasus, Russia, Turkey, Central Asia, Central Europe (including EU) and Other Eastern Europe regions based on their level of FinTech development.** Countries are divided into three categories: Basic, Evolving and Innovating based on a subjective analysis of FinTech development. Three criteria were considered in this assessment:

- Digital Readiness Index (methodology detailed in Annex 5);
- Existence of FinTech-friendly policy and regulatory initiatives—based on a subjective assessment of various relevant regulatory and policy initiatives related to FinTech at the country level; and
- Supply-side landscape of FinTech providers, existence of major FinTech hubs/incubators/ accelerators, and investments in each country—based on various qualitative assessments and commentaries by industry players and commentators in relation to each of these countries.

A cumulative assessment of all three criteria has been provided in Table A2 below.

**Table A2. Level of FinTech Development and Digital Readiness by Country**

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Western Balkans</b>					
<b>Albania</b>	Basic	11	Low	Other FinTech-friendly policies/ measures: Albanian government's "Digital Agenda for Albania 2015-2020" focused on improving ICT infrastructure, proposed measures to align national legislation with EU laws (such as PSD2); Several reforms to the payments system laws; Proposed law on virtual assets	Major FinTech hubs/ incubators/ accelerators: Innovation Hub (Ministry of Innovation), Oficina, AIA  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): EasyPay, MPay, Raiffeisen Bank Shqipëri
<b>Bosnia and Herzegovina</b>	Basic	12.5	Low	Other FinTech-friendly policies/ measures: Proposed measures to align national legislation with EU laws (such as PSD2)	Major FinTech hubs/ incubators/ accelerators: SECO startup fund, ICBL incubator, HUB387  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Printheos, eKupi  Other major strengths: High quality, low cost IT labor
<b>Kosovo</b>	Basic	7.5	Very Low	Other FinTech-friendly policies/ measures: Government of Kosovo provides grants to stimulate innovation and the startup community in the country and promotes a business-friendly environment Innovation Office (announced)	Major FinTech hubs/ incubators/ accelerators: Gjirafa Lab, Innovation Center Kosovo (ICK)  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Trekandi, AR Vision, Decissio
<b>Republic of North Macedonia</b>	Basic	13.67	Low	Other FinTech-friendly policies/ measures: Launch of an innovation gateway by the central bank to communicate with the FinTech sector; Proposed measures to align national legislation with EU laws (such as PSD2)	Major FinTech hubs/ incubators/ accelerators: SEEU TechPark, Seavus Incubator, CEED HUB Skopje  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Tigo, Mogo, MCash, Krediti, Credissimo, Forza, iutecredit



Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
Montenegro	Basic	16	Moderate	Other FinTech-friendly policies/ measures: Government programs to improve finance to SMEs in the ICT sector, proposed measures to align national legislation with EU laws (such as PSD2)	Major FinTech hubs/ incubators/ accelerators: Tehnopolis  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): PlaysafeGroup, ABOS NovoDoba
Serbia	Evolving	14	Low	Regulatory Sandbox  Other key strengths: Several start-ups and scale-ups from Eastern Europe have migrated here to take advantage of the beneficial climate and good ICT infrastructure  Other FinTech-friendly policies/ measures: Government has implemented a range of measures to promote the ICT sector, proposed measures to align national legislation with EU laws (such as PSD2)	Major FinTech hubs/ incubators/ accelerators: Belgrade Incubator of Technical Faculties (BITF), Startit, ICT Hub, Impact Hub Belgrade  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Telenor, TradeCore, iPay, Penta, Cube, TruckTrack, GiftsUwish  Other Key Strengths: Network of venture capital funds, strong startup environment
<b>South Caucasus</b>					
Armenia	Basic	14	Low	Other FinTech-friendly policies/ measures: Several measures promoting crypto-currency mining and other related activities	Major FinTech hubs/ incubators/ accelerators: GovTech Accelerator (UNDP), Impact Aim  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): PayX, FFT, FINCA

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
Azerbaijan	Basic	11	Low	Other FinTech-friendly policies/ measures: Introduction of remote account opening and digital onboarding rules; Several measures promoting use of blockchain, artificial intelligence, internet of things and other technology; regulatory Sandbox development initiated; Open API has been included in policies and in the building of a Central Bank platform; Measures to promote e-governance; Central Bank initiatives to promote use of blockchain technology	Major FinTech hubs/ incubators/ accelerators: SUP Accelerator  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Hesab.az, Pasha Bank, Kapital Bank, International Bank of Azerbaijan, Bank Respublika
Georgia	Basic	14	Low	Other FinTech-friendly policies/ measures: Government initiatives to promote use of blockchain technology; Several measures promoting crypto-currency mining and other related activities	Major FinTech hubs/ incubators/ accelerators: Georgian Innovation and Technology Agency (GITA)  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): TBC Bank, Space Bank, Quickcash, OPPA, Pulsar.ai, Cnick, Optio.ai
<b>Central Asia</b>					
Kazakhstan	Evolving	17	Moderate	Regulatory Sandbox, Special Contact for FinTech questions	Major FinTech hubs/ incubators/ accelerators: Astana  International Financial Center  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Kaspi.kz, Baribirge, Ules, Lendex, Intervale

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Kyrgyz Republic</b>	Basic	10	Low	<p>Regulatory Sandbox (under consideration)</p> <p>Other FinTech-friendly policies/ measures: Introduction of remote account opening and digital onboarding rules; Promotion of e-signature usage; Measures to promote e-governance (TUNDUK); Presidential decree on digitalization as a priority; Central Bank approved directions for digital transformation of banking services; Introduction of rules on use of QR codes to ensure payments and intersystem integration (interoperability) of various payment systems providing payers with a single payment space.</p>	<p>Major FinTech hubs/ incubators/ accelerators: Kyrgyz High Tech Park</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Companion Bank, DOSCredoBank, FINCA, Marketplace, Svetofor, Pay24, NAMBA, KICBank, Beeline, MegaCom; Nurtelecom; ONOI</p>
<b>Tajikistan</b>	Basic	7.5	Very Low	<p>Regulatory Sandbox</p> <p>Other FinTech-friendly policies/ measures: Introduction of e-money and agency banking; Introduction of remote account opening and digital onboarding rules; Measures to promote e-governance; support for creation of technological hubs</p>	<p>Major FinTech hubs/ incubators/ accelerators: -</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): MNO MegaPhone, MNO Tcell, ExpressPay, MDO Humo &amp; Partners, Spitamen Bank, Eskhata Bank, Imon International</p>
<b>Turkmenistan</b>	Basic	6.67	Very Low	<p>Other FinTech-Friendly policies/ measures: Government initiatives promoting use of blockchain technology</p>	<p>Major FinTech hubs/ incubators/ accelerators: Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Ccinvest, TezSum</p>

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Uzbekistan</b>	Basic	8.33	Very Low	Other FinTech-friendly policies/measures: Presidential decree on e-commerce development; Presidential decree on digitalization in banking sector; Presidential Charters on digitization; Presidential decree on encouraging crypto-asset related activities, measures to adopt blockchain technology in government activities and e-governance	Major FinTech hubs/ incubators/ accelerators: FinTech lab  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Payme, Paynet, Humo, Uzcard, Kapital Bank, IpakYuli Banl; Universabank, NBU, Infin Bank, Asaka Bank, Teoco, TBC launched e-market place (Vendoo)
<b>Central Europe</b>					
<b>Bulgaria*</b>	Innovating	16	Moderate	EU Regulatory Sandbox	Major FinTech hubs/ incubators/ accelerators: ELEVEN, LAUNCHub  Cumulative FinTech funding (2008-18): €28 million  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): TokenGet, Cash Credit, Software Group, Klear, Fabric Token, Azimo  Other key strengths: High-speed broadband internet, Low labor costs in the EU, growing startup scene in Sofia

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Croatia*</b>	Evolving	19	Moderate	<p>EU Regulatory Sandbox</p> <p>Other FinTech-friendly policies/ measures: Croatian Financial Services Supervisory Agency (HANFA) and Capital Markets, Insurance and Savings Authority have jointly signed a memorandum of understanding for collaboration on FinTech issues with the Israel Security Authority</p>	<p>Major FinTech hubs/ incubators/ accelerators: ABC accelerator, FRCM Accelerator, Start-up Factory Zagreb, Zip Incubator and BIOS Incubator Osijek</p> <p>Cumulative FinTech funding (2008-18): No info</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Microblink, Moj-eRacun, Azimo</p> <p>Other key strengths: Large number of enterprises utilize cloud services</p>
<b>Czech Republic*</b>	Innovating	22	High	<p>EU Regulatory Sandbox</p> <p>Other FinTech-friendly policies/ measures: Memorandum with Blockchain Republic</p>	<p>Major FinTech hubs/ incubators/ accelerators: Rockaway, Creative Dock, StartupYard</p> <p>Cumulative FinTech funding (2008-18): €132 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Avast Software, Price F(x), Twisto, Netbrokers Holding, BudgetBakers, ClaimAir, Fragments, Trulioo, EVO Payments</p>

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
Hungary*	Innovating	18	Moderate	Regulatory Sandbox, Innovation Office, EU Regulatory Sandbox	<p>Major FinTech hubs/ incubators/ accelerators: MKB Fintechlab, OTPLab, StartIT @ KH</p> <p>Cumulative FinTech funding (2008-18): €9 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Cherrisk, bitrise, Credit4sales, MultipassSolution, TrustChain Systems, Erste Bank Hungary, OTP Bank</p>
Poland*	Innovating	20	High	<p>Regulatory Sandbox, Innovation Office, EU Regulatory Sandbox</p> <p>Other FinTech-friendly policies/ measures: Special Task Force for Financial Innovation</p>	<p>Major FinTech hubs/ incubators/ accelerators: StartInPoland program</p> <p>Cumulative FinTech funding (2008-18): €64 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): ING Bank</p> <p>Śląski, mBank, Pekao SA, PKO BP, Credit Suisse, Citi, UBS, Liber Finance Group, Roche, Creamfinance, MAM, SALESMango, FinAi, Backbase, Braintri, Efigence</p> <p>Other key strengths: European leader in modern banking solutions such as contactless payment, and sector-wide tools (BLIK mobile payment service), strong support for FinTech innovation among local banks</p>

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
Romania*	Evolving	16	Moderate	Innovation office, EU Regulatory Sandbox	<p>Major FinTech hubs/ incubators/ accelerators: TechHub Bucharest, Smart eHub</p> <p>Cumulative FinTech funding (2008-18): €8 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Fagura, Maillon, Otto Broker, Netopia Systems, Smart Bill, Virtual Cards, Finastra, Payfone, Personetics, Raiffeisen Bank International, Moxtra</p> <p>Other key strengths: Active local startup scene, growing investments in tech companies</p>
Slovak Republic*	Evolving	19	Moderate	<p>Special contact for FinTech questions, EU Regulatory Sandbox</p> <p>Other FinTech-friendly policies/ measures: The Ministry of the Interior has created an API designed to facilitate the automation of know-your-customer processes.</p>	<p>Major FinTech hubs/ incubators/ accelerators: Elevator Lab</p> <p>Cumulative FinTech funding (2008-18): €5 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Trulioo, Minit, Zlty Melon, Datamolino, Business Boz, Keepi</p> <p>Other Key Strengths: Strong presence of local and foreign venture capital investors</p>

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Slovenia*</b>	Innovating	21	High	EU Regulatory Sandbox	<p>Major FinTech hubs/ incubators/ accelerators: Banka Slovenije's Fintech Innovation Hub</p> <p>Cumulative FinTech funding (2008-18): No info</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Nets, HRC, Bankart, Abanka, Token, Eligma, mBills, CargoX, Iconomi</p> <p>Other Key Strengths: Strong ICT infrastructure and access to high speed internet</p>
<b>Other Eastern Europe</b>					
<b>Belarus</b>	Evolving	16.67	Moderate	Other FinTech-friendly policies/ measures: The central bank of Belarus has proposed allowing banks to make smart contracts using blockchain technology and allow financial institutions to make electronic deals using software and hardware tools and technologies (including biometrics) without digital signatures. The Belarus High Tech Park has been set up and rules for conducting business in the high-tech field have been relaxed.	<p>Major FinTech hubs/ incubators/ accelerators: High Tech Park, Imaguru Startup Hub, Blockchain Technology Association Belarus, FTh</p> <p>Fintech &amp; Banking accelerator</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): GiniMachine, Alfa Bank, iDiscount</p>



Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Moldova</b>	Basic	14	Low		<p>Major FinTech hubs/ incubators/ accelerators: MiLab (UNDP), Startup Grind Chisinau</p> <p>Cumulative FinTech funding (2008-18): No info</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Moldova Agroindbank, Fagura</p>
<b>Ukraine</b>	Evolving	13	Low	<p>Sandbox (announced), Special contact for FinTech questions</p> <p>Other FinTech-friendly policies/ measures: Several initiatives taken by the National Bank of Ukraine in 2017, including the task force on E-hryvnia test, introduction of electronic signatures, remote identification, support to improve financial literacy, and new rules to facilitate the licensing of payments services providers</p>	<p>Major FinTech hubs/ incubators/ accelerators: UNIT city, RadarTech, Conceptor, Ukrinnovate, IoT Hub Accelerator</p> <p>Cumulative FinTech funding (2008-18): €3 million</p> <p>Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): EasyPay, Attic Lab, Treeum, Moneyveo, bNesis, LendingStar, Plato Trade, Kaznachey, Akhmetov Bank, Fortytwo Data</p> <p>Other Key Strengths: Favorable investment environment and presence of private investors</p>

Country	FinTech Development	Digital Readiness Index		Enabling Environment: FinTech-focused regulatory initiatives and policies	FinTech supply-side landscape
		Digital Readiness Score (5 - 25)	Digital Readiness Rating		
<b>Russian Federation</b>	Innovating	19	Moderate	Regulatory Sandbox, RegTech  Other FinTech-friendly policies/ measures: Russia's Central Bank has launched a Fintech Association	Major FinTech hubs/ incubators/ accelerators: FintechLab, FRII accelerator, HSE incubator, partnership programs by Sberbank, Raiffeisenbank, Tinkoff and Alfa Bank  Cumulative funding (2008-18): €292 million  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Coinkeeper, EasyFinance.ru, Moi Kolshelki, Tinkoff Bank, Alfabank, Bistrodengi, Biglio, TOT, money
<b>Turkey</b>	Innovating	18	Moderate	Special contact for FinTech questions  Other FinTech-friendly policies/ measures: The Turkish Central Bank has launched a Fintech Task Force.	Major FinTech hubs/ incubators/ accelerators: Koophub, Startupbootcamp, StartersHub  Cumulative FinTech funding (2008-18): €11 million  Prominent FinTech service providers (B2B/ B2P/ P2P/ P2B): Moka Payment Agency, Parasut, Tarfin, Ininal, iyzi, Jetract, Smart Pulse  Other Key Strengths: Strong presence of early-stage investors

\* EU countries.

# Annex 5.

## Digital Readiness Index: Scoring Methodology



**The Digital Readiness Index is a relative scoring and ranking methodology for ECA countries in the Western Balkans, South Caucasus, Central Asia, Central Europe (including EU countries), Other Eastern Europe, Russia and Turkey.** Each country’s performance has been ranked relative to global data on four specific data points (representing availability, adoption and penetration of digital technologies):

- Scores for level of digitization as per BBVA’s Digix (2017);
- Scores for “Technological Readiness” under the 9th pillar of World Economic Forum’s Competitiveness Index (WEF Competitiveness Index);
- World Bank’s Digital Adoption Index score (2016) (DAI);
- Percentage of adults who made digital payments as per Global Findex (2017);
- Percentage of adults who used mobile phone or the internet to access a financial institution account as per Global Findex (2017).

**Data sets:** Data sets under each of these indices represented a global sample of countries spanning different income categories (with Digix having the smallest sample size of 100 countries ranked from highest to lowest). Considering that all ECA countries being ranked were in the lower-middle, upper-middle- and high-income categories only, each of the data sets were trimmed to remove data points for low income countries, to curate an appropriate peer group of middle-and-high income countries for comparison.

**Scoring and ranking:** Countries were ranked into quintiles, with a score of 1 assigned to any country that featured in the bottom-most quintile of a given category (lower than the 20th percentile), and a score of 5 assigned to any country that featured in the highest quintile (80th percentile or higher). Final scores represent the cumulative score under each index, with 5 indicating that the country featured in the lowest quintile under all categories, and 25 indicating that the country featured in the highest quintile under all categories.

Data points were missing for Uzbekistan, Kosovo, Belarus, North Macedonia, Tajikistan and Turkmenistan under one or more data sets—in each case, the score assigned is the average of the scores under other categories. For Kosovo in particular,

the final score represents the scaled average of scores under the Findex data points only.

Final ratings were assigned based on the following overall score ranges: 6-9 (Very Low), 10-14 (Low), 15-19 (Moderate), 20-24 (High) (depicted in the table below).

**What the Digital Readiness Index means:** The Digital Readiness Index in this paper is meant to be a

rough approximation of a country's readiness to adopt FinTech technologies relative to other countries in the middle-and-high income categories. The overall score is not to be taken as an absolute measure of a country's level of digital readiness. Further, given significant advances in technology adoption by countries in past couple of years, some countries may have made significant strides in their level of digital readiness since the time each of these data sets were prepared.

**Table A3. Ranking of ECA Countries Under the Digital Readiness Index**

Country Name	Overall Score	Final Rating
Czech Republic*	22.00	High
Slovenia*	21.00	High
Poland*	20.00	High
Croatia*	19.00	Moderate
Russian Federation	19.00	Moderate
Slovak Republic*	19.00	Moderate
Hungary*	18.00	Moderate
Turkey	18.00	Moderate
Kazakhstan	17.00	Moderate
Belarus	16.67	Moderate
Bulgaria*	16.00	Moderate
Montenegro	16.00	Moderate
Romania*	16.00	Moderate
Armenia	14.00	Low
Georgia	14.00	Low
Moldova	14.00	Low
Serbia	14.00	Low
Republic of North Macedonia	13.67	Low
Ukraine	13.00	Low
Bosnia and Herzegovina	12.50	Low
Albania	11.00	Low
Azerbaijan	11.00	Low
Kyrgyz Republic	10.00	Low
Uzbekistan	8.33	Very Low
Kosovo	7.50	Very Low
Tajikistan	7.50	Very Low
Turkmenistan	6.67	Very Low

\*Member of the European Union.

## Endnotes

1. Average remittance costs for Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Georgia, Kazakhstan, Kosovo, Kyrgyz Republic, Moldova, Montenegro, North Macedonia, Poland, Romania, Serbia, Tajikistan, Ukraine, Uzbekistan. Russia has a unique environment where cross border remittances are mostly conducted in the same currency and possible additional cost deriving from a currency exchange are not known.
2. World Bank. 2019. "Remittance Prices Worldwide." Issue 29, March 2019, World Bank: Washington DC.
3. World Bank Group. 2019. "KNOMAD Migration and Remittances: Recent Developments and Outlook."
4. Using the average cost of remittance services in World Bank ECA countries including Russia and assuming that FinTech players could offer services at about 4 percent.
5. For example: Albania, Kosovo, Kyrgyz Republic, Azerbaijan.
6. Enterprise Survey data are not recent for several countries, with some data points stemming from 2013. The data should therefore be interpreted with caution. See <https://www.enterprisesurveys.org/> for more information.
7. Europe and Central Asia Economic Update, Office of the Chief Economist, World Bank Group (Spring 2019)
8. IMF and World Bank, 2019.
9. Several of the World Bank's diagnostic reviews in the ECA region have discussed these vulnerabilities. See for example Rutledge, S.L. 2010.
10. EBA Fintech Roadmap, p. 16.
11. In this context, the Financial Action Task Force (FATF) has issued an interpretative note covering virtual assets and virtual asset service providers, including their licensing and registration. FATF, 2019.
12. <https://carnegieendowment.org/specialprojects/protectingfinancialstability/timeline>

13. FinTech Bulletin. 2018.
14. FSB, 2019.
15. The main differences between BigTech and regular FinTech firms are their access to large, established customer networks, their name recognition, their access to a wide range of customer information, including through social media, as well as a strong financial position, all of which FinTechs typically lack. BigTech firms can use their customer data for risk assessments and credit underwriting, information that is not available to traditional financial services providers.
16. EBA, 2018.
17. For take up of digital finance, Global Findex numbers show that the poor are less likely to use their mobile phone or internet to access an account at a financial institution. The Gallup World Poll (2017) shows a larger disparity in internet access between the poorest (40 percent) and the richest (60 percent), in comparison to the disparity in mobile phone access between these two groups.
18. ECA Economic Update, Spring 2019.
19. See Annex 1 for the country classification used in this report.
20. The index looks at digitization by assessing the factors, agents' behavior and institutions that enable a country to fully leverage Information and Communication Technologies. The DiGiX is composed of 21 indicators grouped around six dimensions: infrastructure, users' adoption, enterprises' adoption, costs, regulation, and digital content. See [https://www.bbvaresearch.com/wp-content/uploads/2017/02/WP\\_17-03\\_DiGiX\\_methodology.pdf](https://www.bbvaresearch.com/wp-content/uploads/2017/02/WP_17-03_DiGiX_methodology.pdf) for more information.
21. FinTechNews Switzerland. 2018.
22. Meeting with Marius Jurgilas, Board Member, Bank of Lithuania at the World Bank Headquarters, Washington, D.C. on March 29, 2019.
23. Comprising the following categories of countries: Central Europe, Other Eastern Europe, Russia, Turkey.
24. UniCredit Bank. 2018.
25. Matthews, A. 2018.
26. SeeNews. 2018.
27. Responses were provided by country regulators (Central Banks, Financial Supervision Authorities and/or Ministries of Finance).
28. FINMA (Swiss Financial Market Supervisory Authority). 2018, 2019.
29. GLI (Global Legal Insights). 2019.
30. De, N. 2018.
31. UNSGSA FinTech Working Group and Cambridge Centre for Alternative Finance (CCAF). 2019.
32. See AIFC (Astana International Finance Centre). 2019.
33. Fintech: The Experience So Far, p. 19.
34. UK Verify website, <https://www.gov.uk/government/publications/introducing-govuk-verify/introducing-govuk-verify#govuk-verify-overview>

35. Mobile Money Regulation Index. 2018. GSMA. <https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2019/03/The-Mobile-Money-Regulatory-Index-1.pdf>.
36. Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kosovo, North Macedonia, Moldova, Montenegro, Poland, Romania, Russia, Serbia, Turkey (Source: International Comparative Legal Guides (ICLG), country reports and central bank websites).
37. Global Payment Systems Survey. 2018. The World Bank. <https://www.worldbank.org/en/topic/financialinclusion/brief/gpss>.
38. Countries in the region that require all customer funds to be kept at a prudentially regulated financial institution include Bulgaria, Croatia, Georgia, Moldova, Montenegro, Serbia, and Turkey. Countries that require a fraction to be kept at a prudentially regulated financial institution include Albania and Armenia (Source: Global Financial Inclusion and Consumer Protection Survey, 2017. <https://www.worldbank.org/en/topic/financialinclusion/brief/ficpsurvey>).
39. The long-standing international best practice in the financial sector of focusing the regulatory interventions on underlying economic functions rather than specific categorization of entities or technology, remains applicable to FinTech.
40. Negreiro, M., 2015; EC (European Commission), 2017; EC, 2018.
41. Fintech: The Experience So Far, p. 38.
42. Republic of Uzbekistan. 2018..
43. FATF (Financial Action Task Force). 2012-2019.
44. EBA Fintech Roadmap, p. 16.
45. Fintech: The Experience So Far, p. 20.
46. FinTechNews Switzerland. 2018.
47. See website at <https://www.startupestonia.ee/>
48. See website at <https://www.eas.ee/eas/?lang=en>
49. See website at <https://fundwise.me/>
50. Wallen, J. 2018.
51. Meeting with Marius Jurgilas, Board Member, Bank of Lithuania at the World Bank Headquarters, Washington, D.C. on March 29, 2019.
52. KPMG. 2019.
53. Meeting with Marius Jurgilas, Board Member, Bank of Lithuania at the World Bank Headquarters, Washington, D.C. on March 29, 2019.
54. Will Europe's Emerging Fintech Cities Rival London in 2019?, Forbes, 2018.
55. ECN (European Crowdfunding Network). 2018.
56. UniCredit Bank Press Release, 9 May 2018.
57. Wasik, Z. 2017.
58. Andreasyan, T. 2017.

59. FinTech Futures. 2019.
60. See website at <https://alastria.io/>
61. Will Europe's Emerging Fintech Cities Rival London in 2019?, Forbes, 2018.
62. UniCredit Bank. 2018.
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64. Peyton, A. 2018.
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69. Bilgic, T. 2018.
70. FinTechNews Switzerland. 2019.
71. See website at <http://park.by/it/enterprises/?lng=en&start=13>
72. SeeNews. 2018.
73. Matthews, A. 2018.
74. Bhattacharya, M. 2019.
75. FinTech Bulletin. 2019.
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