

# Latin America *Digital Money Index*

2023 Annual Report





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# Introduction



**Steve Donovan**

Latin America Treasury and  
Trade Solutions Head, Citi

The digital economy is no longer a futuristic concept; it is the present reality. Driven by technological advancements, it is transforming the way we live, work, and interact financially. At the heart of this transformation lies a fundamental shift: the move towards a cashless society. Although the advantages of adopting digital money have been well-articulated and widely known for years, technological innovation, regulatory initiatives, and shifts in consumer behavior prompted by the pandemic are accelerating preparedness for digital money in dozens of countries around the world.

Some nations have leveraged these trends, propelling their economies forward, while others have faced challenges. What features are consistent among economies ascending the readiness curve? Answers to this and more can be found in Citi and Imperial College Business School updated Latin America Digital Money Index (DMI) report.

Certainly, the journey to drive digital money readiness and adoption has been challenging, as extensively documented by Citi and Imperial College Business School in previous global editions of the Digital Money Index over the past nine years. Achieving liftoff requires collaboration among economic stakeholders around a shared digital vision, coupled with the need for a comprehensive digital policy, as detailed in this report. A holistic digital policy can empower countries to fully exploit the benefits of a digitized economy.

Yet, it goes beyond mere policy. As explained later in this paper, it seems that in developing markets, policymakers that have translated their vision into targeted initiatives and direct investments to build the foundations of a digital economy have achieved digital adoption at a rate comparable to developed markets. These countries have also surpassed their counterparts in economic growth.

Recognizing the pivotal role of governments in driving readiness and adoption, Citi and Imperial College Business School have overhauled the Digital Money Index for the Latin America version to prioritize the role of government and market support; it is one of the five core pillars in the Index. Additionally, several new indicators increasingly used across multiple countries were incorporated to track and measure digital progress more robustly. It is exciting to apply all these enhancements to keep track of new developments in Latin America on an ongoing basis as the region's advancement on the digital money journey is both encouraging and exhilarating.

**Leonardo Gazzo**

Latin America Corporate,  
Commercial, and Public  
Sector Sales Head, Treasury  
and Trade Solutions, Citi

**Significance of The Digital Money Index for Public Sector Clients**

The Latin America Digital Money Index (Latam DMI) holds particular importance for public sector clients to help navigating the evolving landscape of Digital Economy, Digital Money and Financial Technologies for a cash less society. Latam DMI comprehensive report offers strategic insights by:

- **Providing a data-driven framework:** The DMI utilizes a robust methodology to assess and compare the digital money preparedness of various countries within Latin America. This data-driven approach equips public sector clients with objective evaluations, and enabling informed decision-making.
- **Identifying areas of focus:** By highlighting strengths and weaknesses in individual countries' digital money infrastructure, the DMI pinpoints crucial areas where public sector intervention and investment are most needed. This facilitates the development of targeted policies and initiatives to foster innovation and financial inclusion.
- **Facilitating regional collaboration:** Through comparative analysis, the DMI encourages collaboration and knowledge sharing between countries within Latin America. Public sector clients can leverage these insights to learn from best practices implemented by regional peers, ultimately accelerating the region's collective progress towards a thriving digital economy.

The LatAm DMI empowers public sector clients with vital data and actionable insights, shaping informed policies and fostering a more robust and inclusive digital financial ecosystem across Latin America.



The background is a dark blue gradient. It features a faint, pixelated world map in a light blue color. Overlaid on this are several vertical lines of varying colors (red, orange, yellow, white) and various geometric shapes including circles, squares, and rectangles. Some of these shapes are filled with colors, while others are outlines. The overall aesthetic is modern and digital.

About  
*this edition*



### **Driss Temsamani**

Americas Head of Digital,  
Treasury and Trade  
Solutions, Citi

### **The digital economy is a powerful force**

The digital economy has boomed, creating new ways of working through technological platforms – 4 out of 10 people are part of the gig economy<sup>1</sup>, according to ILO data. This has increased money flows and taken electronic money to 90% of total flows; it has also led to an explosion of micro-payments of less than \$5, which have grown by 400%.

When thinking about the future of money, it is crucial to consider who uses money in the informal segment; this is where the opportunity to empower change lies. Digital money – which we define as any means of payment for real-time value exchange using legal tender currency that exists in electronic form – will allow people in the informal sector to interact financially in a global environment, facilitate greater access to financial services, and enable them to be integrated into the global economy. In addition, by replacing cash with digital money, costs associated with printing, security, distribution and use of cash can be reduced, saving 2% of GDP, according to the World Bank.

As a society we must be visionary about the potential of digital money. We must make sure it is available when required and that there is adequate infrastructure for its free flow and transfer. Moreover, we must ensure that digital money is an inclusive tool that does not add costs. In conclusion, digital money must be efficient, intelligent, programmable, and move instantly on demand – and it must be for everyone, via a universal transactional platform.

Progress in this area, as evidenced by the Digital Money Index, would allow more than 220 million people to be incorporated into the formal economy. This would generate \$1 trillion in flows that, by shifting from physical cash to digital, could result in operational savings of more than \$300 trillion on average for governments and corporations.

Latin America's financial market infrastructure is changing dramatically. Central banks are pushing to develop new modern clearing systems driven by regulations around instant payments, Open Banking, and central bank digital currencies (CBDCs) as part of digital policies designed to drive financial inclusion and promote wider access to the digital economy. Businesses of all sizes can harness the opportunity of the digital economy by integrating their commerce into new alternative payment methods, such as eWallets with QR Codes, to digitize their cash collection and automate their payments reconciliation.

<sup>1</sup> <https://www.ilo.org/global/research/lang--en/index.htm>



**Liza Niño**

Latin America Clients  
and Market Integration  
Head, Treasury and Trade  
Solutions, Citi

### **Business models and Financial Market Infrastructure (FMI) modernization go hand-in-hand**

The global economy is being transformed as the result of billions of daily online connections between people, devices and businesses; physical and digital experiences are blending across all aspects of our lives. Never before has there been such a convergence of disruptive and new technologies, helping to drive exponential change for individuals, businesses and society, as well as commerce and the broader economy.

The worldwide acceleration towards a digital economy is irreversible. Conventional ways of consuming and exchanging goods and services are changing, prompting the evolution of business models. Digital technologies allow the creation of new solutions and experiences for people, businesses and ecosystems.

In this context, the adoption of digital money is necessary to respond to today's emerging dynamics. It will boost commerce, result in the development of digital transactional ecosystems, and prompt more sustainable and inclusive economic growth.

Digital money readiness has tangible benefits for governments, businesses, and consumers. All parties are aware of the need to move away from the use of cash, which is insecure, costly to produce and handle, and does not align with the new business dynamics of the digital era. Facilitating digital money readiness can therefore act as an engine for progress and development. Public and private collaboration that engages all relevant stakeholders, builds a clear strategy and achieves synergies and efficiencies in execution is critical. As digital money gains ground, it has the potential to transform Latin America's economies and financial services sector, driving an increase in commerce. Brazil's success in FMI modernization, which is fast becoming a key case study globally, indicates the opportunities that are possible across Latin America.

We hope this first edition of the Latin America Digital Money Index encourages public and private stakeholders to focus efforts on accelerating digital money readiness in order to strengthen Latin America's digital economy, boost economic development and encourage the development of inclusive and accessible digital money solutions for all.



**Luis Martinez**

Latin America Platform and  
Data Services Head, Treasury  
and Trade Solutions, Citi

**The Latin America Digital Money Index delivers actionable insights**

This Latin America Digital Money Index presents a comprehensive analysis of initiatives in the region, drawing on diverse open sources and utilizing data science techniques to deliver a nuanced understanding of the digital landscape across the region and provide actionable insights.

Our approach has resulted in the development of a powerful tool that includes scaling normalization to ensure that the disparities in data scales do not skew the results; it also deploys clustering (grouping countries based on tiers) to enable a more in-depth analysis and comparison, revealing common strengths and identifying best practices and areas for improvement. These findings reveal a broad spectrum of digital readiness, offering valuable guidance for business expansion, investment decisions, and policy formulation.

Future releases of our Latin America Digital Money Index could integrate additional data sources, refine clustering algorithms, include additional indicators and apply machine learning models for prediction and trend analysis. This approach is not only data-driven but also business-friendly, providing actionable insights to drive success in an increasingly digital world.



# Latin America *Digital Money Index 2023*

The world is witnessing a profound shift towards digital commerce, digital payments, and a digital economy. With cash gradually fading from everyday transactions, **Digital money readiness has tangible benefits for governments, businesses, and consumers and has the potential to revolutionize Latin America's societies and economies supporting their progress and development.**

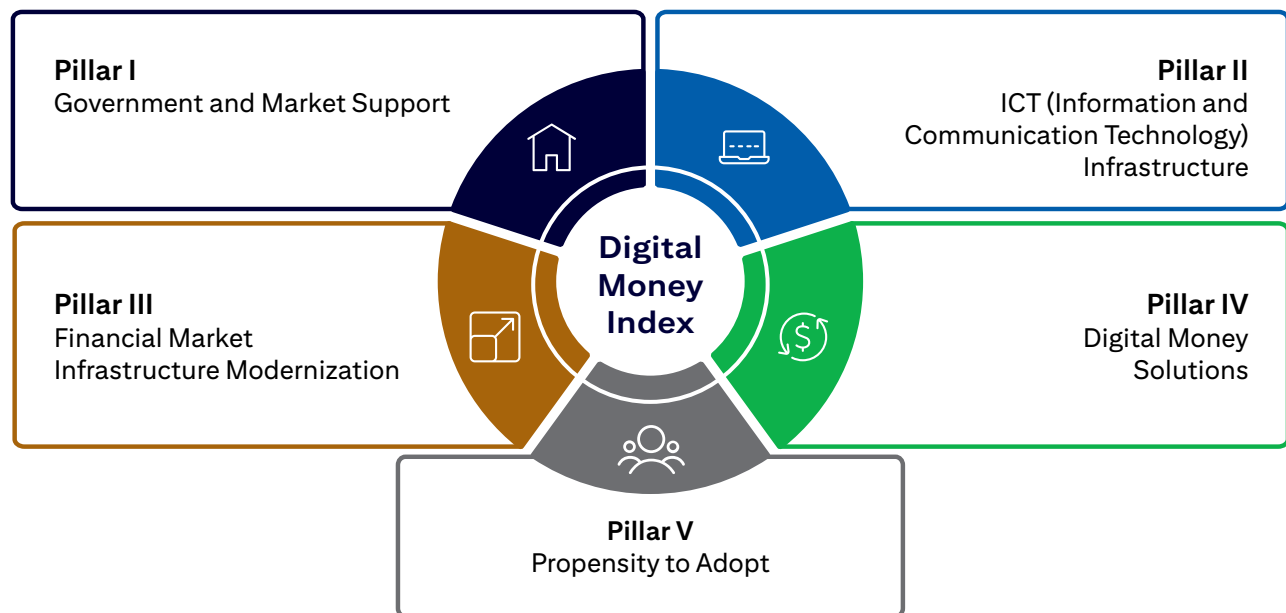
This report, **Latin America Digital Money Index**, takes a deep dive into the region's progress and aims to map the proximity of each country to becoming cashless societies and achieving this digital money transformation.

This special Latin America edition incorporates new factors that are driving financial services modernization as well as others that are supporting digital money advances in developing countries. Based on a framework consisting of **5 key pillars**, the index incorporates relevant aspects that need to be addressed. **Latin America DMI**, paints a vibrant

picture of the enablers and challenges propelling the region forward. We want to acknowledge the valuable contribution of Imperial College Business School's Centre for Financial Technology, in the co-development of this special Latin America Digital Money Index edition.

By analyzing these pillars, the Latin America DMI provides a comprehensive picture of each country's journey towards a cashless future.

This report brings essential knowledge to understand the diverse paths different Latin America countries are taking towards digital money society. It reveals factors accelerating progress, as well as the obstacles that need to be overcome. Whether you are a policymaker, a government entity, a corporation, or simply a curious about the region's digital trajectory, we expect the **Latin America DMI** serves as your as a comprehensive guide to this dynamic and evolving landscape.



Get ready to embark on a journey  
*exploring the future of money in Latin America!*



## Top 5 countries for DMI



## Latin America Insights

Latin America is brimming with potential when it comes to digital money adoption. The region's financial services are undergoing a significant modernization, fueled by cutting-edge technologies to provide universal access to digital financial services and collaborative spirit between government, businesses, multilaterals entities, and individuals.

While the cash use remains as one of main payments instruments in some countries, digital payments is rapidly transforming the landscape, offering hope for greater financial inclusion, economic growth, and economy efficiency.



### A Region on the Move

The report brings insights of dynamic change:

- **Financial services modernization:** Governments are embracing new technologies to support digital financial services modernization with initiatives such as instant payments, payments interoperability between financial institutions and FinTechs, Open finance, and digital identity, paving the way for a more dynamic and inclusive financial ecosystem.
- **Public- Private partnerships:** This transformation is occurring with an extensive public-private collaboration, which is fueling innovation, tailoring solutions to meet specific country needs and fostering inclusive growth. The presence of 8 Financial Innovation Hubs and 6 Financial Sand Boxes reflects an open space for collaboration and to contribute from different angles to help to shape the transformation of transactional schemes and financial services, to be more inclusive, efficient, and innovative.
- **A region embracing the change and early adopters:** Brazil's Pix instant payments scheme, and Brazil Open Finance framework stand as global showcases because of its high adoption, demonstrating the power of government leading the change, holistic digital policies, targeted efforts, and investments. The Central Bank Digital Currencies (CBDC) is another example, Bahamas was the first country in the worldwide issuing a CBDC, the SandDollar in 2020, followed by Jamaica issuing Jam-Dex in 2022, and now Brazil with DREX under pilot stage. In the other hand, El Salvador was the 1st country in the world to adopt Bitcoin as legal tender currency, deploying a government ewallet named Chivo.





## Challenges and Opportunities

Despite these advances, significant challenges remain so there is still a long journey ahead to advance in digital money readiness:

**Uneven progress:** Countries vary greatly in their digital infrastructure, regulatory landscape, digital money services and financial inclusion rate. Closing the gaps requires a balance between tailored approaches and leveraging the available capabilities of different stakeholders, as well as taking advantage of key success elements identified in the journey of countries ahead.

- **Holistic Policies:** While many are taking steps, a comprehensive digital strategy and execution across all stakeholders is crucial to accelerate progress. Countries that have augmented a holistic digital policy with targeted investments (and collaboration across all economic stakeholders) have performed well on digital money readiness as measured by our Digital Money Index. This is evident from the case study of Brazil, which has outperformed its peers. Citi's Holistic Digital Policy report released in October 2021 articulates how a holistic digital policy combined with focused investments can drive not just digital readiness, but also overall economic growth.
- **Financial literacy and correct incentives:** Bridging the digital divide requires targeted educational initiatives to empower individuals and businesses to harness the benefits of Digital Finance, as well as setting the right incentives according with each country's reality and needs.

## Deep Dive In Digital Money Index (DMI) composition

Citi, in collaboration with Imperial College Business School's Centre for Financial Technology, has now produced eight versions of the Digital Money Index. The latest version covers 113 countries using 47 indicators to gauge their progress in adopting digital financial technologies.

Post-COVID-19, we recognized that some of these indicators suffer from latency issues. Many countries, notably in Latin America, had made strides which were not being adequately reflected in the index.

Following a deep dive on Latin America in partnership with Citi's Latin America teams, we reformulated the index to incorporate factors driving digital money transformation and adoption in the region. These reflect priorities such as government digital agendas and FMI modernization, which directly impact digital money, including instant payments, Open Finance, and digital assets.

The revamped Latin America Index acknowledges the progress made by several developing economies in driving digital money readiness. Several developing countries are on par with developed economies.



### Pillar I: Government and Market Support

It is important to reflect institutional and market conditions driving and facilitating digital money enablement and its adoption for people and businesses.

This pillar encompasses key metrics related to government policies, regulations, and strategies for digital inclusion, digital money and digital safety, including:

- **Government strategy** around broadband and wi-fi, and support for digital literacy.
- **E-government tangibles:** Public online services, e-government, e-inclusion, and national digital ID systems.
- **Foundational regulatory frameworks to enable a suitable digital money environment:** General regulations around privacy, consumer protection and cyber security. Specific regulatory frameworks to promote digital financial services transformation, in relation to electronic transactions, e-commerce, instant payments, Open Banking and Open Finance, and digital assets. The presence of financial services sandboxes to promote public private collaboration.

This pillar evaluates a country's commitment to fostering a supportive digital environment. A higher score in this group suggests a strong regulatory framework and government dedication to digital infrastructure development and safety.



### **Pillar II: ICT (Information and Communication Technology) Infrastructure:**

ICT infrastructures are essential enablers to bring people and the private and public sectors online, and to unleash the value of digital services, digital money and a digital economy. ICT infrastructure enables economic growth through technologies such as high-speed internet, mobile broadband, and computing.

Considerations include the availability and quality of connectivity and communications infrastructure, such as broadband and mobile network, internet access/wi-fi, secure internet servers, broadband funding, mobile funding, mobile latency, 4G and 5G deployment and coverage, online services and PC and smartphone penetration.

Metrics in this group are pivotal for assessing a country's digital infrastructure and connectivity. A higher score in this group signifies a robust digital infrastructure, ensuring that high-speed internet access and high quality is widespread.



### **Pillar III: Financial Market Infrastructure Modernization**

FMI modernization supports the advance of a digital economy and digital money readiness. These infrastructures are the fundamental rails for an ecosystem where innovative financial services solutions can be deployed with scalability, interoperability, and security.

This pillar incorporates infrastructure that underpins digital finance and digital transactional ecosystems. It evaluates the country's readiness in terms of e-commerce, instant payments, Open Banking/Open Finance, and digital assets. A strong score in this group reflects a secure and modern digital finance ecosystem to support a digital economy and digital money, ultimately boosting commerce, efficiency, interoperability and encouraging innovation and financial inclusion.





#### Pillar IV: Digital Money Solutions

Government and private sectors solutions for digital money use include online transactional and financial solutions, e-transactions and fintech solutions.

The metrics in this group gauge user trust, online privacy, and adoption, as well as key factors to enable digital money solutions such as digital money security measures. Trust in online privacy, VPN usage, and the online presence of businesses play a crucial role in fostering user confidence in digital services. A higher score in this group suggests a country's commitment to protecting online privacy and user trust.



#### Pillar V: Propensity to Adopt

This group focuses on a country's adaptability to emerging technologies, digital solutions, and digital financial services. This pillar reflects a country's adoption of technological innovations and digital solutions by individuals, businesses and digital financial services.

More information on the index construction can be found in the methodology section of the Appendix.







# Market developments –

*providing the necessary impetus  
to digital money readiness*



## Emerging technology

Technology availability and maturity, driven by continuous innovation, has accelerated exponentially in recent years. Technology is reshaping businesses, consumer behavior (how consumers buy and use products and services), and also governments interactions, and how they engage with their citizens. According to World Economic Forum estimates, 70% of incremental value created over the next decade will come from digitally-enabled platform business models.<sup>1</sup>

Businesses across industries are reaping the benefits of digitalization. They are leveraging technology to remain competitive in the new digital economy and evolve their business models. Forward-thinking businesses are using new technologies to improve customer experience and engagement, drive operational efficiency and explore new business models.

There are a wide available variety of technologies and applications. For example, companies are using **application programming interfaces (APIs)** to gain efficiencies, connect with partners and create ecosystems that enable them to better serve clients while providing differentiated and integrated experiences.

Advancements in **analytics and machine learning** are allowing businesses to gain deeper insights from customer data and personalize their offerings, as these allow them to mine large volumes of consumer data to better understand customers needs and context. **Blockchain-based solutions** are also gaining traction across industries including financial services. It is estimated that the technology will save banks \$10 billion in cross-border payments alone.<sup>2</sup> Blockchain can also improve accountability, transparency, and efficiency across the supply chains – a big focus area for industrial firms.

**Artificial intelligence (AI)** and its subset machine learning (ML) are altering how we do business and interact with our environment, they are transforming how we interact with one another too. As regulators address the risks, it will be designers, builders and users who will ensure that AI and ML operate transparently they must ensure it works fairly and ethically.

Trends such as APIs, blockchain, the internet of things (IoT), AI and 5G will continue to grow over the next few years, and participants across industries that embrace these technologies and integrate them into their digitalization strategies will be well-positioned to thrive in the evolving global landscape. The Citi Emerging Technologies report provides a detailed analysis of the impact of technology on different industries.<sup>3</sup>

## Regulatory trends

The rise of e-commerce, which necessitates **real-time payments** infrastructure, has helped to popularize a variety of digital payment methods (depending on the country), as well as the introduction of 24/7 closed-loop payment networks such as digital wallets. These have significantly contributed to financial inclusion and are now an important part of the payments ecosystem; in some countries these payment methods have moved to open loop networks thanks to regulatory frameworks and interoperability. More generally, these developments have helped industry participants to recognize the need to upgrade ageing payments infrastructures. Regulators around the world are accelerating investments in payments infrastructure and evaluating opportunities to move to 24/7 models, either by extending the hours of operation of existing systems or by introducing instant payments schemes. There are currently 79 countries around the world with live instant payments schemes.<sup>4</sup>

<sup>1</sup> <https://intelligence.weforum.org/topics/a1Gb0000001SH21EAG>

<sup>2</sup> <https://www.businesswire.com/news/home/20211107005028/en/Juniper-Research-Blockchain-to-Facilitate-10-Billion-Savings-Globally-in-Cross-border-Payments-as-Operational-Efficiencies-Take-Effect>

<sup>3</sup> <https://icg.citi.com/rcs/icgPublic/storage/public/gra34788-Emerging-Technologies-Whitepaper-v7-Single.pdf>

<sup>4</sup> <https://www.pymnts.com/news/faster-payments/2023/new-map-shows-real-time-payments-progress-in-2023/>

Another important development impacting the industry is **Open Banking**. The UK took the first step toward Open Banking with the Open Banking Initiative, followed by the European Union's PSD2. Since then, a slew of other countries have launched their versions of Open Banking regulations. Open Banking allows conventional banks and fintech companies to collaborate and offer superior products and services to end clients. Open Banking is expected to improve customer experience while lowering distribution costs for service providers. It is estimated that Open Banking and APIs can help those "on the margins" save about 2.5% of their income due to the availability of better products and services and lower fees.<sup>5</sup>

In a number of countries Open Banking is **evolving to become Open Finance and Open Data**, which represents a financial market revolution where customer information, previously held exclusively by banks and other financial institutions, becomes a raw material for fintechs, third-party service providers and even other banks and financial institutions, to create new services and tools. Third-party providers, Account Information Payments Providers (AISPs) and Payment Initiator Service Providers (PISPs), can access customer financial data and have the ability to initiate payments (with the explicit consent of the individual or business account owners) to create and customize innovative financial products and services.

FMI modernization initiatives are showing impactful results and increasing adoption. One example is the evolution of instant payments to leverage Open Banking/Finance payment initiation APIs to address challenges such as recurrent variable payments.

Finally, the rise of payment instruments based in **Digital Assets**, such as cryptocurrencies and stablecoins is forcing regulators to reconsider their regulatory framework around digital money. To combat the threat of high-risk alternative currencies to the financial system, 130 countries, representing 98% of GDP,<sup>6</sup> have already started exploring **Central Bank Digital Currencies (CBDCs)** and 11 countries have fully launched a digital currency as of December 2023. Policymakers' goal in introducing CBDCs is to preserve financial stability, in addition to streamlining the payment system. Harvard Business Review expects CBDCs to reduce the cost of managing payments, with the US economy alone expected to save \$750 billion every year as a result of CBDC adoption.<sup>7</sup> Adoption of CBDCs is expected to further accelerate with the advancement of the underlying distributed ledger technology (DLT).

Digital ID is another foundational technology that helps improve efficiency while influencing overall client experience. Banks in India were able to issue around 440 million no-frills bank accounts seamlessly to underprivileged individuals using Aadhaar (India's digital ID).<sup>8</sup> Digital ID solutions also have the potential to transform economies. According to McKinsey, digital identities might lead up to a 13% rise in GDP by 2030 as they become more generally available.<sup>9</sup>

Fundamental changes, such as instant payments, payments interoperability, Digital ID, CBDCs, and Open Banking and Open Finance, will take time to completely emerge on a global scale. However, the potential of these technologies to transform the payments landscape for consumers and corporates is already being felt. Policymakers across the globe will continue to focus on initiatives that address three main themes – driving innovation while ensuring financial stability, consumer protection and compliance.

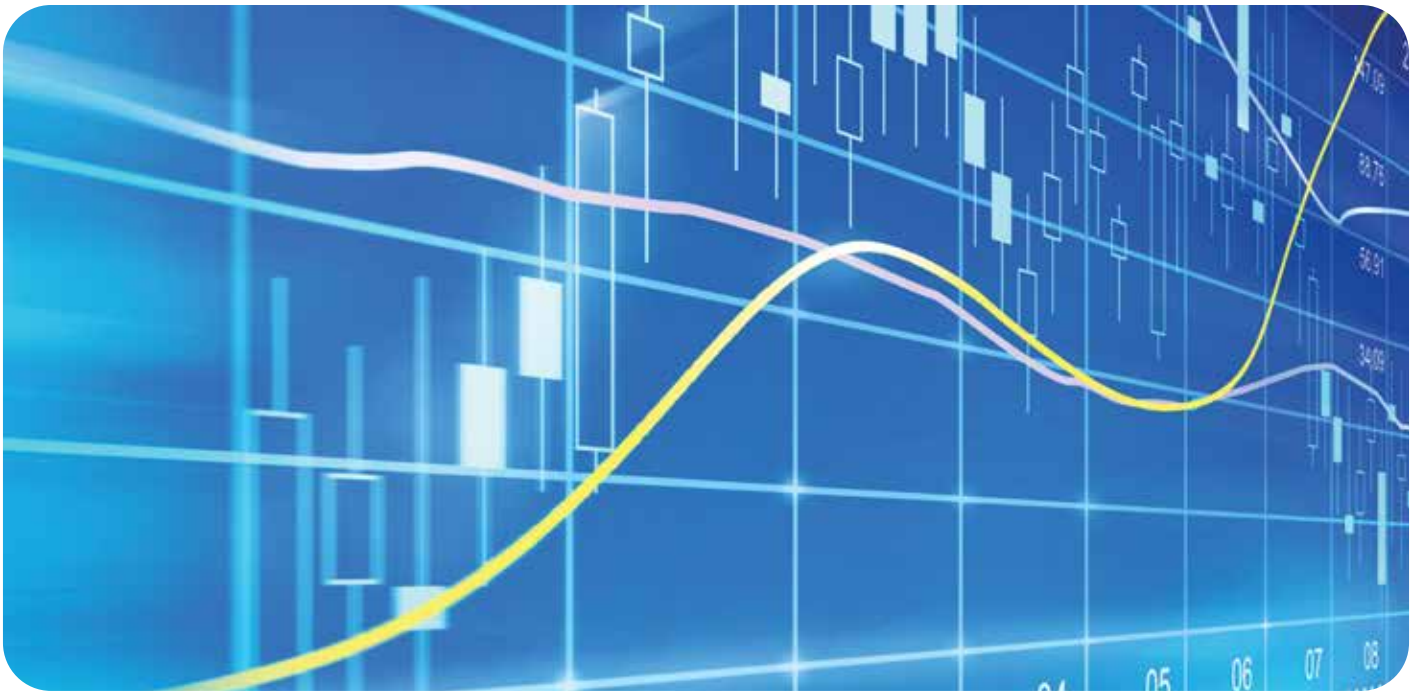
8 [https://www.business-standard.com/article/current-affairs/deposits-in-bank-accounts-opened-under-jan-dhan-scheme-cross-rs-1-5-trn-122010900345\\_1.html#:~:text=As%20per%20the%20data%2C%2029.54,crore%20PMJDY%20accounts%20were%20opened.](https://www.business-standard.com/article/current-affairs/deposits-in-bank-accounts-opened-under-jan-dhan-scheme-cross-rs-1-5-trn-122010900345_1.html#:~:text=As%20per%20the%20data%2C%2029.54,crore%20PMJDY%20accounts%20were%20opened.)

9 <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/digital-identification-a-key-to-inclusive-growth>

5 [https://www.cgap.org/sites/default/files/publications/2020\\_10\\_Working\\_Paper\\_Open\\_Banking.pdf](https://www.cgap.org/sites/default/files/publications/2020_10_Working_Paper_Open_Banking.pdf)

6 <https://www.atlanticcouncil.org/cbdctracker/>

7 <https://hbr.org/2021/10/what-if-central-banks-issued-digital-currency>



### Externalities

The global impact of the COVID-19 epidemic has been enormous and brought new aspects and advances related with the digital economy, that will remain in the society. Lockdowns and subsequent supply chain disruptions served as a catalyst for introspection, prompting consumers to reassess their needs. This reevaluation led to a clear distinction between essential versus luxury products, with a marked shift towards prioritizing necessities.

Furthermore, the pandemic and climate change fostered a growing awareness of sustainability, as consumers became more attuned to the environmental impact of their choices.

Additionally, Lockdowns restrictions significantly altered consumer shopping patterns. Even those who had never purchased online before the pandemic, shopped, and paid for their necessities online. Clearly, the pandemic has significantly impacted the scope and reach of the digital transformation. According to a Forbes survey, 58% of the US consumers are spending more money online, with 27% signing up for at least one new digital streaming service.<sup>10</sup>

Many of the habits developed during the pandemic have lasted long after the crisis has passed, irreversibly altering what people value, how and where they shop and how they live and work. The adoption of a digital lifestyle is now an irreversible change in consumer behavior, and so impacted business and industries, and has proved to be one of the greatest single boosts to digital money readiness and adoption.

Policymakers across the globe will continue to focus on initiatives that address three main themes – *driving innovation while ensuring financial stability, consumer protection and compliance.*

<sup>10</sup> <https://www.forbes.com/sites/davidarmano/2020/09/09/covid-19-will-be-remembered-as-the-great-accelerator-of-digital-transformation/>



# Holistic digital policy –

*a key tool for countries to  
drive digital money readiness*





The winds of change are upon us, presenting a unique opportunity for countries to rise the occasion and drive digital money readiness, it means propel their economies towards a cashless, digitally – empowered future.

However, let us not underestimate the challenges that lie ahead as road to digital transformation is not straight forward. There are numerous challenges such as critical digital infrastructure that has not kept pace with the growing demand for internet connectivity, a digital divide that can prevent the less skilled from adopting emerging technologies, and concerns around trust that have the potential to block innovation and prevent the digital revolution from unleashing its full economic potential.

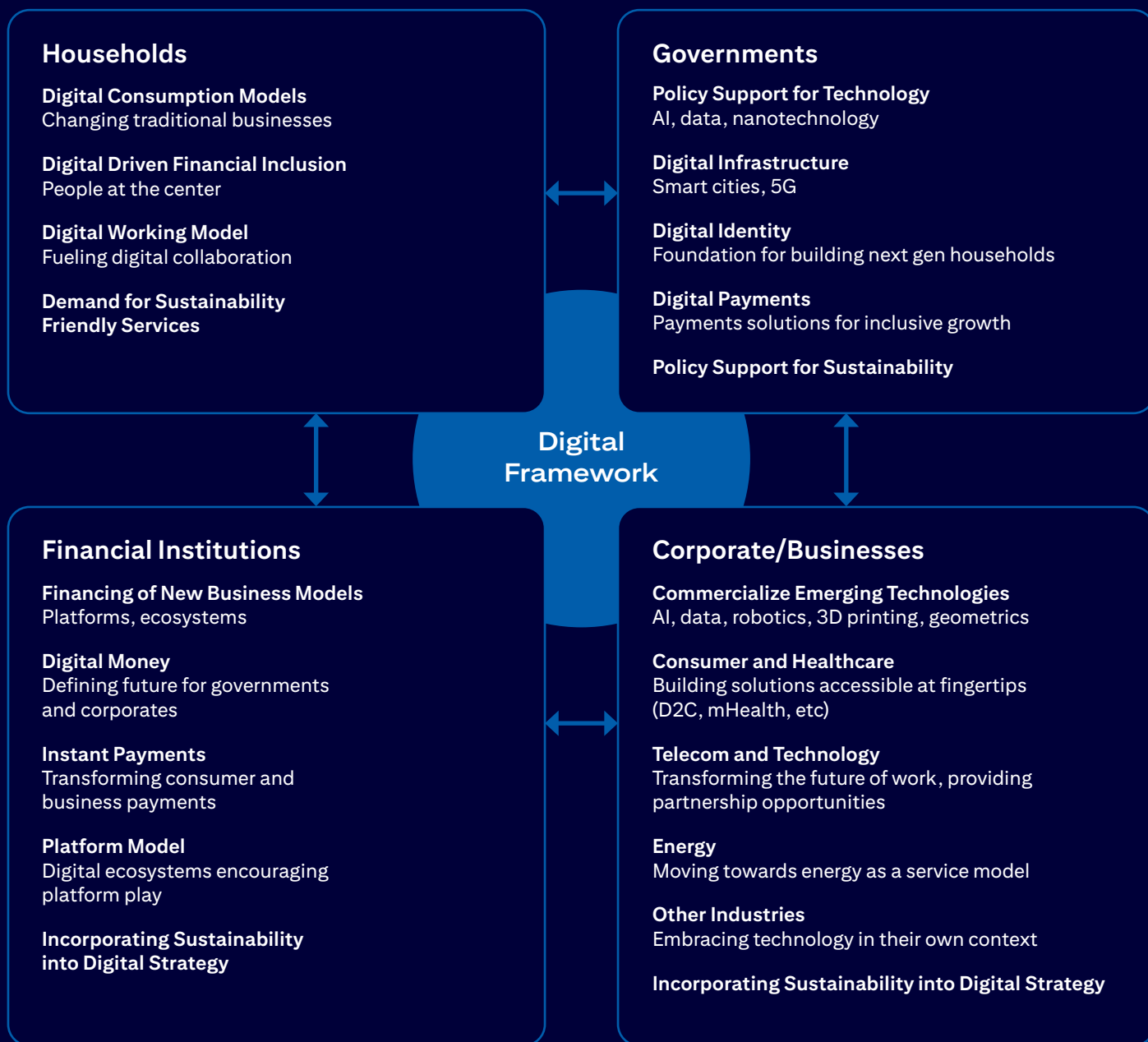
Therefore, driving digital money readiness requires a collective effort and that all the economic stakeholders – governments, corporates, financial institutions and every individual, rally around a shared vision. Governments, naturally, have a pivotal role to play in developing and articulating a holistic digital policy framework to align all these economic stakeholders towards a common digital vision.<sup>1</sup>

<sup>1</sup> <https://www.citivelocity.com/citigps/holistic-digital-policy/>





Figure 1. Citi digital policy, strategy and advisory framework



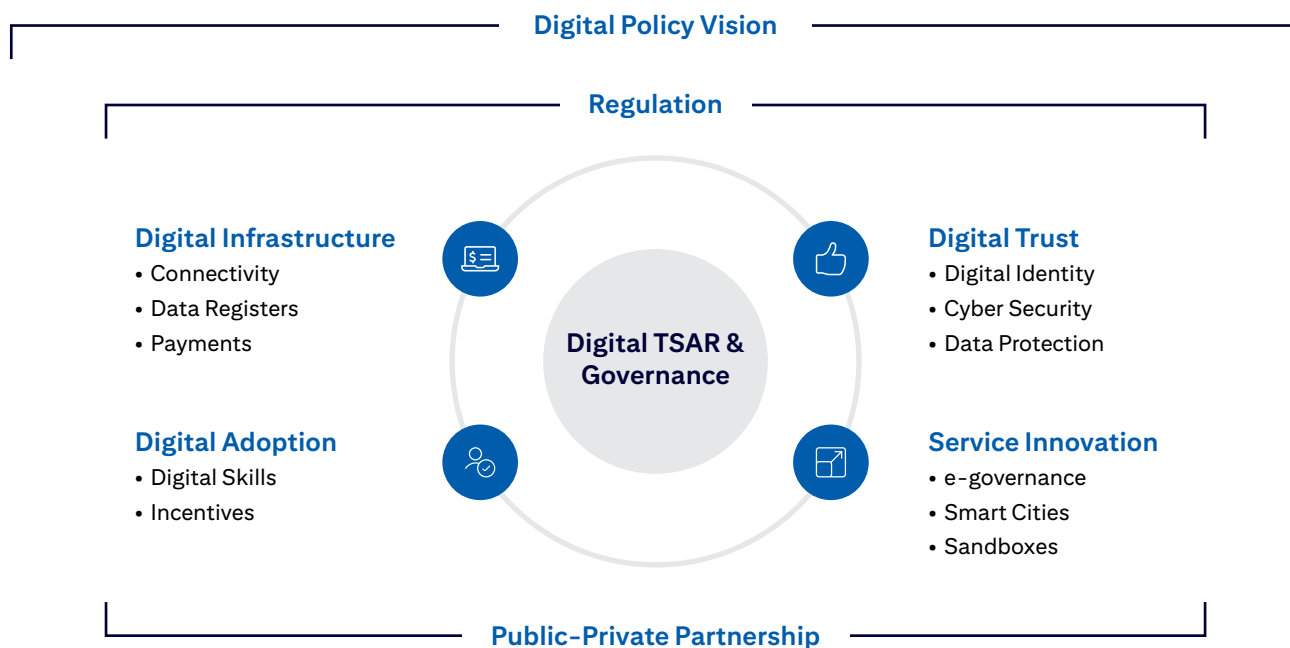
### What is a holistic digital policy?

A holistic digital policy rests on five pillars: digital infrastructure; digital adoption; service innovation; and digital trust, driven by a clear vision and supported by robust regulations and governance.

As a first step, governments must establish a digital vision that aligns with their larger goals, such as promoting growth, improving service delivery, and increasing public involvement, among others. Governments should establish rules to put things in motion after approving the vision and (eventually) establish a solid governance and oversight structure. Governments should build a governance framework that includes a Digital Tsar or Digital Transformation Owner to ensure coordination and track progress. Regardless of a country's digital maturity, digital policy should then focus on these five pillars and governments should collaborate with the private sector and academia to achieve these goals:

- Ensure that everyone has access to the infrastructure that supports the digital economy, such as telecommunications, banking, and payments, as well as shared IT platforms.
- As infrastructure is built, it is important to establish consumer and business trust to bring them on board and raise their level of comfort with technology. Digital identification, cyber security, and data protection solutions are all essential to build this trust.
- Governments must ensure that innovative solutions are available, and must focus on creating a conducive environment for innovation while leading their internal capability development. Sandboxes, government service digitization, smart cities, and other initiatives are relevant to drive service innovation.
- Finally, governments should focus on the development of digital skills and offer incentives for individuals and businesses as appropriate to induce cultural change and maximize consumer adoption of technology.

**Figure 2.** Holistic digital policy framework





# Going beyond policy formulation –

*entrepreneurial states have excelled  
in driving readiness*





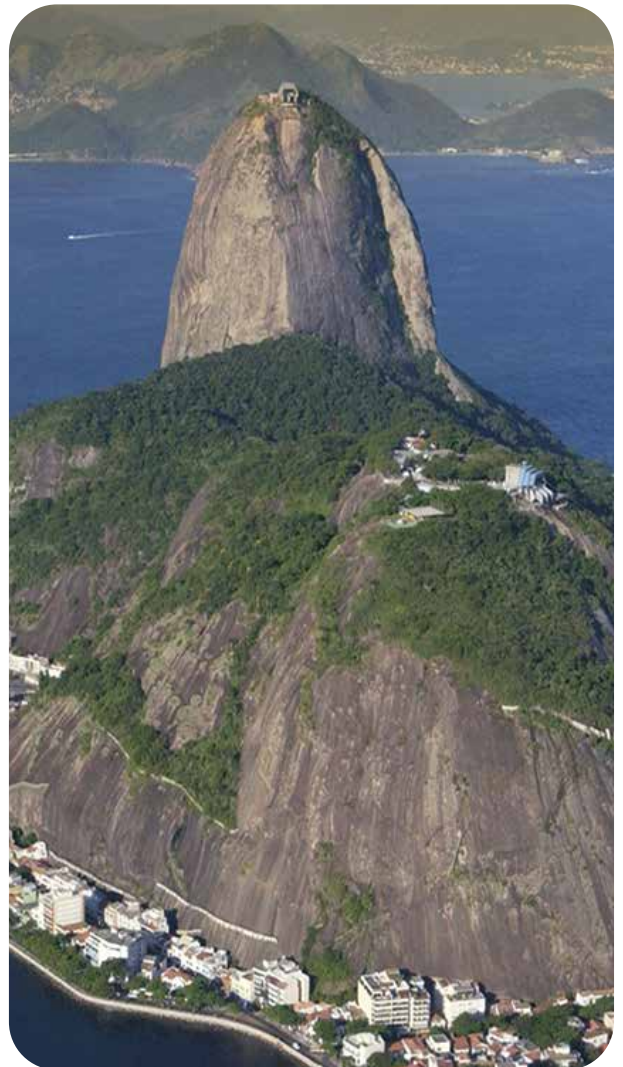
While it is essential to have a holistic digital policy to take advantage of these emerging trends, policymakers that played an **active role** beyond enacting policies and articulating coordination and synergies across different government entities have made more progress in driving digital adoption compared to their peers. These entrepreneurial markets have had a bold vision, enacted favorable policies, and made investments to drive the vision. A close observation of some such emerging markets – such as Brazil, which is discussed below, indicates a performance similar to developed economies, and well ahead of their peer emerging markets.

## Brazil – Latin America's *success story*

Brazil has outperformed other countries in Latin America on the Digital Money Index, demonstrating the importance of a holistic digital policy, targeted investments, and the collaboration of all economic actors to drive progress.

Digitalization is now completely integrated into Brazil's economic planning process in different fields. The government has unveiled a comprehensive digital policy that includes several specific initiatives.

The government has played a crucial role in leading this digital transformation, creating and implementing digital initiatives within a holistic long-term national strategic agenda. The overarching goal of this agenda is to foster competition, innovation, economic growth and promote financial inclusion while modernizing Brazil's financial system.



The government has unveiled a comprehensive digital policy that includes several specific initiatives targeting the information and communication technologies sector. The sector is critical to the digital transformation plan and the government's goal of building a national digital economy as articulated in the 2018-2021 Digital Transformation Strategy and the 2020-2022 Digital Government Strategy (which guided e-government transformation for various government agencies).

Brazil's government is also working with the The Organization for Economic Cooperation and Development (OECD) on the

Going Digital in Brazil project, which seeks to ensure a coherent and cohesive whole-of-government approach to better respond to the digital transformation and make it work for growth and well-being.

It is important to highlight the central role of the Banco Central do Brasil (BCB) and its agenda of FMI modernization. The BCB has led and driven many of Brazil's greatest advances, including the deployment of Pix instant payments and Open Finance; it is now piloting a CBDC pilot with the Digital Brazilian Real (Drex).

## Brazil's greatest advances







## Pix

Pix was launched by BCB in November 2020 during the COVID-19 pandemic. It has proved a phenomenal success and become a part of everyday life for Brazilians. Pix is the second biggest instant payment scheme worldwide by volume, after India's UPI. As of September 2023, there were almost 155 million registered users (close to 13 million are companies while 142 million – of Brazil's population of 213 million – are individuals) and 3.8 billion Pix transactions a month.

Pix's success is attributable to its ease of use, multiple functions to support a wide range of use cases, and seamless integration with purchasing and invoice generation using QR codes. In addition, the use of keys, such as cellphone numbers, makes it easy and convenient to make or receive payments, even without a bank account.

Pix is also integrated into Brazil's Open Finance strategy. The ubiquity of Pix use among consumers has created opportunities for companies and public sector entities to use the instrument. As well as improving convenience for users, Pix can significantly lower costs associated with billing and collection processes, and improve convenience for users.

Pix looks set to continue its phenomenal growth as new use cases, such as recurrent payments, are introduced and functionality becomes more sophisticated.



## Open Finance

Brazil was the second country in Latin America to adopt an Open Finance strategy (after Mexico) but is one of the greatest Open Finance success stories globally, with a world-leading number of Open Finance consents (more than 38 million as of August 2023). The program is led by BCB, which adapted the concept to Brazil's needs and developed a clear strategy and roadmap. Open Finance has been deployed in four phases since 2021:

1. Financial institutions public data (product, services and channels): live.
2. Private data (allowing consumers, with prior consent, to share their data such as records, account transactions, card information and credit operations with institutions of their choice): live.
3. Payment initiation (Pix as a payment method on Open Finance rails): live.
4. Inclusion of new data that can be shared, as well as new products and services, such as the contracting of foreign exchange operations, investments, insurance, and private pensions.



## Drex

Drex – Digital Brazilian Real: Monetary authorities and international organizations around the world are tracking the increasing use of digital assets in financial transactions (tokenization) and are studying, exploring and testing systems for the issuance of CBDCs, which are digital versions of a nation-state currency issued by the central bank. The BCB has explored CBDCs, produced a proof of concept, and has now moved to the pilot phase of a Brazilian CBDC (Drex), which will be concluded in late 2024. Milestones have included:

- **2020:** CBDC Working group created.
- **May 2021:** Disclosure of CBDC general guidelines.
- **2021-2022:** Digital Brazilian Real LIFT Challenge completed.
- **2023:** Digital real pilot: Starting with limited participants for a wholesale pilot, the goal is to enable retail access through tokenized bank deposits.
- **Late 2024 or 2025:** Possible CBDC launch.

With the implementation of Drex, the BCB seeks to promote financial market efficiency and financial inclusion. There is particular interest in payments programmability and cross-border payments. Drex is seen as infrastructure to connect today's financial services with those of the future.

The BCB seeks to build intelligent financial services that are automated, programmable, standardized and safely conducted within the Drex Platform. This should favor the entrance of new financial services providers and the emergence of innovative business models. Consequently, Drex implementation is expected to reduce the costs of financial transactions, supporting, ultimately, financial democratization.

The Drex Platform is a Distributed ledger technology (DLT) ecosystem, in which regulated financial intermediaries will convert balances of demand deposits and electronic money in Drex. The retail version of Drex will be provided by a regulated financial intermediary. It will enable individuals to access various types of financial transactions with digital assets and smart contracts. These will be settled in wholesale Drex issued by the BCB within the Drex Platform.

- Public-private collaboration has been enhanced by a flexible regulatory environment and financial regulatory sandbox.
- Brazil has an ambitious program of public services digitalization. An assessment by the World Bank ranked it as the second most advanced country globally for digital government.

# Lessons *learned*

When considering what to do – and what not to do – in order to maximize digital money readiness, it is important to recognize that every country has different circumstances, needs, and levels of financial services maturity. There is no one-size-fits-all model. Nevertheless, there are some broad aspects of successful digital money readiness that should be prioritized by countries:

## 1

**Strong governance, support and coordination:** If digital money initiatives are to gain traction, promote a reliable ecosystem, ensure sustainability and achieve their goals, structure and practices relating to definitions, implementation, deployment, operation and performance are important, as are measures to foster accountability, responsiveness and inclusiveness. Having a single and specific entity that has responsibility for governance brings orchestration benefits, efficiencies, trust, a faster time to market, and a focus on meeting defined goals. This orchestration role should extend not only across different government entities, policies and regulations, but also strategies relating to ICT infrastructure, financial services and digital inclusion.

## 2

**Public-private collaboration:** Equitable representation of ecosystem actors (government entities, banks, payment schemes, fintechs and organizations representing individuals and enterprises) is valuable in determining definitions to ensure the planned initiatives will deliver benefits for all stakeholders. Benefits may vary. For example, consumers could gain a fluid, accessible and more secure customer experience; merchants may benefit from a more efficient collection method; and government can boost digital financial inclusion and accelerate the switch from cash into the digital formal economy. Public-private collaboration can also be enhanced by a flexible regulatory environment and a financial regulatory sandbox (which has helped to drive the success of Brazil's financial services modernization, for example).

It is important also to take advantage of the support of multilateral organizations, which are supporting Latin America development via a number of programs.

3

**Strengthen Security:** Safeguarding, enhancing, and monitoring technical standards, the operative model, fraud management and cybersecurity are critical. It is also essential to establish a secure participant model to ensure minimum requirements are met. A centralized registry and monitoring of Account information service providers (AISPs) and payment initiation service providers (PISPs) has been shown to be useful.

4

**Maximize efficiencies:** Isolated implementations are extremely costly so technical integration must be efficient. A single integration through a centralized entity brings economic efficiencies and speeds time to market compared to multiple implementations. Ultimately, lower integration costs can be passed on to final users to drive adoption.

5

**Focus on use cases rather than functionalities:** It is advantageous to focus on use cases at the same time as setting out clear phases that will define digital money implementation. Use cases that generate the greatest impact in line with established digital money objectives should be prioritized.





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# 6

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**Reinforce efforts to promote adoption:** A variety of different approaches should be used to maximize adoption. Some aspects to consider include:

- **User experience:** Having a single and streamlined user experience design for each use case brings benefits in terms of clarity, a frictionless experience and adoption.
- **Trust:** Trust can be facilitated in a number of ways. A trust mark can be used covering aspects such as user control to provide and revoke consents to third parties, data privacy and protection, fraud prevention, disputes, costs, and performance.
- **Customized communication strategy for individuals and businesses:** This can accelerate awareness of digital money benefits and dynamics.
- **Incentives:** Establish the proper incentives for individuals, business, banks and third parties. These incentives need to be clearly articulated via a public-private dialogue.

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# 7

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**Long term and cross-border vision:** Strategy needs to encompass multiple areas, including national development plans, government digital strategy, incentives to promote private investment and digital education.

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# 8

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**Lead by example:** Government entities must provide online services, ensure accessible and user-friendly government websites, and prioritize digitalization of government-citizen interactions. The goal should be to ensure that all citizens, regardless of their socio-economic status, have access to and benefit from digital services and information in order to reduce the digital divide.



# Appendix



## Appendix I: 2023 Latin America Index results

ISO3	Pillar 1	Pillar 2	Pillar 3	Pillar 4	Pillar 5	DMI Index
BRA	0.89	0.73	0.80	0.66	0.69	0.75
ARG	0.80	0.77	0.60	0.68	0.59	0.69
CHL	0.66	0.83	0.40	0.72	0.81	0.68
MEX	0.67	0.67	0.56	0.45	0.46	0.56
COL	0.69	0.63	0.35	0.41	0.43	0.50
URY	0.58	0.61	0.20	0.53	0.59	0.50
PER	0.60	0.61	0.50	0.26	0.48	0.49
PRY	0.53	0.53	0.40	0.36	0.36	0.43
JAM	0.51	0.53	0.20	0.49	0.28	0.40
PAN	0.56	0.47	0.20	0.23	0.42	0.38
SLV	0.53	0.34	0.60	0.15	0.18	0.36
DOM	0.58	0.64	0.05	0.18	0.31	0.35
GTM	0.34	0.12	0.05	0.10	0.24	0.17
HND	0.32	0.24	0.00	0.07	0.16	0.16

## Appendix II: Methodology

### Baseline: 2022 onwards

There has been an improvement in data collection in Latin America over the past few years. The new Latin America Index uses datasets published from 2022 onwards, better illustrating the current state of digital readiness.

The COVID-19 pandemic has caused a complete shift in the world we know today. Countries had to rapidly ramp up their digital economies and overall capabilities, so we took the decision to include these new measures.

### Normalization of indicators

The min-max scaler has been used to normalize certain indicators. This helps compare indicators which are orders of magnitude apart, as some indicators are gross numbers and others may be percentage points. This also has the added advantage of being more intuitive as all indicators are now numbers between 1 and 0.

Some indicators have been normalized to GDP or population to compare across countries and not bias countries with larger population or landmass. In addition, the methodology ensures a comprehensive and balanced representation of economic and demographic factors.

### Computation of the Digital Money Index

Each of these indicators has been averaged equally into the pillars and the index. There is a low multicollinearity in our model as we recognize that there are few items which are highly correlated. Recognizing the nuances between correlation and causation is essential for deriving actionable insights from the Digital Money Index.

## Appendix III: Pillars

Making the shift to digital money depends on action across all five Index pillars:



### Pillar I: Government and Market Support

#### 1.1. National broadband strategy

This metric assesses the presence and effectiveness of a national strategy or plan aimed at expanding and improving broadband internet access and infrastructure within a country. A comprehensive national broadband strategy is crucial for enhancing digital connectivity and promoting economic growth.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.2. Government e-inclusion strategy

The government e-inclusion strategy metric evaluates whether a country has a well-defined strategy to ensure that all citizens, regardless of their socio-economic status, have access to and benefit from digital services and information. This strategy is pivotal for reducing the digital divide.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.3. Government initiatives – wi-fi availability

This metric indicates the extent to which the government has implemented initiatives to provide public wi-fi access in various locations, such as public spaces, government buildings, and transportation hubs. The availability of public wi-fi contributes to improved digital access for the population.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.4. National digital ID system

This metric measures the presence and effectiveness of a national digital identification system. A robust digital ID system is essential for secure and efficient online transactions, government services, and overall digital inclusion.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.5. Privacy regulations

Privacy regulations gauge the existence and enforcement of laws and regulations that safeguard individuals' personal data and privacy in the digital realm. Strong privacy regulations are fundamental in building trust in digital services and protecting citizens' data.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.6. Support for digital literacy

This metric examines the government's efforts to provide digital literacy and skills training programs to its citizens. Digital literacy initiatives are essential to empower individuals to participate in the digital economy effectively.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

#### 1.7. E-Government Index (EGDI)

The E-Government Index assesses the maturity and effectiveness of a country's online government services, website development patterns in a country including the accessibility (infrastructure and educational levels) and user-friendliness of government websites, the availability of digital forms and services, and the overall digitalization of government-citizen interactions. The EGDI is a composite measure of three important dimensions of e-government, namely: provision of online services, telecommunication connectivity and human capacity

Source: <https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index>

Year: 2022



**1.8. Cybercrime laws**

Cybercrime laws evaluate the legal framework in place for addressing cybercrimes, such as hacking, online fraud, and digital attacks. Having strong cybercrime laws is crucial for deterring and prosecuting digital criminal activities.

Source: <https://unctad.org/node/19969>

Year: Until 2022

**1.9. Consumer protection laws**

Consumer protection laws assess the legal measures in place to protect consumers in their online transactions and interactions. Strong consumer protection laws are essential for ensuring fair and secure digital commerce.

Source: <https://unctad.org/node/31735>

Year: Until 2022

**1.10. E-Transactions (E-TRX) Laws**

This metric evaluates the legal framework governing electronic transactions (E-TRX) in a country. It encompasses laws related to digital signatures, electronic contracts, and online transactions, ensuring the legality and security of digital business dealings.

Source: <https://unctad.org/node/19971>

Year: 2022

**1.11. Regulatory framework for Open Finance**

The regulatory framework for Open Finance assesses the advance of Government entities and the presence of regulations promoting and governing Open Banking and Open Finance, as these promote competition, interoperability, efficiency and innovation to gain access to financial services and develop solutions.

The following scale was used for the assessment:

Value	Detail
0	Not specific regulation in place. Not included at government digital agenda
0.15	Not specific regulation in place. Included in government digital agenda, early stage
0.25	Not specific regulation in place. At official exploration stage by government and/or financial players (market driven: bank association and/or fintech association)
0.5	Not specific regulation in place. In proof of concept or pilot (regulatory or market driven) and/or primary Regulation In progress (draft).
0.65	Officially launched, primary regulation issued, secondary regulation in progress.
0.75	Officially launched under discussions, primary regulation issued, secondary Regulation in progress and official active working teams and/or pilots in place to issue remaining definitions.
0.8	Officially launched under implementation, primary regulation and secondary provisions issued. Include official target dates defined for data sharing and payment initiation and players performing developments to comply with secondary provisions on target date for data sharing and for payment initiation. If just one phase is live (public data sharing), and remaining phases are on hold (transactional private data and payment initiation).
1	Officially launched, implemented and live with phase including private data sharing and payment initiation.

Source: Official government publications of Open Banking/ Open Finance regulations, primary regulation and secondary provisions. Citi interactions with government entities to map digital agenda priorities to modernize financial services and financial market infrastructure.

Year: Until Oct 2023

**1.12. Regulatory framework for instant payments**

This metric evaluates the regulatory framework in place for instant payment systems, which enable real-time, secure, and convenient digital payments. Effective regulation is essential to ensure the smooth operation of such systems.

The following scale was used for the assessment:

Value	Detail
0	Not specific regulation in place. Not included at government digital agenda
0.15	Not specific regulation in place. Included in government digital agenda, early stage
0.25	Not specific regulation in place. At official exploration stage by government and/or financial players (market driven: bank association and/or fintech Association)
0.5	Not specific regulation in place. In proof of concept or pilot (regulatory or market driven) and/or primary regulation in progress (draft).
0.65	Officially launched, primary regulation issued, secondary regulation in progress.
0.75	Officially launched under discussions, primary regulation issued, secondary regulation in progress, target dates defined and official active working teams and/or pilots in place to issue remaining definitions.
0.8	Officially launched under implementation, primary regulation and secondary provisions issued. Include official target dates and players performing developments to comply with secondary provisions on target date for data sharing and for payment initiation. If just one phase low impact is live (public data sharing), and remaining phases are on hold (transactional private data and payment initiation).
1	Officially launched, implemented and live.

Source: Official government publications of regulations, primary regulation and secondary provisions. Citi interactions with government entities to map digital agenda priorities to modernize financial services and financial market infrastructure. Year: Until Oct 2023

**1.13. Regulatory framework for digital assets as official currency**

This metric examines the legal and regulatory framework governing digital assets, including cryptocurrencies and CBDC, to enable them as official currencies.

The following scale was used for the assessment:

Value	Detail
0	Not specific regulation in place. Not included at government digital agenda
0.15	Not specific regulation in place. Included in government digital agenda, early stage
0.25	Not specific regulation in place. At official exploration stage by government and/or financial players (market driven: bank association and/or fintech association)
0.5	Not specific regulation in place. In proof of concept or pilot (regulatory or market driven) and/or primary regulation in progress (draft).

Value	Detail
0.65	Officially launched, primary regulation issued, secondary regulation in progress.
0.75	Officially launched under discussions, primary regulation issued, secondary regulation in progress and official active working teams and/or pilots in place to issue remaining definitions.
0.8	Officially launched under implementation, primary regulation and secondary provisions issued. Include official target dates and players performing developments to comply with secondary provisions on target date.
1	Officially launched, implemented and live.

Source: Official government publications of regulations, primary regulation and secondary provisions. Citi interactions with government entities to map digital agenda priorities to modernize financial services and financial market infrastructure.  
Year: Until Oct 2023

#### 1.14. Financial services regulatory sandbox and innovation hubs in place

Financial services sandbox refers to a controlled environment where innovative financial technologies and services can be tested and developed without the full regulatory burden. This provides room for experimentation while guiding regulation toward embracing emerging technologies and services, as well as encourage financial institutions and fintech innovation while maintaining financial stability.

The following scale was used for the assessment:

Source: Official government publications and IDB 2022

Value	Detail
0	No financial services regulatory sandbox neither innovation hubs available
+0.5	Innovation hub
+0.5	Financial services regulatory sandbox

Year: Until Oct 2023

#### 1.15. Government online services score

The government online service index assesses the quality of a government's delivery of online services on a 0-to-1 (best) scale. Researchers create the assessment to evaluate "each country's national website in the native language, including the national portal, e-services portal, and e-participation portal, as well as the websites of the related ministries of education, labor, social services, health, finance, and environment, as applicable."

Source: NRI 2022 <https://networkreadinessindex.org/>

United Nations Department of Economic and Social Affairs (UNDESA), UN E-Government Knowledgebase

<https://publicadministration.un.org/egovkb/en-us/>

Year: 2022





## Pillar II: ICT (Information and Communication Technology) Infrastructure

### 2.1 Broadband latency

Broadband latency measures the delay or lag in data transmission over a broadband internet connection. Lower latency indicates faster and more responsive internet service, which is crucial for activities like online gaming, video conferencing, and real-time data transfer.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

### 2.2. Mobile latency

Mobile latency assesses the delay in data communication over mobile networks.

Low mobile latency is essential for smooth and responsive mobile applications, including mobile gaming and real-time communication.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

### 2.3. 5G deployment

This metric evaluates the extent to which 5G technology has been deployed within a country.

5G networks offer significantly faster data speeds and reduced latency, enabling new applications and services like autonomous vehicles and IoT devices.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

### 2.4. 4G coverage

4G coverage measures the geographical reach and availability of 4G mobile network services within a country.

Widespread 4G coverage is fundamental for high-speed mobile internet access across urban and rural areas.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

### 2.5. Online service index

The online service index assesses the quality and accessibility of online services within a country, including e-commerce, e-health, e-education, and more.

A high Online Service Index signifies a robust digital infrastructure for service delivery.

Source: <https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index>

Year: 2022

### 2.6. Telecom infrastructure

This metric evaluates the state of a country's telecommunications infrastructure, including the availability and quality of telecommunications networks, fiber optic cables, and satellite communications. Strong telecom infrastructure is the backbone of digital connectivity.

Source: <https://publicadministration.un.org/egovkb/en-us/About/Overview/-E-Government-Development-Index>

Year: 2022

**2.7. Score secure internet servers**

Secure internet servers (per million population, 2020). Secure internet servers are servers that use encryption technology in Internet transactions.

Source: NRI 2022 <https://networkreadinessindex.org/>

World Bank, World Development Indicators <http://data.worldbank.org/data-catalog/world-developmentindicators>).

Year: 2020

**2.8. Private initiatives – wi-fi availability**

This metric considers the availability of public wi-fi access initiated by private entities, such as businesses, local communities, or non-government organizations. Private initiatives to provide public wi-fi contribute to improved digital access for the population.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

**2.9. Funding for broadband buildout**

Funding for broadband buildout measures the financial investments and government support allocated to expand and improve broadband infrastructure. Adequate funding is essential for the deployment of high-speed internet services in underserved areas.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

**2.10. Internet access**

Digital economies grow when the most amount of people are connected to the internet. This metric measures the percent of the population with access to the internet. The most recent published year is considered.

Source: World Bank <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=ZJ>

Year: 2021

**2.11. Percent of population with a smartphone**

Smartphones are usually the best way people interact with a digital economy. This metric is defined by the percentage of the population (aged 15+) who are smartphone users.

Source: <https://www.statista.com/forecasts/274689/latam-number-of-smartphone-users-by-country>

Year: Survey Year: 2022

**2.12. Broadband download speed (Mbps)**

This metric is given by the average broadband download speed of a country. Broadband download speed determines what people can do on the internet.

Source: Statista Market Insights

Year: 2022 6th Edition



### Pillar III: Financial Market Infrastructure Modernization

#### 3.1 P2P instant payments operating infrastructure

Peer-to-peer (P2P) instant payments operating infrastructure measures the readiness and accessibility of infrastructure to support real-time peer-to-peer payments. This infrastructure includes systems and networks that enable individuals and entities to conduct instant fund transfers directly to one another, facilitating efficient and convenient financial transactions.

The following scale was used for the assessment:

Value	Detail
0	No instant payment scheme operating
0.25	Instant payment scheme operating with low adoption and/or more than 2 limitations (24/7, threshold, timing (more than 40 seconds) interoperability)
0.50	Instant payment scheme operating with limitations and medium/high adoption (24/7, threshold, interoperability)
1	Instant payment scheme operating

Source: Official Government and/or Market Publications

Year: 2023

#### 3.2. B2P, B2B, G2P instant payments infrastructure

This metric evaluates the presence and functionality of the infrastructure necessary for business-to-person (B2P), business-to-business (B2B), and government-to-person (G2P) instant payments. Such infrastructure is essential for seamless, secure, and timely financial transactions between businesses, individuals, and government agencies and to promote commerce and economic growth.

The following scale was used for the assessment:

Value	Detail
0	No instant payment scheme operating
0.25	Instant payment scheme operating with low adoption and/or more than 2 limitations (24/7, threshold, timing (more than 40 seconds) interoperability)
0.50	Instant payment scheme operating with limitations and medium/high adoption (24/7, threshold, interoperability)
1	Instant payment scheme operating

Source: Official Government and/or market publications

Year: 2023



### 3.3. Open Finance operating infrastructure

Open Finance operating infrastructure assesses the readiness and availability of infrastructure that supports Open Banking and financial data sharing. This infrastructure enables secure and regulated access to financial data, empowering financial technology innovations and fostering competition in the financial sector.

The following scale was used for the assessment:

Value	Detail
0	No Open Finance scheme operating
+0.25	Open Banking/Finance public data sharing operating
+0.25	Open Banking/Finance private data sharing operating
+0.25	Open Banking/Finance payment initiation Operating
+0.25	Open Finance operating data sharing operating + private data sharing operating + payment initiation operating

Source: Official government and/or market publications – Check annex

Year: 2023

### 3.4. Digital assets operating infrastructure

Digital assets operating infrastructure, including authorized eWallets, evaluates the authorized infrastructure/schemes that enables the issuance, trading, and/or management of digital assets such as CBDCs, cryptocurrencies and tokenized assets.

The following scale was used for the assessment:

Value	Detail
0	No digital asset infrastructure/model authorized and operating
+0.5	Retail digital asset infrastructure/model authorized and operating
+0.5	Wholesale digital asset infrastructure/model authorized and operating

Source: Official government and/or market publications

Year: 2023

### 3.5. Interoperability between banks and eWallets

This metric evaluates if there is interoperability between banks and authorized eWallets/ electronic deposits/mobile money accounts.

The following scale was used for the assessment:

Value	Detail
0	No interoperability
0.5	Yes, limited (Limited entities).
1	Yes, full interoperability



## Pillar IV: Digital Money Solutions

### 4.1 Online access to financial accounts

People who used a mobile phone or the internet to access a financial institution account in the past year (percentage with a financial institution account, aged 15+, 2017). The online access to financial account indicator refers to the percentage of people who have a financial institution account that report using a mobile phone or the Internet to access their financial institution account within the past 12 months.

Source: NRI 2022 <https://networkreadinessindex.org/>

World Bank, Global Findex Database (<https://globalfindex.worldbank.org/>). Data year: 2020/2022

### 4.2. Percentage of population using mobile money services

Share of adult population who use mobile money service in Latin America in 2021. Sourced via face-to-face and phone interviews.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022

### 4.3. Percentage of accounts in financial institutions per population

This metric measures the amount of bank accounts per million population (aged 15+).

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022



## Pillar V: Propensity to Adopt

### 5.1 Adoption of emerging technologies

Average answer to survey questions concerning the extent to which companies adopt five types of emerging technology (2019). The annual World Economic Forum's Executive Opinion Survey (EOS) gathers information from business leaders on topics with scarce or non-existent data. It is part of the effort to supplement The Global Competitiveness Report in assessing issues that drive national competitiveness.

The adoption of emerging technologies indicator refers to the average answer of a similarly-worded question posited by the EOS regarding five different emerging technologies (artificial intelligence, robotics, app- and web-enabled markets, big data analytics, and cloud computing):

"In your country, to what extent are companies adopting artificial intelligence?" (1: not at all; 7: to a great extent - on par with the most technologically advanced economies)

Source: NRI 2022 <https://networkreadinessindex.org/>

World Economic Forum, Executive Opinion Survey 2019 (<http://reports.weforum.org>).

Data year: 2019.

### 5.2. Socioeconomic gap in the use of digital payments

Difference between rich and poor income groups that made or received digital payments in the past year (percentage, aged 15+, 2021). The following indicator refers to the share of the poorest 40% and the richest 60% income groups in a country that made or received digital payment within the past 12 months. Made digital payments include the use of "mobile money, a debit or credit card, or a mobile phone to make a payment from an account, or report using the internet to pay bills or to buy something online." Received digital payments include receiving money "directly from or into a financial institution account or through a mobile money account." Final scores express the ratio of the share related to the poorest 40% over the share related to the richest 60%.

Source: NRI 2022 <https://networkreadinessindex.org/>

World Bank, Global Findex Database (<https://globalfindex.worldbank.org/>).

Data years: 2014-2021

**5.3. Prevalence of the gig economy**

Average answer to the question: In your country, to what extent is the online gig economy prevalent? [1 = Not at all; 7 = To a great extent] (2020).

The annual World Economic Forum's Executive Opinion Survey (EOS) gathers information from business leaders on topics with scarce or non-existent data. It is part of the effort to supplement The Global Competitiveness Report in assessing issues that drive national competitiveness. The gig economy refers to a labor market specific to digital platforms and work arrangements focused on short-term contracts and task-based work.

Source: NRI 2022 <https://networkreadinessindex.org/>

World Economic Forum, Executive Opinion Survey 2017–2020 (<http://reports.weforum.org>).

Data years: 2017–2020.

**5.4. E-commerce as % of population**

E-commerce refers to the sale of physical goods via a digital channel to a private end consumer (B2C). This metric is the penetration of e-commerce usage in the population.

Source: Statista Market Insights

<https://www.statista.com/outlook/emo/ecommerce/worldwide?currency=usd>

Year: August 2023

**5.5. Trust in online privacy (Previous 4.1)**

Trust in online privacy assesses the level of confidence that individuals have in the security and privacy of their personal information when engaging in online activities. It measures the perceived safety and protection of online privacy, which is essential for user confidence and participation in digital services.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

**5.6. Use of virtual social networks (Previous 4.2)**

The use of virtual social networks indicator refers to the penetration of active social media users expressed as a percentage of the total population. Original data comes from a variety of sources, including company statements and reports in reputable media.

Source: NRI 2022 <https://networkreadinessindex.org/>

We Are Social and Hootsuite Global Digital Report 2020 (<https://wearesocial.com/digital-2020>).

**5.7. Firms' website presence (Previous 4.3)**

The data for the firms with website indicator consists of enterprise surveys conducted by the Organization for Economic Co-operation and Development (OECD) and the World Bank. OECD data is used for OECD countries, accession countries, or key partners, while all other country data is sourced from the World Bank.

Source: NRI 2022 <https://networkreadinessindex.org/>

OECD, ICT Access and Use by Businesses, OECD Telecommunications and Internet Statistics database (<https://doi.org/10.1787/9d2cb97b-en>); World Bank, Enterprise Surveys ([www.enterprisesurveys.org](http://www.enterprisesurveys.org)). Year: 2021

**5.8. Ecommerce safety (Previous 3.5)**

E-commerce safety assesses the security and safety measures in place for online commerce and financial transactions.

This metric examines the extent to which a country has implemented safeguards to protect consumers and businesses from fraudulent activities, ensuring secure and trustworthy e-commerce environments.

Source: <https://impact.economist.com/projects/inclusive-internet-index/>

Year: 2022 6th Edition

**5.9. Withdrew money from a financial institution account 2 or more times a month**

The percentage of respondents (aged 15+) who report withdrawing money from their account two or more times per month.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022

**5.10. Made or received a digital payment**

The percentage of respondents (aged 15+) who report using mobile money, a debit or credit card, or a mobile phone to make a payment from an account, or report using the internet to pay bills or to buy something online or in a store, in the past year. This includes respondents who report paying bills, sending or receiving remittances, receiving payments for agricultural products, receiving government transfers, receiving wages, or receiving a public sector pension directly from or into a financial institution account or through a mobile money account in the past year.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022

**5.11. Store money using a financial institution or a mobile money account**

The percentage of respondents (aged 15+) who report keeping money in a financial institution account or a mobile money account.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022

**5.12. Saved at a financial institution or using a mobile money account**

The percentage of respondents (aged 15+) who report saving or setting aside any money at a bank or another type of financial institution or using a mobile money account to save in the past year.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022

**5.13. Borrowed any money from a formal financial institution or using a mobile money account**

The percentage of respondents (aged 15+) who report borrowing any money from a bank or another type of financial institution, or using a credit card, or using a mobile money account in the past year.

Source: The Global Findex Database <https://www.worldbank.org/en/publication/globalfindex/Data>

Year: 2021/2022



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