

Cloud in Latin America: Opportunities and challenges for financial services

Digital Finance Briefing Note
February 28, 2022

In previous publications, we have emphasised the role of cloud computing as a vital enabler of digital transformation for financial services, as well as a key source of resilience during the pandemic.¹ This note explores the opportunities that cloud computing can unlock in the Latin America region (LatAm)², and some of the challenges that will need to be addressed for that promise to be fulfilled.

In LatAm, we find that cloud-enabled services have been a key enabler of dramatic increases in financial inclusion measures during the pandemic. We also see that cloud adoption is increasingly becoming mainstream in financial services and e-commerce. However, barriers and challenges to cloud adoption remain, including regulatory ambiguity and data localization measures. We close with some recommendations on these topics, and next steps.

1. The mainstreaming of cloud in LatAm financial services

In recent times, there are increasing signs that cloud adoption is becoming mainstream in LatAm financial services and e-commerce more broadly.

The LatAm economy is forecast to spend \$460 billion on IT from 2020 to 2023, 35% of which relates to the cloud.³ While cloud adoption is growing with every region, cloud adoption in a recent Accenture survey was led by Latin and North America with 27% and 20% “high adopters,” respectively.⁴ In Brazil, 52% of companies use some type of cloud as part of their digital infrastructure, even if combined with a traditional data center.⁵

Growth in cloud use is increasing rapidly and moreover appears to be accelerating as a result of the pandemic. The cloud market in LatAm had been expected to grow at a 22.4% compounded annual growth rate (CAGR) from 2019 to 2023, with expected growth of 43% for Infrastructure as a Service (IaaS).⁶ Additionally, 75% of large regional enterprises are expected to have put a

¹ See e.g. IIF (2018), [Cloud Computing in the Financial Sector Part 1: An Essential Enabler](#), August; IIF (2020), [Cloud Computing: A Vital Enabler in Times of Disruption](#), June; and IIF – Deloitte (2021), [Realizing the Digital Promise: Call to Action](#), October.

² The region includes the economies of South America, Central America and, for some measures, includes the Caribbean.

³ IDC, as cited by Access Partnership (undated), [The Future of Banking: Adopting Cloud-Based Solutions in Latin America](#)

⁴ Accenture (2020), [Sky high hopes: Navigating the barriers to maximizing cloud value](#)

⁵ IDC, as cited by Mari, A, (2021) [Pandemic accelerates cloud adoption in Latin America](#), ZDNet, July 13.

⁶ GlobalData (2020), [Cloud Computing in Latin America: Telco Cloud Offers, Best Practices and Market Opportunity](#).

mechanism in place by early 2022 to shift to cloud-centric infrastructure and applications, twice as fast as before the pandemic.⁷

A clear signal of the mainstreaming of cloud adoption in LatAm financial services is the recent announcement of a 10-year deal between **Itaú Unibanco**, LatAm's biggest bank, and Amazon Web Services (**AWS**), under which Itaú Unibanco will move the majority of its IT infrastructure out of on-premises data centers to the cloud. Itaú Unibanco will also migrate its core banking platforms, call center solutions, online, and mobile banking applications to AWS. The bank leverages AWS services to provide secure, scalable compute capacity for Pix, Brazil's first nationwide digital instant payment platform that helps reduce reliance on cash and credit card-based transactions, and to quickly launch and scale new financial services offerings, including iti, the bank's free digital account platform that allows users to scan QR codes to easily and securely pay for products and services and transfer funds.⁸

Grupo Santander is undergoing digital transformation to bolster its service proposition to customers and teams. The Optimized Hosting Environment platform it has created ramps up its cloud adoption, having already migrated 60% of its global IT infrastructure. Santander's stated goal is to complete its cloud migration by 2023 to become a fully digitally-enabled bank.⁹

The rise of cloud-enabled neobanks and fintech/paytechs is a strong trend seen elsewhere which is gathering pace in LatAm. As well as NYSE-listed **Nubank**, whose IPO recently raised \$2.6 billion, some other notable names active in the region include **Neon Bank**, in which **BBVA** recently invested \$300 million, **C6 Bank**, **Banco Patagonia** and Berlin-based **N26**, which is powered by the Mambu platform.¹⁰ Cloud-native neobanks are also hopping across borders and offering new products, many targeted at the financially excluded. Digital bank **Ualá** landed in Colombia recently, its third market after Argentina and Mexico, offering a novel lending product **Cuotas** alongside its Mastercard debit card.¹¹ Among fintechs, the cloud-native **Rappi** delivery app was founded in 2015 in Colombia and quickly became a success across 250 cities in nine South American countries. In 2018, the company became the second Colombian unicorn.¹² The Mexican paytech **Clip**, provider of an e-payments terminal, is another fintech recently cited as a major consumer of cloud services.¹³

In the e-commerce space, Brazilian retailer **Magazine Luiza**, believing that it would have better performance and stability to handle Black Friday traffic running on Google Cloud Platform (**GCP**), migrated 113 apps in less than 60 days before Black Friday, 2018. It was a move that paid off: 2018 was its biggest Black Friday ever, and it saw levels of API traffic that were dramatically higher than before. Apigee helped Magazine Luiza with its execution, meeting customer demand across its platforms, with visibility across all of its API and application activity.¹⁴

⁷ IDC, as cited in Access Partnership (undated), *op. cit.*

⁸ Nasdaq (2020), [Itaú Unibanco Selects AWS as Its Long-Term Strategic Cloud Provider to Accelerate Digital Transformation](#), November 30.

⁹ Grupo Santander (2021), [Santander Cloud: the company's progress in digitalization and SME services](#), July 26.

¹⁰ LABS (2021), [Berlin-based neobank N26 leaves the U.S. and officially lands in Brazil](#), December 22 and Mambu (undated), [The rise of a digital banking pioneer](#)

¹¹ LABS (2022), [Ualá's installment solution is used by over 750,000 customers in Argentina](#), February 5.

¹² Houweling, E. (2021), *op. cit.*

¹³ Intricately (2021), [The LATAM Startups That Cloud Providers Should Be Watching in 2021](#), blog post.

¹⁴ Fatała, A. (2019), [Magazine Luiza: How we transformed our e-commerce platform with Apigee, Firebase, and GCP](#), Google Cloud Blog.

Also in the e-commerce space, in another example of a major cloud deal, major Argentine e-commerce platform **Mercado Libre** migrated 5,000 databases to AWS's DynamoDB. Using the new solution, the company saved developer time, improved reliability, and reduced costs.¹⁵ Perhaps reflecting this new robustness and scalability, user numbers at the Argentine rival to Amazon rose almost 80% during the pandemic, to more than 130 million.¹⁶ MercadoLibre also has a mobile wallet business valued at \$2 billion, which operates a loan business to sellers.¹⁷

2. Cloud as a driver of digital financial inclusion

Previous work has highlighted the potential for cloud adoption to increase financial inclusion.¹⁸ In line with this, cloud enabled technologies have been a key driver of improved financial inclusion in LatAm during the pandemic.

Measures of financial inclusion have risen sharply in LatAm in recent times, partly in response to the choices made by governments in delivering pandemic relief. Prior to the pandemic, an average of only 55% of Latin American adults had an account at a financial institution.¹⁹ COVID-19 related social benefits programs, including pandemic relief payments to bank accounts, through payment apps and to private digital wallets, helped financially integrate more than 40 million people in Brazil, Colombia, and Argentina alone. Brazil reduced its unbanked population by 73%, while Colombia and Argentina also made reductions of 8% and 18% respectively. If similar programs in Chile, Peru, and Uruguay had a similar effect, it is estimated that the unbanked population in all of LatAm will have been reduced by 25% due to the impact of COVID-19 social benefit programs alone.²⁰

Cloud has been an integral part of the digital wallets and payment apps powering this financial inclusion story. **PicPay** and **Nequi** are powered by AWS;²¹ Daviplata provider **Banco Davivienda** and PagBank provider **PagSeguro** have partnered with GCP;²² and **MOVii** is powered by Comviva's mobiqurity platform, which enables over 70 digital financial services in more than 50 countries.²³

LatAm is still a relatively small and undeveloped part of the global cloud market, as well as a region with a lot of diversity in outcomes. The diversity across the region, in terms of both digital and financial inclusion, is strikingly apparent from **Chart 1**, showing penetration rates (pre-pandemic) for bank accounts, smartphones, and credit cards.

¹⁵ AWS (2021), [Mercado Libre Case Study](#)

¹⁶ Mari, A. (2021), [Pandemic provides the push for Latin America to embrace the cloud](#), *Financial Times*, May 18.

¹⁷ Houweling, E. (2021), [Viva fintech in Latin America – why the region's neobanks are booming](#), *The Verdict*, November 17.

¹⁸ IIF (2021), *op. cit*; Digital Monetary Institute (DMI) and AWS Institute (2020), [Enabling financial inclusion in APAC through the Cloud](#) (25 November), p. 7.

¹⁹ Mastercard and Americas Market Intelligence (AMI) (2020) [Financial Inclusion during COVID](#), October, citing the World Bank.

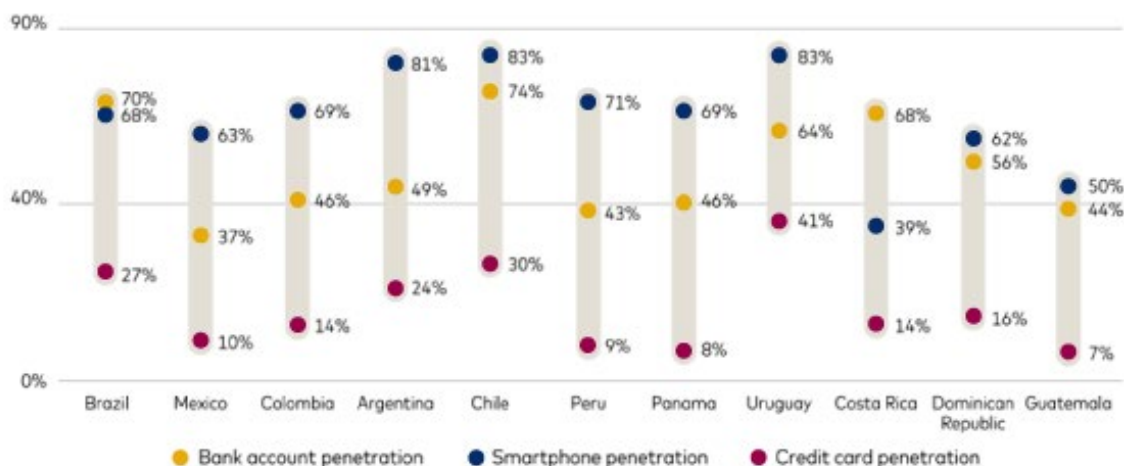
²⁰ Mastercard and AMI (2020), *op cit*. Figures measured as at August 2020 relative to pre-pandemic levels.

²¹ AWS (2021), [PicPay Keeps Pace with 126% Growth Rate with MongoDB \(Atlas\) and AWS](#), August; Pragma, [Nequi: Agile Cloud Services In Compliance With Security Standards](#), undated.

²² Google, [Banco Davivienda: Driving a digital transformation strategy with Google Workspace](#), undated; and [Acquisition Agreement with respect to the acquisition of Google Cloud services April 27, 2021](#)

²³ Comviva (2021), [MOVii achieves 1.5 million customer milestone powered by Comviva's digital wallet platform](#), July 1.

*Chart 1: Diversity and opportunity characterises the LatAm region
Measures of digital and financial inclusion among adults, 15 y/o+*



Sources: World Bank Findex, GSMA, local sources, AMI analysis, as cited in Mastercard and AMI (2020), *op. cit.*

3. Addressing the challenges and barriers to cloud adoption

The flip side of such wide disparities is huge opportunities for those FIs, and other players, that are able to seize the opportunities in terms of unaddressed market. Cloud, as we have argued consistently, is a key enabler of the sorts of transformation that will make this happen.

Of course, in a region of such diversity and different levels of development, major challenges and barriers to cloud adoption remain, relating most notably to regulatory and governance issues; data localization measures; skills and talent; and infrastructure and connectivity. For each of these, the IIF has or references recommendations on how FIs and policymakers should address those challenges and barriers.

a. Regulatory and governance issues

In the area of regulation and governance, a recent study by Access Partnership identified three potential barriers to cloud adoption for FIs:

- a lack of trust by consumers, businesses, or regulators in data governance or privacy around data held in the cloud;
- ambiguity and lack of government endorsement; and
- increased public attention and new data governance regulations.²⁴

²⁴ Access Partnership (undated), *op. cit.*

Similarly, “Security and compliance risks” was the top-cited barrier in a global study of barriers to cloud adoption by Accenture.²⁵

As we found in our study on cloud adoption and regulation in Asia-Pacific financial services²⁶, regulators and FIs themselves generally see potential benefits in terms of cybersecurity from cloud adoption, particularly for smaller institutions, given the increased sophistication of cyber defenses and patching at CSPs, as well as failover arrangements. This chimes with findings of BCG, which reports that the risk profile of cloud providers is no longer a significant point of difference between the public cloud and on-premises data centers.²⁷ In terms of risks, many Asia-Pacific regulators warned that misconfiguration risk is key and that FIs need to fully understand all aspects of cloud installations they are responsible for. This also relates to the skills and talent issue, tackled below.²⁸

Addressing the barrier: Clarifying regulatory expectations and removing grey areas around cyber-security, particularly around information held in CSPs, is essential to giving FIs the confidence to embrace the cloud while keeping valuable customer information safe, and to ensuring that consumers and client businesses also can place trust in these arrangements.

b. Data localization measures

One particular topic that has emerged as a major pain point for FIs seeking to adopt cloud solutions is **data localization**. These measures can take 3 broad forms:

- conditional limitations on data export (for example, on personal information);
- local copy or processing requirements, i.e. the requirement to maintain a local copy or local processing of a particular dataset in jurisdiction;
- “hard” localization, i.e. outright prohibitions on data export, or where export is only permitted under very challenging conditions (such as individual regulator approvals).

In terms of quantifying the costs of data localization, a 2018 Organization for Economic Cooperation and Development (**OECD**) report found that digitalization is linked with greater trade openness, selling more products to more markets, and that a 10% increase in bilateral digital connectivity increased trade in services by over 3.1%.²⁹ Similarly, The World Bank studied six developing countries and the 28 Member States of the EU and found that data localization requirements can reduce GDP by up to 1.7%, investments up to 4%, and exports by 1.7%.³⁰

The Information Technology and Innovation Foundation (**ITIF**) did a major study on data localization measures in 2021. It developed an economic model that links a Data Restrictiveness Index (**DRI**) (on a scale between 0 and 6, with 6 indicating the most data restrictive) with other economic indicators. The model suggests that over a given five-year period, a one-unit increase in a country’s DRI is associated with a 7% decrease in its gross output traded, a 2.9% decrease in

²⁵ Accenture (2020), *op. cit.*

²⁶ IIF (2021), *Cloud Adoption and Regulation in Asia-Pacific Financial Services*, November.

²⁷ BCG (2021), [Financial Institutions Need to Pursue Their Own Path to the Cloud](#), May 5.

²⁸ IIF (2021), *op. cit.*

²⁹ OECD (2018), [Digital Trade and Market Openness](#), OECD Trade Policy Papers, No. 217.

³⁰ IDB (2018), *op. cit.*, fn 8.

productivity in downstream industries, and a 1.5% increase in prices among the goods and services those industries provide.³¹

The ITIF study found data localization measures in place or proposed in a number of LatAm geographies, namely Brazil, Chile, Mexico, Peru, and Venezuela.³²

One particular frustration for regionally active FIs in Asia Pacific is those jurisdictions that provide exceptions to data localization on paper, but where the process for activating those exceptions leads nowhere. Similarly, we have received anecdotal reports that the restrictions on data localization in the United States-Mexico-Canada Agreement (USMCA) are not necessarily being honored in practice by regulators on the ground. In this regard, the ITIF study also noted that Mexico's financial regulators released draft rules requiring payments services to use local computing services as part of their license application.³³

From the IIF's perspective, fundamentally data localization interferes with the principle that data has greatest value when it is able to be utilized freely (with client consent). Data localization requirements that prevent the flow of data, or render that flow more expensive, therefore involve an impairment in value that would otherwise be present.³⁴

Addressing the barrier: As a guiding principle, prior to imposing any data localization measures, regulators and policymakers are encouraged to be clear on the regulatory objective, demonstrate that the rules imposed are the least restrictive means of achieving those objectives, and remain open to new alternative solutions.

Means such as encryption and other privacy-enhancing technologies should be explored, wherever practicable, as alternatives to rules that balkanize the global data economy and prevent the full value of data from being realized, to the ultimate benefit of clients and end users. Existing data localization measures that cannot pass this test should be removed.

c. Skills and talent

According to a recent Accenture survey that included the input of C-suite executives from banks in 17 countries, more than 40% of employees ranked "lack of cloud skills within the organization" as one of their top three barriers to cloud adoption, and 54% of CEOs overall rank the skills issue highest as a Top 3 concern.³⁵

This chimes with findings from our work on cloud adoption in APAC financial services, where regulators we spoke to said availability and retention of talent is an issue – particularly specific, granular expertise around cloud migration, data management, and the characteristics of particular CSP offerings.

³¹ ITIF (2021), [How Barriers to Cross-Border Data Flows Are Spreading Globally, What They Cost, And How To Address Them](#), July

³² ITIF (2021), *op. cit.*, p. 48-49.

³³ ITIF (2021), *op. cit.*, p. 10.

³⁴ IIF (2021), *op. cit.* See further IIF (2020), [Data Localization: Costs, Tradeoffs, and Impacts Across the Economy](#), December, pp. 2-3.

³⁵ Accenture (2020), *op. cit.* cited by Access Partnership (undated), [The Future of Banking: Adopting Cloud-Based Solutions in Latin America](#).

A number of regulators (and some FIs) mentioned they saw FIs reskilling existing workforces as essential in addressing this issue. Other mitigants mentioned by authorities included partnering with CSPs and consultants. One monetary authority in Asia-Pacific went further than regional peers in its efforts to foster talent, saying:

We foster multiple schemes for practitioners to upskill, such as by inviting CSPs to give free training, and in future by working with universities to ensure that computer science courses are relevant to these new technologies.

BCG has stated that every institution needs to build some “muscle” in cloud. For organizations that want to lower the risk and cost of cloud adoption, training staff and building capabilities are just as important as pursuing a specific outcome or benefit.³⁶

Addressing the barrier: FIs and authorities should seek to identify cloud knowledge gaps, including the specifics of particular CSPs’ cloud service offerings. FIs and authorities should work to fill those gaps, including by constructive engagement with CSPs and with the education sector.³⁷

d. Infrastructure and connectivity

One of the critical factors in determining the feasibility and successful use of cloud computing and the build-out of cloud infrastructure in a country is the availability of underlying infrastructure required by the cloud service providers.³⁸

If broadband or mobile penetration is low, or infrastructure unreliable, lack of access or connectivity issues will prevent users from making optimal use of cloud offerings, which will affect the speed with which investments in cloud by FIs pay off. Cloud infrastructure also requires reliable access to electricity, ideally economically priced and generated from renewable or low-emissions sources.

Across these topics, the story is improving quickly, but there is still considerable room for improvement, particularly in those countries in the region that have fallen behind.

As for data connectivity, internet use per head of population increased rapidly from 48.6% in 2014 to 68.2% in 2019.³⁹ However, large disparities across the region remain; Guyana, for example, had a 37.3% rate in 2017, the most recent year for which figures are available, while Chile had 82.3% in the same year.

Mobile penetration, too, continues to climb. The mobile penetration rate across the region is projected to reach over 73% per head of population or 485 million in 2025, up from 69% or 437 million in 2020, growing at a CAGR of 2.1%. The smartphone adoption rate is expected to increase from 72% to 81% over the same period.⁴⁰

As for speed, this has improved strongly. In 2015, no country in the region had 5% or more of its fixed broadband connections operating at speeds of 15 Mbps;⁴¹ by contrast, in Q1 2021, median

³⁶ BCG (2021), *op. cit.*

³⁷ Access Partnership (2021), *op. cit.*

³⁸ IDB (2018), *op. cit.*

³⁹ World Bank, [Individuals using the Internet \(% of population\) - Latin America & Caribbean | Data](#)

⁴⁰ GSMA (2021), [The Mobile Economy Latin America 2021](#)

⁴¹ ECLAC (2016) as cited in IDB (2018), *op. cit.*

fixed broadband speeds in major LatAm markets had reached well over 25 Mbps, with mobile download speeds in major markets all above 10 Mbps.⁴²

Cloud is also part of the picture of increasing mobile penetration, leading to a virtuous circle:

[Mobile] Operators have been moving to virtualised core functions for years, but 5G represents an opportunity to move this transformation further forward. Latin American mobile operators have announced partnerships with cloud players to support this, reflecting a global trend in cloud-telecoms co-opetition.⁴³

The IDB's 2018 report has a comprehensive set of recommendations for addressing these barriers. Other challenges cited in that report include high taxes on utilities and the need for a robust electricity infrastructure.⁴⁴

4. High-level recommendations

Many FIs are hesitant about cloud adoption because of mixed regulatory signals, risk concerns, and the initial costs. While these are risks to understand and mitigate, the transformational benefits of shifting from a closed IT system to cloud have become essential.

In the IIF's view, the business risks to FIs of not adopting cloud are greater than the risks posed by cloud, due also to the competitive threat to regulated FIs from cloud-enabled BigTechs and fintechs in an environment of heightened user expectations, reduced margins, and, for the present, cheap capital.

FIs and regulators should therefore adopt approaches that help smooth the transition to cloud technology, while always ensuring that risks are adequately monitored and managed.

Data localization requirements are frequently not the best means to achieve regulatory objectives. Clearly identifying objectives, working with industry, and employing privacy-enhancing technologies wherever practicable can yield better results for the entire economy.

FIs should focus on developing an adoption plan based on their institution's strategic goals and objectives consistent with their risk management strategies.

Financial institutions and regulators working closely together could enable safe and successful migration, chiefly by providing clear guidance and timely and easy to navigate notification and approval processes.

5. Looking forward

The IIF will continue to research and write on cloud computing, which we continue to see as a vital enabler of digital transformation and additive to resilience, including during the pandemic.

As we did in the wake of our report on cloud in Asia-Pacific financial services, we will look for opportunities to host events that leverage that work, and bring together FIs, CSPs, and regulators to address the opportunities and challenges ahead.

⁴² GSMA (2021), [Brazil's Internet Is Getting Faster and Accessible 5G Is on the Horizon](#), June 9.

⁴³ GSMA (2021), [The Mobile Economy Latin America 2021](#)

⁴⁴ IBD (2018), *op. cit.*

Lead author



Laurence White
Consultant Senior Advisor
Digital Finance | Asia Pacific
lwhite@iif.com

Other Contributors



Jessica Renier
Managing Director, Digital Finance
jrenier@iif.com



Conan French
Director, Digital Finance
cfrench@iif.com