Supporting Firms in the Digital Age

The Case of Investment Promotion

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Foreword

Public agencies that support firms operate today against a difficult combination of challenges. The information firms need to make decisions has grown more abundant and more complex, reflecting an evolving global environment marked by geopolitical realignment, supply-chain reconfiguration, and rising market volatility. In addition, public budgets are increasingly under pressure, particularly in developing economies. Together, these factors raise the demand for public services that provide timely and tailored intelligence on cross-border opportunities, while shrinking the resources available to deliver them. This dynamic is changing both what such services require and what they can achieve.

These pressures fall most directly on entities that are responsible for public policies that aim to support firms by addressing market and coordination failures, especially those associated with information frictions. In this context, the effectiveness of such policies depends on the strength of their interactions with the firms they serve and on the quality of the information they can gather, both of which are being reshaped by digital technologies. Investment promotion provides a useful lens through which to observe this broader transformation: investment promotion agencies (IPAs) are information-intensive, firm-facing, and operate through close personal contact with potential investors, which makes them both particularly exposed to digitalization and a leading indicator of how such policies are being reconfigured.

Digitalization can meaningfully change how IPAs work and what they can achieve. It can affect what activities cost, what scale they can be delivered at, how accurately they can be targeted, and, ultimately, the effectiveness of agencies' interventions. For example, in *image-building*, search-engine optimization, social media, and virtual events, agencies can reach a wider universe of firms at far lower marginal cost than traditional outreach. Similarly, in *investment generation*, targeted email tools, digital prospecting platforms, and machine-learning approaches can sharpen the targeting of potential investors and improve the accuracy of IPA decisions. Across the agency, customer-relationship-management systems and decentralized cloud platforms can reduce the share of staff time consumed by tracking, managing, and sharing information, freeing scarce human capital for higher-value engagement with firms. These gains, however, do not materialize automatically. Digital tools require organizational adjustment, new skills, and a degree of cultural change within agencies for their full benefits to emerge.

This report presents new, comparative evidence on the long-term evolution and patterns of digital tool adoption by IPAs and how these trends responded to the disruptions caused by the COVID-19 pandemic, drawing on a unique survey of 50 agencies in advanced and developing economies. It also documents how agencies have adapted, what strategies have allowed thinly resourced ones to keep pace, and how digital adoption is associated with the effectiveness of their interventions. The report builds on previous work analytical by the Inter-American Development Bank: *Solving the Investment Promotion Puzzle*, which mapped the institutional landscape of IPAs in Latin America and the Caribbean (LAC) and OECD countries, and *Making the Invisible Visible*, which examined how IPA assistance affects the location decisions of multinational firms. Together, these three publications provide an increasingly complete picture of how investment promotion works in practice.

The report is intended to serve as a reference for investment promotion policymaking, a contribution to the policy research debate on the digitalization of firm-support policies, and an input for technical and financial assistance activities. At the IDB, these findings will inform our continued engagement with IPAs in the region — through policy dialogue, capacity-building, and financing, including ongoing pilots on the use of artificial intelligence in investment promotion.

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[1] Currently, Costa Rica's national IPA is PROCOMER, whereas El Salvador's national IPA is Invest In El Salvador.

GTAI (Germany), Invest India (India), IDA Ireland (Ireland), Invest in Israel (Israel), the Italian Trade Agency (Italy), the Japan External Trade Organization, JETRO (Japan), Invest Lithuania (Lithuania), the Netherlands Foreign Investment Agency (Netherlands), New Zealand Trade & Enterprise (New Zealand), the Polish Investment and Trade Agency (Poland), AICEP – Agência para o Investimento e Comércio Externo de Portugal (Portugal), SPIRIT Slovenia (Slovenia), KOTRA – Korea Trade-Investment Promotion Agency (South Korea), ICEX-INVEST in Spain (Spain), FIPA Tunisia – Foreign Investment Promotion Agency (Tunisia), the Department for International Trade (United Kingdom), and SelectUSA (United States).[2]

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[2] Currently, UK's national IPA is the Department for Business and Trade.

Executive Summary

The combination of rapid digitalization, rising global uncertainty, and tightening public budgets is reshaping what it takes to deliver public services to firms and what those services can achieve. Digital technologies have transformed how firms, citizens, and governments interact with digital platforms and artificial intelligence (AI), expanding at historically high rates over the past two decades. At the same time, geopolitical tensions, supply-chain disruptions, and higher market volatility have raised the value of timely, accurate, and tailored information for cross-border business decisions. Meanwhile, public budgets — particularly in developing economies — are under pressure, forcing a reassessment of priorities. The combined effect of these factors is to raise the demand for public services that help firms navigate an uncertain and complex environment while squeezing the resources available to provide them.

These pressures bear most directly on one class of public policies: those that support firms by addressing market and coordination failures. Such programs typically seek to reduce the information frictions (including search and matching) and coordination problems that shape firms' decisions — precisely the frictions digitalization is transforming. Because the largest, most productive, and most internationalized firms tend to demand such support most intensively, the government bodies that serve them are on the front line of this shift. Trade and investment promotion agencies (TPAs and IPAs) are a leading case in point, and a closer look at IPAs' digital adoption offers a useful illustration of how digitalization is reshaping firm-support policies more broadly.

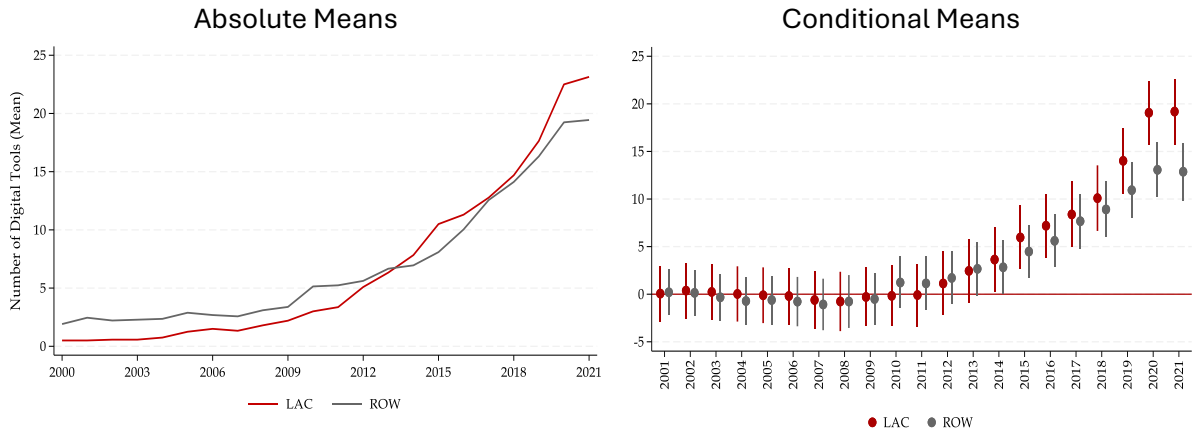
What this report does

This report aims to address these questions by providing new, detailed evidence on the long-term evolution and patterns of digitalization of IPAs, their determinants, including specifically the unprecedented shock to in-person activities associated with COVID-19, and their effects. To do so, it relies on comprehensive data on the use of specific digital tools and other relevant characteristics that have been gathered through a dedicated survey of 50 IPAs (15 from Latin America and the Caribbean (LAC) and 35 from the rest of the world (ROW), including developed and developing countries and national and sub-national IPAs.

Main findings

1. **Digital tool adoption by IPAs has accelerated since the early 2010s, with the rate of catch-up strongest in less developed economies.** The average number of digital tools used by IPAs has risen sharply since the early 2010s. While IPAs in ROW had a head start in the 2000s, IPAs in less developed economies, including those in LAC, have adopted tools at a faster rate. The pattern of stronger adoption by LAC IPAs holds after controlling for country size and GDP per capita. The median IPA used 22 different digital tools after COVID-19, of which 5 had been adopted in the previous three years. Subnational IPAs operate at a smaller absolute scale than their national counterparts across most dimensions of digitalization, including resources and digital tools, and started digitalizing later. At the same time, the largest ones match or exceed the median deployment levels of national IPAs.

Figure 0.1. Average Number of IPA Digital Tools Used by Region, 2000-2021



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools
Note: The figure in the left panel shows the absolute means of the number of digital tools adopted by IPAs over time. The figure in the right panel shows the estimated coefficients on year dummies (along with the respective 10% confidence intervals) from an OLS estimation of an equation whose dependent variable is the (natural logarithm of the) number of digital tools adopted by an IPA and whose explanatory variables are (the natural logarithm of) countries' GDP size, (the natural logarithm of) countries' GDP per capita and country and year fixed effects. The sample period is 2000-2021 and the omitted year is 2000. Red color=LAC, dark gray=ROW.

2. **Digitalization has progressed unevenly across IPA functions, advancing fastest where tasks can be standardizable or scalable to wide audiences and slowest where relational engagement matters.** General organization functions were the first and most extensively digitalized. Image-building and investment generation followed suit, allowing IPAs to extend their reach without proportional increases in staff time (e.g., through search-engine optimization, social media, and virtual events). Investment facilitation digitalized later, while

policy advocacy lagged furthest behind, reflecting their reliance on tailored engagement with firms and stakeholders. The share of tools devoted to general organization accordingly fell from 42% in 2010 to 34% in recent years as agencies diversified into other functions.

3. **Rather than driving the long-term trend, the COVID-19 pandemic reshaped what IPAs digitalized and partially reversed the earlier cross-country pattern of adoption.** The structural rise in IPA digital tool use began roughly a decade before COVID-19. Of the 22 digital tools used by the median IPA after the pandemic's onset, only one was reportedly adopted in response to it. The tools added in response to the pandemic concentrated in tools designed to overcome mobility restrictions (e.g., videoconferencing, virtual showrooms, online events, remote working platforms, and selected facilitation and advocacy tools). In addition, richer and smaller economies adopted more digital tools during the crisis, particularly for image-building, partly reversing the pre-pandemic pattern in which less developed economies were the more active. At the same time, IPAs in advanced economies expanded their digital tool budgets and IT teams during the crisis, while resource increases were more constrained elsewhere — pointing to a potentially growing gap in resources for digital capacity.

4. **The agencies that have expanded their digital footprint the most are those with internal IT teams and a reliance on subscription-based tools, not necessarily those with the largest overall budgets.** The number of digital tools an IPA uses is uncorrelated with the size of its overall investment promotion budget, but it is positively associated with the size of its IT team (particularly for investment generation and policy advocacy) and with the share of its digital budget devoted to subscriptions. In other words, dedicated digital staff and access to off-the-shelf solutions appear to be the key channels through which agencies expand their digital toolkit, more than aggregate financial resources. This pattern is consistent with two broader observations: subscription-heavy strategies enabled faster tool adoption during COVID-19 across all IPA business functions, and roughly half of the specific digital solutions that IPAs use are free or conditionally free.

5. **The largest remaining adoption gap lies not within agencies but across different public agencies within a government. The median IPA has integrated about 40% of its digital tools with its own internal systems, but only 7% with the systems of other public bodies, an order of magnitude lower than within-agency integration, even in advanced economies. This is a binding constraint on whole-of-government coordination and on the**

ability of IPAs to draw on data and processes held elsewhere in the public sector. On the supply side, the digital provider market is concentrated. Tools sourced from multinational providers are perceived as more advantageous on every dimension reported by IPAs, with the largest gap on ease of use.

Taken together, these findings show that LAC IPAs have closed, and in some respects reversed, their digital adoption gap with ROW peers, despite a substantially wider gap in absolute resources. The total budget of the median LAC IPA was roughly 11 times smaller than that of the median ROW IPA in the first years of this decade, a disparity that has widened since the previous IDB-OECD survey (Volpe Martincus and Sztajerowska, 2019). The digital performance indices proposed in this report capture this contrast. LAC IPAs trail ROW peers on the *Digital Resources Index*, which measures absolute digital budget per IT staff member. However, they exceed ROW peers on three other indices: the *Digital Resources Intensity Index* (a higher share of total budget and human capital allocated to digitalization), the *Digital External Reliance Index* (greater reliance on subscriptions and other external sources of digital tools), and the *Digital Solutions Index* (a comparable or larger number of digital solutions in use).

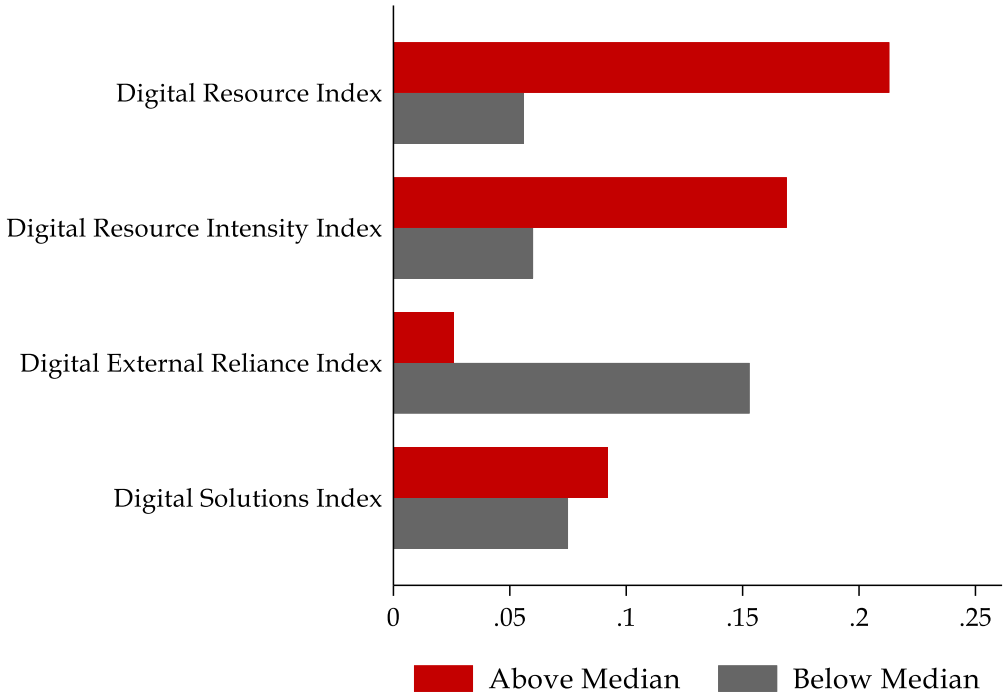
Figure 0.2. IPA Digitalization Indices by Region

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

These patterns suggest that LAC IPAs expanded their digital footprint despite tighter resources by relying on specific strategies: greater use of subscriptions and internal IT teams, and a higher share of total budget and human capital devoted to digital tools, which together compensated for fewer absolute resources. At the same time, the COVID-19 pandemic widened the underlying resource disparity between LAC and ROW, raising questions about the sustainability of the catch-up. This dynamic is likely common to the broader use of firm-support policies.

Does the level of IPA digitalization affect investment outcomes? More digitalized agencies have larger effects on multinational firms' decisions to enter a country, but not on their decisions to expand once present. IPAs that score above the median on most of the digital indices proposed in this report – including the size of resources, the intensity of their allocation to digitalization and the breadth of use of digital solutions – have a significantly larger effect on the probability that a multinational firm *establishes a first affiliate* in the country, all else equal. Conversely, greater reliance on external sources of financing for digitalization is associated with a smaller effect on the probability of MNE first entry, potentially reflecting less control over such budgets or the need to adopt less tailored tools. Higher digital scores are not, however, associated with larger effects on *reinvestment* by multinationals already operating locally. This is likely because digital tools matter most for the initial identification of and outreach to new investors, while existing affiliates already have direct information channels. These findings provide some of the first cross-country empirical evidence linking the digitalization of a firm-support policy to its measurable effects on firm outcomes, and suggest that digital tools are particularly valuable for attracting new multinational firms.

Figure 0.3. How Digitalization Can Affect Effectiveness of Firm Support Policies?
IPA's Digitalization and Effectiveness



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools, Dun and Bradstreet's WorldBase data on location of multinational firms and their affiliates, and data on firm-level assistance by IPAs as outlined in Volpe Martincus et al. (2021). See Section 5 for further details.

Implications

The findings illustrate the role digitalization plays in shaping the effectiveness of IPA interventions. The detailed data on digital tools, specific solutions, and providers gathered for this report can help IPAs benchmark their own positions against peers, with the new indices facilitating self-assessment and cross-country comparisons. The report is also intended to serve as an input into policy dialogue, capacity-building, and operational work between international organizations such as the IDB and IPAs in the region and beyond. It can further support targeted projects. For example, a pilot on the use of machine learning in investment generation, developed jointly with one LAC IPA, raised the probability of identifying multinational firms that became pipeline leads by 10 to 11% and prospects by 17 to 19% relative to a generic machine-learning approach, and can be extended further in the future. Finally, the report aims to shed light on the interaction between targeted firm-support programs and digitalization, contributing to further research and policy debate in this area.

1

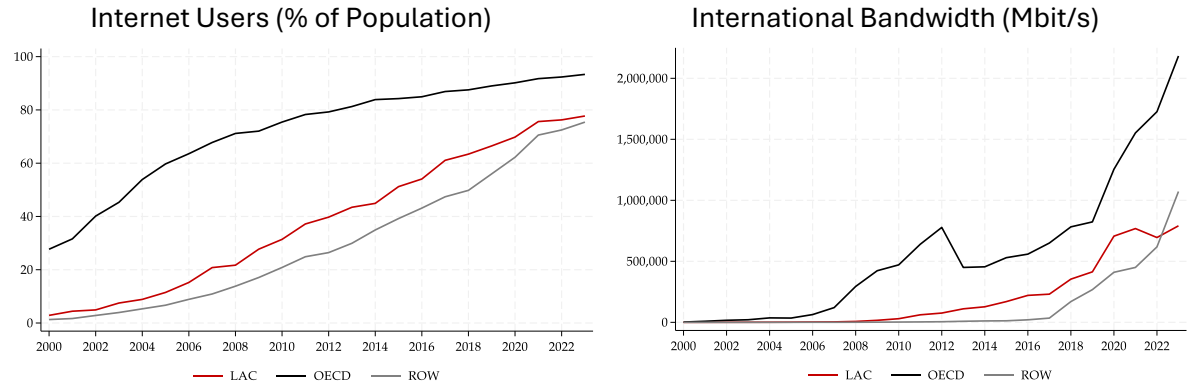
The Digital Imperative in a More Uncertain and Demanding Context

1. The Digital Imperative in a More Uncertain and Demanding Context

1.1 Rising Digitalization

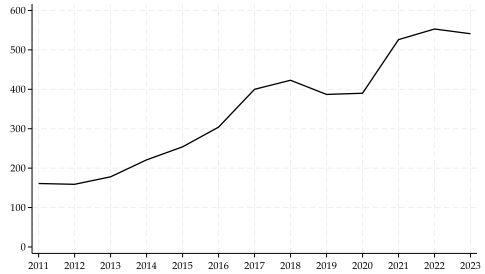
The rise of digital technology is rapidly transforming the ways that firms, workers, consumers, and governments interact. Information and communications technologies (ICT) grew at a high rate over the last two decades (see Figure 1). The associated expansion of digital platforms and e-commerce, and the increased use of artificial intelligence (AI), virtual reality, blockchain, and other related technologies, are affecting the production, organization, and exchange of economic activities in varied and complex ways and at a fast pace.[3] For example, the spread of digital platforms transformed several important sectors, such as retail, transport, and accommodation.[4] The adoption of AI-related technologies, allowing access to new services and improving the existing ones, is also found to impact trade and welfare.[5] The same holds for other technologies. This is, for instance, the case with 3-D printing or cloud computing, which directly alter firms' production costs.[6] Notably, such an uptake of new digital technologies has even further accelerated during the COVID-19 pandemic.[7]

Figure 1. The Rise of Digitalization Over Time and Across Regions

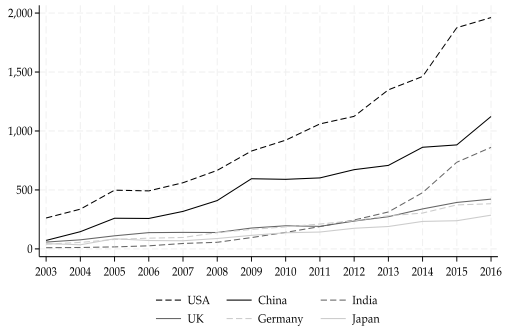


[3] See, e.g., Baldwin and Forslid (2020) and Chen and Volpe Martincus (2022).
[4] See, e.g., OECD (2021a, 2021b) and UNCTAD (2020a). According to UNCTAD (2020b), global e-commerce platforms accounted for 14%of total global retail sales in 2018.
[5] See Sun and Trefler (2022).
[6] See Abeliansky et al. (2020), DeStefano et al. (2020), and Freund et al. (2022).
[7] See, e.g., Apedo-Amah et al. (2020) and Ragoussis and Timmis (2022).

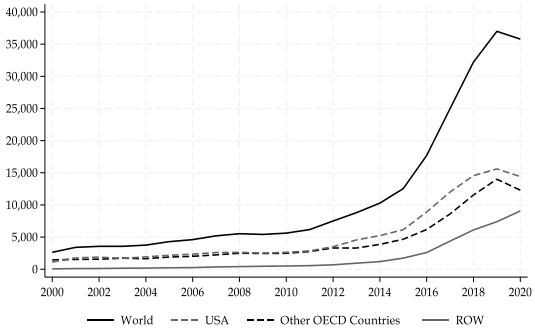
Annual Installations of Industrial Robots (in thousand)



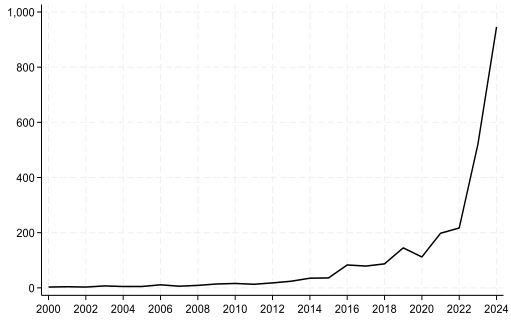
Trend in Scientific Publications Related to Machine Learning



AI Public Patent Applications



AI Models Publications



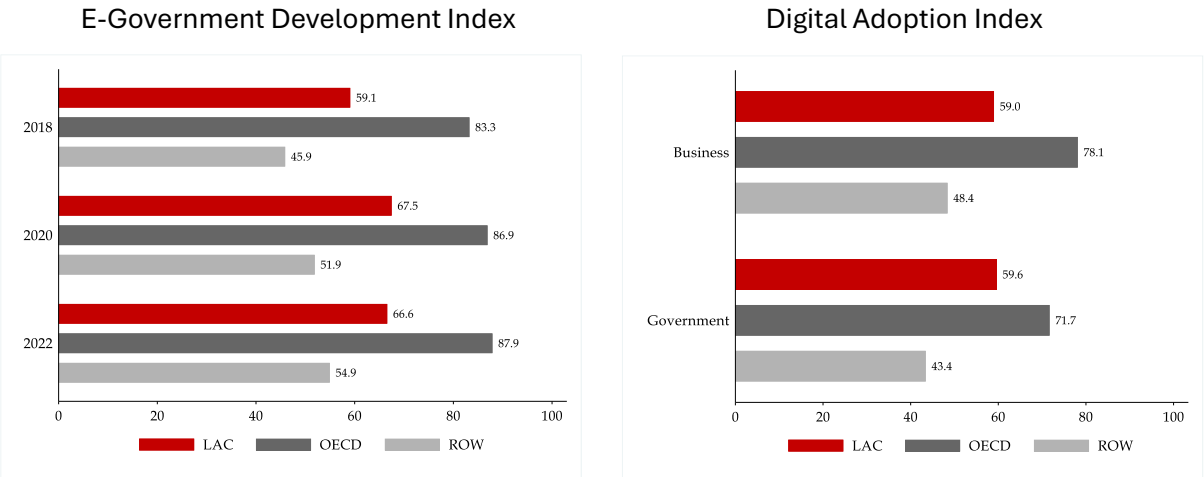
Source: Authors' calculations based on data from the World Telecommunication/ICT Development Report and the database of the International Telecommunication Union, IFR, USPTO, and OECD (2022).
*Note: In the first panel on the left, internet users refer to the percentage of individuals who have used the Internet from any location in the last three months. In the first panel on the right, international bandwidth refers to the average traffic load (expressed in Mbit/s) of international fiber-optic cables and radio links for carrying Internet traffic. The second panel on the left shows the worldwide annual robot installations between 2015 and 2021. The second panel on the right reports the number of scientific publications related to machine learning, where estimates are based on fractional counts of documents by authors affiliated to institutions in each economy. These estimates are based on a search for the text item "*machine learn*" in the abstracts, titles and keywords of documents published between 2003 and 2016 and indexed in the Scopus database. The third panel on the left reports the number of patent applications in technologies related to artificial intelligence, filed between 2000 and 2020, to European Patent Office, World Intellectual Property Organization and United States Patent and Trademark Office8 (including machine learning, natural language processing, computer vision, speech, knowledge processing, AI hardware, evolutionary computation, and planning and control). The third panel on the right presents the publication date of AI models between 2000 and 2024 (EPOCH AI, 2025). Whereby AI refers to the "Human interface" and "Cognition and meaning understanding" categories in the patent taxonomy in Inaba and Squicciarini (2017).*

This digital transformation affects firms' and citizens' behavior and puts increasing demands on governments. Easier access of firms and citizens to ICT and intensified use of these means are raising the pressure on public bodies to digitalize their own services. Countries around the world have accordingly increased their digital capacity in recent years, with their public sectors consequently scoring similarly on the level of digital adoption to their respective private

[8] USPTO AI patent counts exceed OECD figures primarily due to differences in methodology and scope. The USPTO reports all applications and grants filed directly with it, capturing the full volume of filings in the US market, where AI patenting is heavily concentrated. The OECD, however, applies stricter filters by focusing on internationally comparable indicators, such as Triadic or IP5 patent families, which require protection across multiple major offices simultaneously. This deliberately excludes USPTO-only filings, reducing the "home advantage" bias inherent in domestic patent counts. In short, the USPTO counts every AI patent it processes, while the OECD counts only those meeting cross-jurisdictional thresholds, making OECD figures lower but more internationally comparable.

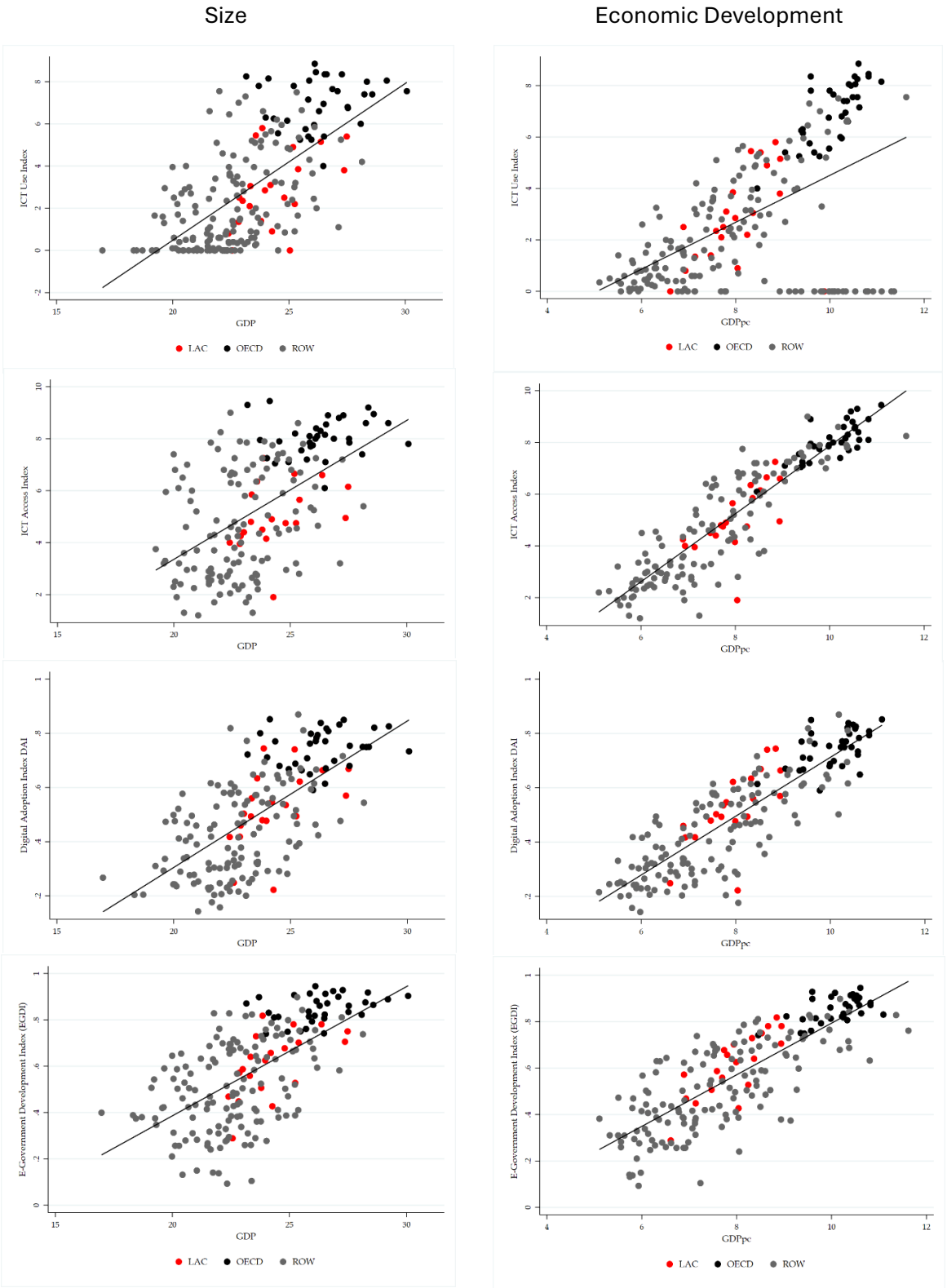
sectors at large, in particular in LAC (see Figure 2). Overall and as a result, LAC countries now generally have levels of digitalization comparable to those observed in other countries with similar size and level of development of their economies (see Figure 3). Consistently, the share of firms digitally interacting with public entities has increased over time. This is, for instance, the case with those using the Internet to interact with public authorities (see Figure 4).

Figure 2. Digitalization of Government Services, by Region



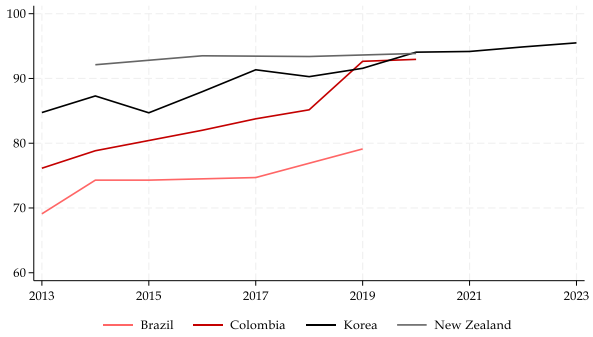
Source: Authors' calculations based on data from the World Bank and the United Nations.
Note: The left panel shows the E-Government Development Index (EGDI) of the United Nations, which is a composite measure available for 193 countries of three dimensions of e-government: provision of online services, telecommunication connectivity and human capacity, and for which the latest available years are 2018, 2020, 2022. The right panel shows the Digital Adoption Index (DAI) of the World Bank, which is an index that measures digital adoption capacity in 180 countries on a 0–1 scale in three sub-components: business, government, and people, for which the latest available year is 2016.

Figure 3. **Level of Digitalization and Size and Economic Development**



Source: Authors' calculations based on data from the World Bank.
Note: The figure shows the relationship between different measures of digitalization of public services and the size and economic development of the respective countries, as proxied by their GDP and GDP per capita, respectively. The ICT Use Index, ICT Access Index, Digital Adoption Index and E-Government Development Index are taken from the World Bank. Red dots correspond to LAC countries, dark gray dots correspond to OECD countries, and black dots correspond to other countries.

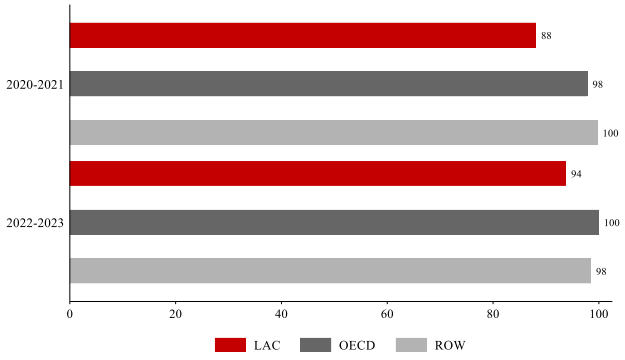
Figure 4. Digitalization of Public Services: Share of Firms Using Internet to Interact with Public Authorities



Source: Authors' calculations based on data from the OECD.
Note: The figure shows the percentage share of firms using Internet to interact with public authorities from the OECD ICT Access and Usage by Businesses Database for countries for which a time series after 2015 is available.

Investment and trade-related public bodies are particularly exposed to challenges related to digitalization. As digital technologies are most frequently used by the most productive, high-growth firms and globalized, they are likely to affect most government bodies interacting with such firms.[9] The experience of customs authorities is illustrative in this regard: the median LAC country registered 94% of customs declarations in an electronic form in 2022-2023, and the ratio was even higher in OECD countries (see Figure 5). Trade promotion organizations (TPOs) and investment promotion agencies (IPA) –the focus of the present report— frequently provide support services to such firms and are therefore particularly confronted with the digitalization imperative.

Figure 5. Digitalization of Public Services: Share of Electronic Customs Declarations



Source: Authors' calculations based on data from the WCO.
Note: The figure shows the average share of electronic declarations in total declarations submitted to customs authorities across countries in LAC (red bar), OECD (dark gray bar), and the Rest of the World (ROW) (light gray bar). The raw data comes from the WCO's Annual Report 2020-2021, and 2022-2023. The "Electronic Declarations Rate" was calculated by dividing "Electronic Declarations" by "Declarations" which were processed by Customs administrations throughout 2022/2023 and 2022/2023 respectively.

[9] See, e.g., Haller and Siedschlag (2011), Bernard et al. (2020), and Stapleton and Webb (2026).

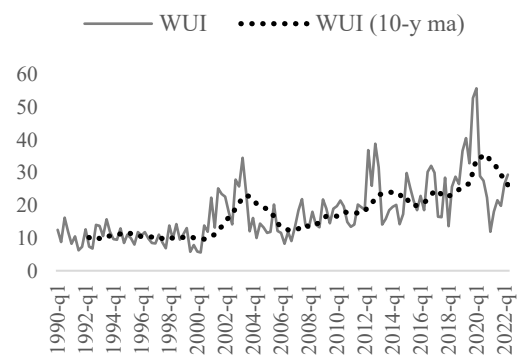
1.2 Increased Global Uncertainty and Information Frictions

Such a mega-trend of increased digitalization has been accompanied by increased global uncertainty. There has been a rise in uncertainty in the last few years. This has been driven by the global health situation, a series of geopolitical developments, the introduction of various restrictive trade and investment policy measures, and their implications, including the acceleration of inflation, increased stock market price volatility, and supply chain disruptions, among others (see Figure 6).

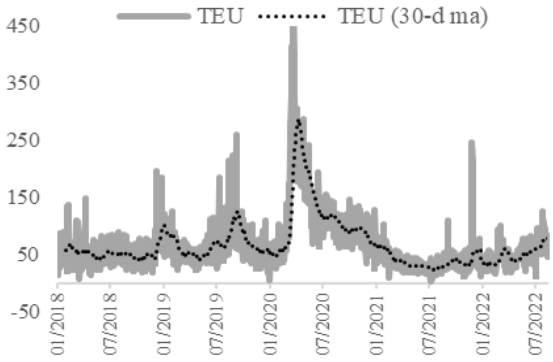
Uncertainty raises information frictions and puts a higher premium on support services to firms that can reduce the associated costs. This challenging global environment means that agencies tasked with helping businesses navigate complicated and fast-changing rules have an important role to play. Available impact evaluations of IPAs' activities suggest that timely, specialized information services have a positive and significant effect on the probability of multinational firms establishing a first foreign affiliate in their respective countries.[10] Such positive effects can be even stronger in the current context characterized by more important information frictions. Consistent with this, IPAs have been reacting to the changed economic reality and new ways of working by adapting their services in the aftermath of the pandemic. In particular, many agencies started to offer international investors more frequent updates and detailed information – for example, on the applicable rules or local suppliers and clients – and resort to new means to provide it to better serve their needs.[11]

Figure 6. Increased Global Uncertainty

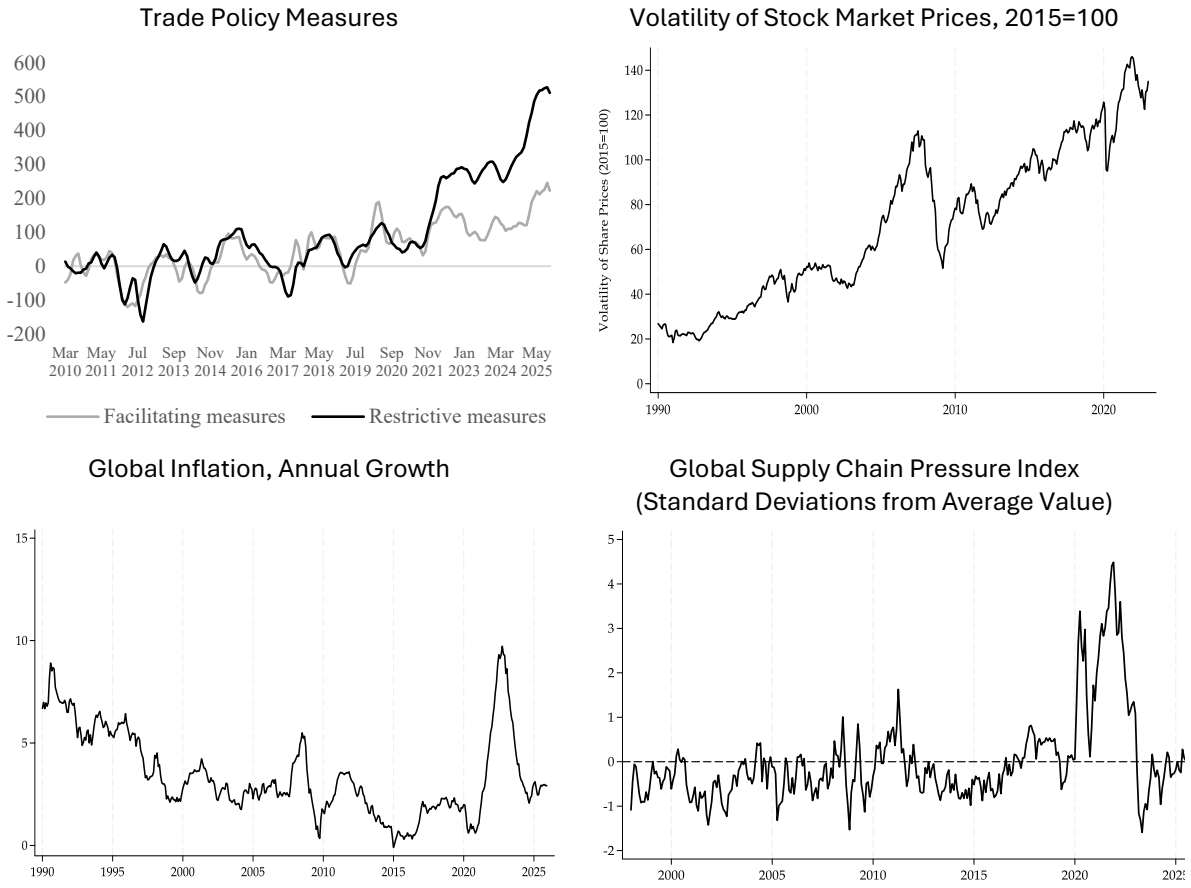
World Uncertainty Index, 1990-2022



Twitter Economic Uncertainty Index, 2018-2022



[10] See Carballo et al. (2022) and Volpe Martincus et al. (2021).
[11] See OECD (2020b).



Source: Authors' calculations based on data from the World Uncertainty Index from Ahir et al. (2022), Twitter Economic Uncertainty Index from Baker et al. (2021), Centorrino et al. (2025), Federal Reserve Bank of New York GSCPI (2026) and OECD Consumer Price Indices (2025a) and Share Prices (2025b).
Note: The first panel on the left shows the World Uncertainty Index, which is computed by calculating the percentage of the word "uncertain" (or its variants) in the Economist Intelligence Unit country reports. The first panel on the right presents the daily Twitter Economic Uncertainty index for the USA from January 2019 to February 2021, which was renormalized to a mean of 100 from January 2011 to December 2019. The second panel on the left reports the Trade Policy Activity Index using only restrictive and facilitating trade policy measures, respectively, from Centorrino et al. (2025) using data between 2010 and 2025. The second panel on the right shows an index of stock market price volatility where the share price indices are calculated from the prices of common shares of companies traded on national or foreign stock exchanges (in particular, stock exchange closing daily values expressed as simple arithmetic averages of the daily data. The third panel on the left shows the annual growth rate of world inflation measured by the consumer price index (CPI). The third panel on the right presents the Global Supply Chain Pressure Index (GSCPI). The GSCPI integrates transportation cost data and manufacturing indicators to provide a gauge of global supply chain conditions.

1.3 Rising Pressures on Public Resources for Trade and Investment Promotion

At the same time, investment and trade promotion agencies face budget pressures – and are asked to do more with less. With slower growth forecasts and the need for fiscal consolidations, some governments are tightening overall spending and revisiting priorities.[12] Budgets of different public entities may be affected, including those of trade and investment promotion agencies. A median agency surveyed in this report experienced a drop in its investment promotion budget in

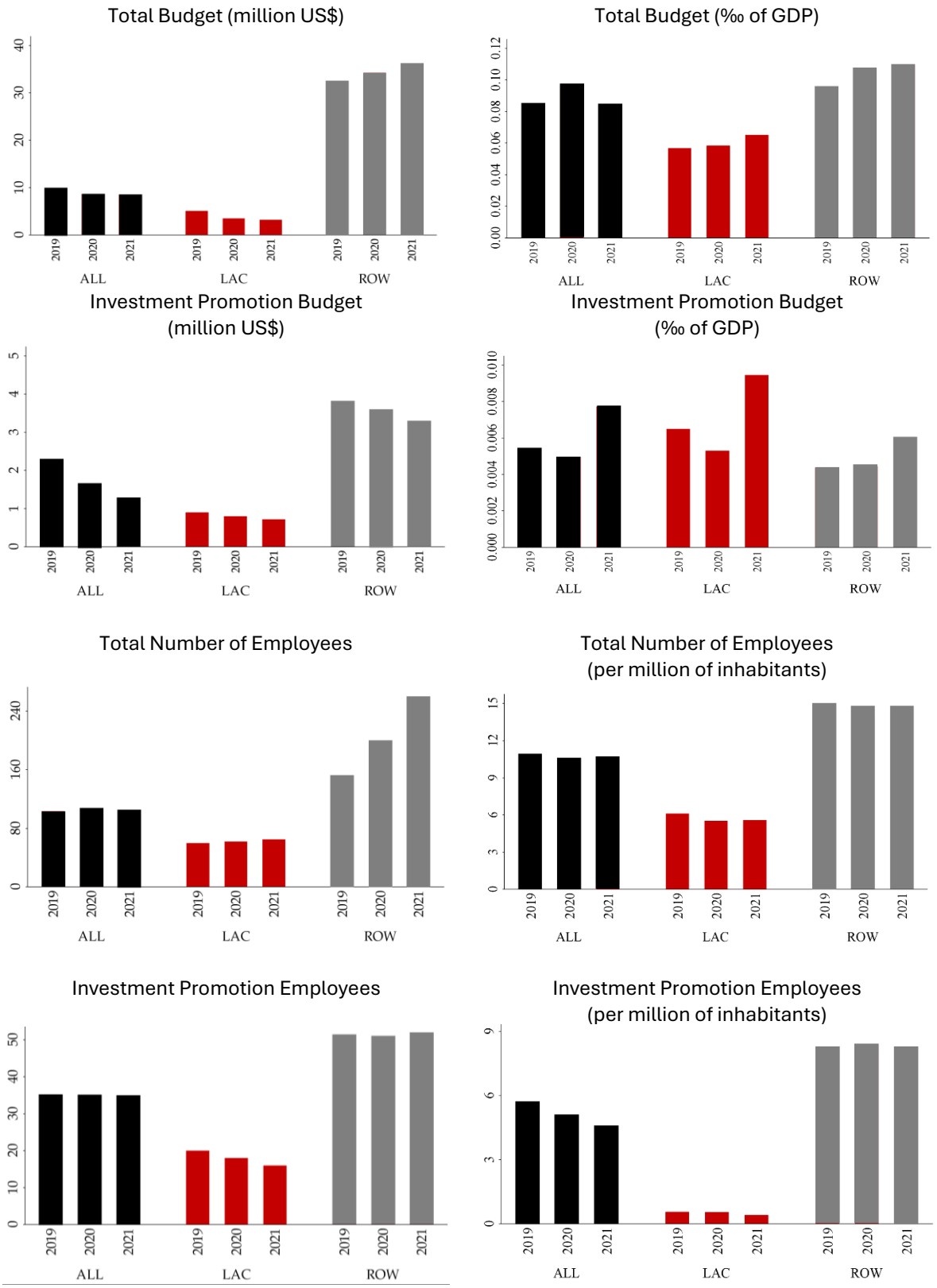
[12] See OECD (2022a) and IMF (2022).

2021, compared to the pre-COVID-19 period[13], and the drop in ROW has been driven mainly by downward adjustment of non-OECD IPAs (see Figure 7). In LAC, the number of FDI promotion staff has also fallen during the pandemic.

This drop in IPA resources in LAC marks a reversal of the trend during a few years prior to the COVID-19 crisis and indicates tightening of resource conditions (see Box 1). As LAC agencies generally experienced stronger cuts of budget and personnel than their counterparts in advanced economies during the pandemic, the differences in size between LAC and OECD IPAs – already substantial at the time of publication of the previous IDB report (Volpe Martincus and Sztajerowska, 2019) – have increased further.[14] Thus, the total budget of the median LAC IPA was roughly 11 times smaller, and the investment promotion budget was over 5 times smaller than those of the median ROW IPA (see Figure 7 for the medians and Box 2 for country-specific information). Further, while the median LAC IPA's investment promotion budget exceeds that of the median ROW IPA when measured as ‰ of GDP (roughly 0.010 vs 0.006), its total budget falls short on both metrics — in absolute terms and as a share of GDP — as do total staff and investment promotion staff per million inhabitants.[15]

[13] To make comparisons with the previous survey from which the data on investment promotion budget in 2016 was taken, only countries that responded to both surveys are retained for the calculation.
[14] The total budget of the median LAC IPA dropped by 37% (it grew by 82% in OECD) and the investment promotion budget fell by 13% (compared to 12% in OECD) between 2019 and 2021. The total staff grew by 7% in LAC (it grew by 15% in OECD), whereas investment promotion staff was cut by 20% (compared to only 1.7% in OECD) during the same period.
[15] See Figure A2.2 in Annex 2 for the relationship between IPA total budget, total staff, and number of foreign offices and countries' GDP and GDP per capita.

Figure 7. Pre- and Post-COVID-19 IPAs' Financial and Human Resources

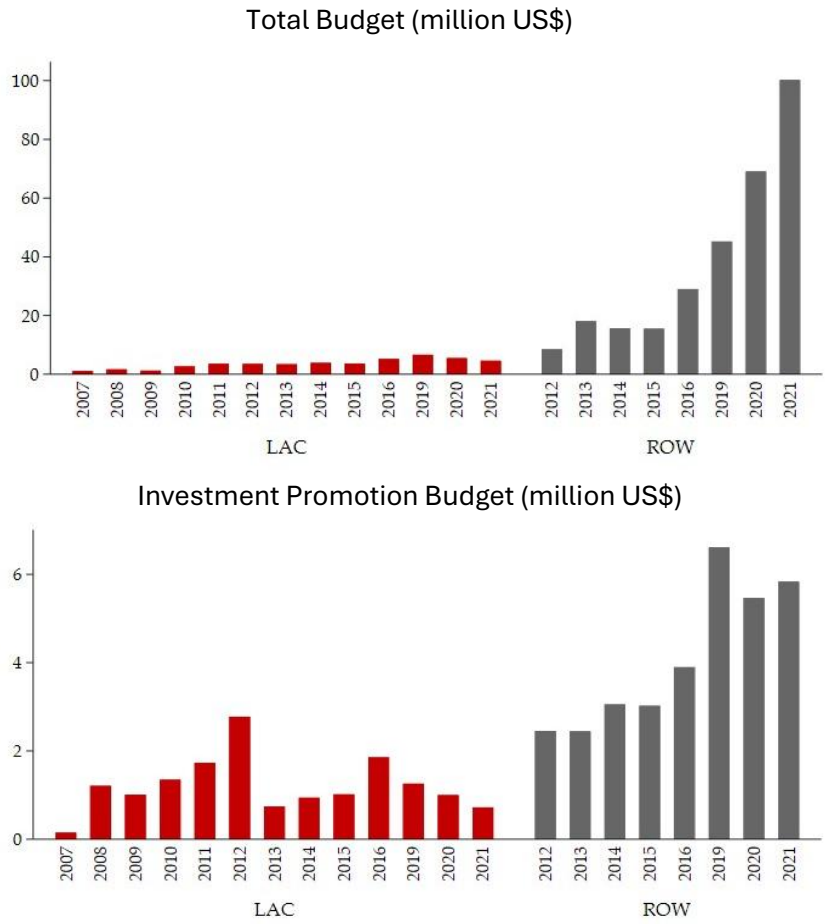


Source: Authors' calculations based on data from IDB Survey on IPAs' Digital Tools and World Development Indicators.
Note: The figures on the left panel show the median total budget, the median investment promotion budget, the median total number of employees, and the median number of employees working on investment promotion in 2019, 2020, and 2021 for all sample countries (black bars), LAC (red bars), and ROW (gray bars) IPAs. The figures on the right panel present the same size measures but scaled by the respective set of countries' GDP (budget) and population (employees).

Box 1 | Long-Term Evolution of IPA Size by Region: Growing Unequal?

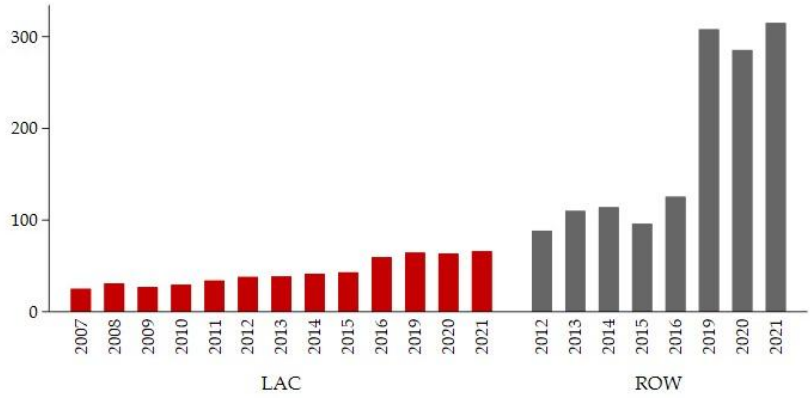
The original IDB-OECD survey on investment promotion agencies and the associated report (see Volpe Martincus and Sztajerowska, 2019) have shown that LAC IPAs are significantly smaller than their OECD counterparts. When the data from the previous survey and the current survey are combined for the same sample of countries, it becomes apparent that the trend has exacerbated since then (see Figure B1.1).[16] While IPAs in LAC have been expanding their total and IPA budgets and number of staff in the years prior to the pandemic, the shocks associated with COVID-19 have meant retrenchment. As such, potentially reflecting countries' ability to provide stimulus in the time of economic shocks, inequalities appear to have grown and may put further pressure on agencies in the region.

Figure B1.1. Long-Term Evolution of IPAs' Financial and Human Resources

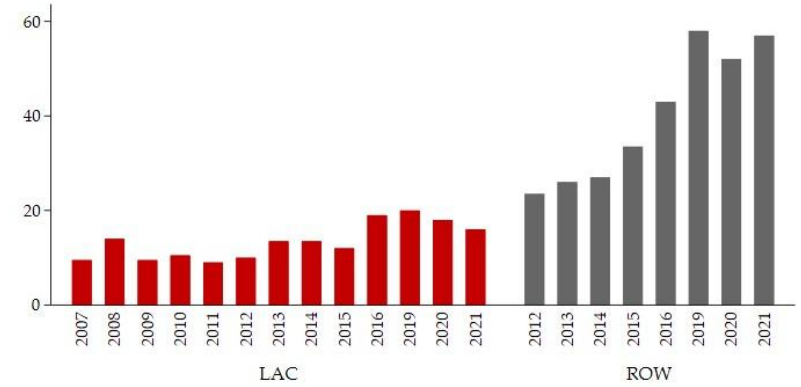


[16] See Figure A2.1 in Annex for larger scale figures per each region and the numbers reported in Figure 7 for the sample of IPAs that responded to both surveys.

Total Number of Employees



Investment Promotion Employees



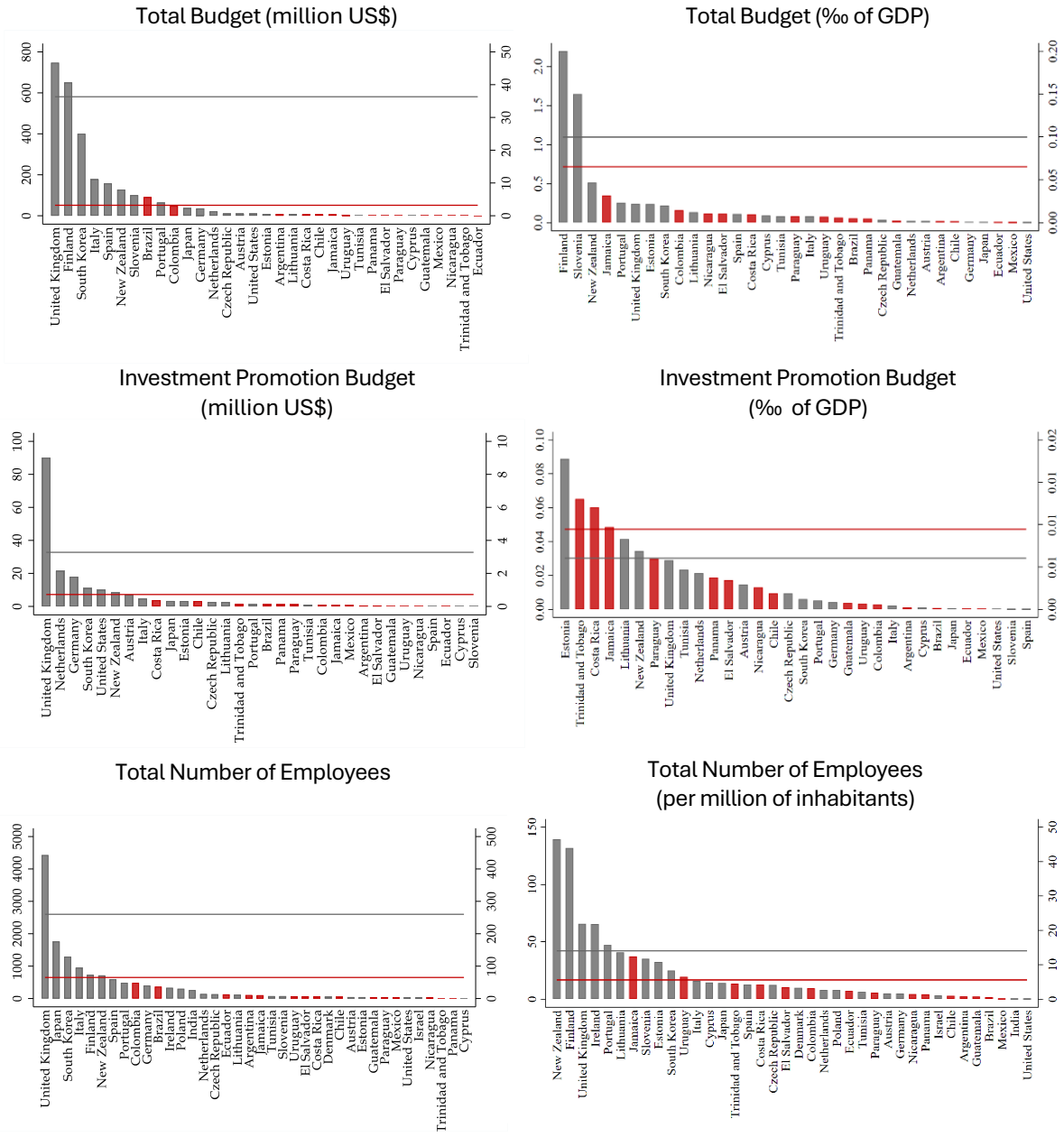
Source: Authors' calculations based on data from the IDB Survey of IPA Digital Tools and Volpe Martincus and Sztajerowska (2019).
Note: The figure shows median values for agencies in a given region and year for the sample of IPAs that responded to the current survey used throughout this report and the previous IDB-OECD survey (see Volpe Martincus and Sztajerowska, 2019), i.e., ARG, AUT, BRA, CHL, COL, CRI, CZE, DEU, DNK, ECU, EST, ESP, FIN, GBR, IRL, ISR, ITA, JAM, JPN, KOR, MEX, NIC, NLD, NZL, POL, PRT, PRY, SVN, SLV, TTO, URY. Data for 2019-2021 comes from the survey used in this report and the data for 2007/2012-2016 from Volpe Martincus and Sztajerowska (2019). Budgets are expressed in million US$. The number of employees working on investment promotion for 2019-2021 is obtained by multiplying the share of investment promotion staff obtained from Volpe Martincus and Sztajerowska (2019) by the total number of employees obtained in the current survey.

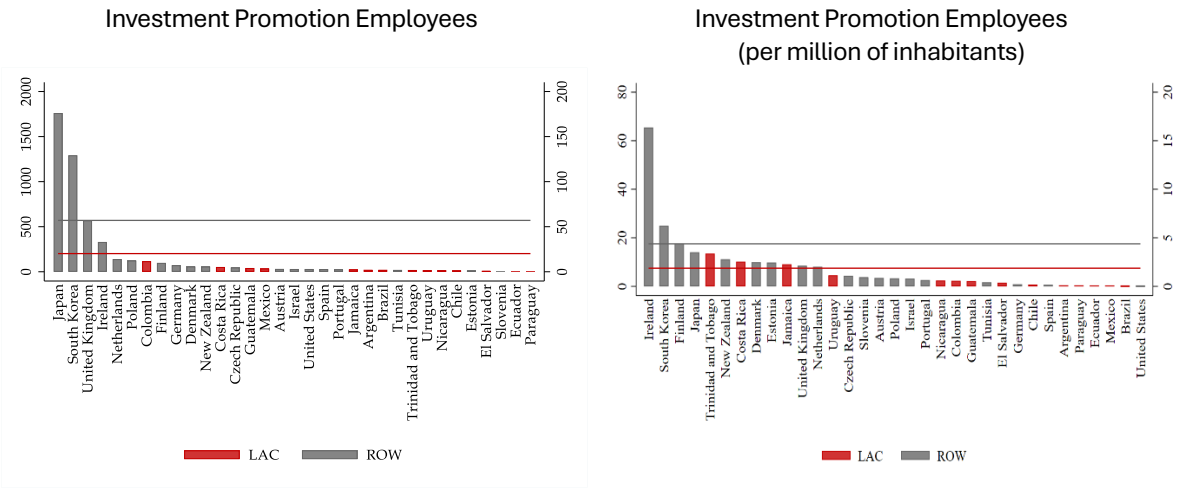
These growing differences in size can create challenges, especially as a larger number of actors are intervening in investment promotion policy over time (Figure 8). Besides national IPAs, a multitude of subnational IPAs and related bodies operate at the regional, municipal, city, and other levels within countries. They play an important role in investment promotion, especially in certain regions (Crescenzi et al., 2021; OECD, 2022**). While a median subnational IPA in ROW is smaller than a median national IPA in ROW, some of those agencies have sizable resources** – comparable or even larger than a median LAC national IPA in some dimensions (Box 3). The interaction between these different types of agencies may influence the IPA adoption of digital tools and increase the need for greater coordination.

Box 2 | Overall Size of National IPAs

According to the latest figures gathered through the IDB survey on which this report is based, the total budget of the median IPA in LAC was US$ 3.2 million compared to US$ 35.8 million in the rest of the world (ROW). In terms of staff, the median IPA in LAC had 65 employees, whereas the counterpart in ROW had 260 employees. As some agencies have multiple mandates –such as export promotion—, the median resources devoted to investment promotion are even smaller: US$ 0.7 million in LAC compared to US$ 3.9 million in ROW, and 16 devoted investment promotion staff in LAC and 52 in ROW. Overall, larger and more developed economies tend to have larger IPAs, but there are wide differences across individual countries (see Figure B2.1 and Figure A2.1 in Annex 2).

Figure B2.1. Total IPA Resources, by Country

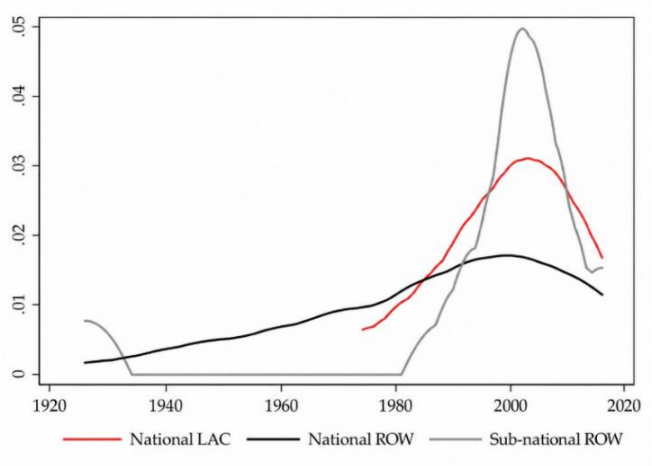




Source: Authors' calculations based on data from IDB Survey on IPAs' Digital Tools and Volpe Martincus and Sztajerowska (2019).

Note: The figures in the top panel show the IPAs' median total and investment promotion budgets, where the figures in the bottom panel report IPAs' median total and investment promotion employees The number of staff working on investment promotion in 2021 is calculated using the shares of investment promotion staff to total staff from the previous IPA survey (IDB, 2017) and the values for the total employment reported by agencies for 2021. Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red whereas ROW countries are shown in dark gray.

Figure 8. Creation of IPAs by Type over Time



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

Box 3 | Small Giants? The Size of Subnational IPAs

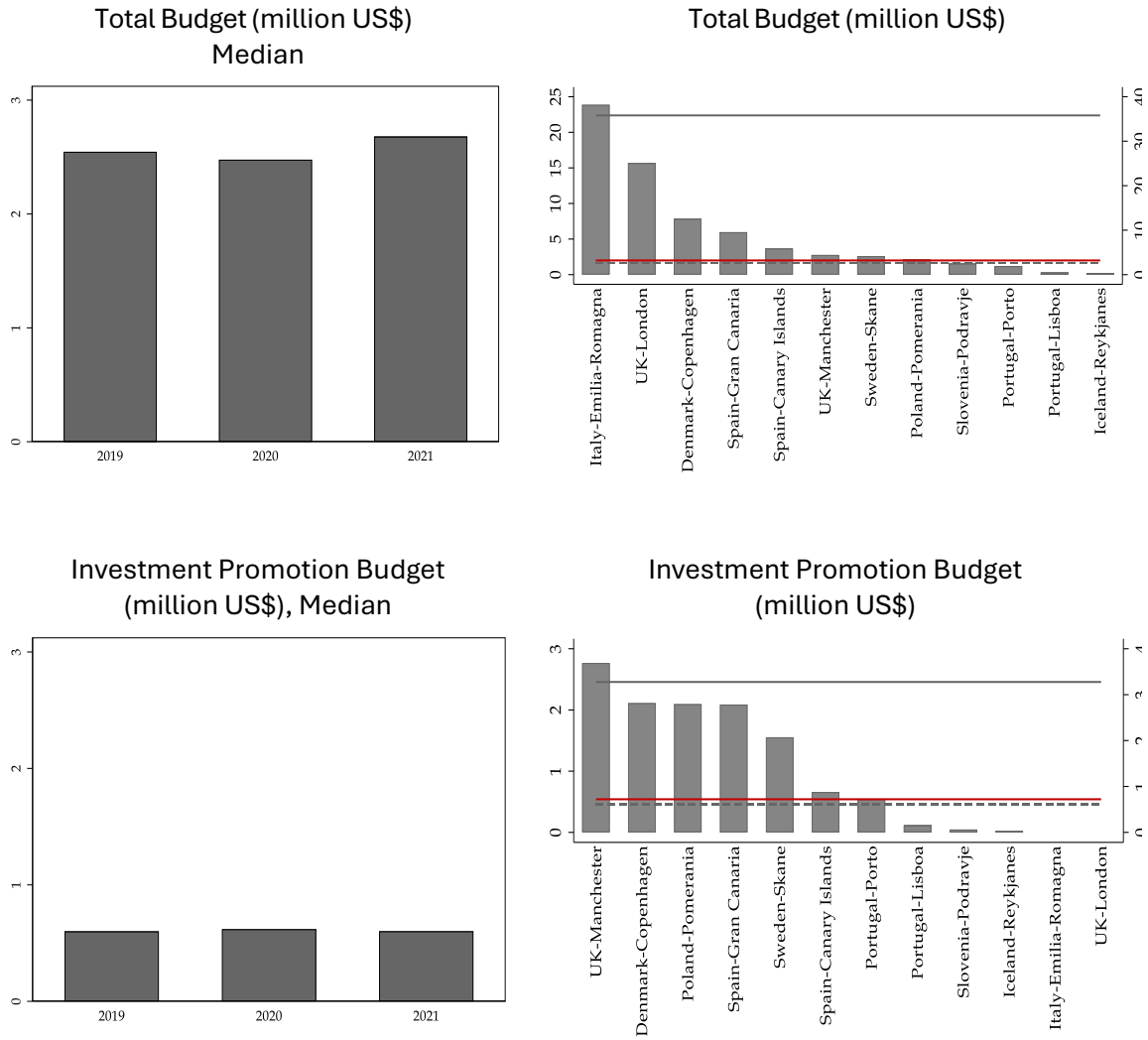
Subnational IPAs – operating at the regional, municipal, or city level – play an important role in reducing information gaps for investors. They can bridge important information gaps regarding suitable landing destinations outside of most well-known locations and are often the first point of contact when investors need to undertake administrative steps to realize the investment. How large are they?

A median subnational IPA from ROW was significantly smaller than a national IPA in ROW. It had a total budget of US$ 2.7 million and an investment promotion budget of US$ 0.6 million. As such, surveyed

subnational IPAs in ROW were similar in size in terms of budget to the agencies in LAC, and some – located in larger and more developed economies – are significantly larger than those national LAC IPAs (see top panel in Figure B3.1). The median ROW subnational IPA employed 24 employees, which corresponded to about half the employment of a median national IPA in LAC and one tenth of that of a median national IPA in ROW.

How did the resources of subnational IPAs evolve during the COVID-19 pandemic? Unlike those of their national counterparts, the total and investment promotion budget of surveyed subnational level IPAs has remained relatively stable (see the middle and bottom panel in Figure B3.1). Total employment has also increased, following a similar trend observed in national IPAs during the same period.

Figure B3.1. Total Subnational IPAs' Budgets, by Agency/Region



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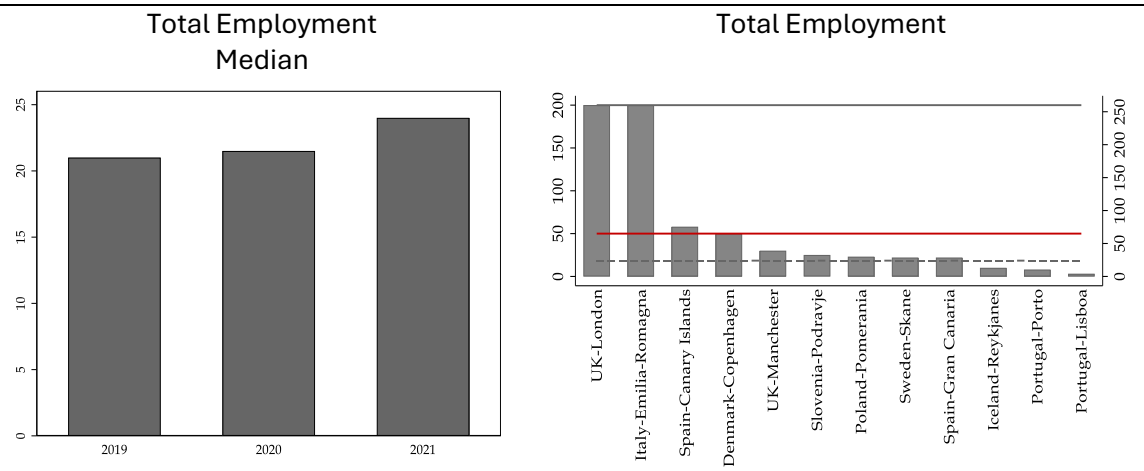


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: Figures for FDI employment are not available for the surveyed subnational IPAs and, therefore, comparison of size along this dimension has not been possible. Dotted horizontal lines correspond to the median across subnational IPA, red horizontal lines correspond to the median LAC national IPA, and gray horizontal lines correspond to the median ROW national IPA on the secondary axis.

1.4. New Data and Insights on Digitalization of Investment Promotion

It is in this context that IPAs have been undergoing their digital transformation. The adaptation has been multifaceted. For example, it meant a change in IPAs' targeting strategies to focus further on attracting more digital sectors and activities.[17] It also implied adjustments in the way IPAs organize and carry out their own actions and provide their services through the adoption of a new ICT infrastructure, new digital tools, and investment in staff recruitment and training, among others. While changing prioritization strategies have been studied thus far, there is virtually no detailed comparative data on the extent and patterns of digitalization of IPAs' activities.[18] This information is, in turn, critical to assess their drivers and their implications for effectiveness. Relatedly, it helps identify remaining gaps to assist IPAs in this dynamically changing environment.

This new IDB report, which is based on a comprehensive survey on IPAs' digital tools, takes stock and sheds light on the evolving digitalization strategies and digital tools used by IPAs, including changes in the aftermath of COVID-19. Specifically, the report presents the main insights regarding the current use and remaining gaps in IPAs' digital toolkit from a survey that benefited from responses of 50 agencies worldwide – 15 in LAC and 35 elsewhere (see Box 4) – and IDB's experience in this area. The rest of this report is structured as follows: Sections 2 and 3

[17] In 2021, ICT has been second-most frequently targeted sector by IPAs, including such sub-sectors as computer programming activities, data processing and hosting and wireless communication technologies and new digital technologies (see Sztajerowska and Volpe Martincus, 2021).
[18] See OECD (2018), Sztajerowska and Volpe Martincus (2019, 2021) and de Crombrugghe and Moore (2021).

provide information on financing and staffing of IPA digitalization, respectively. Section 4 examines the implementation of IPA digital strategies, notably through the use of different types of tools and providers –currently and their adoption over time– and the varying development and integration approaches taken by the agencies. Section 5 summarizes the main findings proposing a series of IPA Digital Indices to capture different aspects of IPAs' capacity to face the digitalization challenge. Section 6 concludes and provides suggestions on the way forward.

Box 4 | IDB Survey of IPAs Digital Tools

The IDB Survey on IPAs Digital Tools has been developed by the Productivity, Trade, and Innovation Sector (PTI) at the IDB. It has benefited from the IDB's long-standing experience in interacting with, advising, and providing technical assistance and financial support to IPAs in different areas of operations, including digital transformation. The survey provides novel and detailed information across three key areas for digital transformation of IPAs and other public bodies:

- **Financing** – budget available for the design and adoption of new digital tools
- **Staffing –** human capital available for the design, adoption, and use of new tools
- **Implementation –** relating to the number and type of digital tools (along with the spatial and temporal adoption patterns of such tools), specific digital development and integration strategies, and criteria used for tool selection.

The survey was circulated to all the national-level IPAs in IDB LAC member countries in 2021-2022 and was open to participation by agencies of other countries and those operating subnationally. Fifty agencies from different parts of the world and at different levels of development responded to the survey: 15 agencies from LAC and 35 from ROW, including 23 national-level IPAs and 12 subnational IPAs. As such, the data gathered through the survey permits unique comparisons across countries in different regions (and across agencies operating at the national and subnational level), representing the first initiative of this kind.

Figure B4.1. Coverage of the IDB IPA Digital Tools Survey

Source: Authors' calculations based on the IDB Survey of IPA Digital Tools.

2

Financing Digitalization: Resources

2. Financing Digitalization: Resources

A median IPA had an annual budget of US$ 0.37 million available for the adoption and use of digital tools. There are large differences across countries, with the maximum digital budget reaching nearly US$ 11 million, and the minimum budget being US$ 5 thousand a year.

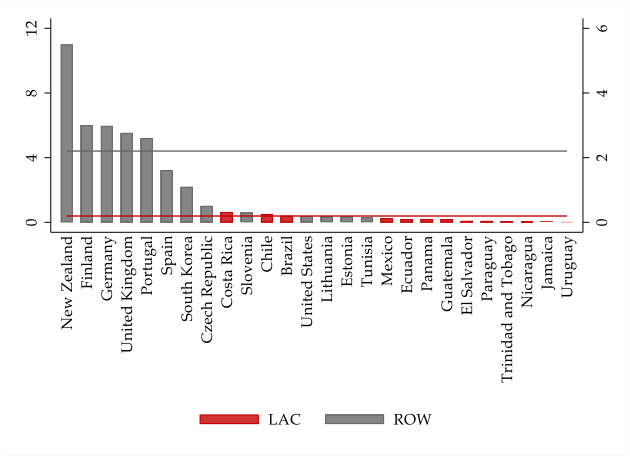
Consistent with differences in the agencies' overall size, LAC IPAs have smaller digital budgets in absolute terms than IPAs in ROW (see Figure 9, top panel).[19] In relative terms, the median LAC IPA assigns a slightly higher share of its total budget (5% LAC and 4% ROW) to digital tools (see Figure 9, middle panel) and lower in per employee terms, i.e., US$ 2.2 thousand in LAC compared to US$ 8 thousand in ROW in 2021 (see Figure 9, bottom panel).[20] The size of the digital budget also differs widely across individual agencies within each region. At the subnational level, agencies tend to have a relatively lower share of staff and budget devoted to digitalization than their national counterparts either in ROW or LAC (see Box 5).

Overall, larger and more developed economies tend to have more resources for digital tools in absolute terms (Figure 10). This is confirmed even when accounting for the agency's budget fluctuations, the quality of e-government development, and overall investment climate in the host country (see Table 1);[21] whereby, besides the size captured by the budget for investment promotion, high quality of e-government is associated with a higher IPA budget for digital tools – potentially capturing a higher public sector's demand for digitization – while the overall business climate, lowering digital and other providers' entry, is not.

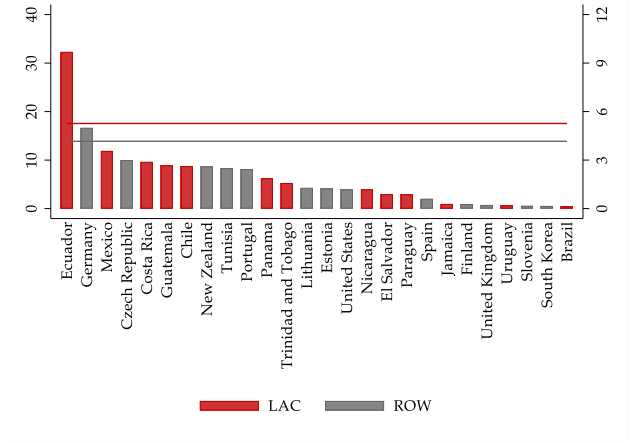
[19] The median LAC IPA had an annual digital budget of US$ 0.2 million and that of its ROW counterpart was ten times larger (US$ 2.2 million).
[20] The extent to which these differences in IPAs' digital budgets translates into differences in purchasing powers depend on the prices actually paid by the IPAs for the digital tools.
[21] However, the relationship is less clear for the share of digital tools budget to total budget, which may be related to a small sample size (see Figure A2.3 in Annex 2).

Figure 9. IPA Budget for Digital Tools by Region

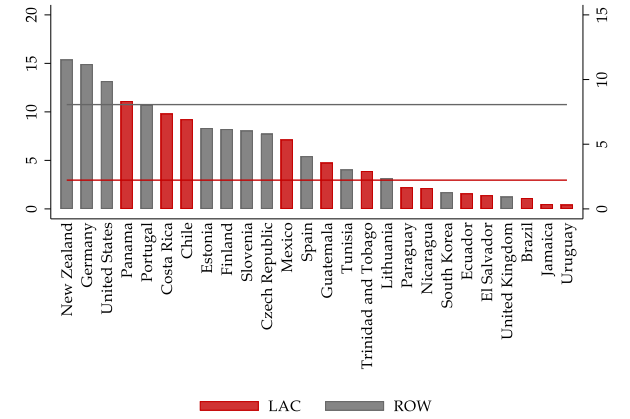
Absolute Budget for Digital Tools (million US$)



Budget for Digital Tools Relative to Total Budget (Percentage)



Budget for Digital Tools Relative to Staff (thousand US$ per employee)



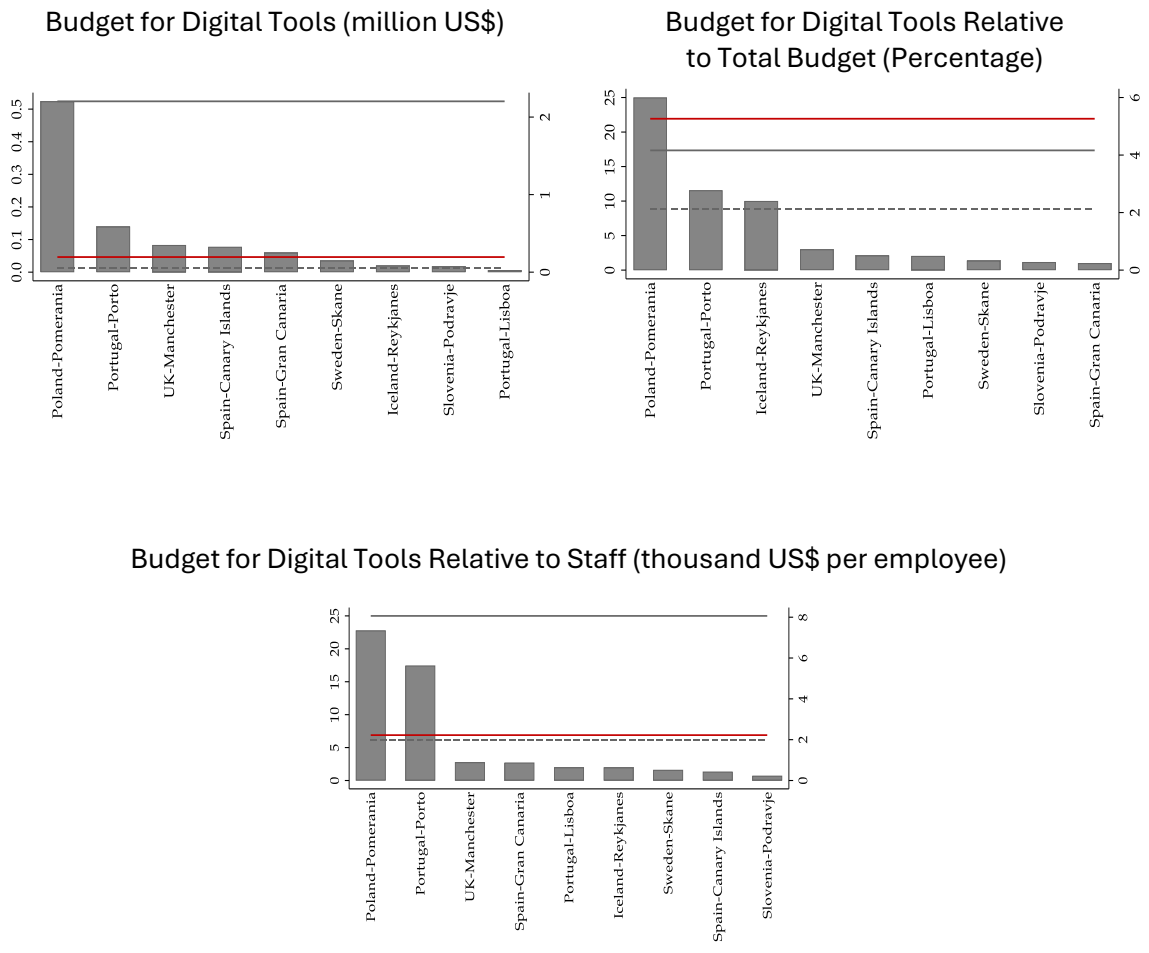
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures show national IPA absolute total budget for digital tools by country (first panel), as a percentage share of total national IPA budget (second panel), and per national IPA employee (third panel). Horizontal lines on the secondary y- axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Box 5 | Resources for Digitalization of Subnational IPAs

Like their national counterparts, subnational IPAs are also on the quest for greater and faster digitalization. While data on the digitization of such agencies is scarce, responses provided by nine such agencies as part of the survey (all outside of LAC) shed light on their differences from national agencies.

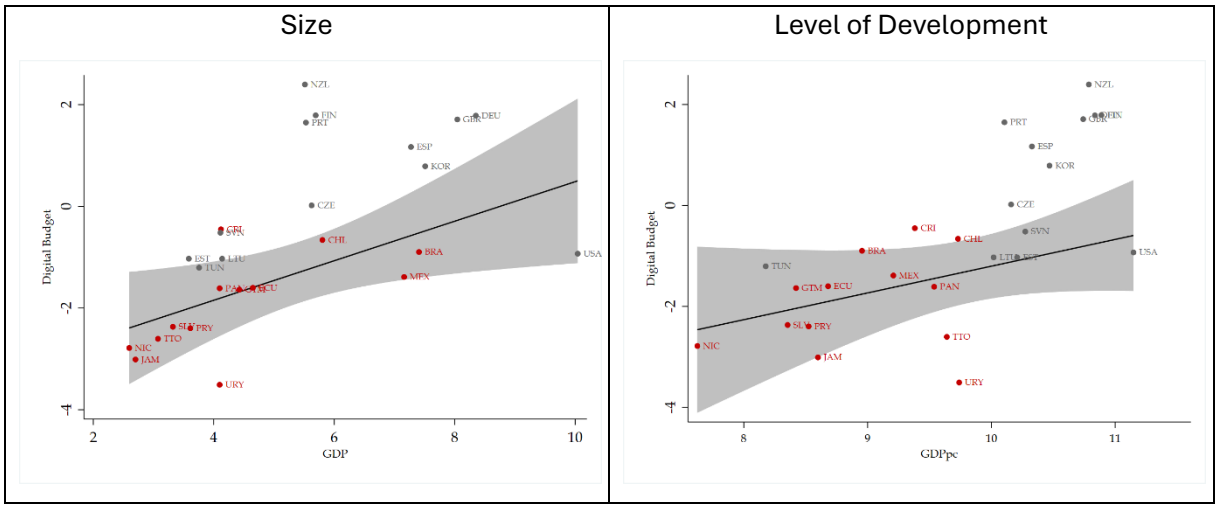
Reflecting their overall smaller size than national IPAs, a median subnational IPAs has a budget for digital tools below the levels of national IPAs in ROW and LAC, equal to US$ 59.7 thousand, corresponding to 2.1% of the median total budget and US$ 1.9 thousand per employee (see top panel on the right and bottom panel in Figure B.5.1). Some subnational IPAs are, nevertheless, highly endowed: for example, the agency of Pomerania in Poland (Invest in Pomerania) and of Porto in Portugal (InvestPorto) have above-median levels of budget devoted to the development and use of digital tools (see Figure B.5.1).

Figure B.5.1. Subnational IPA Budget for Digital Tools by Region



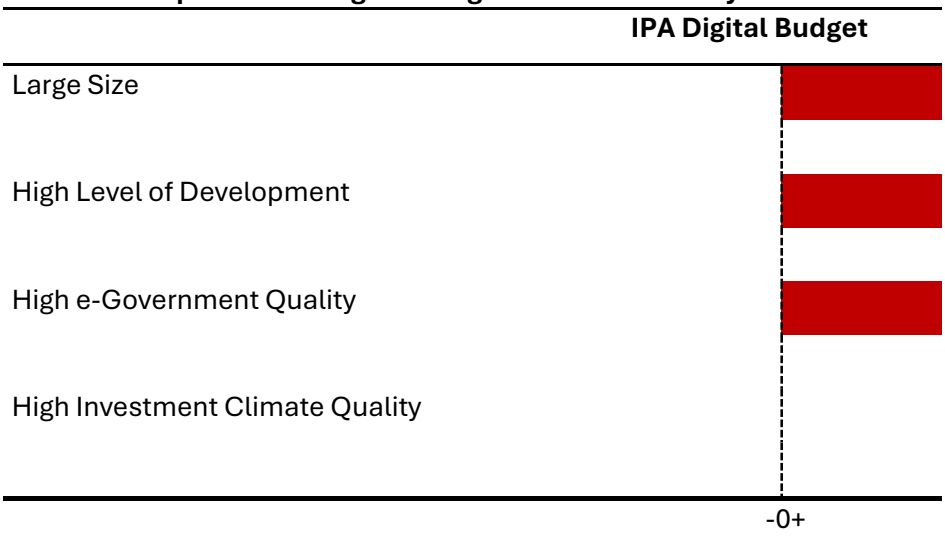
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures show subnational IPA absolute total budget for digital tools by country/region (first panel), as a percentage share of total subnational IPA budget (second panel), and per subnational IPA employee (third panel). Dotted horizontal lines correspond to the median across subnational IPA, red horizontal lines correspond to the median LAC national IPA, and gray horizontal lines correspond to the median ROW national IPA on the secondary axis.

Figure 10. IPA Digital Resources and Size and Development of the Economy



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure shows the relationship between national IPAs' budget for digital tools and their respective countries' GDP and GDP per capita, in natural logarithm (left and right panels, respectively). LAC countries are shown in red, whereas ROW countries are shown in dark gray.

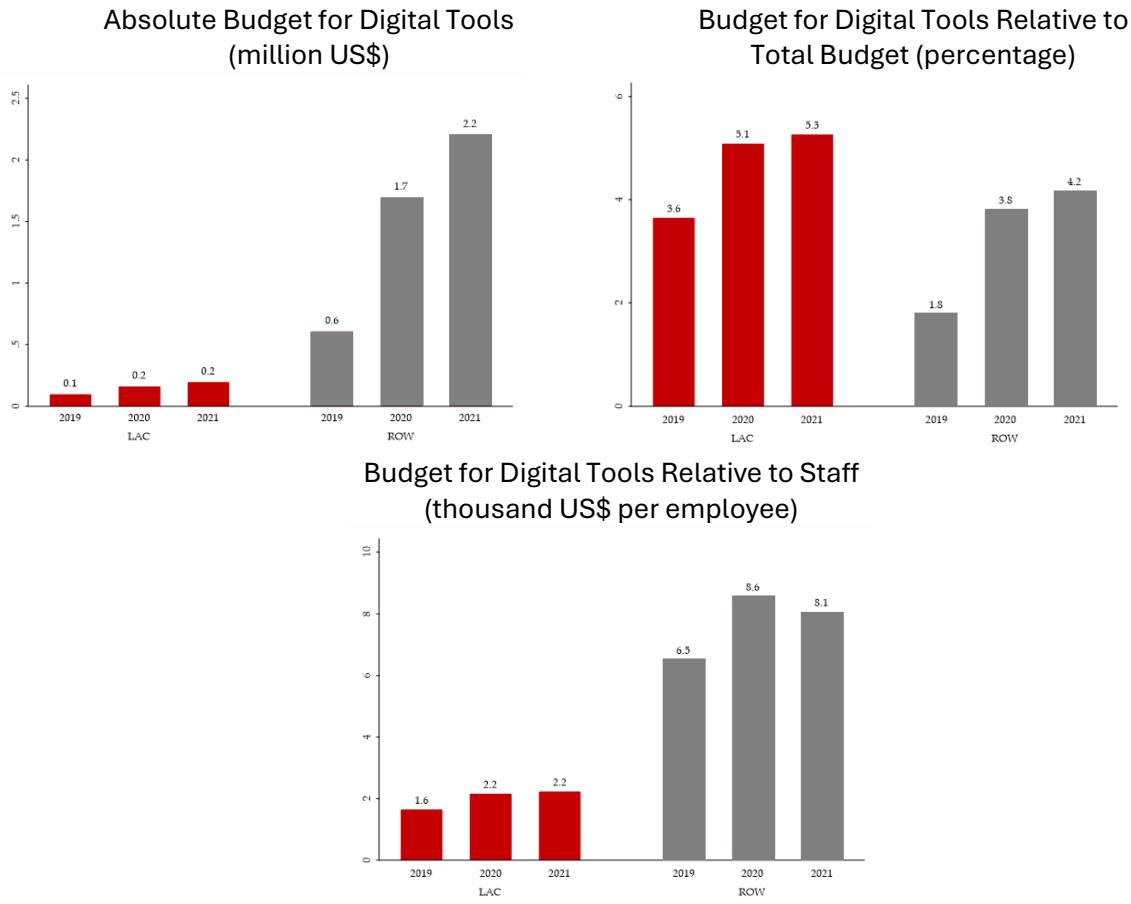
Table 1. Relationship Between Digital Budget Size and Country-Level Characteristics



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools, World Bank's World Development Indicators, UN, and WEF.
Note: The table reports the sign of the estimated coefficients of an equation whose dependent variable is the size of the agency's digital budget (in natural logarithm) and whose main explanatory variables are: a binary indicator of economic size (Large Size) taking a value of 1 if the country's GDP size is above the sample median in the pre-sample period, and 0 otherwise; a binary indicator of level of development (High Level of Development) taking a value of 1 if the country's GDP per capita is above the sample median in the pre-sample period, and 0 otherwise; and binary indicators for e-government (High e-Government Quality) and investment climate quality (High Investment Climate) that equal 1 when the country's score on the UN E-Government Development Index is above the sample median and on the Global Competitiveness Index measure of domestic regulatory burden is below the sample median in the pre-sample period, respectively. The specification includes the agency's investment promotion budget (in natural logarithm) and year fixed effects as control variables. Dark red indicates statistical significance at 1% and light red at 10% level. Standard errors are robust

Beyond these general patterns, IPAs have adapted their digital budgets in different ways, including in response to the COVID-19 pandemic. The median IPA in LAC and ROW increased its budget for digital tools after the pandemic, both in absolute and relative terms (see Figure 11), with IPAs in more developed economies experiencing larger and more frequent increases, even when relevant macroeconomic and other relevant factors are controlled for (see Box 6). [22]

Figure 11. IPA Digital Tools Budget Pre- and Post- COVID-19



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure presents the median budget for digital tools by region per year. The figure includes the median absolute budget for digital tools, the median budget for digital tools relative to total budget, and the median budget for digital tools relative to total staff. LAC is shown in red, whereas ROW is shown in dark gray.

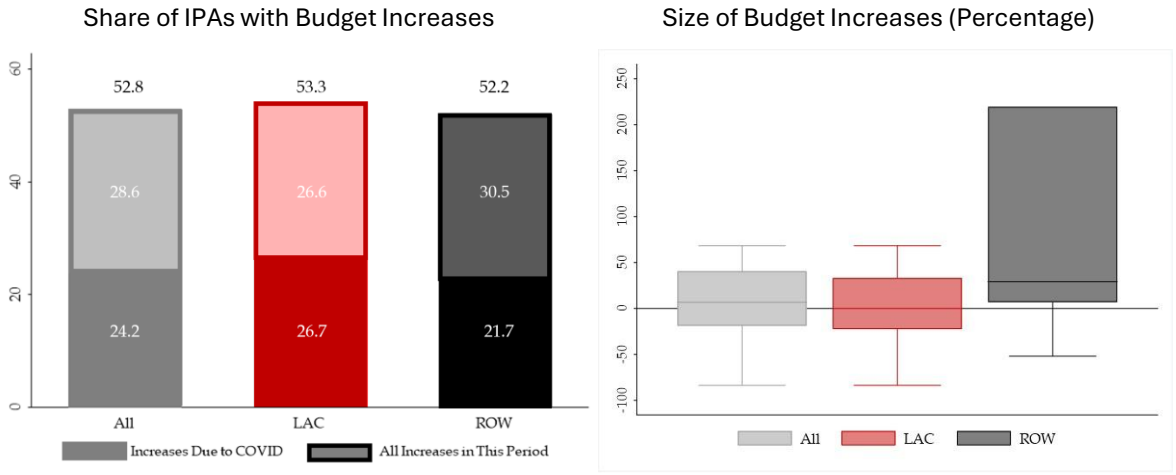
Box 6 | How Did IPAs Change Their Digital Tools Budget During COVID-19?

The COVID-19 pandemic was associated with increases in the agencies' digital tools budgets. Among IPAs reporting digital tools' budget increases – which account for about half of agencies in both

[22] Such an increase has been particularly sizable in some IPAs. For example, Korea, Lithuania and Estonia in ROW and Panama and Paraguay in the LAC at least doubled their resources in 2020. However, several agencies from LAC have also seen their digital budgets decrease during the same period (e.g., El Salvador, Chile, Jamaica and Mexico).

LAC and ROW – nearly half self-report that the increase was due to COVID-19 (see Figure B6.1, left panel), with the upward adjustments being much larger in ROW (see Figure B6.1, right panel).

Figure B6.1. Changes of IPA Digital Tools Budgets post-COVID-19



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure on the left shows the share of IPAs with increases in their budget for digital tools and, among these, the share of those that reported that an increase was due to COVID-19 (dark tone area) by group. The figure on the right presents the distribution of the percentage changes of IPAs' budgets for digital tools across groups.

IPAs of more developed economies increased their digital budgets more during the COVID-19 pandemic. This holds even after accounting for macroeconomic conditions, the size of the agencies' investment promotion budget, as well as high e-government and investment climate quality that may be associated with higher or lower levels of resources for digitalization (see Table B6.1).

Table B6.1. Changes of IPA Digital Tools Budgets post-COVID-19 and Country Characteristics

	IPA Digital Budget
Pre-COVID-19 x Size	
Post-COVID-19 x Size	
Pre-COVID-19 x Level of Development	
Post-COVID-19 x Level of Development	
Pre-COVID-19 x High e-Government Quality	
Post-COVID-19 x High e-Government Quality	
Pre-COVID-19 x High Investment Climate Quality	
Post-COVID-19 x High Investment Climate Quality	
	-0+

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools, World Bank's World Development Indicators, UN, and WEF.

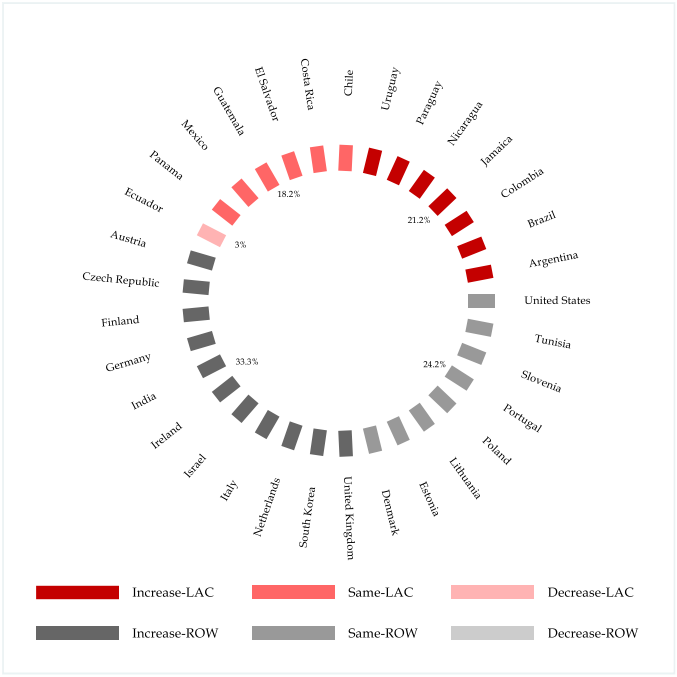
Note: The table reports the sign of the estimated coefficients of an equation whose dependent variable is the size of the agency's digital budget (in natural logarithm) and whose main explanatory variables are: Size measured through the country's GDP size (log) and Level of Development measured through the country's GDP per capita (log) and binary indicators for e-government (High e-Government Quality) and investment climate quality (High Investment Climate) that equal 1 when the country's score on the UN E-Government Development Index is above the sample median and on the Global Competitiveness Index measure of domestic regulatory burden is below the sample median in the pre-sample period, respectively, all of them interacted with binary indicators indicating different time periods: Pre-COVID-19 takes the value of 1 for 2019 and 0 otherwise and Post-COVID-19 takes a value of 1 for years 2020-2021 and 0 otherwise, respectively. The specification includes the agency's investment promotion budget (in natural logarithm) and year fixed effects as control variables. Dark red indicates statistical significance at 1% and lighter red at 5% level. Standard errors are robust.

Going forward, larger digital budgets may be a new feature. Most IPAs indicated either an increase or sustaining the same levels of funding in this area– and the interest in increasing such resources is particularly strong in LAC (see Box 7).

Box 7 | Digital Budget Expansion Plans

When asked about their plans, over half of the agencies indicated that they wish to expand their digital tools' budgets. The trend is even stronger in LAC: nearly two-thirds of LAC IPAs and 57% in ROW planned to increase their digital budgets. Only one agency in each region reported planned budget decreases, with the rest aiming to at least sustain the higher levels (see Figure B7.1).

Figure B7.1. Planned IPA Digital Budget Changes



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the IPAs' plans for the digital budget for the next few years. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

3

Staffing Digitalization:
IT Team and Staff Training

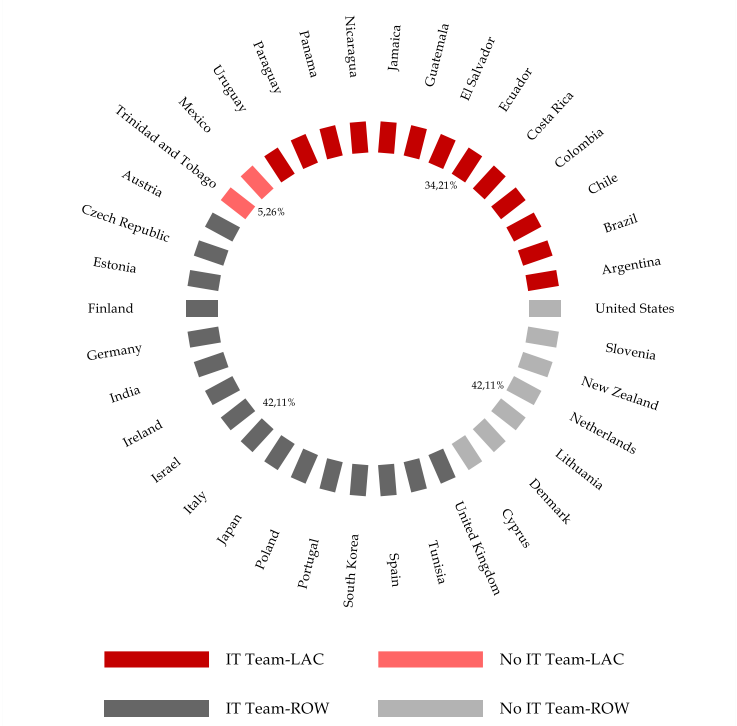
3. Staffing Digitalization: IT Team and Staff Training

3.1. IT Team Size

Over three-quarters of the IPAs have a dedicated IT team within the agency, and the share is higher in LAC

Figure 12). In fact, only two agencies in LAC (Trinidad and Tobago and Mexico) and eight agencies in ROW (Cyprus, Denmark, Lithuania, Netherlands, New Zealand, Slovenia, United States) reported not having a specialized IT team. Still, there are large differences in size and skill set of those teams.

Figure 12. Presence of an IT Team by Country and Region



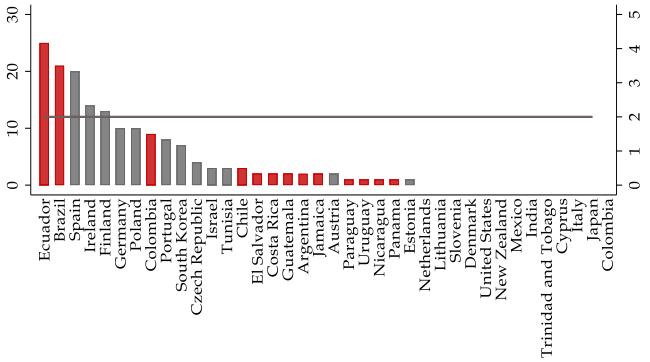
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows if a country's national IPA has an IT team (dark tones) or not (light tones) by region. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

The IPAs' IT teams tend to be small in both LAC and elsewhere. A median IT team in LAC and ROW is composed of 2 members, which corresponds to 2.9% and 1.6% of the agency's total staff, respectively. Some LAC countries – such as Ecuador and Brazil – have particularly sizable IT teams in absolute and relative terms (see

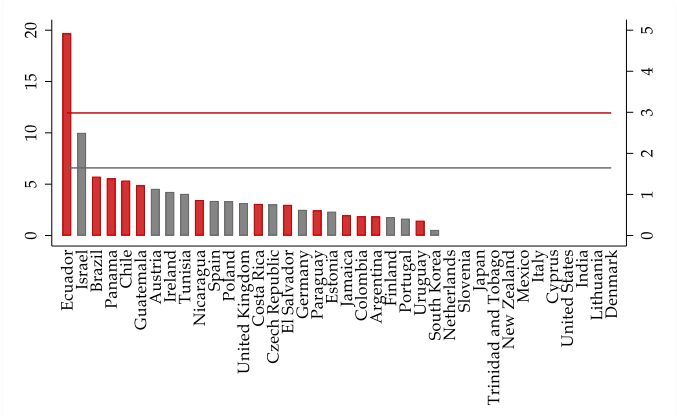
Figure **13**).[23] When compared to the size of IPAs' digital budgets, a median IPA has 194 thousand US$ at its disposal per year per each member of the IT team and the ratio in ROW largely exceeding that in LAC (US$ 336 thousand compared to US$ 62 thousand).[24]

Figure 13. IPA IT Team by Country

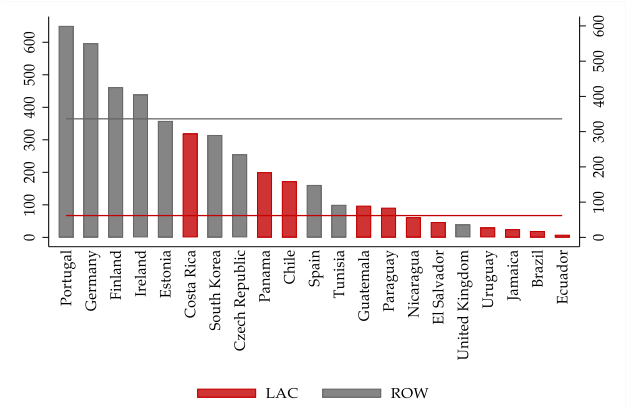
Absolute Size of IPA IT Team



IT Team as a Percentage Share of Total Staff



IPA Digital Budget per IT Team Member (thousand US$ per employee)



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

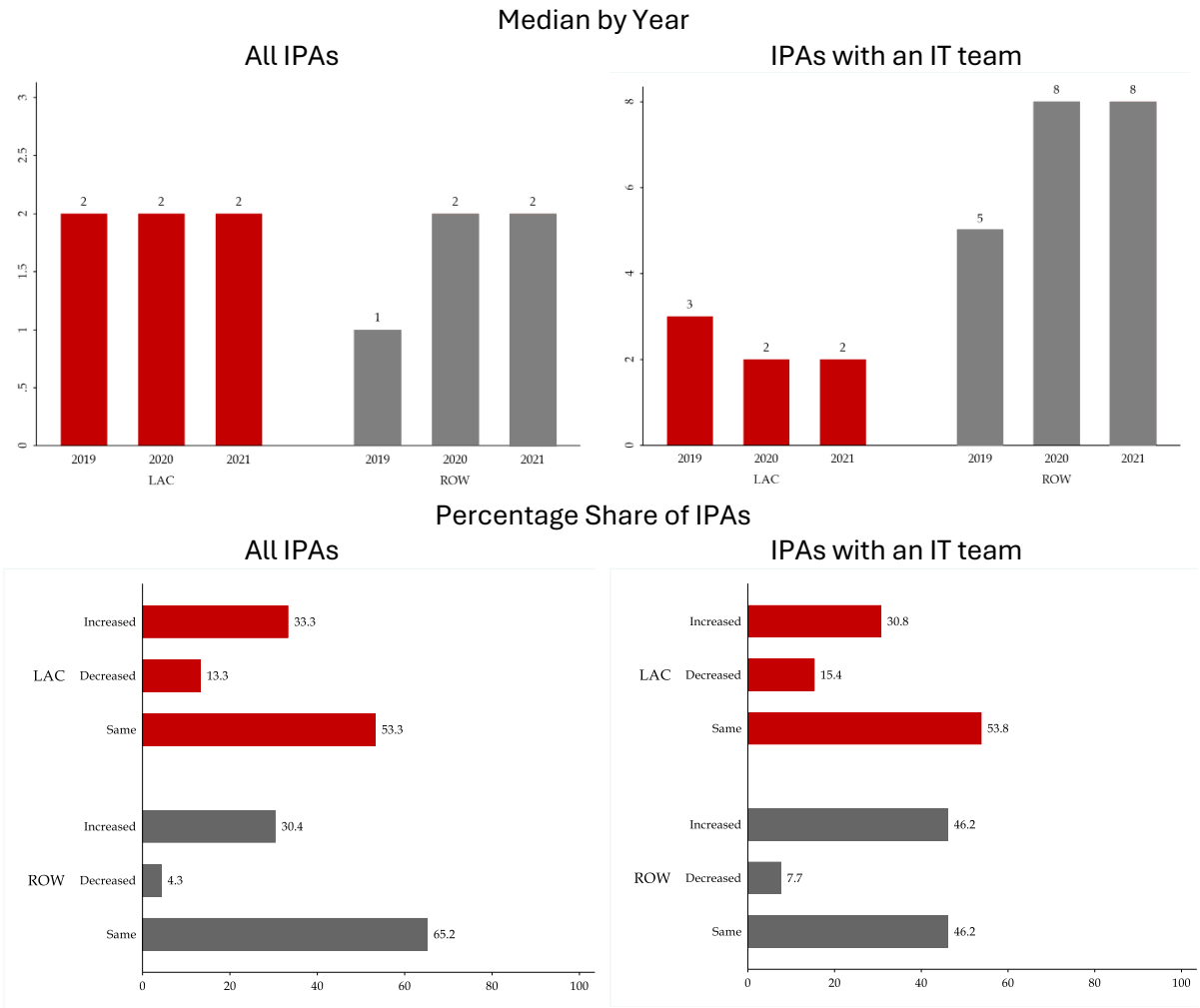
[23] Agencies with small IT teams can have access to a larger set of specialists by relying on and rotating external consultants depending on specific needs over time, while keeping the team's size small at any given moment.

[24] See Figure A2.4 in Annex 2 for the relationship between IT team size and its share in total staff and countries' size and level of development.

Note: The figures show the absolute size of IPA's IT Team (first panel), the percentage share of IT Team in total IPA staff (second panel), and the IPA digital budget per IT Team member (third panel). Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray. The United Kingdom national agency is not included in the first panel because (it has 140 IT team members).

IPAs outside of LAC expanded their IT teams during the pandemic, while the changes in LAC have been more ambiguous. Agencies in ROW have either increased their teams (30%), such as Germany and Ireland, or kept them the same (65%), such as the Netherlands or Israel. In contrast, about half of LAC IPAs did not make any changes, and a similar share of agencies expanded (e.g., Brazil and Ecuador) and reduced them (e.g., Argentina or El Salvador). **As a result, a median IPA in ROW added one IT team member during the pandemic while the median remained the same in LAC** (see Figure 14). Potentially linked to the speed of adjustment, there are also differences across regions regarding future expansion plans (see Box 8).

Figure 14. IPA IT Team Size, Pre- and Post-COVID-19



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures in the top panel report the median IT team size per year. The median values shown on the left are calculated by treating the lack of an IT team as 0. The median values shown on the right exclude agencies that do not

have an IT team. The figures in the bottom panel present the percentage share of IPAs that increased, decreased, and did not change the size of their IT teams between 2019 and 2021, by region. LAC is shown in red, whereas ROW is shown in dark gray.

Box 8 | IPA IT Staff Expansion Plans

As in the case of digital tools' budget, LAC IPAs have made fewer adjustments in the size of their IT team than their counterparts outside of the region during COVID-19. The question then arises of whether and, if so, to what extent they planned to change the course going forward.

A large share of LAC IPAs was planning IT team expansions: 62% vs. 31% in ROW (see Figure B8.1). IPAs without IT expansion plans quoted mainly budget restrictions as reasons for not having them: 80% of LAC IPAs and 45% outside of LAC. In addition, the remaining 20% of agencies in LAC and 27% of agencies outside of the region report having already sufficient capacity. As for the size of the planned changes, **most of the IT team expansions would involve adding 1-3 members,** with larger expansions planned in LAC – reaching up to 10 new IT staff (see Figure B8.2).

Figure B8.1. Share of IPAs Reporting to Plan Expansion of Their IT Team, by Region

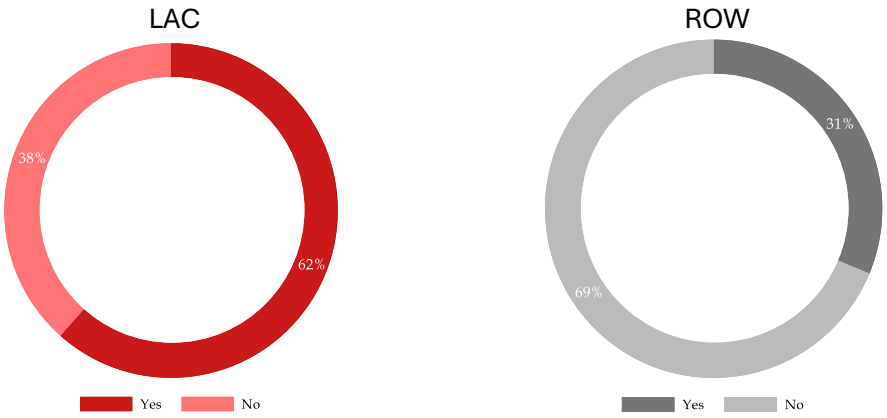
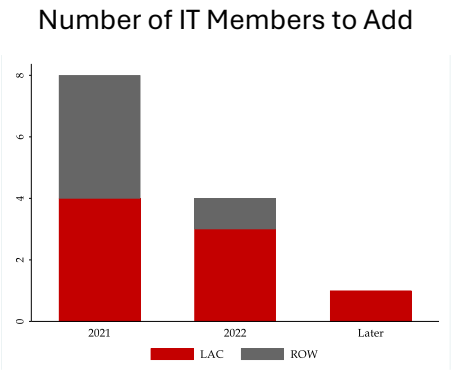


Figure B8.2. Size and Speed of Planned Expansion of IPA IT Team, by Region

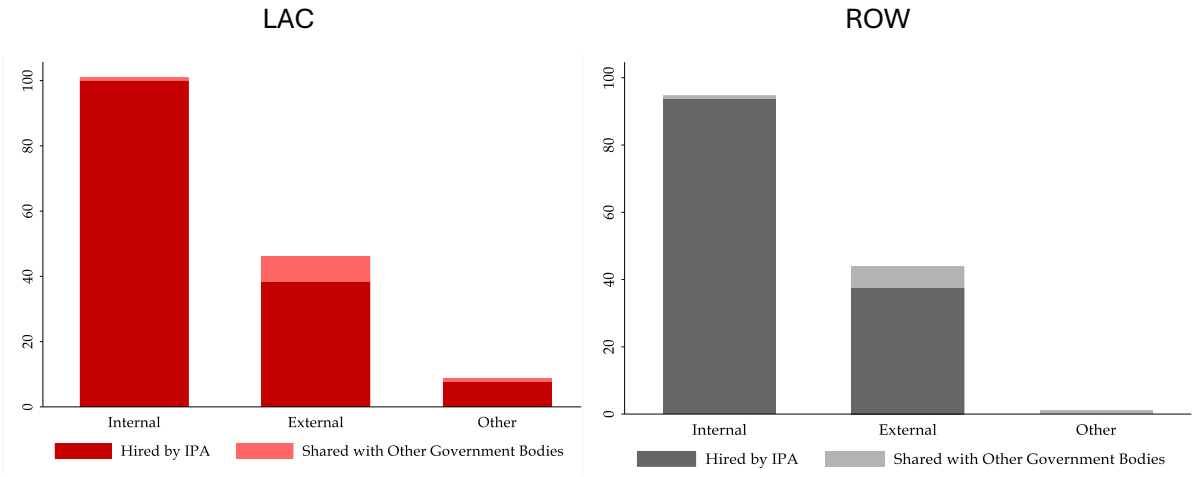


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the percentage of IPAs that plan to increase their IT team and the number of IT members to add. LAC is shown in red, whereas ROW is shown in dark gray.

3.2. IT Team Employment Structure

Besides internal employees, nearly 40% of IPAs hire external consultants for IT functions.[25] The reliance on external specialists allows IPAs to flexibly adjust their IT teams according to their evolving needs without long-lasting increases in payroll. Most external consultants are contracted directly by the IPA, while some agencies share IT consultants with other public agencies (e.g., Chile and South Korea). These shares are virtually identical within and outside LAC, even though there are differences across individual IPAs (see Figures 15 and 16 and Figures A2.9 and A2.10 in Annex 2 for planned IT team expansion by contract type, by region and country, respectively).

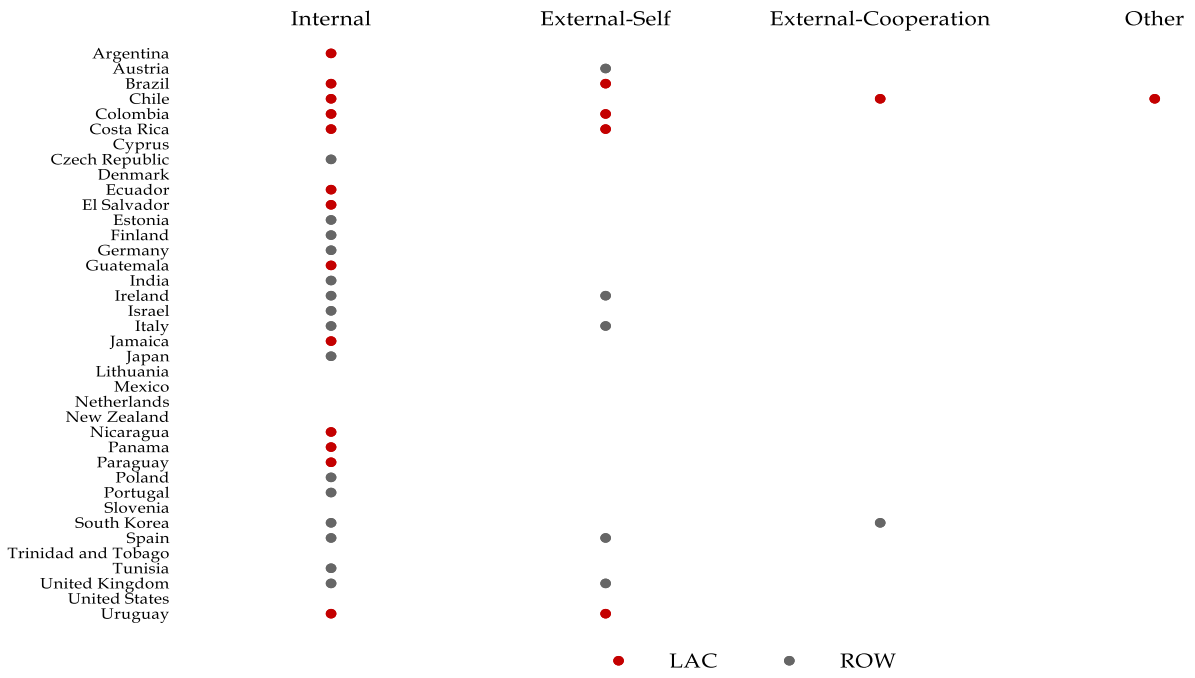
Figure 15. Percentage Share of IPAs with a Given IT Contract Type by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the IPA's IT team contract types by country and region and the median percentage share of a given contract modality by region. "Internal" refers to arrangements in which the IT team is composed by employees on the agency's own payroll. "External" denotes cases in which the agency independently contracts external consultants or third-party providers to fulfill IT functions ("Hired by IPA") or enters arrangements in which IT services are provided through consultants or personnel shared with, or coordinated across, other public sector institutions ("Shared with Other Government Bodies"). "Other" encompasses IT team compositions that do not fall clearly into any of these categories. LAC is shown in red, whereas ROW is shown in dark gray.

[25] Austria is the exception relying entirely on external consultants for its IT services.

Figure 16. IPA's IT Team by Contract Type and Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the composition of IPAs' IT teams by contract type. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

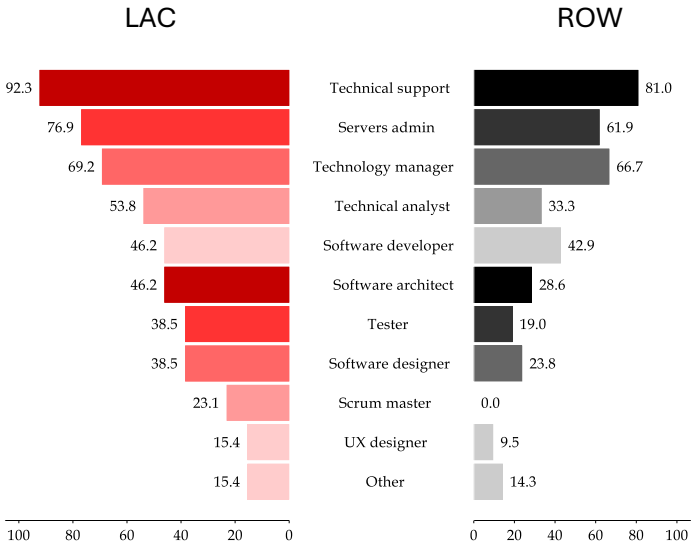
3.3. IT Team Functions

Technical support is the most common function within IPA IT teams (present in 92% of LAC IPAs and 81% of those in ROW with an IT team), followed by a server administrator (77% and 62%) and a technology manager (70% and 67%). Technical analysts, software developers, and software architects are also frequently represented in IPA IT teams, especially in LAC. The roles of a *scrum master*, who leads the team through an IT project using agile project management, and of a *user experience (UX) designer*, who is responsible for websites, apps, and other IT products that users interact with, are instead less common.

LAC agencies have a larger range of functions covered within their IT teams (see Figure 17). This is, for instance, the case with Argentina, Brazil, Colombia, and Uruguay (and India and Portugal in ROW) (see Figure 18). Considering that LAC IT teams are generally smaller, this may mean that IPAs in the region hire staff that combine a broader set of skills or hire external consultants that possess different skills on a rotational basis over time. There are also some differences in the type of IT professionals sought for future expansions across regions: in LAC, IPAs plan to hire more technical support staff, software developers, and UX designers, while their

ROW counterparts aim to recruit technology managers, technical support staff, and software specialists, with the former relying more on external consultants to grow[26].

Figure 17. Percentage Share of IPAs With a Given Function in Their IT Team by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the percentage share of IPAs with a given function in their IT team by region in 2021. LAC is shown in red, whereas ROW region is shown in dark gray.

Figure 18. Presence of Different IT Functions within the IPA IT Team by Country

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the presence of different IT functions within the IPA IT team by country. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

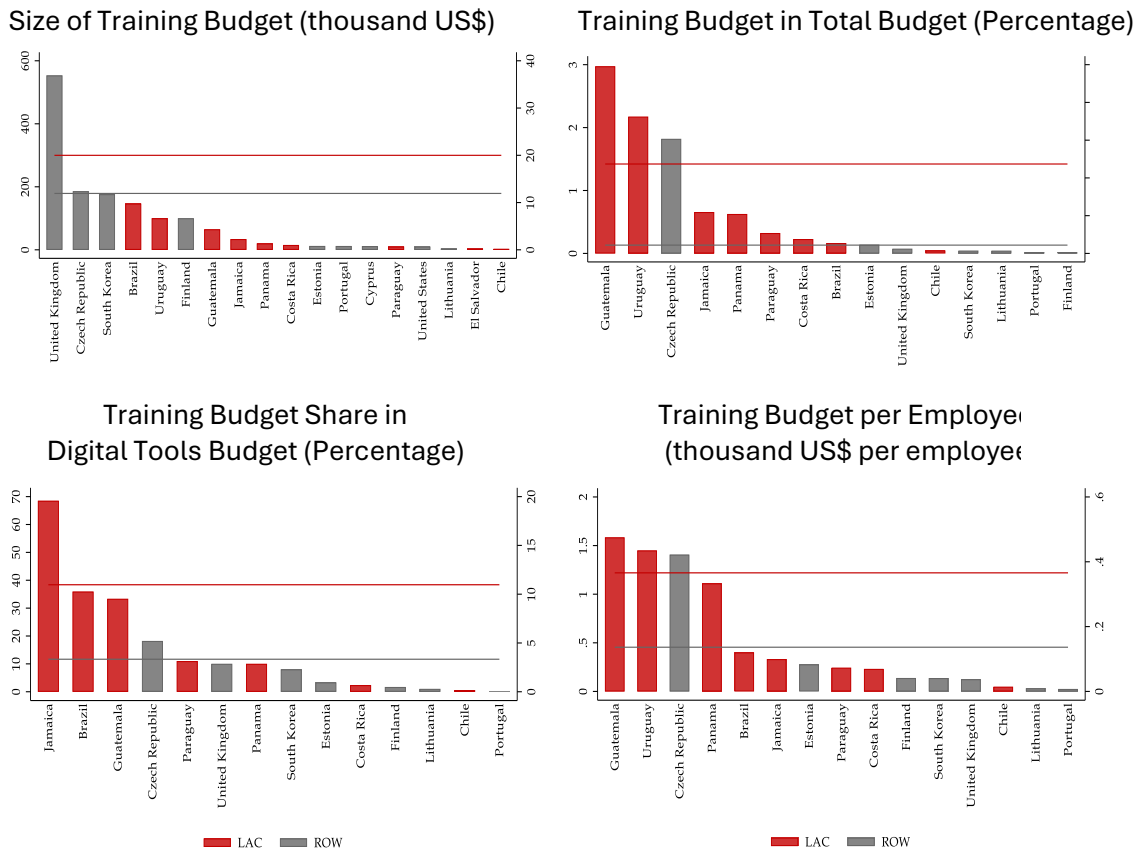
[26] See Figure A2.7 in Annex 2 for the share of IPAs planning to expand a given IT team function by region, and Figure A2.8 for country-level detail.

3.4 Training of Staff

In addition to its IT team, IPAs may also have a dedicated budget and activities for training their employees in the use of new digital technologies to facilitate skill-upgrading.

The median surveyed IPA reporting such budgets has US$ 17,500 available for training of employees in the use of new technologies (US$ 20,000 in LAC and US$ 12,000 in ROW) (see Figure 19).[27] This figure corresponds to 8% of the digital tools' budget (10% for LAC and 3% for ROW) and less than 0.15% of the total budget of a median IPA (0.32% for LAC and 0.004% for ROW). The median LAC IPA has a larger training budget than its ROW counterpart in absolute and relative terms. Overall, larger and more developed economies tend to have higher training budgets in absolute terms but similar in relative terms (see Figure A2.7 in Annex 2).

Figure 19. Budget for Training Employees for the Use of New Technologies



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the IPA's training budget for the adoption of new technologies in million US$, their percentage share in the total budget, the percentage share in the digital tools budget, and the training budget per employee. Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

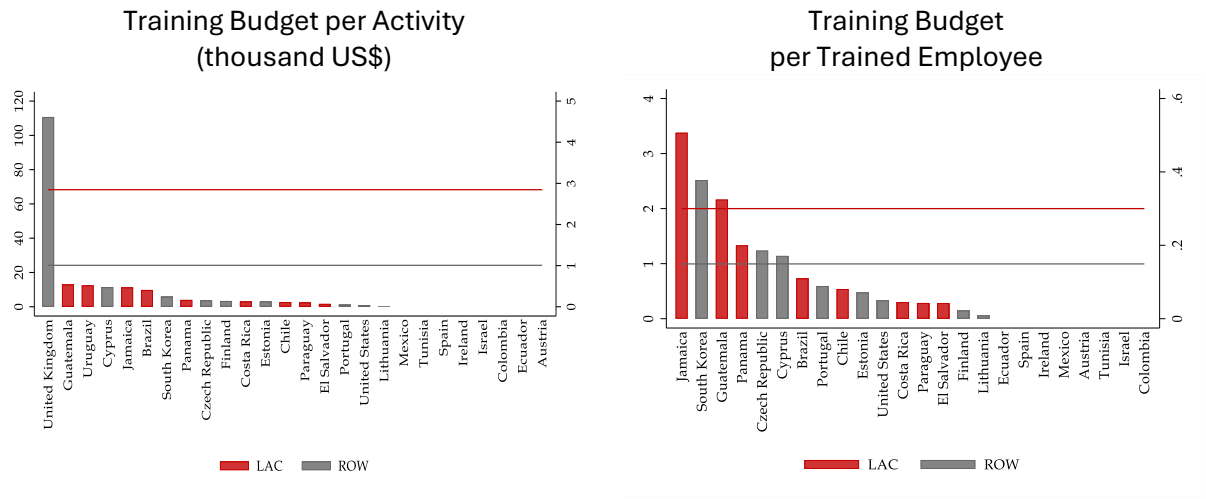
[27] 17 agencies worldwide reported their figures: 7 from LAC and 10 from ROW.

A median IPA organized 5 different training activities for its staff and trained 30 employees. LAC agencies appear to offer fewer training offerings involving a large number of staff, while their extra-regional counterparts provide more training activities per employee: a median IPA in LAC offered 4 different training activities, training 35 employees, compared to 10 activities training 24 employees in ROW (see Figure 20).

IPAs in LAC increased the share of staff and budget devoted to new technologies. More precisely, the share of employees trained in new technologies increased from 25% to 47%, and the share of training budget in the total budget increased by about 0.8 percentage points from pre- and post-COVID-19 to reach 0.5% for the median LAC IPA. **In ROW, the share of instructed employees also increased** – from 17% to 28% in ROW— **but the relative training budget remained essentially the same over the period** (see Figure 21). As is shown in Box 9, subnational IPAs in ROW have followed a similar path as their national counterparts[28].

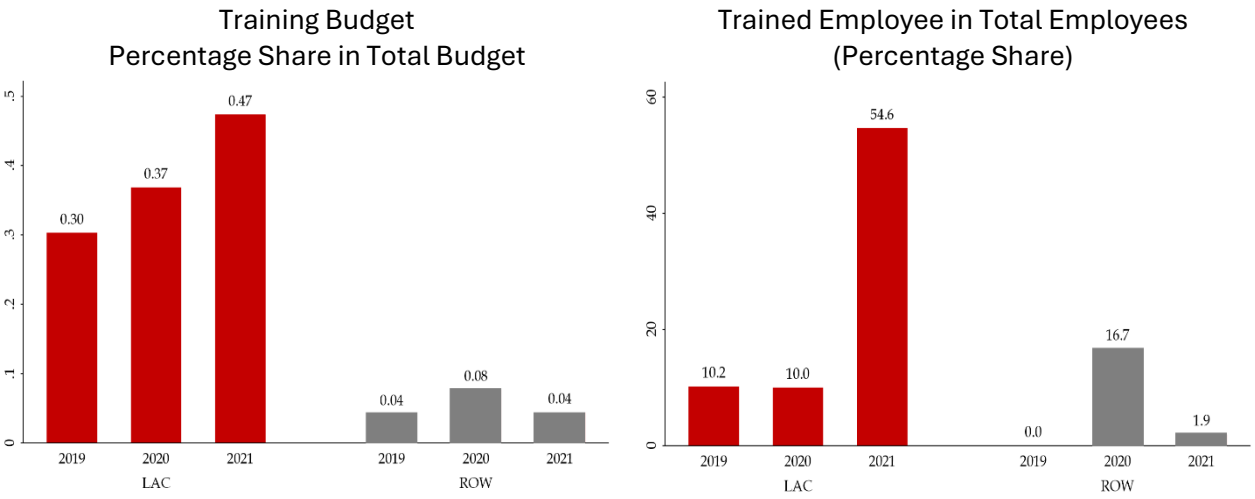
Figure 20. Training Activities and Trained Employees

[28] See Figure A2.4 in Annex 2 for the relationship between training budget size, number of training activities, and share of trained employees and countries' size and level of development.



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures show the training activities, trained employees, and training budget by IPA country, with the median by region in the secondary axis. Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Figure 21. Training Budget and Trained Employees, Pre- and Post-COVID-19



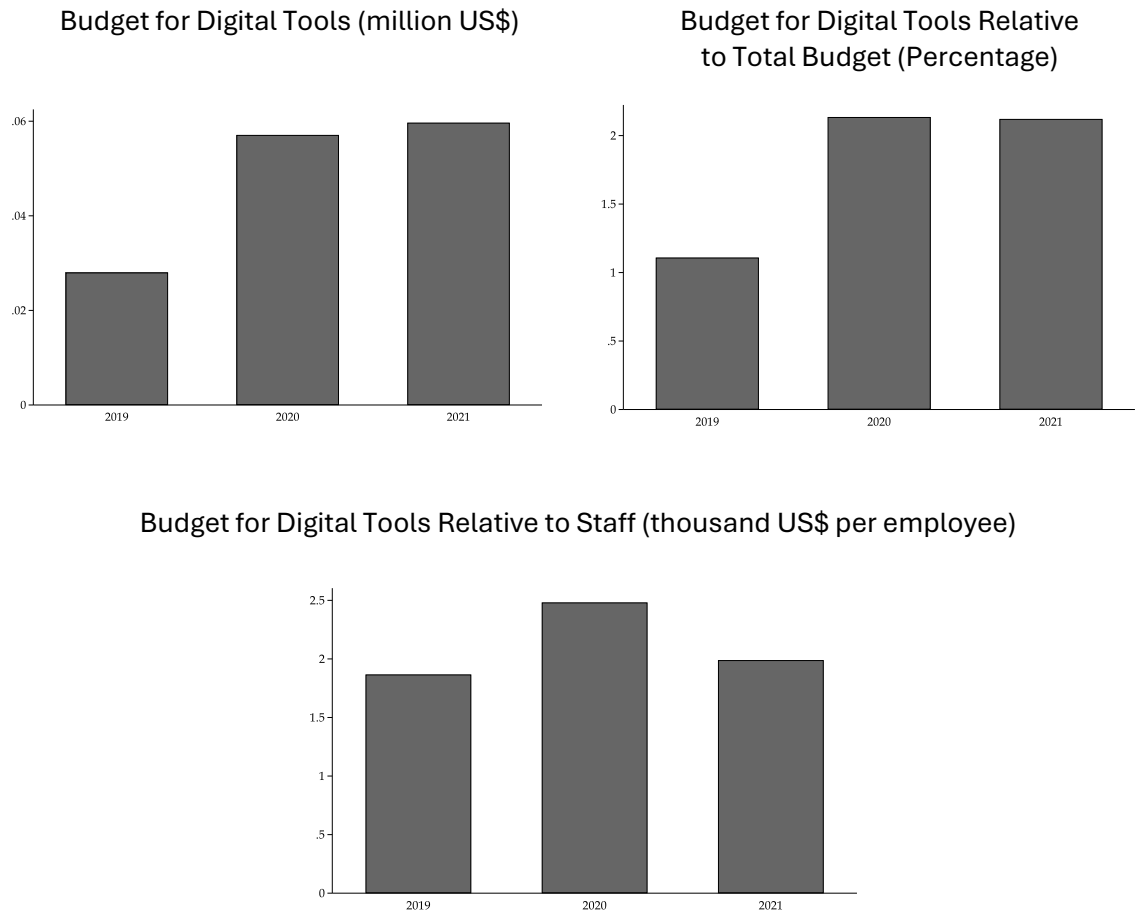
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the median training budget as a percentage share of the respective IPAs' total budget and the median number of trained employees as a percentage share of the total number of employees pre- and post- COVID-19. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Box 9 | Resources for Digitalization During COVID-19: Do National and Subnational IPAs Follow a Similar Path?

As national IPAs, subnational IPAs have also faced the challenge of moving certain operations online and providing additional information to investors during the COVID-19 pandemic. Did they benefit from additional resources for the adoption of digital solutions involved?

The absolute and relative size of the budget devoted to digital tools of subnational IPAs increased during the pandemic (see Figure B9.1). In per-worker terms, the budget for digital tools also increased in 2020 and dropped somewhat subsequently due to a relatively stronger increase in the number of staff. As such, the evolution of the total budget for digitalization of subnational IPAs in ROW followed the trend for national IPAs in ROW. Meanwhile, the median budget for training employees in the use of digital tools, as well as the size of the IT team, was 0 for subnational IPAs.

Figure B9.1. Pre- and Post-COVID-19 Subnational IPAs' Financial Resources for Digitalization



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the median budget for digital tools in absolute terms, as a percentage share of total budget, and per employee for ROW subnational IPAs. The figure uses data from IPAs that report a positive value.

4

Implementing Digitalization: Tools and Providers

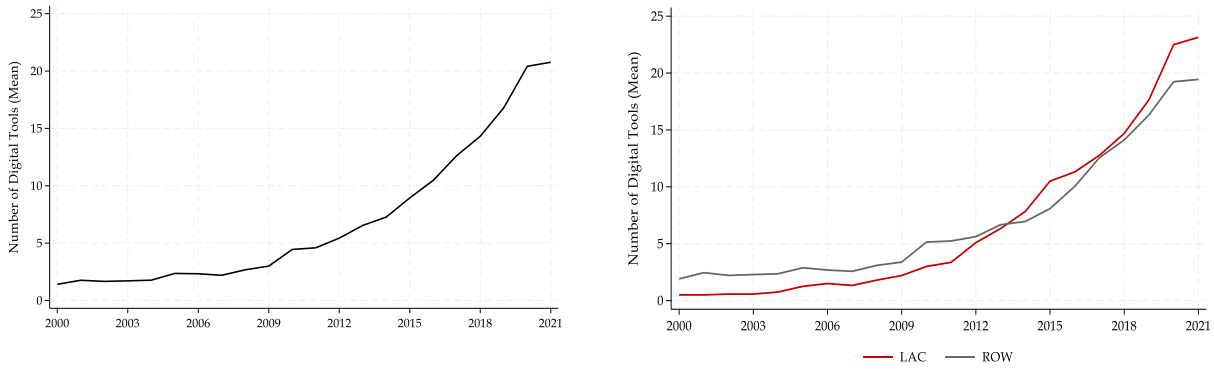
4. Implementing Digitalization: Tools and Providers

4.1. Number of Digital Tools

Paralleling rising resources for digitalization, IPAs have been increasingly adopting more digital tools in support of their activities. This section describes the patterns in IPAs' use of digital tools over time, the types of digital tools adopted, the choice of specific digital solutions and strategies selected for developing and integrating the tools with the agency's systems.

Digitalization of IPA tools has accelerated markedly since the early 2010s, especially in LAC. While IPAs outside of LAC, mostly in high-income OECD economies, had a head-start and used more digital tools in the 2000s, the average number of digital tools used by LAC agencies grew at a higher rate, surpassing that of their ROW counterparts by mid-2010s (see Figure 22).[29] This secular rise in the 2010s in the number of digital tools used by IPAs, in general, and a faster digital tools' adoption by LAC IPAs, in particular, is confirmed even after controlling for countries' characteristics such as size and level of development (see Figure 23) and visualized with the maps (see Figure 24).[30]

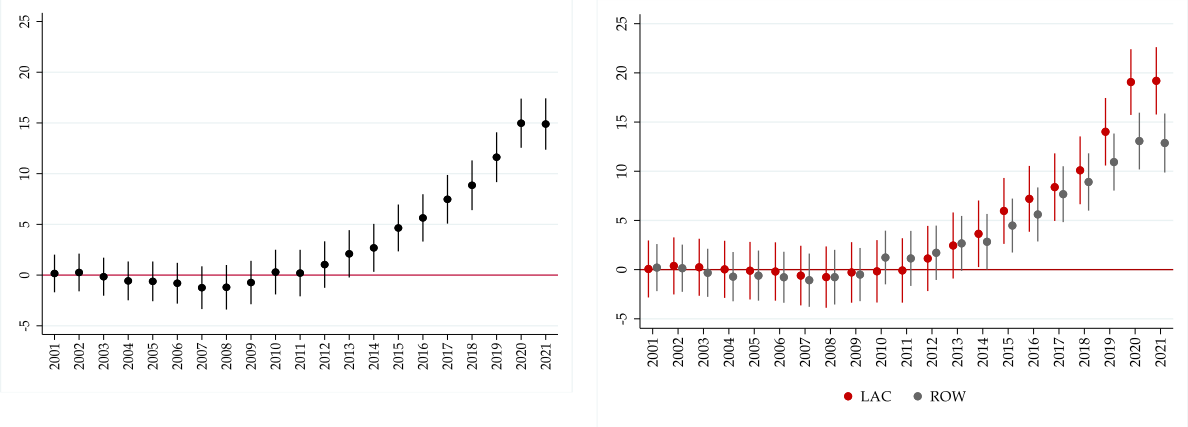
Figure 22. Average Number of IPA Digital Tools Used by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure shows the average number of digital tools adopted by an IPA between 2000 and 2021.

[29] This is also true when considering the median number of digital tools instead.
[30] The difference between the number of digital tools used by LAC IPAs and those in other countries is statistically significant for years 2020 and 2021 when controlling for time invariant country characteristics and common shocks over time through country and year fixed effects and for time-varying country characteristics such as countries' GDP and GDP per capita. See Figure A2.6 in Annex 2 for the relationship between the number of digital tools, number of new digital tools, and number of digital providers and countries' GDP and GDP per capita.

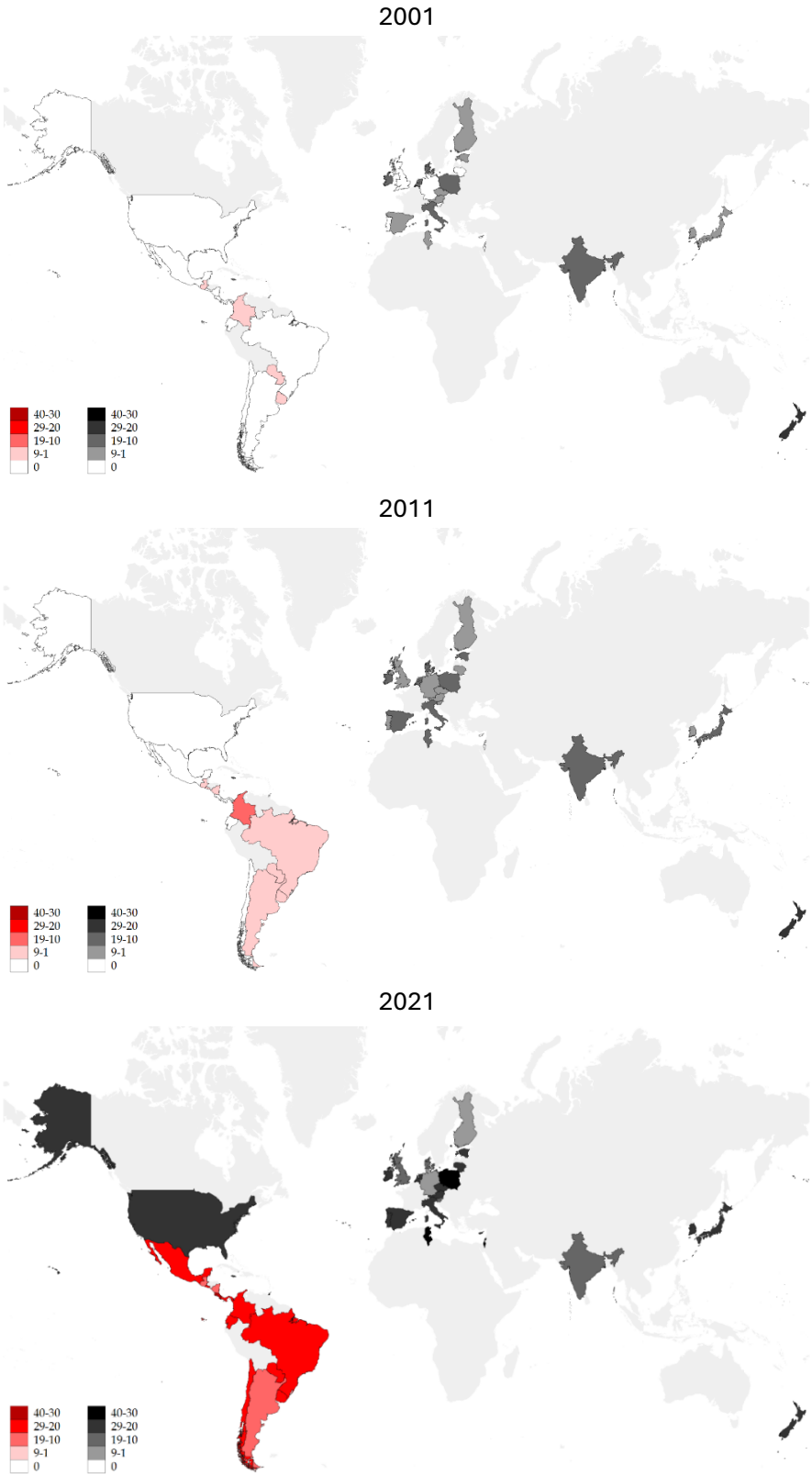
Figure 23. Rise in the Number of IPA Digital Tools Used Over Time



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure shows the estimated coefficients on year dummies (along with the respective 10% confidence intervals) from an OLS estimation of an equation whose dependent variable is the (natural logarithm of the) number of digital tools adopted by an IPA and whose explanatory variables are (the natural logarithm of) countries' GDP size, (the natural logarithm of) countries' GDP per capita and country and year fixed effects. The sample period is 2000-2021, and the omitted year is 2000. A PPML estimation yields very similar results, which are available from the authors upon request.

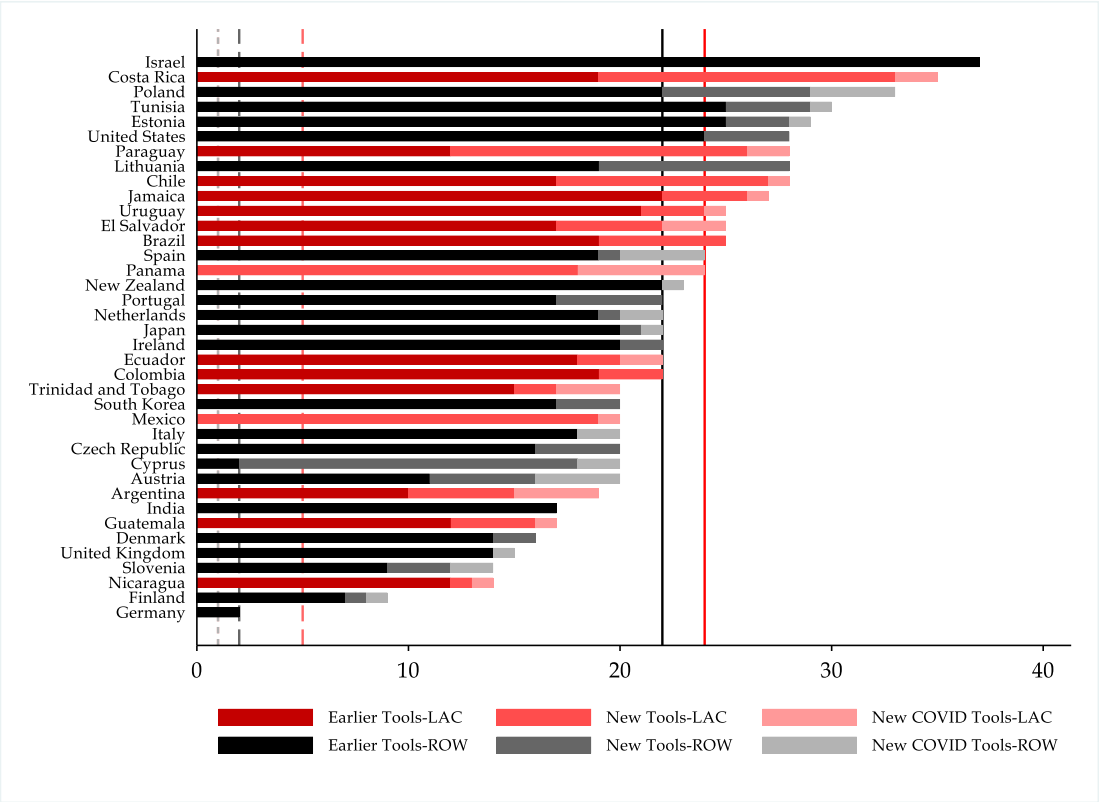
Right after COVID-19, the median IPA employed 22 different digital tools, 5 of which were introduced in the last three years, and 1 reportedly because of the pandemic (see Figure 25). There are large differences across IPAs: the maximum number of total digital tools used by an agency is 37 (and 24 for new tools), and the minimum is 2 (0 for new tools). The median LAC used slightly more digital tools overall than the agencies elsewhere (24 compared to 22), including new tools (6 compared to 3), but the same number of tools due to COVID-19 (1 tool). As IPAs outside of LAC added fewer new digital tools prior to the pandemic and made similar adjustments as LAC IPAs due to COVID-19, ROW IPAs display higher shares of new digital tools introduced due to COVID-19 (see Figure 26).

Figure 24 . Adoption of Digital Tools by IPAs Across Space and Time by Region



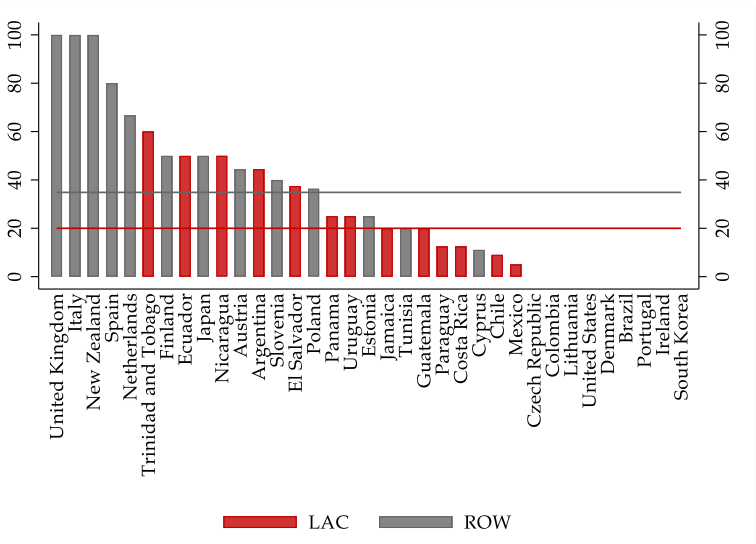
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the evolution of the adoption of digital tools by IPAs across space and time. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Figure 25. Number of Digital Tools Used by IPAs, Total, New, and Introduced Due to COVID-19



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the total number of digital tools used by agencies by region. LAC countries are shown in tones of red, whereas ROW countries are shown in tones of dark gray. Tools are classified as follows: tools adopted prior to 2019 ("Earlier Tools"), which are shown in the darkest tone; tools adopted in 2019-2021 ("New tools"), which are shown in the lighter tones; and tools adopted due to COVID-19 ("New COVID Tools"), which refer to those reportedly introduced as a result of the pandemic and are shown in the lightest tones. Horizontal lines correspond to the regional medians.

Figure 26. Share of New IPA Digital Tools Introduced due to COVID-19



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of digital tools that were introduced by agencies in response to the pandemic. Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

4.2. Number of Digital Tools by Function

The use of digital tools by agencies varies. The exact mix of tools and patterns of adoption over time depend on the IPAs' specific strategies and accordingly on how they perform their functions and the associated needs. For example, some agencies adopt more intensely digital tools for general organization purposes, such as interactive working platforms and chat functions, cybersecurity tools, or project management solutions. Other IPAs introduce digital tools for specific investment attraction functions, such as the use of search engine optimization for image-building, virtual fairs for investment generation, or virtual-site selection geographic information system mapping, and electronic investment single windows (EISWs) for investment facilitation (see Box 10 and Box 11). This subsection explores broad trends across agencies.

Box 10 | IPAs' Main Functions and Available Types of Digital Tools

IPAs carry out different activities that can be grouped into four broad investment promotion functions: image-building, investment generation, investment facilitation and retention, and policy advocacy (see, e.g., Volpe Martincus and Sztajerowska, 2019, OECD, 2018). *National image-building* encompasses actions that aim to improve the perception of the country as an attractive location for FDI. *Investment generation* entails identifying and approaching potential investors. *Investment facilitation and retention* consists of providing investors with assistance in analyzing business opportunities, obtaining permits for establishing a business in the host country, and spreading information on available incentives. This category also entails providing support for accessing these incentives and investment aftercare for multinational firms that have already set up operations in the country. *Policy advocacy* comprises all activities that seek to improve the investment climate, identifying the public inputs needed by the private sector, and coordinating with the rest of the public sector to deliver those inputs.

IPAs can employ digital tools for their own general organization and to perform any of those functions. Examples of types of digital tools belonging to different categories are listed below.[31]

General Organization

- CRM software tools
- Interactive working platforms and cross-institutional collaboration and chatting tools (e.g., to coordinate with subnational IPAs)
- Cyber-security tools

[31] While –admittedly—some tools can be used for different purposes, such a classification permits useful comparisons across agencies.

Image-Building

- Search engine optimization tools
- Broad digital advertising tools
- Social media tools and social media content management

Investment Generation

- Targeted email marketing tools and chat box with automated answers to frequent questions
- Digital client prospecting tools
- Video-conferencing solutions

Investment Facilitation

- Geographic information systems (GIS) combining interactive maps, location intelligence, and real estate data to identify sites and tools that can help access talent and providers
- Online site-selection tools using virtual-, mixed- or augmented reality
- Investor e-interface allowing investors to obtain project-specific data and permits

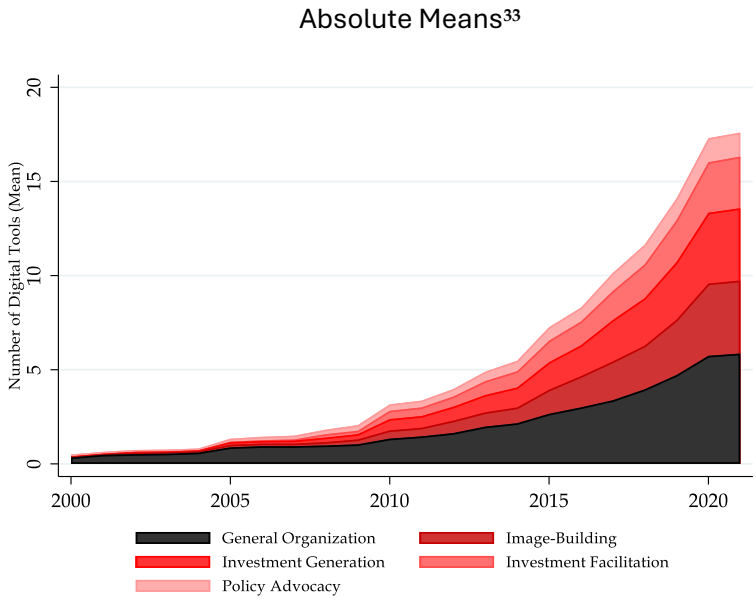
Policy Advocacy

- Digital media alert systems on relevant country-, sector-, and policy-related topics
- Software tools focusing exclusively on home government services
- Digital tools providing information on worldwide government activities

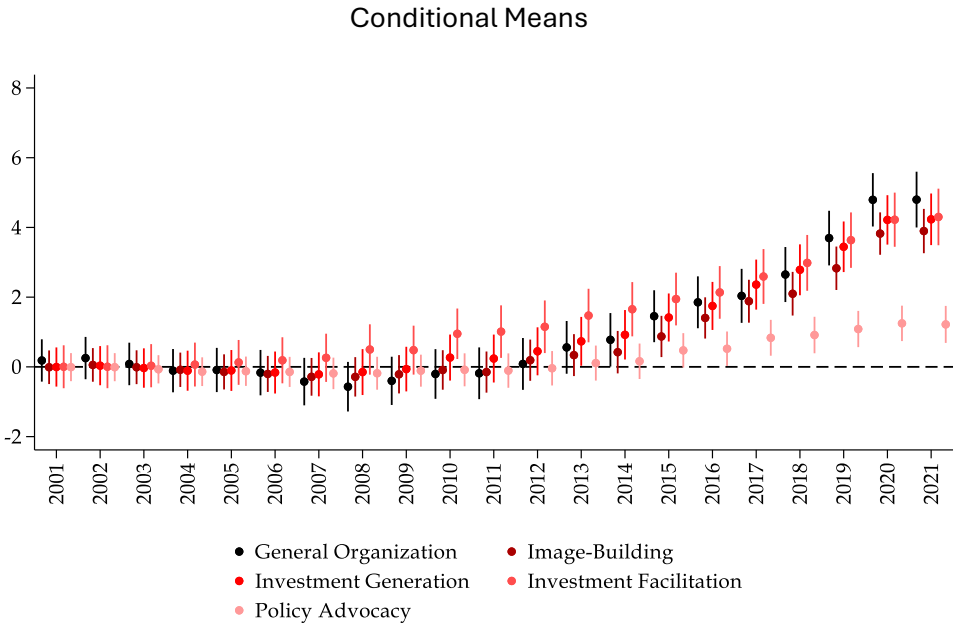
Over time, IPAs have increased the number of digital tools for general organization, followed by image-building and investment generation, then investment facilitation, and least for policy advocacy (see Figure 27, top panel). Such patterns are consistent with the nature of the activities that are carried out to perform these functions. Namely, general organization services support different IPA functions and use broadly available digital tools, whereas policy advocacy involves extensive and intensive personal interactions and involvement with stakeholders. This pattern of adoption over time is confirmed after controlling for country characteristics (see Figure 27, bottom panel) – yet, once both GDP and GDP per capita are controlled for, the difference is only statistically significant between policy advocacy, on the one hand, and other functions, on the other[32].

[32] See Figure A2.14 in Annex 2 for the share of IPAs adopting digital tools by type and region over the period 2000–2021, separately for each IPA business function.

Figure 27. Number of IPA Digital Tools by Function



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the absolute mean number of digital tools of a given type adopted by an IPA over the period 2000-2021.



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the estimated coefficients on year dummies (along with the respective 10% confidence intervals) from an OLS estimation of an equation whose dependent variable is the (natural logarithm of the) number of digital tools of a given type adopted by an IPA and whose explanatory variables are (the natural logarithm of) countries' GDP, (the natural logarithm of) countries' GDP per capita, and country and year fixed effects. The sample period is 2000-2021, and the omitted year is 2000. A Poisson estimation yields very similar results, which are available from the authors upon request.

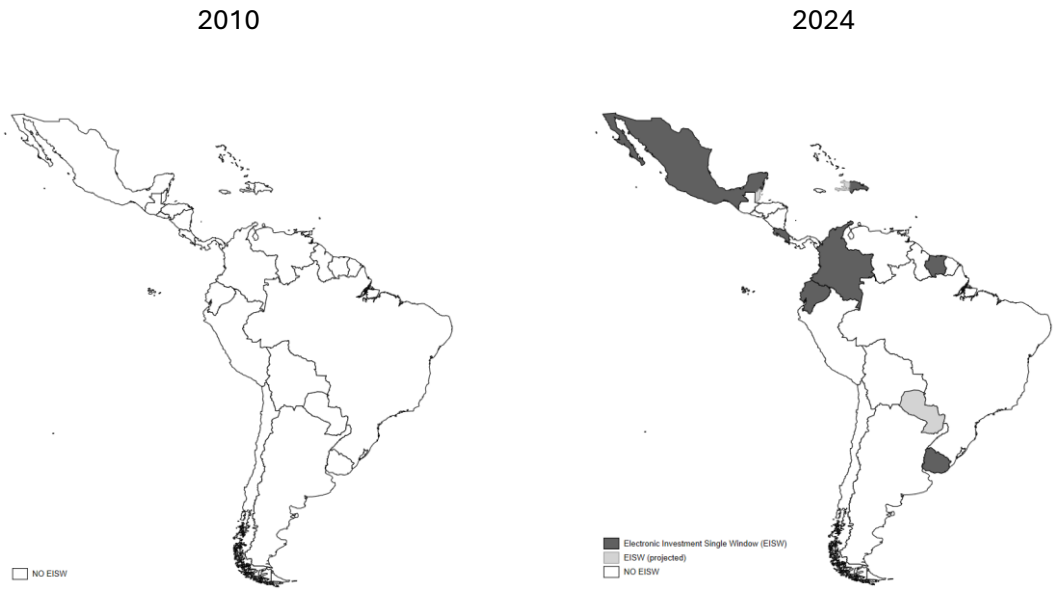
[33] Throughout the analysis, we use the median for cross-sectional comparisons and the mean when tracking trends over time, as it captures greater variability across periods. The latter results are robust to using the median instead.

Box 11 | Electronic Investment Single Windows (EISWs)

EISWs are a digital platform that provides investing firms with a single-entry point to fulfill local establishment and reinvestment regulatory requirements: registration, licenses, and payments. In this environment, firms can track the status of their application in real-time, which increases accountability thereby further expediting completion; and government databases talk to each other, preventing firms from acting as a courier between public offices.

EISWs are starting to gain momentum in LAC, including because 125 countries (several of the region) recently signed an Agreement on Investment Facilitation for Development at the WTO (see Figure B11.1).

Figure B11.1. Implementation of EISW in LAC



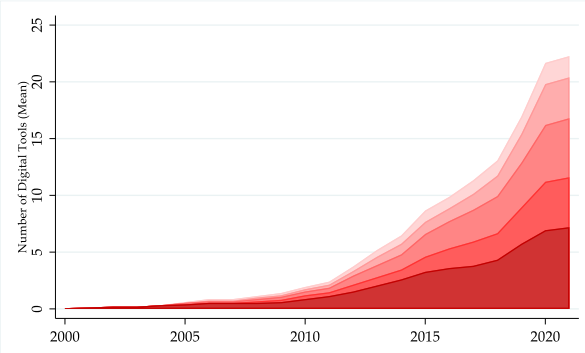
Source: Authors' calculation based on IDB data.

[34] As shown in Section 2, larger and more developed economies tend to have larger IPA budgets, which in turn are associated with higher resources devoted to digitalization. Larger resources may translate into higher digital tools' adoption. On the other hand, recognizing their resource limitations, IPAs of smaller and less developed economies may strategically invest in their digital capabilities to reduce their ongoing operational costs. Hence, ideally, the changing levels of IPAs' budget for digital tools should be directly controlled for. However, digital budget data are only available for the three latest years of the sample period and not for the full period for which data on the adoption of digital tools could be accessed. To account for the former, the estimation equation includes country fixed effects and time-varying variables capturing the countries' size and level of development (GDP and DP per capita, respectively), which, as shown above, have a robust relationship with IPAs' total and digital budgets.

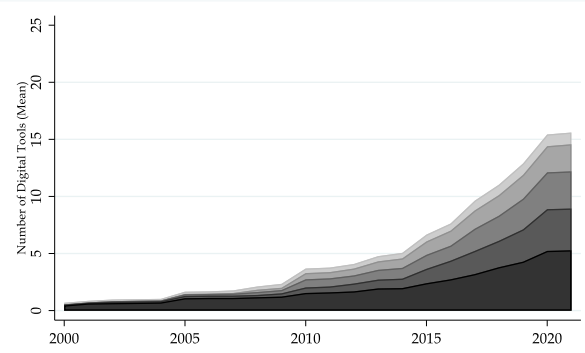
Figure 28. **Number of IPA Digital Tools, by Function, Absolute Means**

By Region

LAC

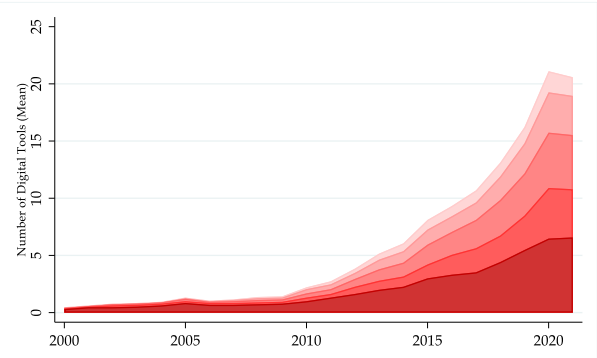


ROW

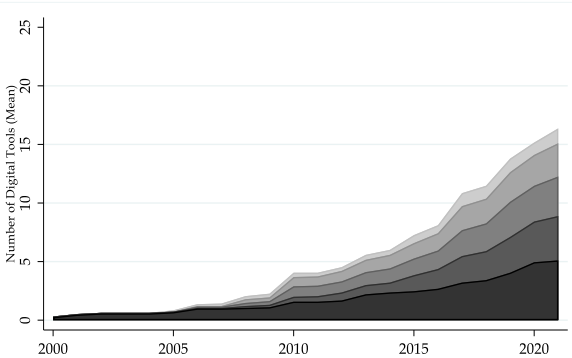


By Country Size

Smaller Countries

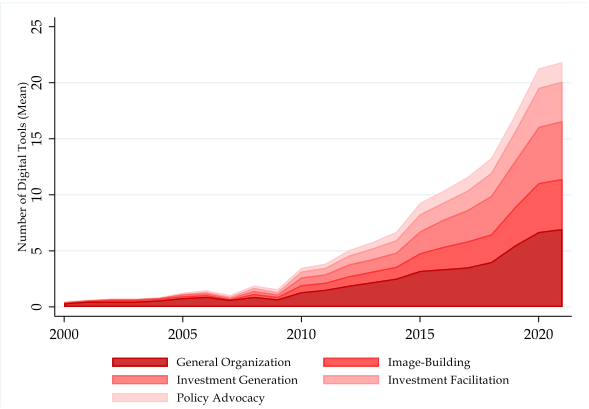


Larger Countries

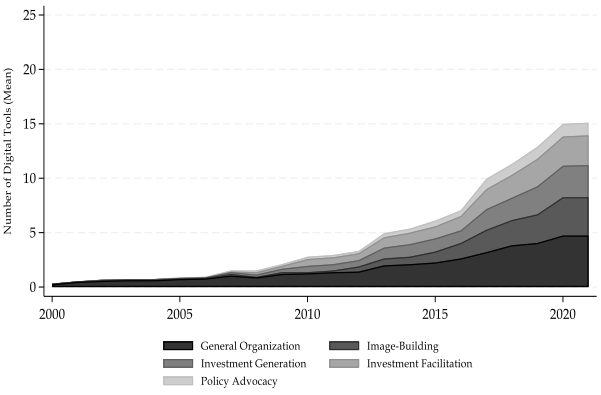


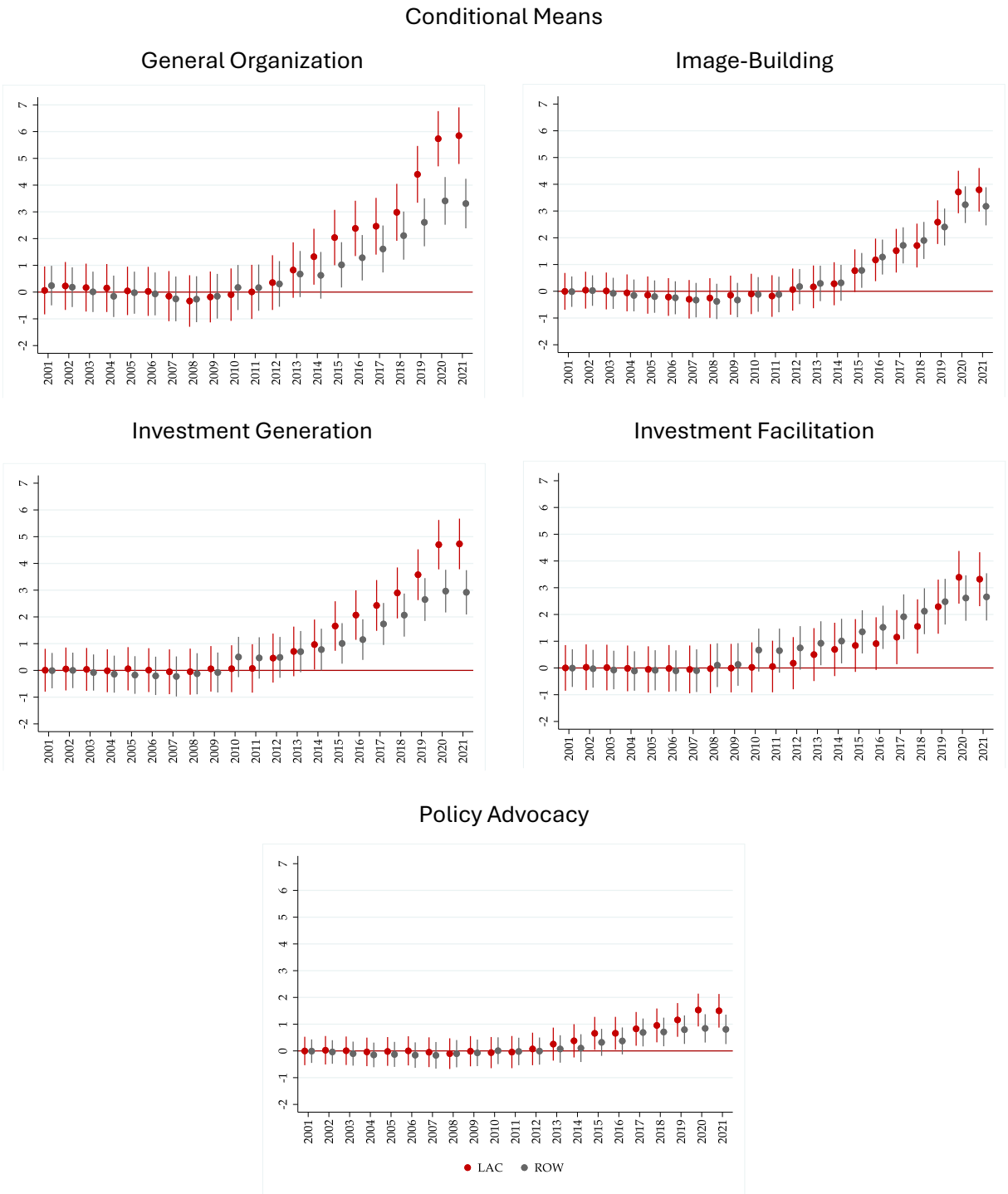
By Level of Development

Less Developed Countries



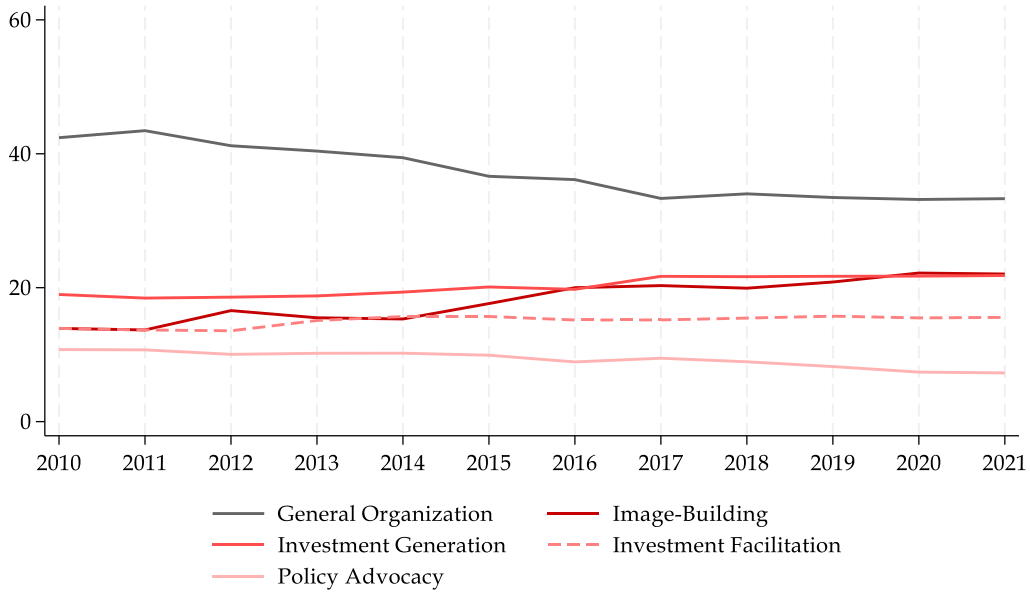
More Developed Countries





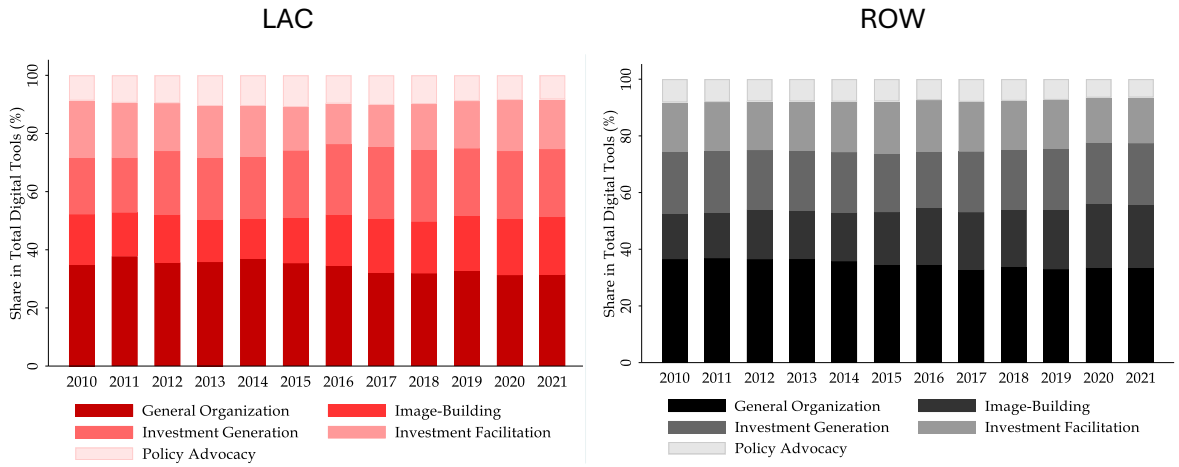
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure in the top panel shows the absolute mean number of digital tools of a given type adopted by an IPA between 2000-2021 by region. The figure in the bottom panel shows the estimated coefficients on the interaction between year- and country-group dummies (and 10% confidence intervals) from an OLS estimation of function-specific equations whose dependent variable are the (natural logarithm of the) number of digital tools adopted by an IPA in a given function and whose explanatory variables are (the natural logarithm of) countries' GDP, (the natural logarithm of) countries' GDP per capita, country fixed effects, and a set of region (LAC/ROW)-year fixed effects interactions. The sample period is 2000-2021, and the omitted year is 2000. Poisson estimations yield very similar results, which are available from the authors upon request.

Figure 29. Share of IPA Digital Tools by Function Over Time



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of IPA digital tools used by function, from 2010 to 2021.

Figure 30. Share of IPA Digital Tools by Function and by Region Over Time

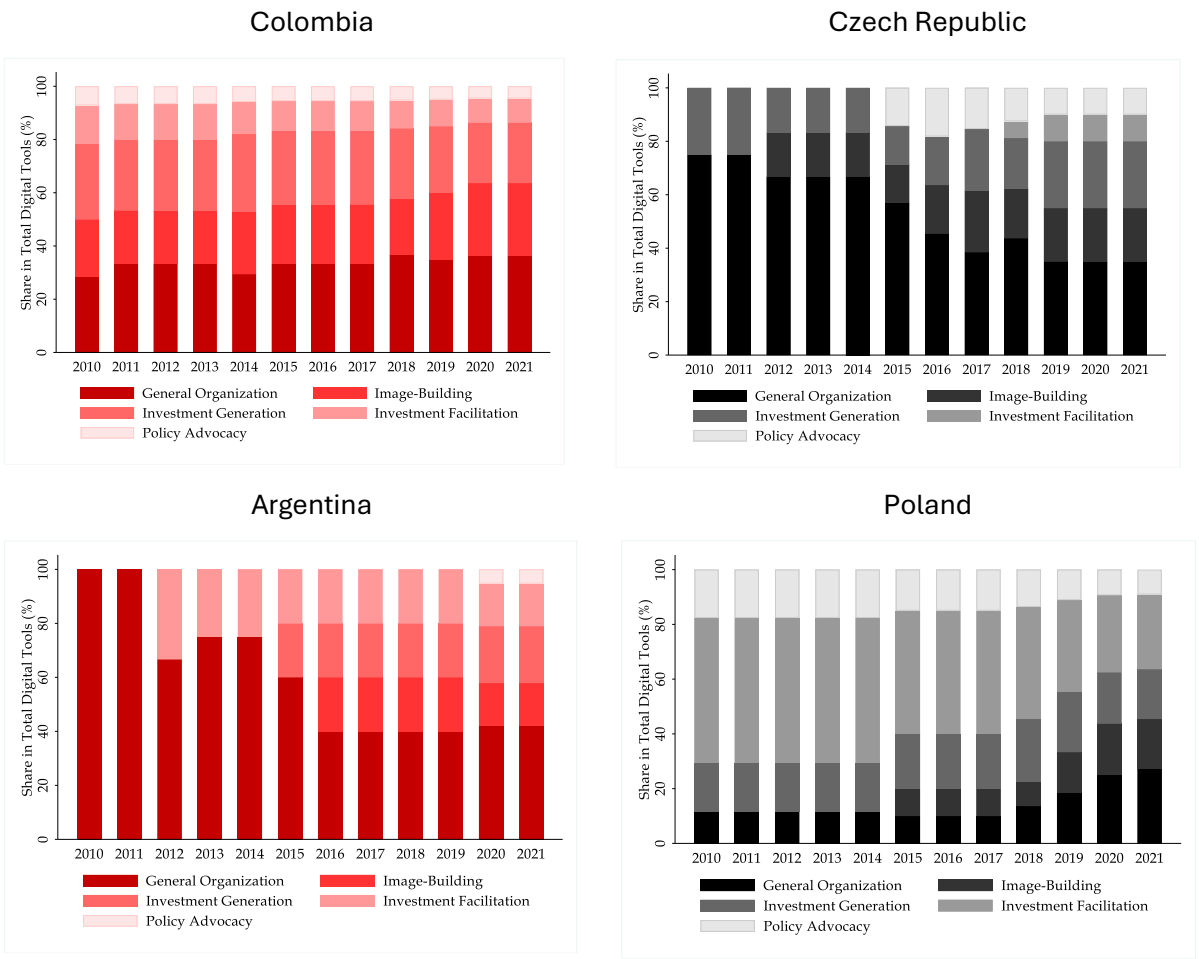


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of IPA digital tools used by function within a given regional group from 2010 to 2021. LAC is shown in red tones, whereas ROW is shown in gray tones.

Box 12 | Where Do All Digital Roads Lead To?
Cross-Country Country-Differences in Digital Tools' Adoption

Despite these overall regional trends, agencies can invest in the adoption of digital tools differently across functions. Figure B12.1 illustrates these differing paths. For example, Colombia's IPA increased the use of digital tools at a similar pace across all its functions, with the highest share of tools devoted to general organization and investment generation. Meanwhile, the Argentinian counterpart --that became responsible for investment promotion in 2016 after initially focusing only on export promotion— started using digital tools for general organization and investment facilitation and then expanded to the core investment generation functions around and after 2016. In ROW, the Czech Republic's IPAs were using digital tools for general organization and investment generation up to the mid-2010s, later digitalizing other functions; while Poland's IPA focused its use of digital tools on investment facilitation (see Figure B12.1).

Figure B12.1. Share of IPA Digital Tools by Function and Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of IPA digital tools used by function from 2010 to 2021. LAC is shown in red tonalities, whereas ROW is shown in gray tonalities. For years prior to the creation of the current agency, adoption of digital tools by the respective predecessor agency is considered.

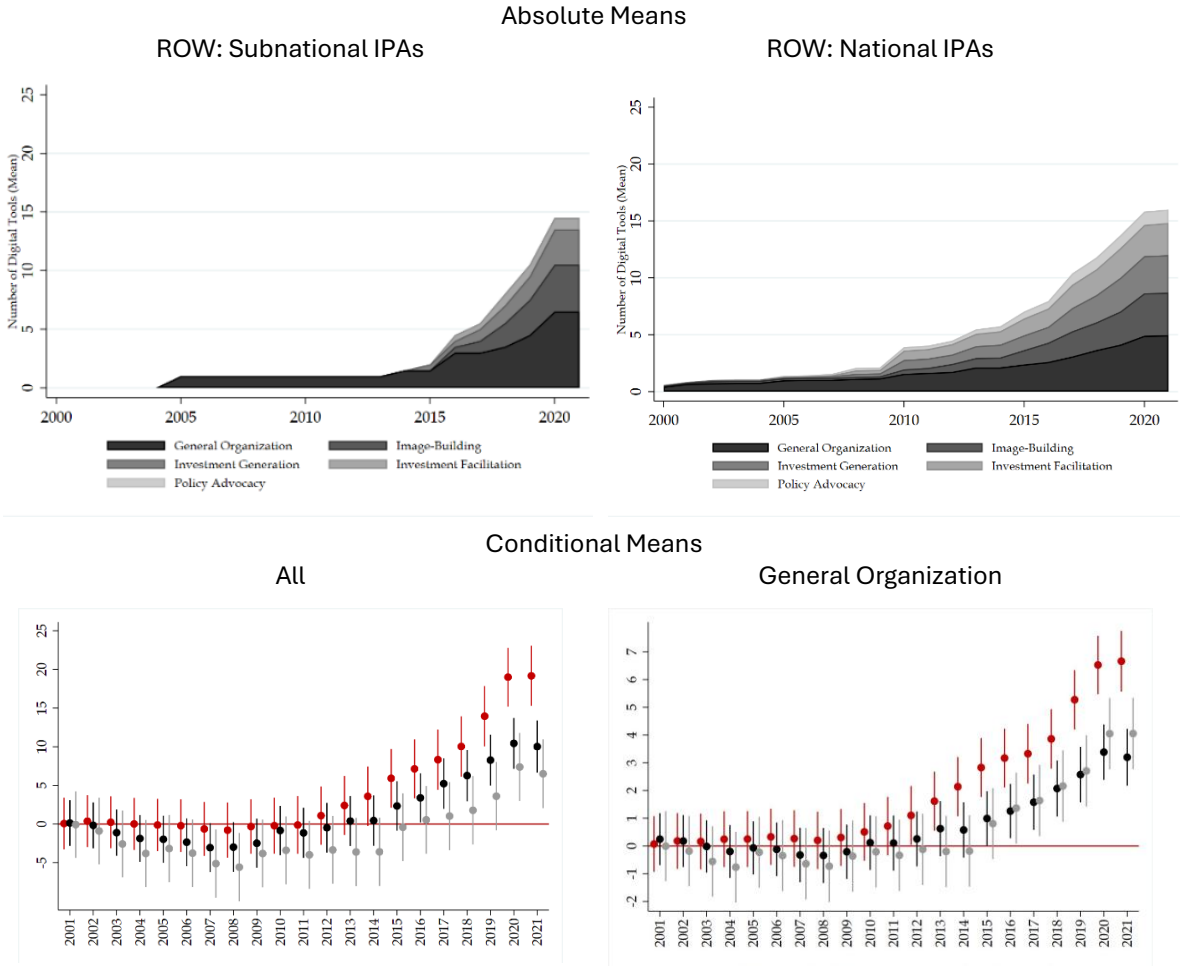
Box 13 | Digitalization of IPAs at the Subnational Level

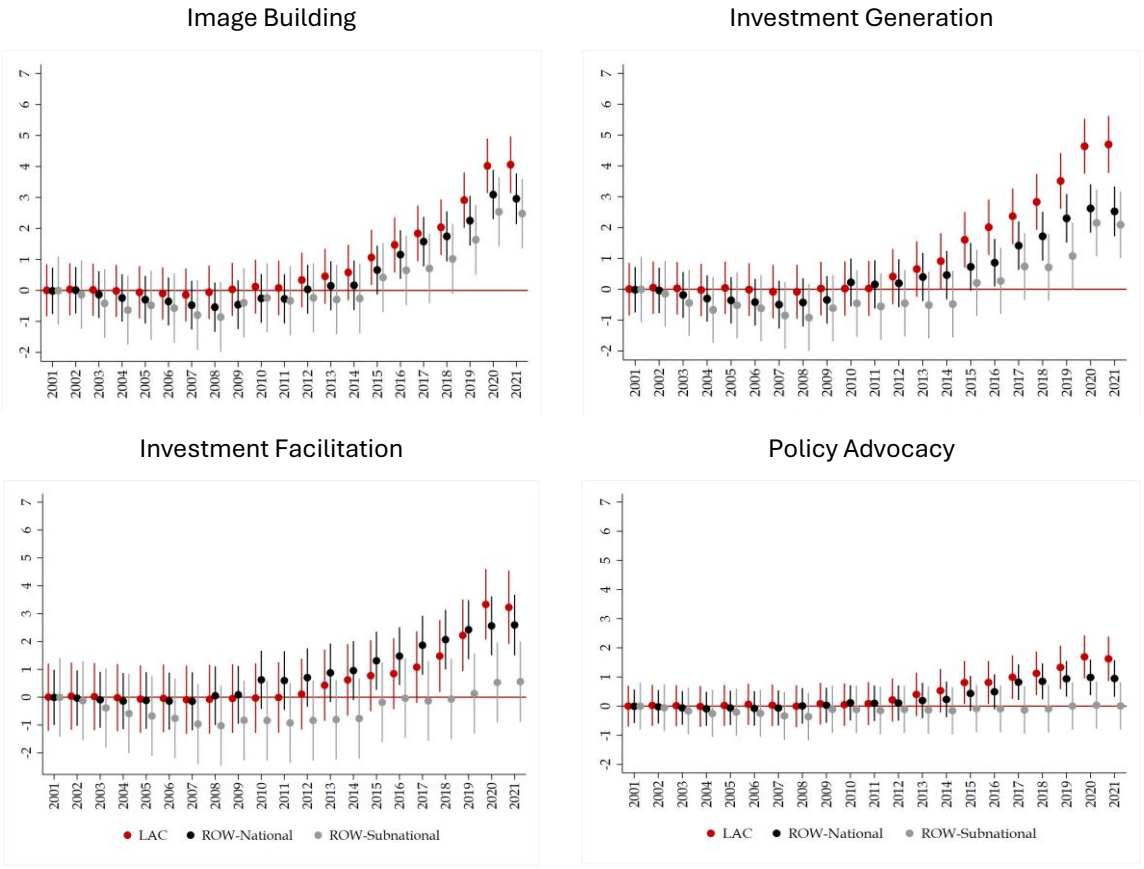
The path to digitalization of subnational IPAs can differ from their national counterparts.

While national IPAs in ROW have accelerated their process of digitalization at the start of the 2010s, subnational IPAs have been done slightly later, after 2015 (see the left top panel in Figure B13.1). At the same time, once the basic country characteristics are controlled for, the mean number of digital tools adopted by subnational agencies is overall not statistically significantly different from the national agencies in ROW (see the bottom panel in Figure B13.1).

When we consider differences by IPA business function, subnational IPAs do appear to be using markedly fewer tools for investment facilitation and policy advocacy than their national counterparts. While those differences are not statistically significant, they may suggest that barriers to digitalization in these areas may be the highest at the subnational level. In some cases, it could be considered whether digital tools developed by national IPAs could usefully be extended to the bodies operating at the subnational level, especially if they significantly facilitate investors' location decisions and operation.

Figure B13.1. Number of Subnational IPA Digital Tools, Overall and by Function





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure shows the estimated coefficients on the interaction between year- and country-group dummies (and 10% confidence intervals) from an OLS estimation of function-specific equations whose dependent variable are the (natural logarithm of the) number of digital tools adopted by an IPA in a given function and whose explanatory variables are (the natural logarithm of) countries' GDP, (the natural logarithm of) countries' GDP per capita, country fixed effects, and a set of region (LAC/ROW-National/ROW-Subnational)-year fixed effects interactions. The sample period is 2000-2021, and the omitted year is 2000. Poisson estimations yield very similar results, which are available from the authors upon request.

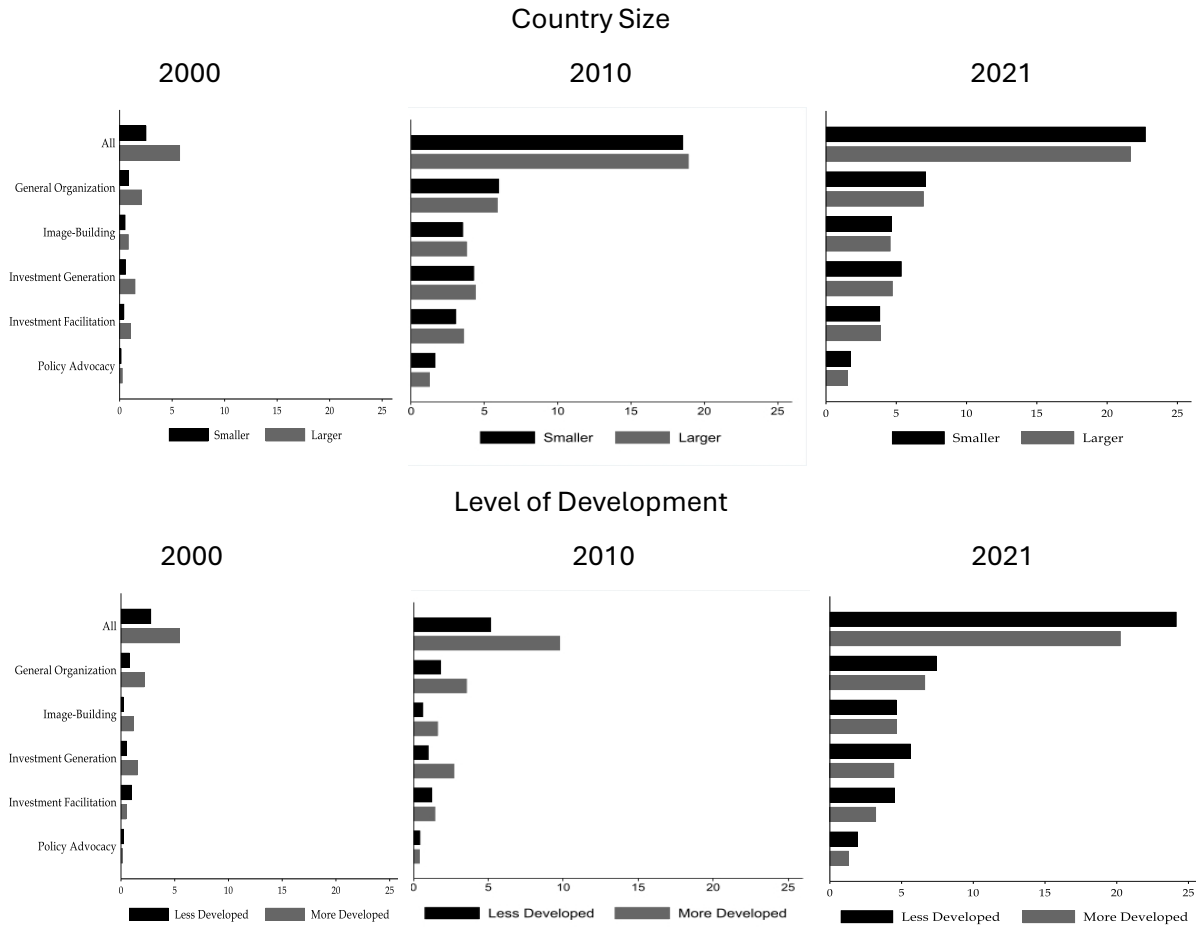
On average, agencies of less developed countries tended to have a slightly larger average number of digital tools across most investment functions after the COVID-19 pandemic (see the top panel on the right in Figure 31). The unconditional differences between smaller and larger economies were even narrower (see the bottom panel on the right in Figure 32).

In contrast, at the start of the 2000s, IPAs of larger and more developed economies had a larger average number of digital tools, pointing to a process of catching up since then. Indeed, controlling for year-specific cyclical factors, less developed economies tended to adopt more digital tools in general, and for general organization, investment facilitation and policy advocacy functions in particular during 2000-2021 (see Figure 32). Larger economies have tended to adopt more digital tools for core functions of investment generation and facilitation, as well as

policy advocacy – signaling the scope of gains from automation in those areas in the case of larger economies, while smaller countries tend to adopt tools for image building.

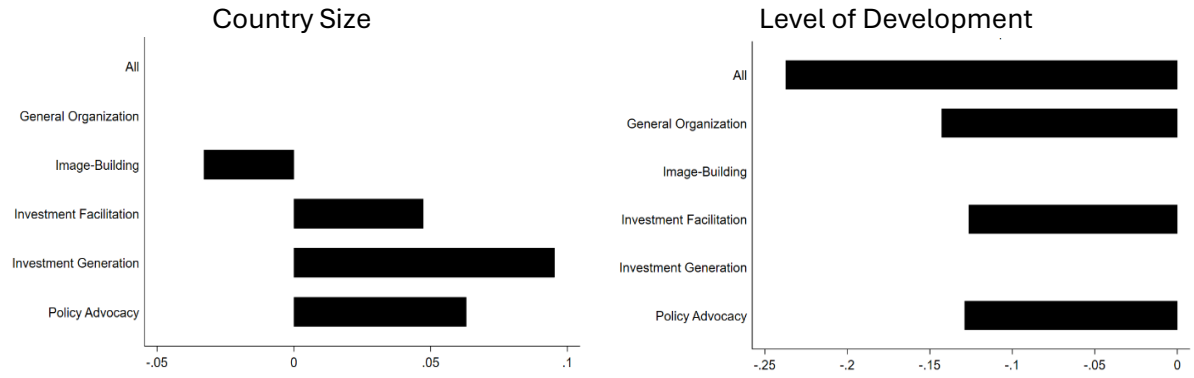
The COVID-19 pandemic does not appear to have influenced that pattern strongly in the short term. Specifically, patterns of digital tools adoption across these dimensions changed only for image-building during the pandemic, with smaller and more developed economies adopting more tools in this area. These patterns are consistent with the type of digital tools that agencies self-reported to have adopted due to the pandemic (see Figure A2.12 in Annex 2). The patterns in the adoption of digital tools by IPAs from different countries and regions, by function, can also be represented in a series of time-specific maps (see Figure 33). **Cross-country spillovers in the adoption of such tools seem to have played some role in shaping these patterns** (see Box 15).

Figure 31. Average Number of Digital Tools by Country Characteristics Over Time



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: A country is classified as "smaller" if its GDP size was below the median level of GDP (expressed in constant 2015 US$) of the countries in the sample at the start of the sample period. A country is classified as "less developed" if its GDP per capita was below the median level of GDP per capita (expressed in constant 2015 US$) of the countries in the sample at the start of the sample period.

Figure 32. Estimated Relationship Between Number of Digital Tools and Country Characteristics



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The left (right) panel shows the estimated coefficient on the (natural logarithm of) countries' GDP per capita, proxying the level of development (the (natural logarithm of) countries' GDP, proxying country size) from an OLS regression where the dependent variable is the (natural logarithm of the) number of digital tools of a given type and which includes the (natural logarithm of) countries' GDP (GDP per capita) and year fixed effects as controls. Only estimates significant at least at the 5% level are displayed. The sample period is 2000–2021. Results using a PPML estimator are similar and are available from the authors upon request.

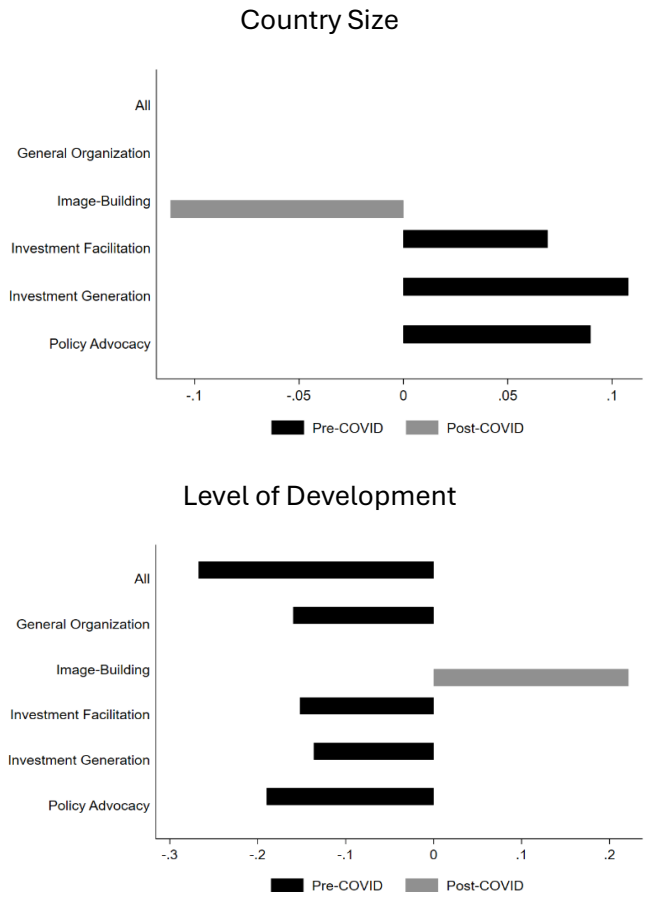
Box 14 | Digital Tools Adoption During the COVID-19 Pandemic
The Role of Country Characteristics

Crises such as the COVID-19 pandemic can induce changes in the adoption of digital tools, in general, and their relationship to the size and the level of development of countries, in particular. For example, IPAs that had adopted fewer digital tools beforehand may have been propelled to do so during the pandemic. To test this hypothesis, we introduce an interaction between IPA country characteristics and the COVID-19 period (building on regressions presented in Figure 32).

Overall, the COVID-19 pandemic does not appear to have significantly upended the previous patterns. While lower levels of development and larger GDP size are associated with the adoption of more digital tools during 2000-2021, during COVID-19, smaller and more developed economies adopted more digital tools relating to image-building (see Figure B14.1). Interestingly, these patterns reflect similar trends as those identified based on agencies' self-reporting of tools adopted due to the pandemic, described in Section 4.3 of this report, which focused mainly on image-building (and, to a lesser extent, investment generation).

Continues on the next page.

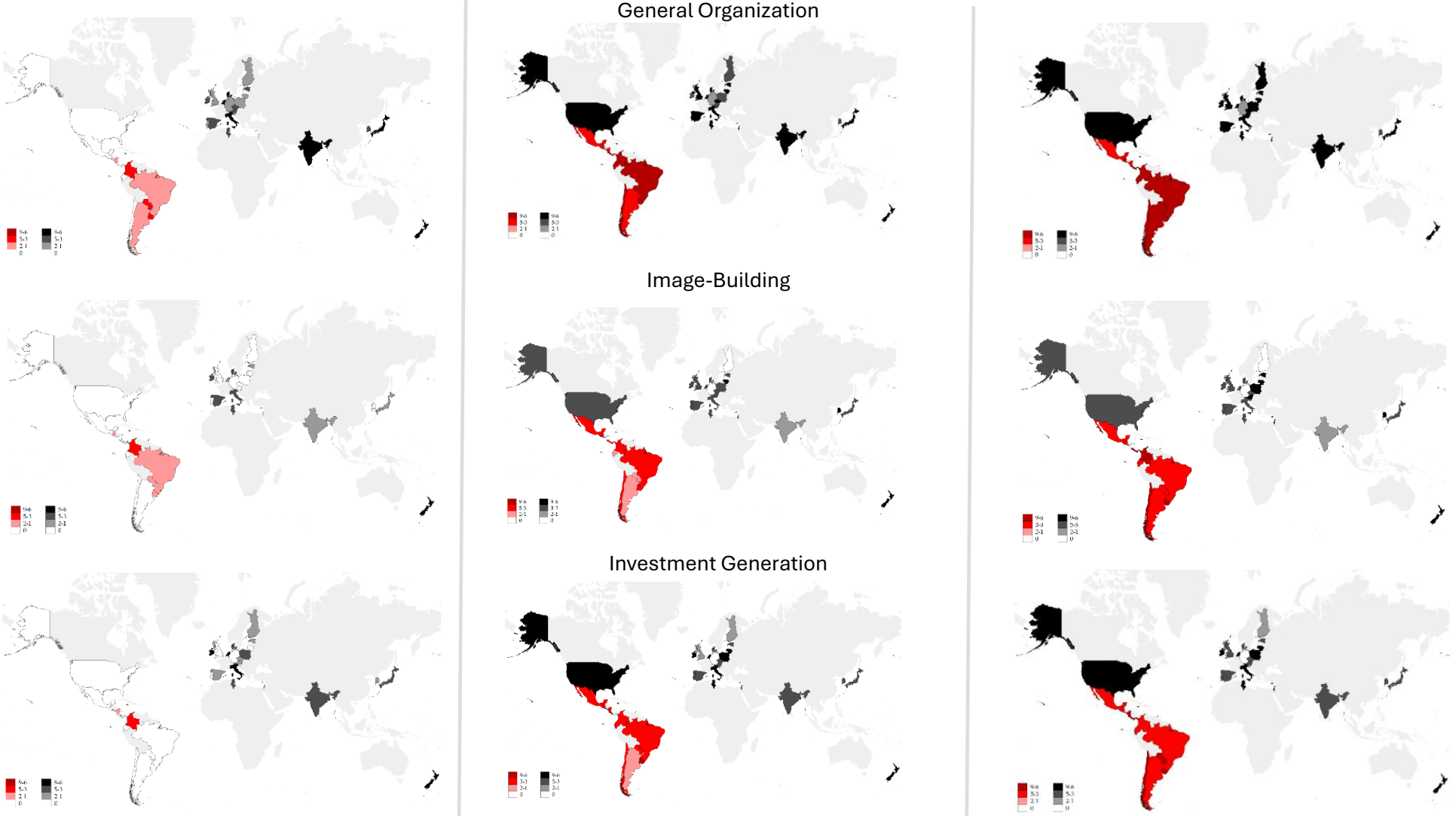
Figure B14.1. Digital Tools Adoption During COVID-19 and Country Characteristics

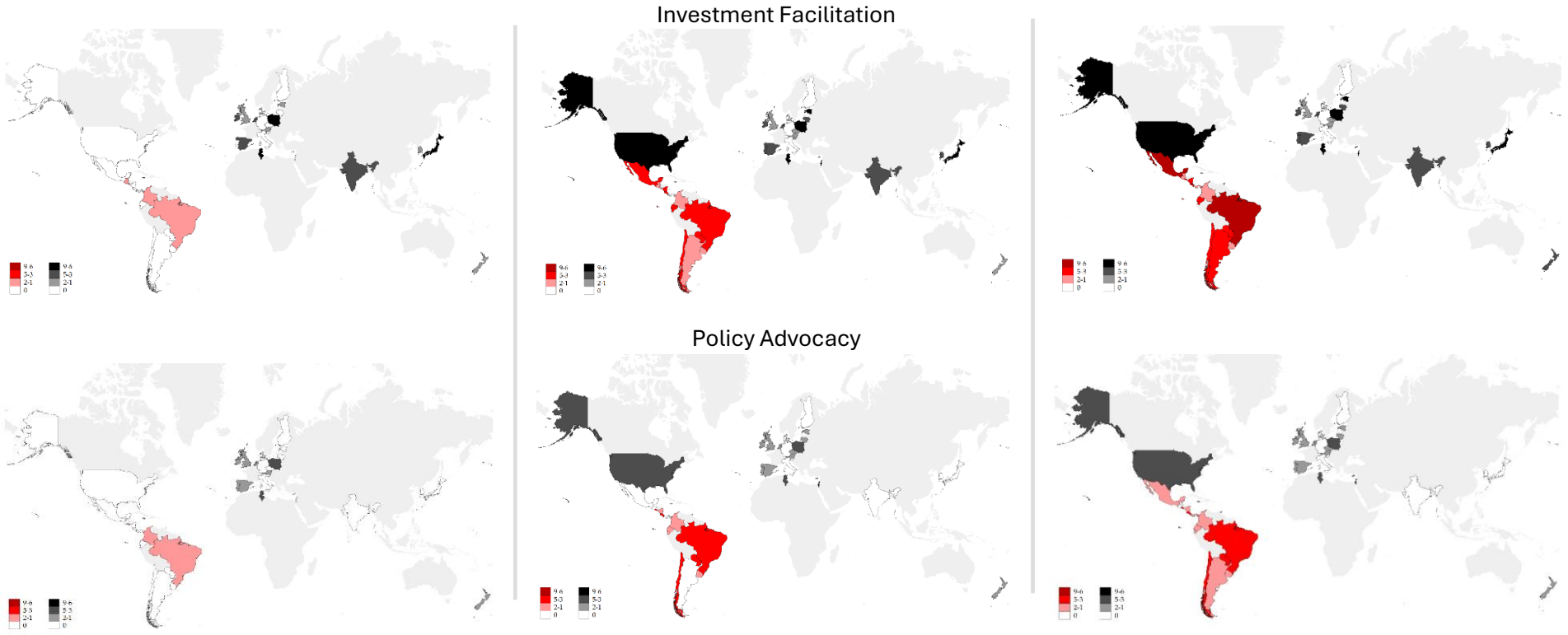


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.

Notes: The figure shows the estimated slope of the (natural logarithm of) countries' GDP (top panel) and (natural logarithm of) countries' GDP per capita (bottom panel) on the (natural logarithm of the) number of digital tools adopted by an IPA overall and in a given function, respectively, before and during the COVID-19 pandemic. The slopes are recovered from OLS estimations that interact each of these variables with a binary variable indicating the COVID-19 pandemic period (i.e., takes the value of one for years 2020 and 2021, and zero otherwise), including year fixed effects. Only estimates significant at least at the 5% level are displayed. The sample period is 2000–2021. The year of a given tool's adoption is reported by the agency, and the number of tools in a given category is treated as missing prior to the agency's establishment and as 0 thereafter prior to the adoption of the first tool in a given category. Results based on alternative specifications, including a PPML estimator, are similar and are available from the authors upon request.

Figure 33. Number of Digital Tools Used by IPAs Pre- and Post-COVID-19, by Function





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: LAC is shown in red tones, whereas ROW is shown in gray tones.

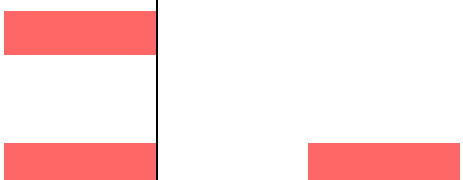
Box 15 | Adoption of Digital Tools Over Space and Time: Learning from The Neighbor?

Several factors affect the adoption of digital tools by agencies. One of them is the use of digital tools by other IPAs – in general or of certain kind (of nearby countries or countries with which there are close economic ties). There is evidence of some degree of cross-country spillovers of this type, at least in relation to the adoption of digital tools for investment facilitation, and – for the extensive margin – general organization. More precisely, the number of digital tools adopted in investment facilitation and general organization by other IPAs located in less distant countries (i.e., those with below median distance) is associated with a higher probability that the agency itself introduces digital tools in these areas a few years later, after controlling for countries' size, level of development, systematic (time-invariant) country characteristics, and macro trends (see the left panel in Table B15.1). The number of tools adopted by the agency in for investment facilitation also increases (see the right panel in Table B15.1).

One possible reason for this pattern may be that initiatives associated with investment facilitation – such as electronic investment single windows (see Box 11) –tend to be coordinated at higher levels of government and involve several agencies, making them more visible. As they tend to be innovative, they are also highlighted by international organizations as an example of best practices, not least in the context of ongoing negotiations regarding the plurilateral Investment Facilitation Agreement for Development (IFD) involving 129 WTO members. As such, it may be easier for countries, including IPAs, to learn about them and attempt their implementation using digital solutions at home.

Table B15.1. Relation Between IPAs' Adoption of Digital Tools and That of Other Countries' Counterparts

	Extensive Margin			Intensive Margin		
	Adoption by Others (t-1)	Adoption by Others (t-2)	Adoption by Others (t-3)	Adoption by Others (t-1)	Adoption by Others (t-2)	Adoption by Others (t-3)
All						
General Organization						
Image-Building						
Investment Generation						
Investment Facilitation						
Policy Advocacy						

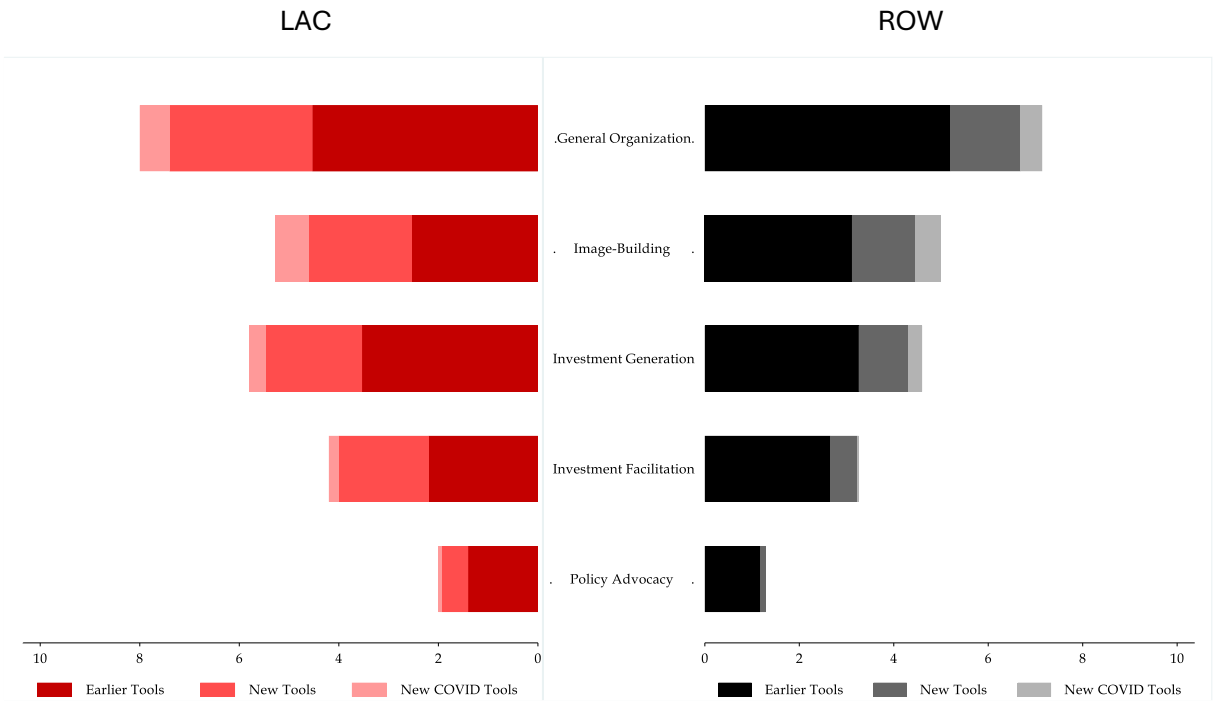


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and World Bank's World Development Indicators.

Note: The panel on the left (Extensive Margin) in the figure above shows the sign of the estimated coefficients (red=positive; black=negative) on the median number of digital tools of the other countries whose distance to the IPA country is below the median of the distribution of distances to other countries in the sample from a linear probability model (LPM) where the dependent variable is a binary variable that takes a value of one when the agency has at least one digital tool adopted in a given business function in a given year and zero otherwise and whose control variables are the (natural logarithm of) countries' GDP, the (natural logarithm of) countries' GDP per capita and the (natural logarithm of) IPA's age along with country and year fixed effects. The panel on the right (Intensive Margin) shows the sign of the estimated coefficients of the same variables as the previous regression, estimated using an OLS model where the dependent variable is the number of digital tools in a given category in a given year (expressed in logs). The sample period is 2000-2021. Dark red indicates statistical significance at 1% level, whereas lighter red indicates statistical significance at the at 5% level. The results obtained using the PPML estimator (not reported) yield very similar results.

These differing digitalization paths have shaped the recent levels of digital tools' use by IPAs. **Overall, high shares of IPAs use digital tools for general organization, followed by image-building and investment generation.** This may reflect the ease with which certain activities yield themselves to digitalization: for instance, various aspects of general organization – including project management and collaboration – can be supported by existing digital tools. Similarly, online events, search engine optimization, and chatbots can complement more traditional image-building activities. Meanwhile, policy advocacy activities – requiring intensive interactions with different stakeholders – may be more complex to digitize. In general, LAC agencies have adopted more digital tools across several areas, in particular investment generation (see Figure 34). They have also added new tools relating to investment facilitation, including during the COVID-19 pandemic (see Figures A2.11 and A2.12 in Annex 2 for the share of IPAs using digital tools by function by region and country, respectively). There is a high level of heterogeneity in the use of digital tools across functions among the individual IPAs (see Figure A2.13 in Annex 2).

Figure 34. Average Number of Digital Tools IPAs by Function, Region and Type

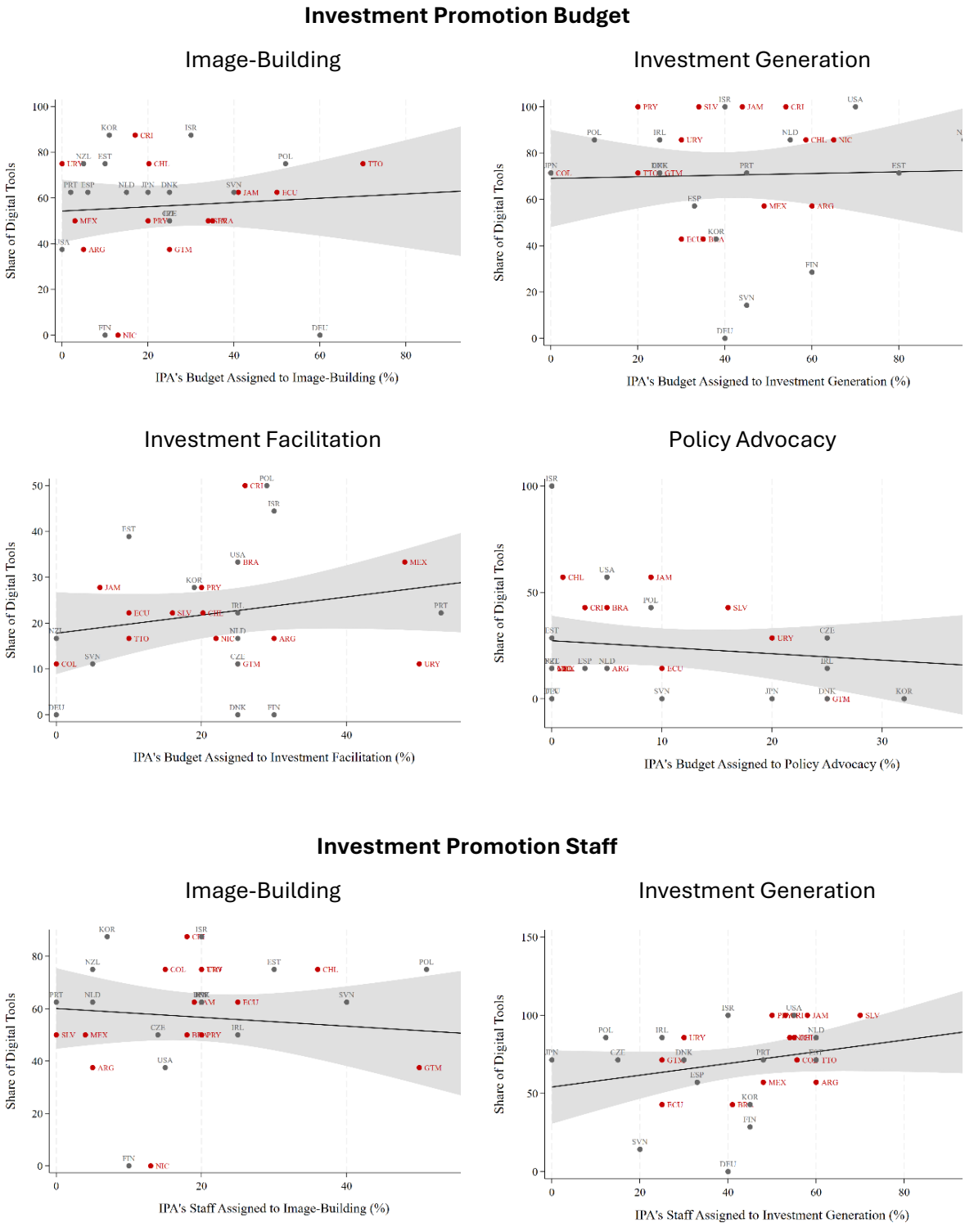


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the average number of Digital Tools adopted by IPAs, by function and region. "Earlier Tools" refer to digital tools adopted prior to 2019, "New Tools" refer to digital tools adopted in 2019-21, and "New COVID Tools" refer to digital tools that IPAs report to have adopted due to COVID-19.

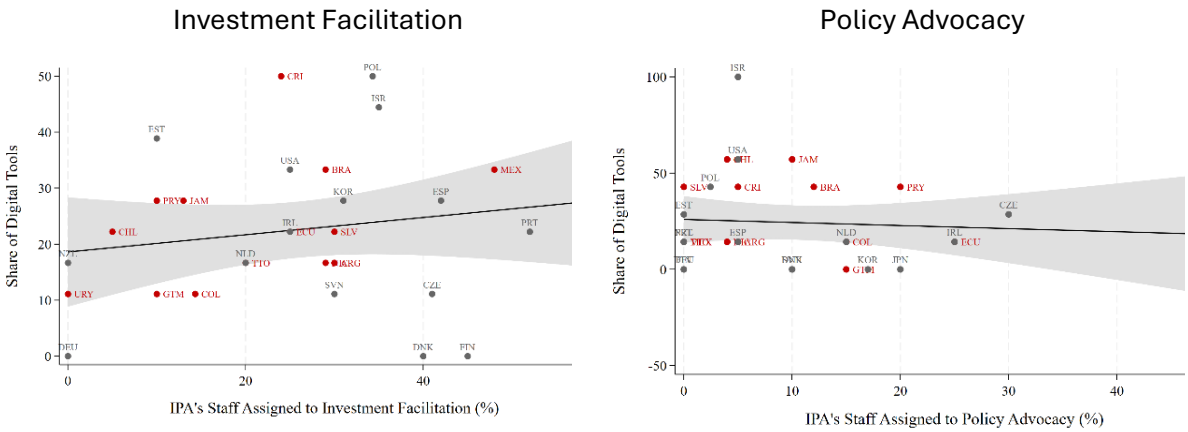
In specific cases, IPAs' degree of relative digitalization of their different functions resembles their relative resource allocation to these functions. More precisely, the share of IPA digital tools in investment generation and facilitation seems to be positively correlated with the share of

investment promotion budget and staff that the IPAs allocated to these functions (see 35). Such a relationship is statistically significant for investment generation (and investment facilitation in the case of the number of staff), after accounting for relevant covariates (Table 2).[35]

Figure 35. IPA's Resources for Investment Promotion and Share of Digital Tools



[35] We run seemingly unrelated regressions (SUR) to account for the potential correlation of standard across functions. In these regressions, the dependent variables are the shares of digital tools in a given function.



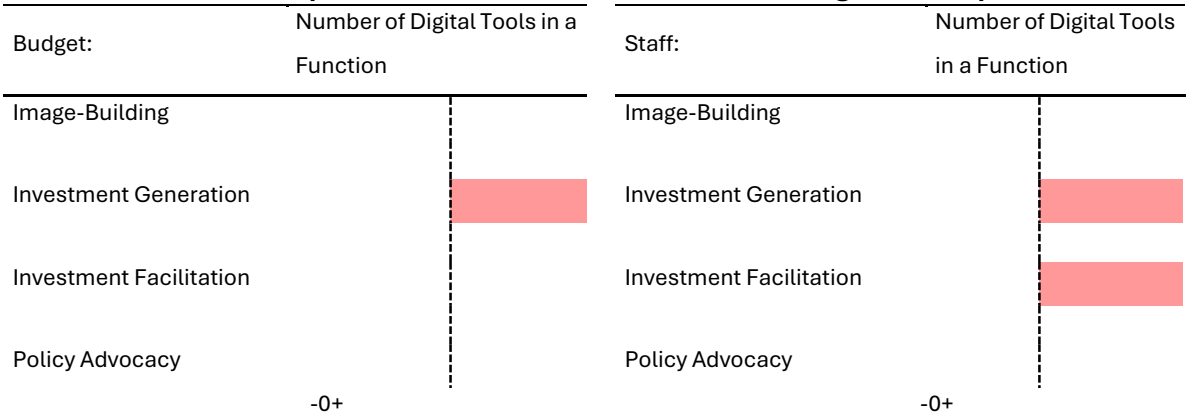
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the number of digital tools used per function and the share of IPA Foreign Direct Investment (FDI) budget and staff. Shares are taken from the total budget and total staff, respectively.

Interestingly, there is no strong relationship between IPA's total investment promotion budget and the share of digital tools used in different IPA functions, while the association is markedly positive for the size of the IT team, especially for investment generation and policy advocacy functions (see Table A2.4 and Figure A2.5 in Annex). In other words, human capital endowment through an IT team may serve as an important mechanism facilitating digital tool adoption by the agencies. The same holds true for the share of digital tools budget dedicated to subscriptions (see Table A2.5 in Annex), which offer another way of expanding the scope of digital tools used.

These patterns may explain why, despite having lower digital budgets, LAC IPAs have managed to adopt more digital tools – relying more on their internal IT teams and subscriptions (rather than tailored digital solutions developers that may require higher budgets). As such, there may be a degree of substitutability between an internal IT team and the need for a large digital budget in certain contexts.[36] Finally, cross-country differences in the use of CRM within each business function also appear to be positively correlated with the number of digital tools in that function (see Box 16), and differences in CRM coverage across functions may capture the degree of technological difficulty in digitizing certain IPA activities.

[36] This likely hinges on the market wage of skilled IT professionals available for an IPA to hire.

Table 2. Relationship Between Resources and Number of Digital Tools per Function



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The panel on the left (right) in the figure shows the sign of the estimated coefficient on the share of IPA's budget (staff) devoted to a given function (red=positive; black=negative) from seemingly unrelated regressions (SUR) where the dependent variables are the shares of digital tools in a given function and whose control variables are the (natural logarithm of) countries' GDP and the (natural logarithm of) countries' GDP per capita. Results are robust to the inclusion of controls for the total IPA budget and total staff. Dark red indicates statistical significance at the 1% level, whereas light red indicates statistical significance at the at least 5% level.

Box 16 | The Use of CRM: A Good Proxy for Digitalization?

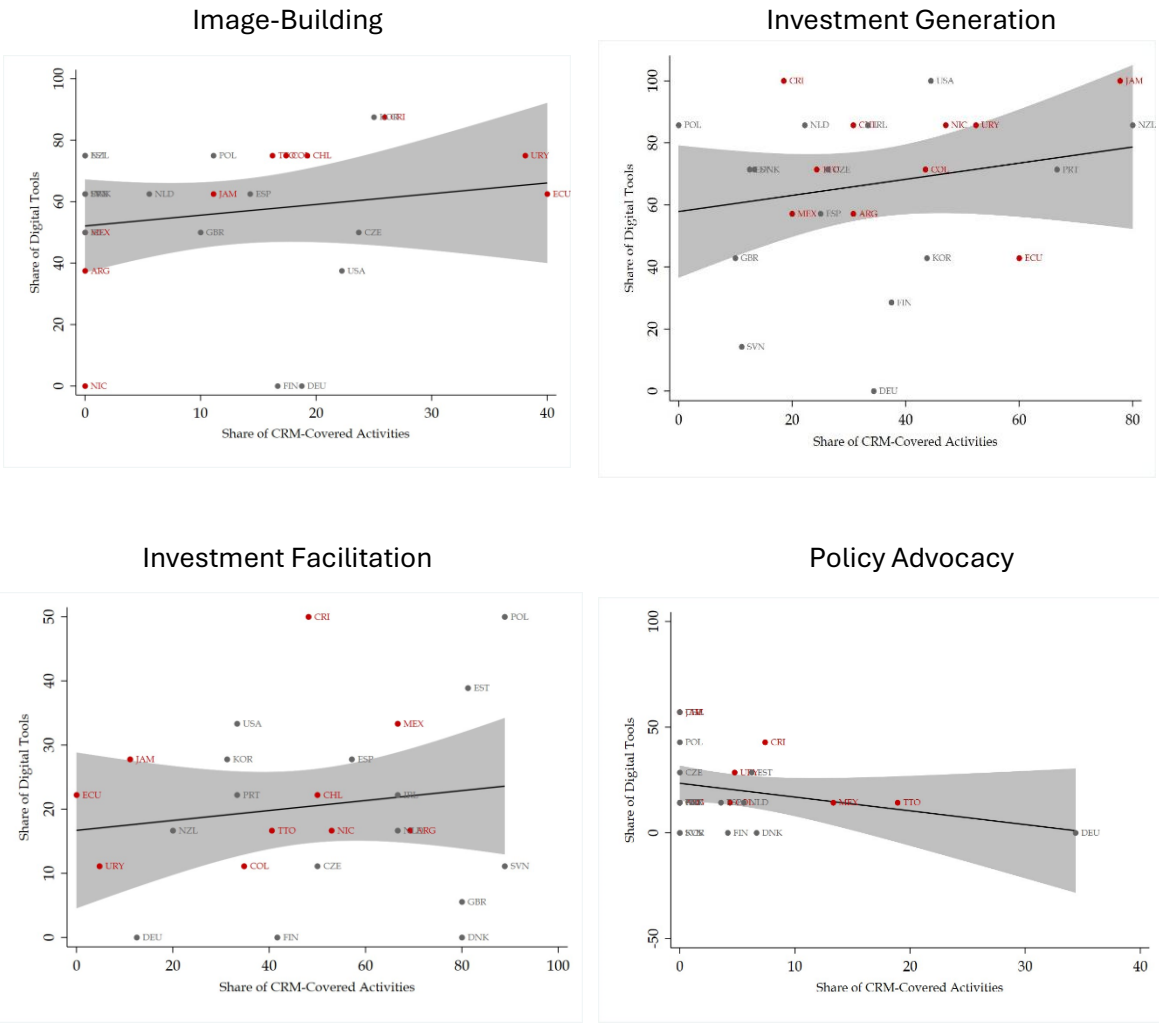
As discussed in this section, there are noticeable differences in the degree of digitalization of IPA business functions in general and across countries in particular. Are some functions inherently more difficult to digitize?

Data from the previous IDB survey of IPAs, explored in Volpe Martincus and Sztajerowska (2019) and Volpe Martincus et al. (2021), show that IPAs differ in the extent to which they record their activities in the customer relationship management (CRM) system. There are some systematic differences across IPA business functions whereby some activities are more difficult to track systematically (e.g., image-building and policy advocacy functions).

We combine the data from the OECD-IDB survey of IPAs – which also included information on the coverage of different IPA activities in CRM by business function – with the current survey of digital tools and find that there is a positive correlation between the share of IPA activities covered in the CRM and the share of digital tools adopted in a given business function across all functions besides policy advocacy (see Figure B16.1). This may suggest that agencies with better infrastructure or procedures for recording their activities systematically are also more prone to, or capable of, digitalizing their activities. Differences across functions can also be indicative of those functions' relative technological propensity for digitalization.

Continues on the next page.

Figure B16.1. The Relationship Between the Degree of Digitalization and CRM-Coverage of a Given IPA Business Function



Source: Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools, Volpe Martincus and Sztajerowska (2019) and Volpe Martincus et al. (2021).
Note: The figures are scatterplots showing the relationship between the percentage share of activities of a given investment promotion covered in the IPA CRM and the percentage share of digital tools used in the respective function.

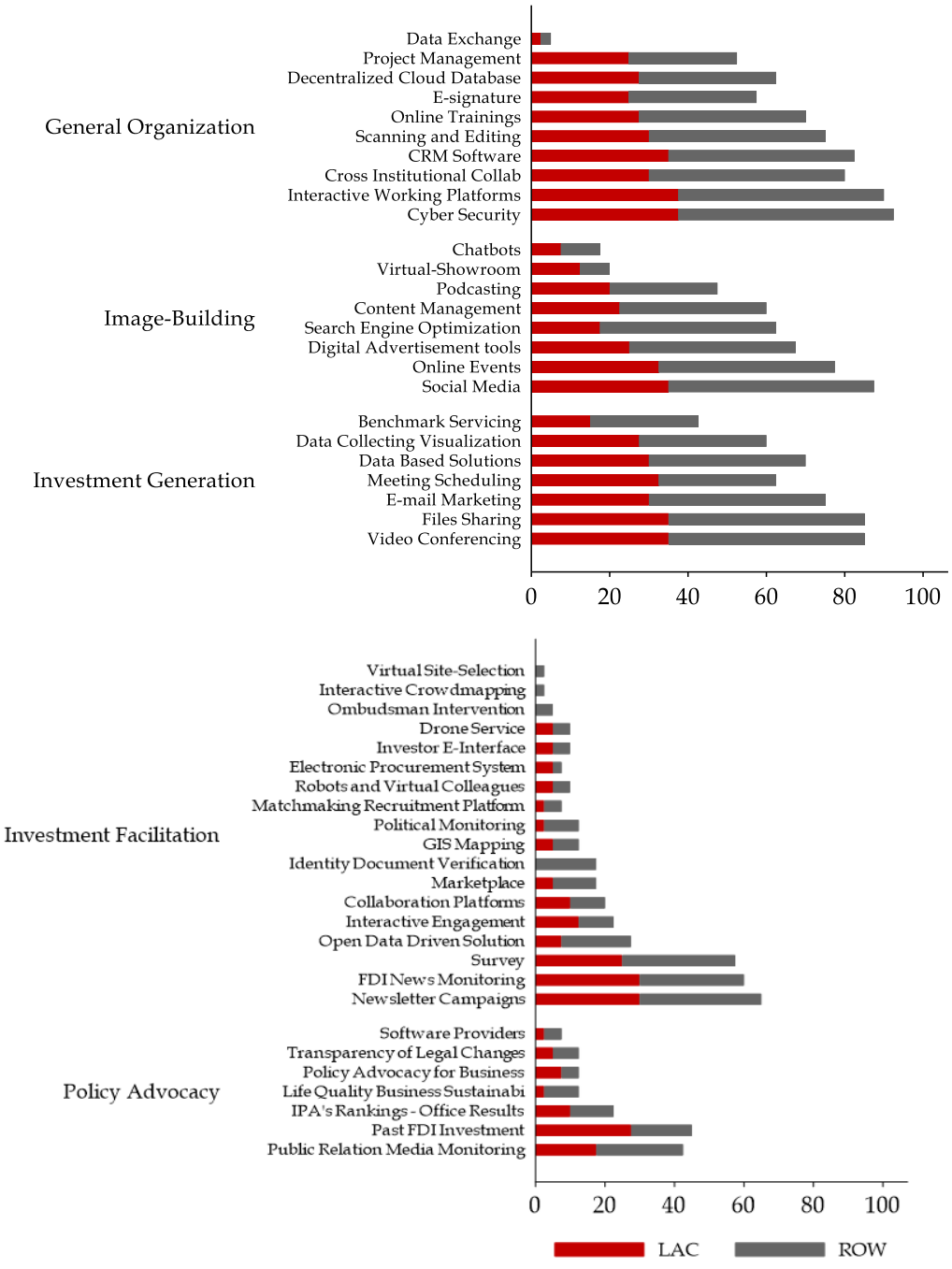
4.3. Types of Digital Tools

An operative question that naturally follows from the discussion above is what specific types of digital tools IPAs use most frequently within each of their main functions. Figures 36 and 37 provide a first answer to that question, reporting the relative use of different digital tools by IPA's broad function and for different tool categories. Several patterns emerge:

- **Overall:** Besides differences across the main functions – with the highest level of digitization recorded in general organization and image-building and the lowest in policy advocacy (see Figure 36) – the extent of use of digital tools varies for specific activities within those functions. These are discussed, by function, below.

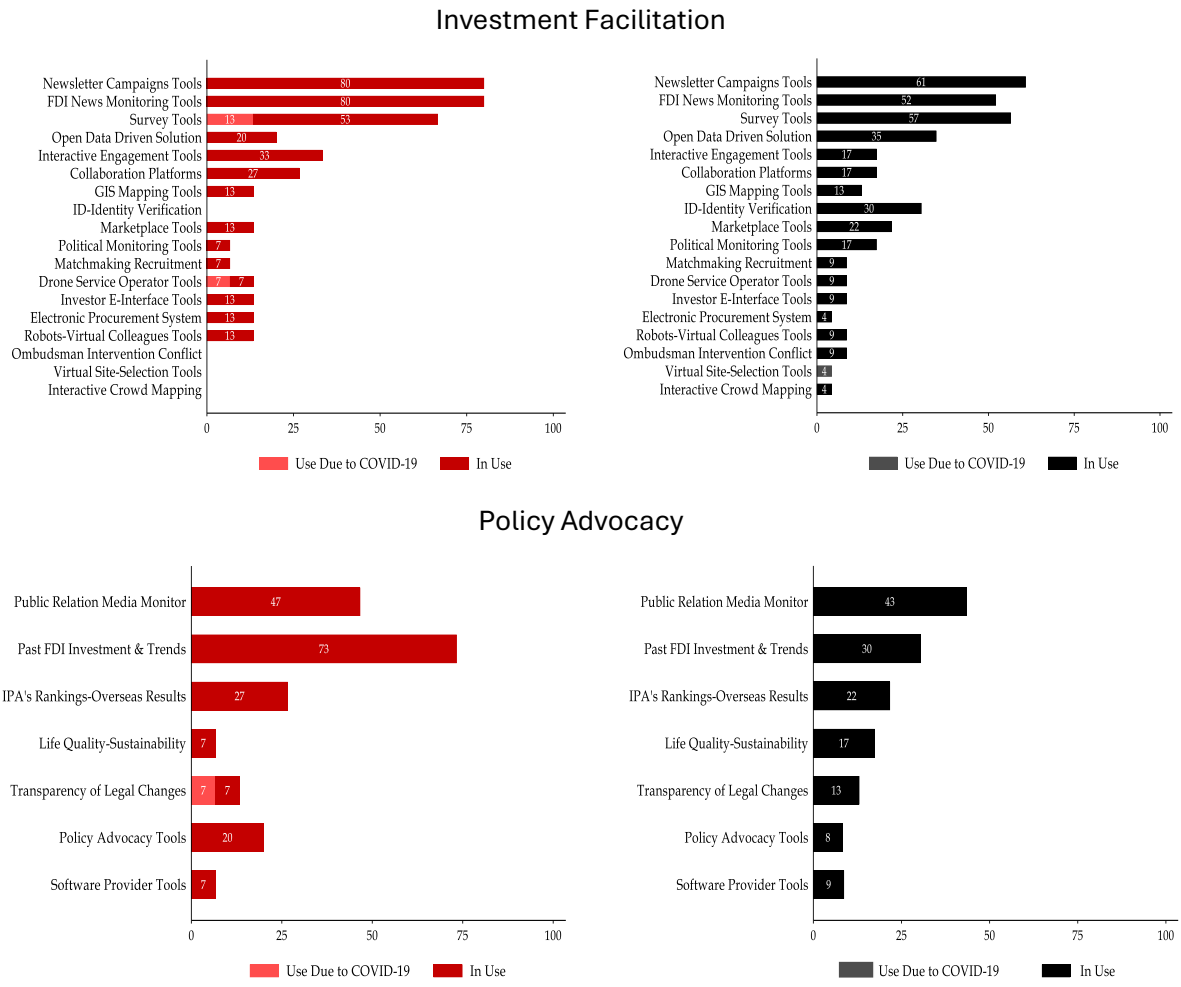
- **General Organization**: **Cybersecurity solutions, interactive work platforms, and CRM software are the most popular types of digital tools among IPAs.** LAC IPAs use relatively more frequently cross-institutional working platforms, e-signature, and project management tools, whereas those in ROW adopt more often CRM solutions. Agencies in both regions increased the use of online training and interactive working platforms due to the pandemic, with such an increase being stronger in LAC.
- **Image-Building**: **Social media and online event tools are the most popular among IPAs, followed by those for digital advertising and search engine optimization.** Virtual showrooms and chatbot tools prevail among LAC IPAs, while search engine optimization is more frequently used by their ROW counterparts. Many agencies in both regions have started to use online events, podcasts, and virtual showrooms during the pandemic.
- **Investment Generation**: **Video-conference solutions, file-sharing, email marketing, and data-based solutions are the most common IPA digital tools.** Many IPAs increased the use of videoconferencing during the COVID-19 outbreak when mobility restrictions prevented in-person events. LAC IPAs use more investment generation digital tools in most categories, and in particular data-based lead generation, meeting scheduling, and data collection and visualization solutions.
- **Investment Facilitation**: **Fewer digital tools are used by IPAs to perform this function and relate mostly to newsletter campaigns, FDI monitoring, and surveys.** IPAs in LAC use interactive collaboration tools more often, and those for identity verification, political monitoring, and marketplace support less frequently. GIS mapping, drone services, or virtual-site selection tools are still used by only a few agencies, although there has been some take-up of the latter in LAC during COVID-19.
- **Policy Advocacy**: **The set of digital tools is even more limited in this function, and most focus on monitoring public relations media, FDI investment trends, and IPA rankings.** This is not surprising considering the nature of this function, which primarily relies more on in-person interactions. LAC IPAs report using digital tools for FDI monitoring more often than their ROW peers. During the pandemic, LAC IPAs started using more tools for monitoring legal changes, while there were no such changes in ROW.

Figure 36. Share of IPAs Using Specific Digital Tools by IPA, by Function and Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the percentage share of IPAs using a particular tool by main IPA function. LAC countries are shown in red, whereas ROW countries are shown in gray.

Figure 37. IPAs Use of Digital Tools by Type and Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the percentage share of IPAs using a particular digital tool and the percentage share of those that have adopted a tool due to COVID-19. LAC countries are shown in red, whereas ROW countries are shown black/dark gray.

Overall, the adoption of digital tools due to COVID-19 concentrated on a few specific areas, primarily related to overcoming mobility restrictions. Thus, these tools include those that allow for remote ways of working (interacting working platforms, online training tools); organization of online events and virtual showrooms and videoconferencing; and performing virtual investment facilitation and policy advocacy (e.g., use of online surveys, drone services to monitor the situation on the ground, and systems tracking legal changes). In addition, Box 17 shows and discusses the nature of IPA expansion plans in these different categories.

Box 17 | IPA Plans for Digital Tool Adoption

As shown in this section, in some categories, IPAs have been increasing their use of digital tools over the years in a steady fashion, while in others, adoption accelerated during the COVID-19 pandemic. In which areas do the agencies plan to increase the adoption of digital tools? Figure B17.1 provides an overview, and key insights are summarized below by function, highlighting differences between LAC and ROW:

- **General Organization:** The highest share of IPAs in both regions (one-third) report a wish to increase adoption of data exchange tools. A large share of ROW agencies reports an increase in the use of project management tools, e-signature solutions, and decentralized cloud systems. Meanwhile, LAC agencies more frequently report plans to expand the use of CRM systems. The same share of agencies in both regions plans to adopt digital tools for online training.
- **Image-building:** A high share of IPAs in both regions plan to boost the use of digital chatbot tools embedded on their websites and virtual showrooms in the future. A significantly higher share of agencies in LAC plan to adopt digital tools for search engine optimization than IPAs in ROW, reflecting, among others, the relatively less frequent use of such tools in the region.
- **Investment Generation:** A high share of IPAs in ROW plan to increase the use of digital tools in this area in the future, reflecting their relatively less intense use of such tools than LAC IPAs. The largest share of IPAs plan to adopt new meeting scheduling tools and data collection and visualization solutions. Further investments in data-based solutions for investment generation are also foreseen by a similar share of IPAs in ROW and LAC (17% and 13%, respectively).
- **Investment Facilitation**: In this area, LAC IPAs report a frequent interest in adopting new tools across the different categories. The highest share of LAC agencies wishes to adopt new digital marketplace support tools, investor e-interface, and online surveys. Meanwhile, IPAs in ROW report more frequently to plan to use more GIS mapping. A similar share of IPAs wants to adopt a virtual colleague or site selection tools.
- **Policy advocacy:** For this function, the highest share of IPAs in LAC plan to invest in their capacity to monitor and provide information on the applicable legal changes. ROW IPAs focus more frequently on the use of digital policy advocacy tools instead of legal changes themselves and the monitoring of FDI, life-quality sustainability, and other related trends.

Figure B17.1. IPA Planned Use of Digital Tools by Type and Region

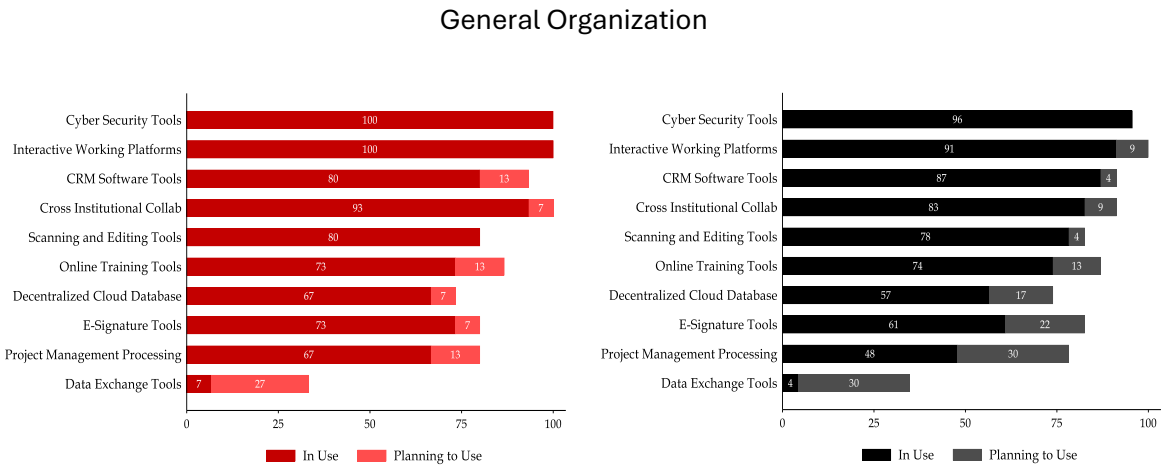
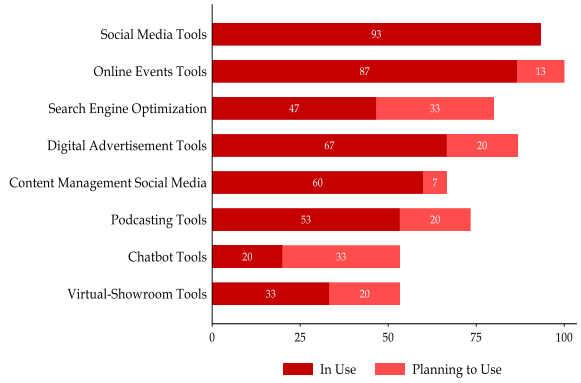
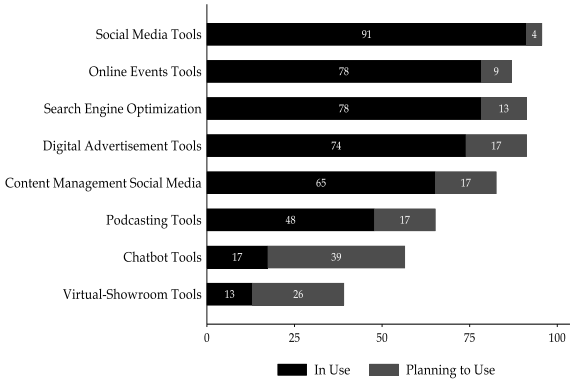
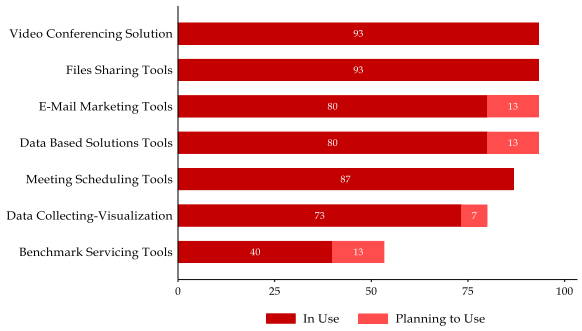


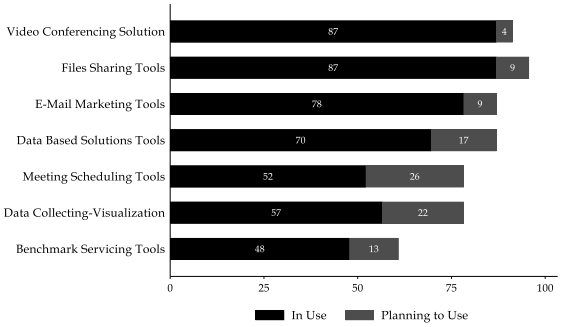
Image-Building



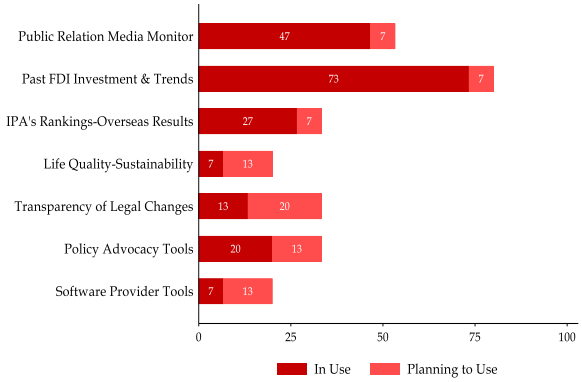


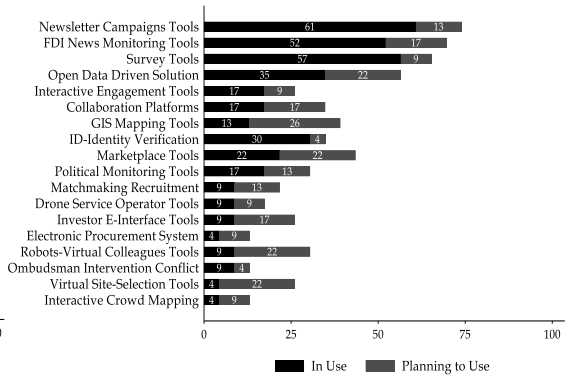
Investment Generation



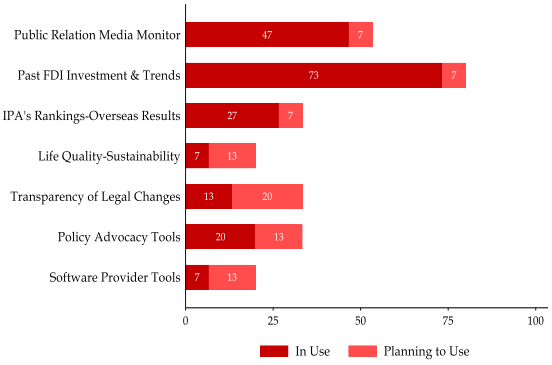


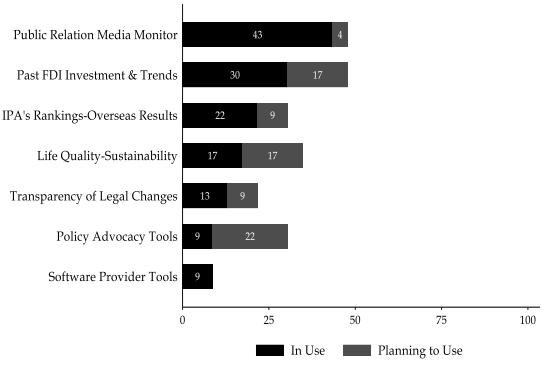
Investment Facilitation





Policy Advocacy





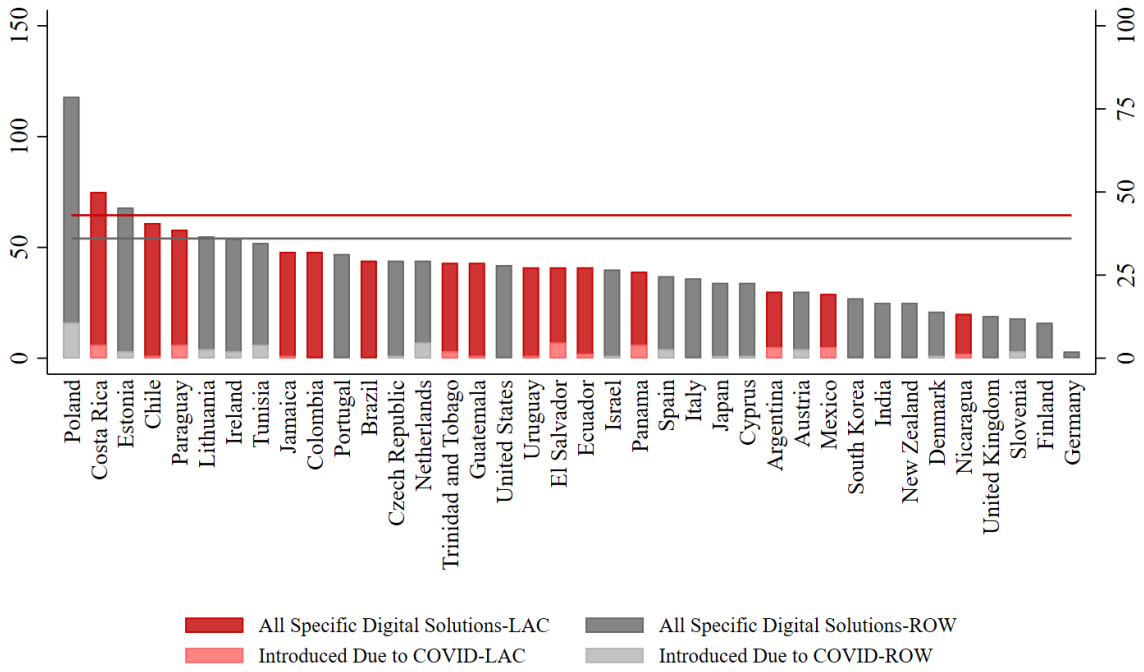
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the percentage share of IPAs using a particular digital tool and the percentage share of those planning to use it. LAC countries are shown in red, whereas ROW countries are shown in black/dark gray.

4.4. Specific Digital Solutions and Providers

In addition to deciding which functions to digitize, IPAs need to choose a specific digital solution – and, hence, the associated provider – that is best suited to their needs, conditional on available resources and other constraints. This task is far from trivial as it requires agencies to identify available alternatives and understand their respective advantages and disadvantages. More specifically, identifying and assessing such solutions may be subject to important information frictions since data is dispersed and investment promotion staff are unlikely to be aware of all existing options and may require time to gather the relevant information. To assist the agencies in this activity, the IDB has created a repository of the different digital tools' providers used by IPAs (see Box 18).

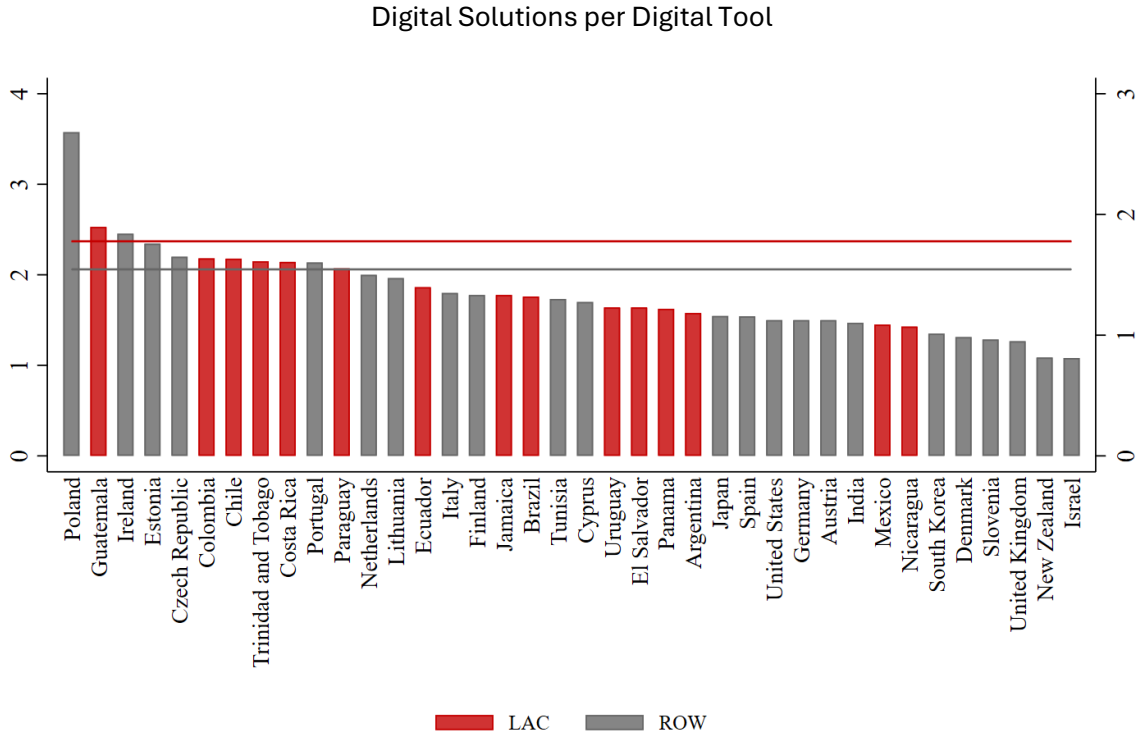
A median IPA relies on 1-2 specific digital solutions for any given digital tool. In absolute terms, the median IPA used 41 different specific digital solutions for the delivery of its 22 digital tools, with the maximum being 118 and the minimum 3 (see Figure 38). In relative terms, the median IPA relies on less than two solutions per digital tool, with LAC using slightly more solutions per tool than ROW (1.8 versus 1.5) and having lower concentration of digital tools per provider used (3 versus 3.7, see Figure 39). The patterns for subnational IPAs are described in Box 19.

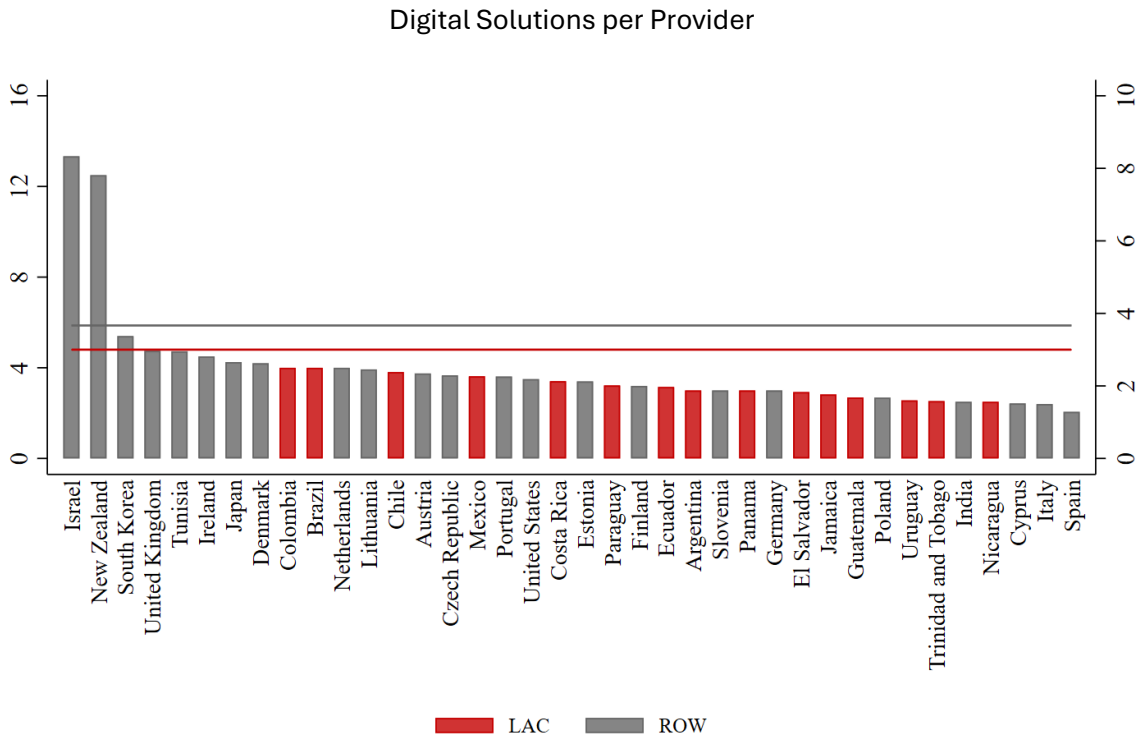
Figure 38. Total Number of IPA Specific Digital Solutions, by Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the total number of digital solutions used by each IPA. LAC countries are shown in dark red/light red, whereas those in ROW are shown in dark gray/light gray. Median numbers of specific digital solutions used within each region are presented in the secondary axis.

Figure 39. Median Number of IPA Specific Digital Solutions per Digital Tool and Provider, by Country





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the average number of digital solutions per digital tool used by each IPA (top panel) and average number of digital solutions per provider used by each IPA. LAC countries are shown in dark red/light red, whereas those in ROW are shown in dark gray/light gray.

Box 18 | IDB IPA Digital Solutions Repository

Through its Survey of IPA Digital Tools, the IDB has collected detailed data on the digital tools, specific digital solutions, and their providers used by IPAs in the region and elsewhere across the agencies' main functions. This exercise has made it possible to create a first-of-its-kind repository of IPA digital tools at a very granular level.

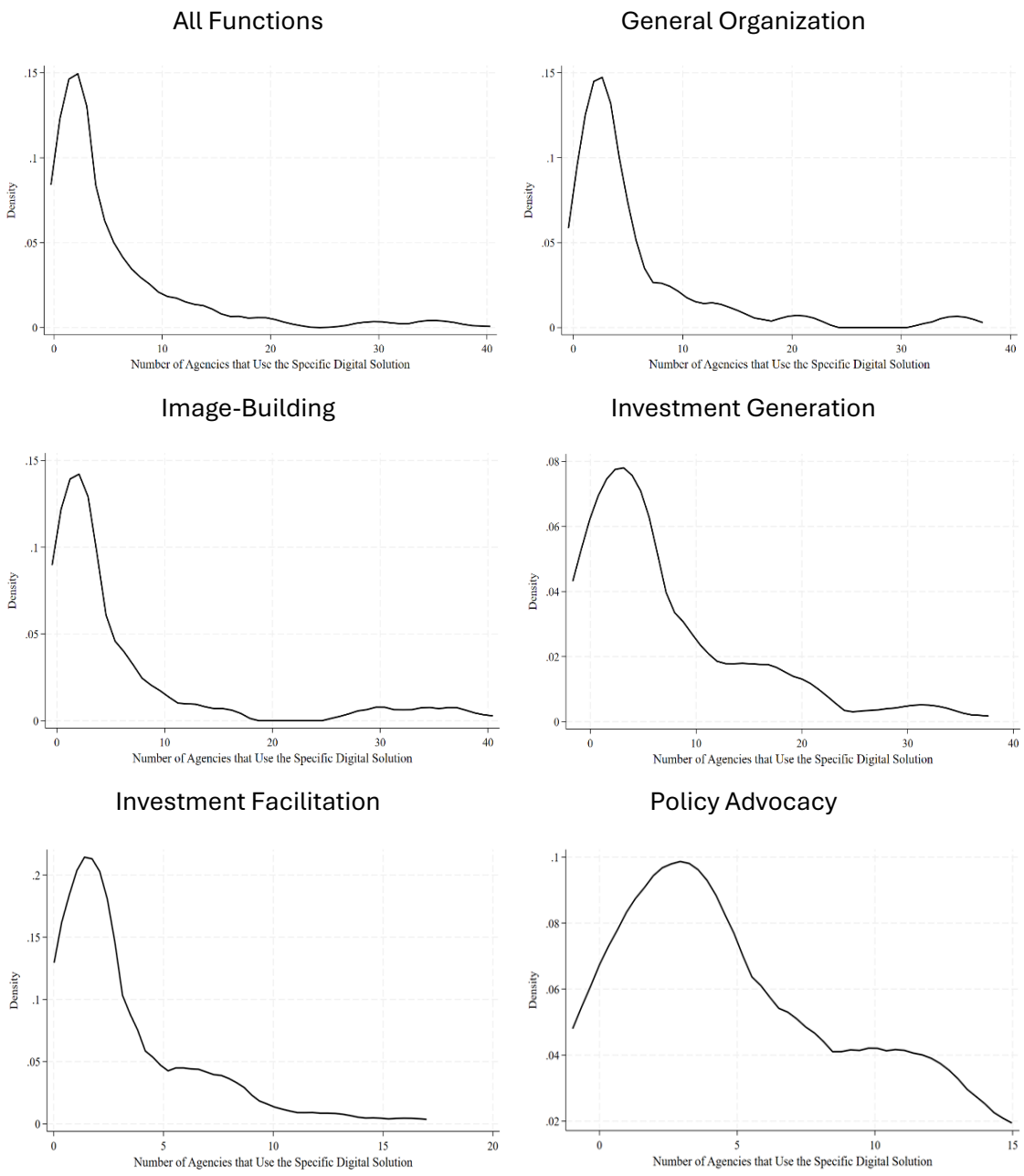
This repository includes an as-wide-as-possible list of possible specific digital solutions that are non-exhaustive and non-descriptive in nature; their relative frequency of use by IPAs in LAC and outside of the region, the degree of integration with IPAs' own tools and those of other relevant agencies, and the most frequently mentioned advantages and disadvantages.

As such, the repository can help broaden the scope of tools which IPAs are aware of and, thereby, support internal reflections on the available options, and, eventually, the selection and implementation of an optimal mix of tools suitable to IPAs' needs, including through technical assistance.

The repository currently documents 291 specific digital solutions used by at least one IPA, sourced from 76 distinct providers. Despite this breadth, usage is highly concentrated: the median digital solution is used by only 2 agencies, while most tools remain niche choices specific to one or very few agencies, and few solutions are used by many agencies (see Figure B18.1).

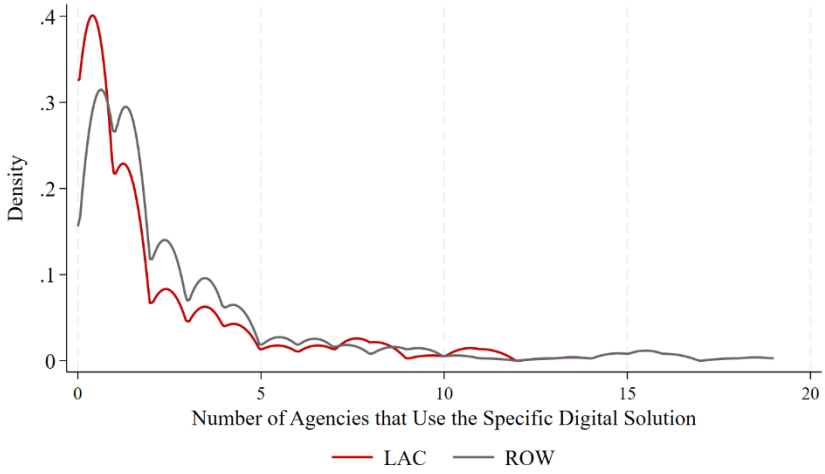
This pattern holds across investment promotion functions although investment generation and policy advocacy stand out as the functions with the highest use by many agencies (with the median of 4 agencies per solution, i.e., double the overall median). There are no differences in the agencies' use of free versus paid tools. Similarly, there are also no significant differences in the frequency of use of specific digital solutions by agencies in LAC versus ROW (see Figure B18.2).

Figure B18.1. Number of IPAs using the Same Digital Solutions by Function



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows kernel density of the number of IPAs that use the same specific digital solutions, overall and function.

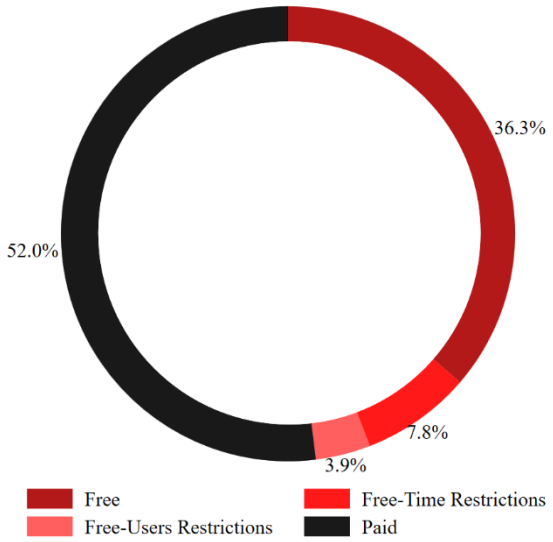
Figure B18.2. Number of IPAs using the Same Digital Solutions by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows kernel density of the number of IPAs that use the same specific digital solutions by region.

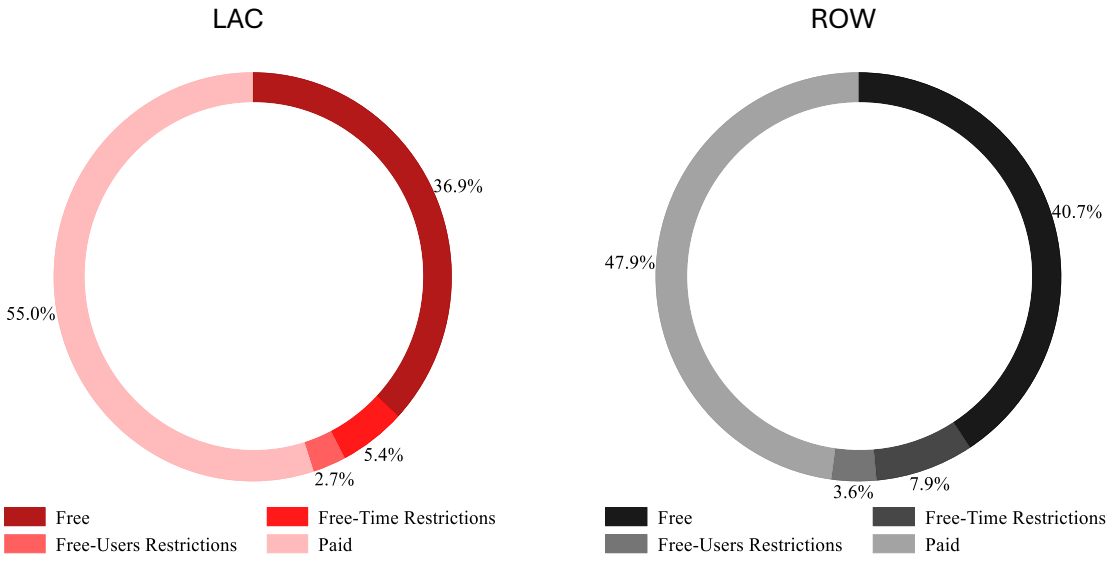
Most specific digital solutions used by IPAs are paid, but nearly half are free, or conditionally free (see Figure 40). In this latter category, which accounts for about 12% of all digital solutions to which IPAs resorted, access to the basic version may be free, but there are specific time or user-related restrictions. In addition, nearly two-fifths of free digital tools used open-source solutions. The share of agencies using free, or conditionally free tools, in either region is similar (see Figure 41).

Figure 40. Share of IPA Digital Providers by Type



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of IPA digital providers by type.

Figure 41. Share of IPA Digital Providers by Type



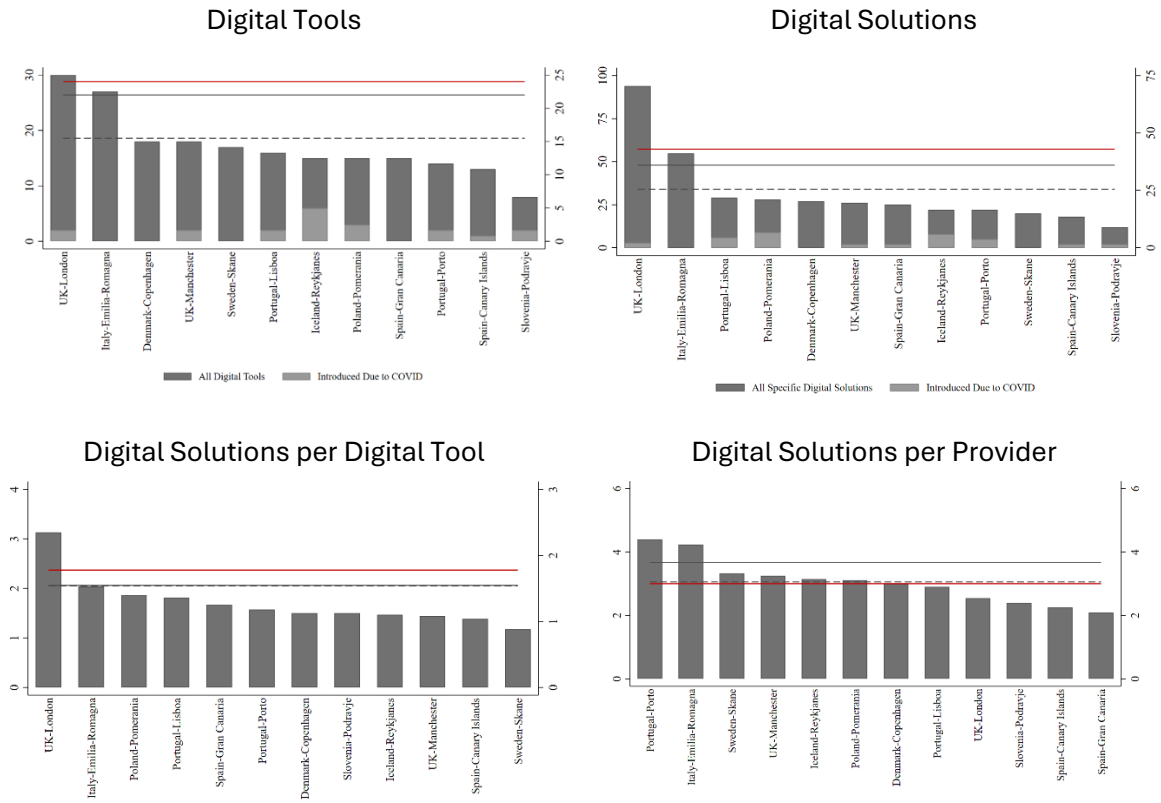
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of IPA digital providers by type.

Digital solutions have distinguishing attributes that can be heterogeneously valued and lead to different choices by IPAs. These attributes can be grouped into the following categories: ease of use, good functionality and performance, low cost, and good customer service. **Overall, good functionality and performance are the most frequent consideration highlighted by the median surveyed IPA** (see Figure 42, top panel). The ease of use was mentioned for one-fifth, and low cost for 13% of solutions. Meanwhile, good customer service appears to be a much less important aspect. There are also interesting differences in types of advantages highlighted by region (e.g., the ease of use is more frequently reported as important in LAC) as well as the type of tool (e.g., free tools have a benefit of lower cost, which may come at the expense of better functionality, see Box 20).

Box 19 | Digital Tools and Specific Solutions of Subnational IPAs

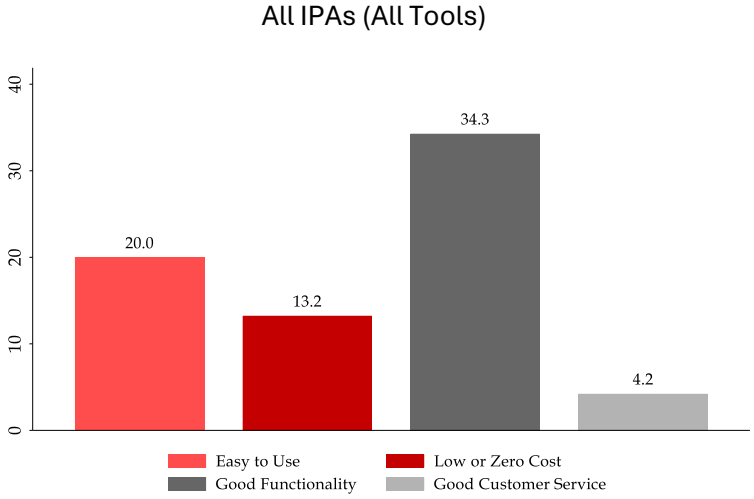
Subnational IPAs use far fewer digital tools and solutions than their national counterparts. The median subnational IPA uses 15 digital tools and 25 specific digital solutions to deliver them, below the medians for national IPAs in both ROW and LAC (see Figure B19.1). Yet, the two largest subnational IPAs — UK-London and Italy-Emilia-Romagna — match or exceed the deployment levels of national agencies. Some agencies, such as Iceland-Reykjanes and Poland-Pomerania, adopted new tools in response to the COVID-19 pandemic. A median subnational IPA relies on 1.5 specific solutions per digital tool, similar to its national ROW counterpart. However, it uses three specific digital solutions per provider, showing lower concentration than national ROW IPAs, and resembling LAC IPAs more closely in this regard.

Figure B19.1. Number of Digital Tools and Specific Solutions Used by Subnational IPAs

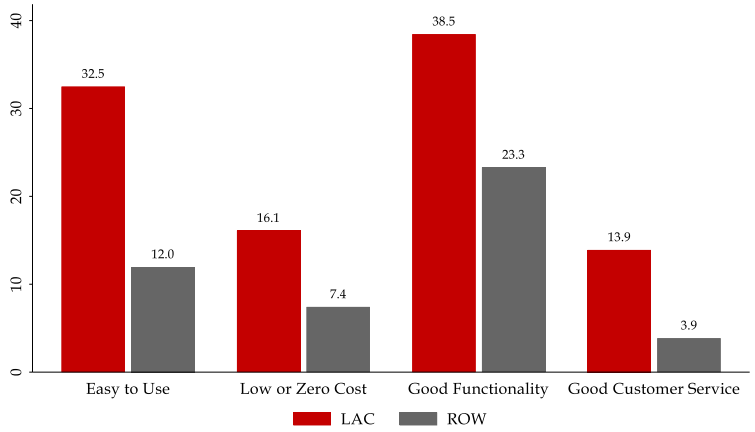


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows, for each subnational IPA: the number of digital tools (top left panel), the number of specific digital solutions (top right panel), the average number of digital solutions per digital tool (bottom left panel), and the average number of digital solutions per provider (bottom right panel). Medians are indicated by the horizontal lines: dashed black for subnational IPAs, solid dark gray for national IPAs in ROW, and solid dark red for LAC.

Figure 39. Advantages of Specific Digital Solutions According to IPAs



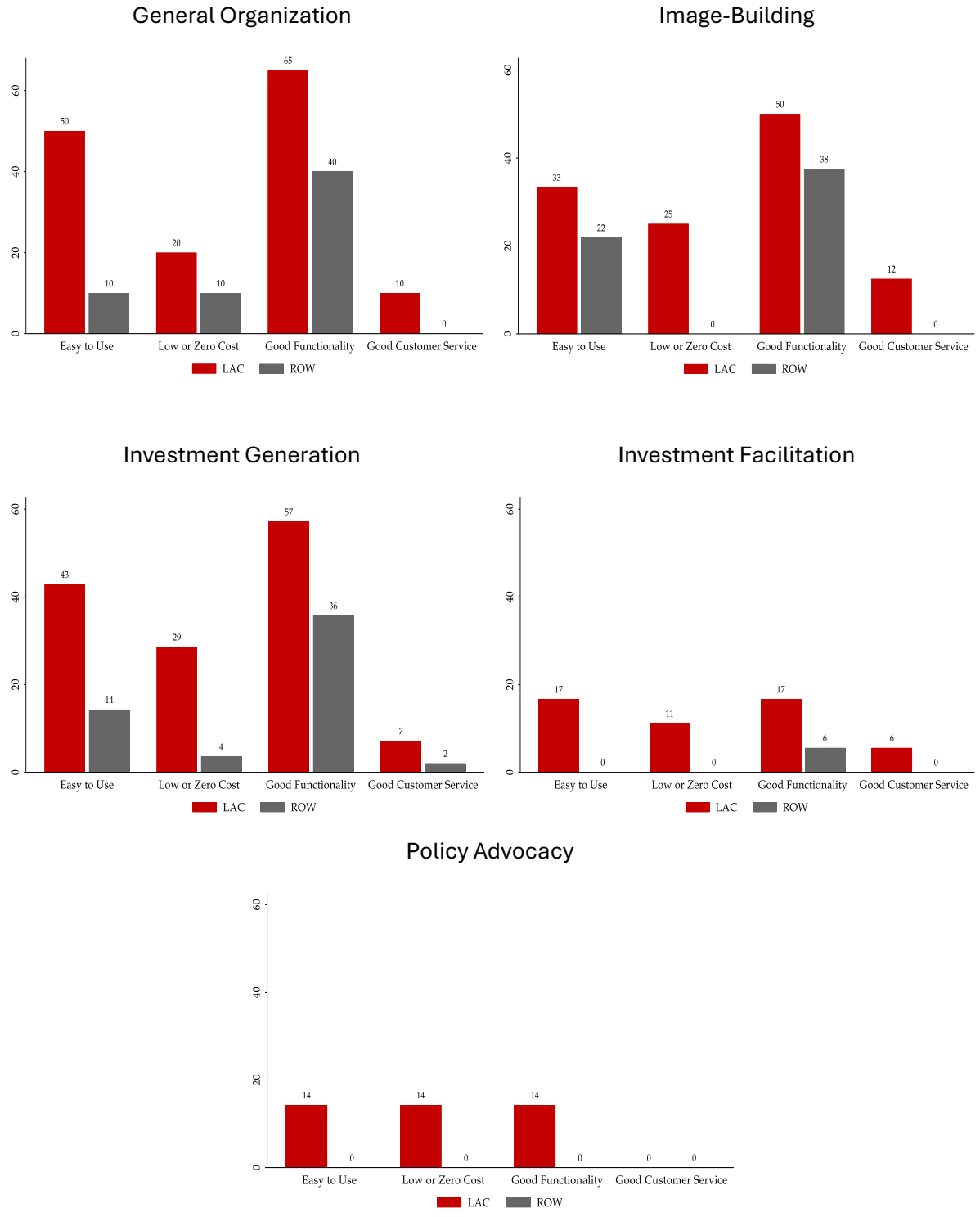
By Region (All Tools)



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure in the top panel reports the percentage share of advantages reported by the median IPA of all tools used, whereas the figure in the bottom panel reports the differences across regions. For each agency, the share of tools associated with each advantage category — "Easy to Use", "Low or Zero Cost", "Good Functionality", and "Good Customer Service" — is computed as a percentage of the total number of tools used by that agency. This normalization ensures comparability across agencies regardless of the total number of tools employed. Since agencies could report multiple advantages per tool, these shares do not sum to one hundred percent. Agencies could also report "Other Advantages" or "None", though these categories are omitted from the figure for brevity. The values displayed correspond to the median share across all agencies within each group. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

The extent to which the advantages of different digital tools matter depends on the investment promotion function. While good functionality is most important across all functions, the relative importance of the ease of use and cost is relatively higher in IPA business functions other than general organization, especially in the case of investment facilitation and policy advocacy functions, for which IPAs continue using relatively fewer digital tools (see Figure 43).

Figure 40. Advantages of Specific Digital Solutions by Investment Promotion Function and Region

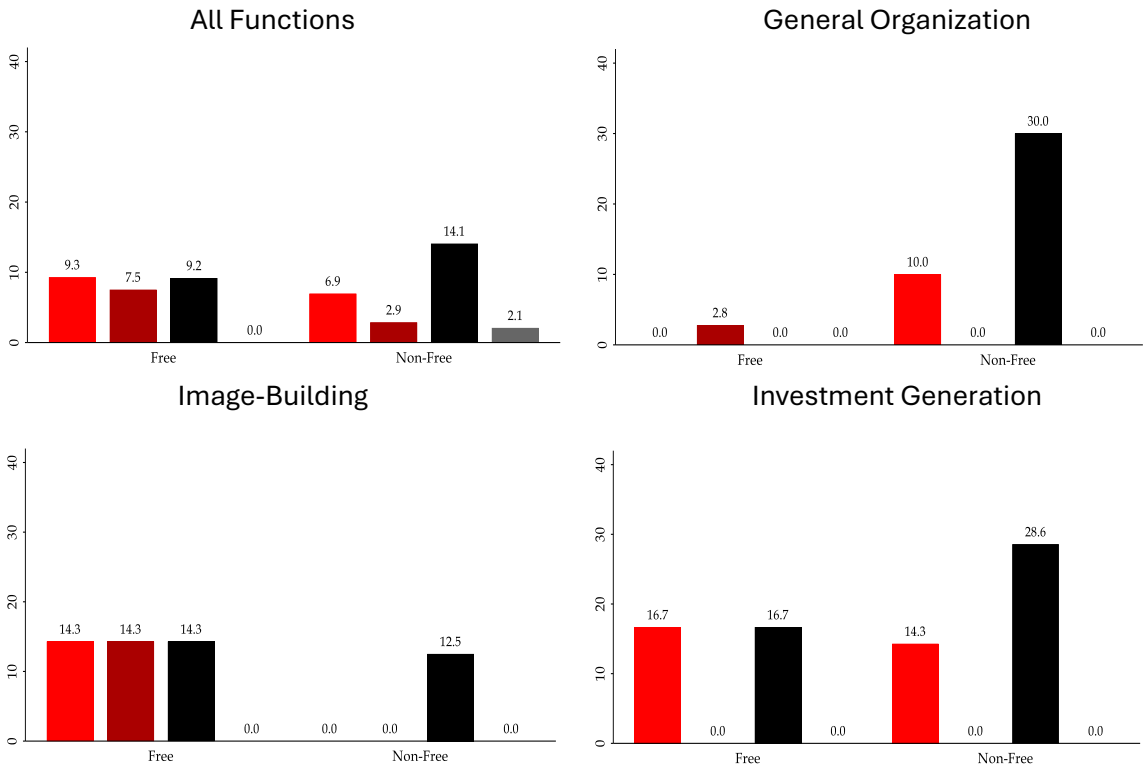


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the percentage share of advantages reported by the median IPA by the function used. IPAs could report multiple advantages per tool used. For each agency, the share of tools associated with each advantage category — "Easy to Use", "Low or Zero Cost", "Good Functionality", and "Good Customer Service" — is computed as a percentage of the total number of tools used by that agency. This normalization ensures comparability across agencies regardless of the total number of tools employed. Since agencies could report multiple advantages per tool, these shares do not sum to one hundred percent. Agencies could also report "Other Advantages" or "None", though these categories are omitted from the figure for brevity. The values displayed correspond to the median share across all agencies within each group. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Box 20 | Advantages of Specific Digital Solutions: Does It Matter if You Pay?

As explained above, the use of different digital tools and specific providers by IPAs involves different trade-offs as agencies aim to maximize performance and ease of use while minimizing cost, among others. As such, it is pertinent to consider if digital tools that are free of charge are perceived differently by IPAs. Figure B20.1 shows the share of advantages of different types of tools mentioned by a median IPA using them, both by business function and the type of tool used (free or paid). Overall, agencies highlight the benefits of low cost, and at times ease of use, of free digital tools while appreciating more the functionality of paid tools. The advantage of functionality of paid tools is highlighted most in the case of general organization tools and investment generation, while the pattern is less clear for image-building.[37]

Figure B20.1. Digital Solutions' Attributes by Acquisition Mode (Free vs. Paid), Overall and by Function



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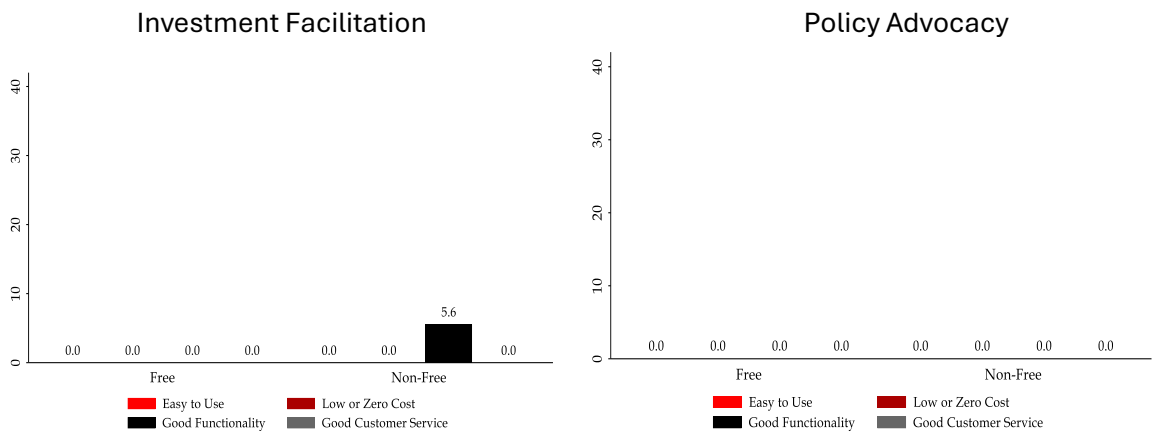
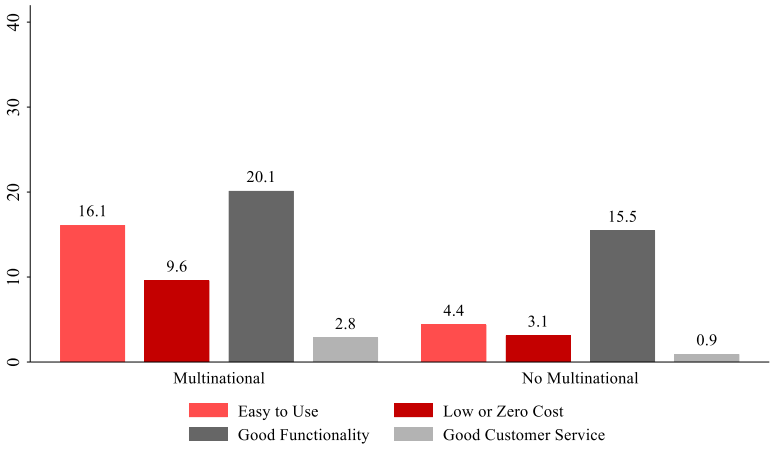
[37] A median IPA reports no specific advantages of digital tools for policy advocacy.



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the percentage share of advantages reported by the median IPA by acquisition modality (free vs. paid) and function in which tools were used. IPAs could report multiple advantages per tool used. For each agency, the share of tools associated with each advantage category — "Easy to Use", "Low or Zero Cost", "Good Functionality", and "Good Customer Service" — is computed as a percentage of the total number of tools used by that agency. This normalization ensures comparability across agencies regardless of the total number of tools employed. Since agencies could report multiple advantages per tool, these shares do not sum to one hundred percent. Agencies could also report "Other Advantages" or "None", though these categories are omitted from the figure for brevity.

Digital tools sourced from multinational providers are perceived as more advantageous across all dimensions reported by IPAs, but the gap is particularly striking for the ease of use (see Figure 44). This may reflect the ability of multinational firms to invest relatively more in user experience. Meanwhile, the functionality gap is smaller, suggesting that solutions delivered by non-multinational providers may still offer relatively advantageous technical performance even if falling short on usability.

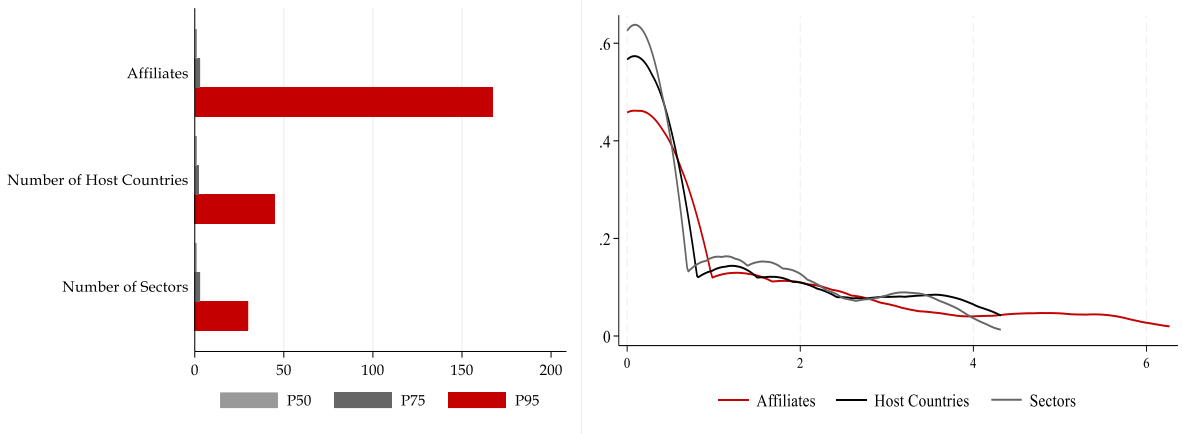
Figure 41. Type of IPAs Digital Tools' Providers



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and Dun and Bradstreet's WorldBase.
Note: The figure shows the percentage share of advantages reported by the median IPA by provider type (Multinational firms vs. non-multinational firm).

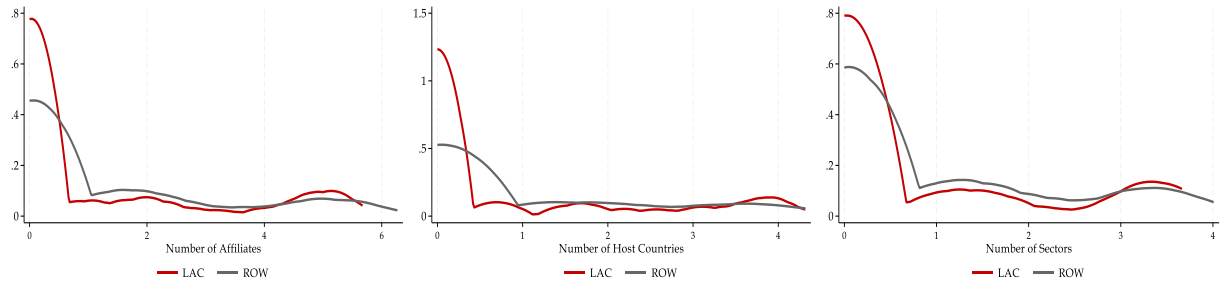
The providers of the specific digital solution used by the IPAs exhibited significant heterogeneity in terms of their size and international footprint. While the median provider had only one affiliate operating in one foreign country in one sector, some were among the largest global firms with several hundred affiliates operating in over 70 countries and 75 different sectors (see Figure 45). In general, LAC IPAs tended to use providers that are smaller than their ROW counterparts (see Figure 46).

Figure 42. Size of IPAs Digital Tools' Providers



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and Dun and Bradstreet's WorldBase.
Note: The figure on the left shows the percentiles 50, 75 and 95 of the number of affiliates, number of host countries, and number of sectors of the firms that provide IPAs with digital tools. The figure on the right shows the Kernel density of the (natural logarithm of the) number of affiliates, number of host countries, and number of sectors of the firms that provide the IPAs with the digital tools.

Figure 43. Differences in Size of IPA Digital Tools' Providers by Region

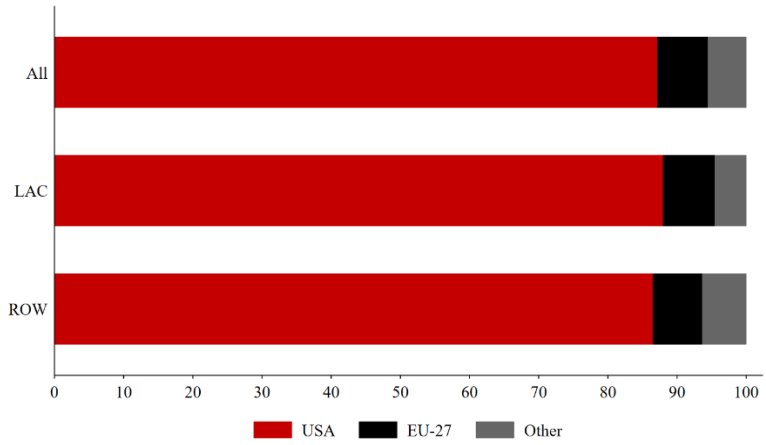


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and Dun and Bradstreet's WorldBase.
Note: The figure shows the Kernel density of the (natural logarithm of the) number of affiliates, number of host countries, and number of sectors of the firms that provide the IPAs with the digital tools.

Providers of digital tools' used by IPAs remain dominated by U.S. based firms with a wide network of affiliates (see Figure 47). Close to 90% of providers of the digital tools used by IPAs are headquartered in the United States (87%), 7% from the European Union, and the remainder is from elsewhere (see top panel of Figure 47). The most frequently used providers also tend to have a wide, and expanding, network of foreign affiliates (see bottom panel of Figure 47).

Figure 44. Location of Digital Tools' Providers

Share of Digital Tools by Origin Country of a Provider



Location of Foreign Affiliates of Most Commonly Used IPA Digital Tools' Providers

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and Dun and Bradstreet's WorldBase.
Note: The figure presents maps that show the foreign affiliates' location of the most frequently used digital tools' provider.

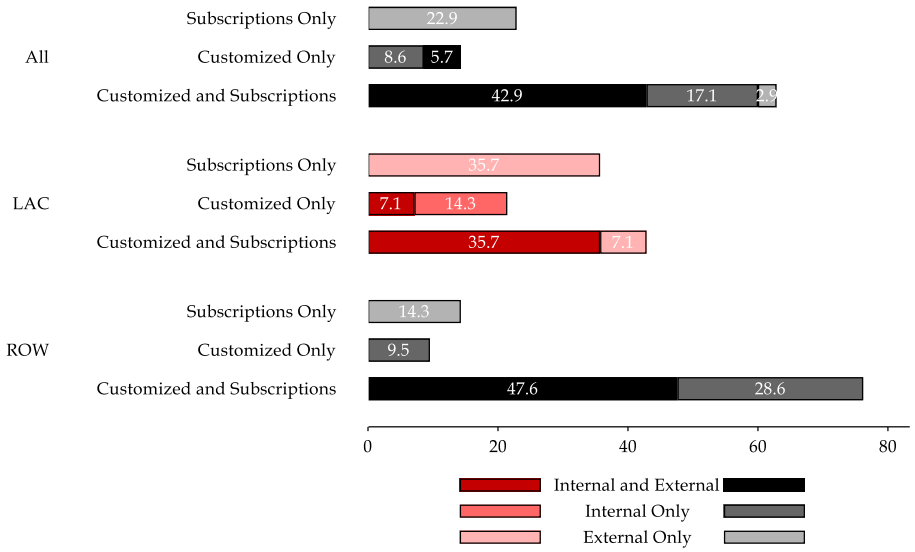
4.5. Digital Tools' Development Strategies

Besides determining what types of specific digital tools are required to perform their functions, IPAs also face a choice as to *how* to acquire access to such tools. Thus, they may decide to pay for off-the-shelf solutions –either purchasing subscriptions or using freely available alternatives– or may develop customized tools, adapted to the agency's specific needs.[38] In the latter case, they may primarily rely on their internal IT team and staff to design and implement such solutions, or commission the work externally – for example, to specialized IT firms. The strategic choice among these different types of strategies will depend on agencies' own capacities vis-à-vis those of external providers, which will influence the digital tools' relative cost, deployment speed, and quality, among others.[39]

IPAs used both off-the-shelf and customized digital solutions, while the former are more common in LAC. In particular, 36% of agencies in LAC used only subscriptions compared to 14% in ROW, whereas their ROW counterparts combined subscriptions more often with internal and external tool development (76%) (see Figure 48). Primarily, a few IPAs of large economies in LAC and ROW (e.g., South Korea, the United Kingdom, and Mexico) developed digital tools entirely in-house. In addition, ten IPAs, from LAC and ROW, have entered partnerships with external providers to jointly develop digital tools: Brazil, Chile, Colombia, Jamaica, and Panama in LAC and Cyprus, India, Lithuania, Slovenia, and the United States in ROW – as reflected in a high share of external and internal solutions when using both subscriptions and customized solutions (see Figure 49).

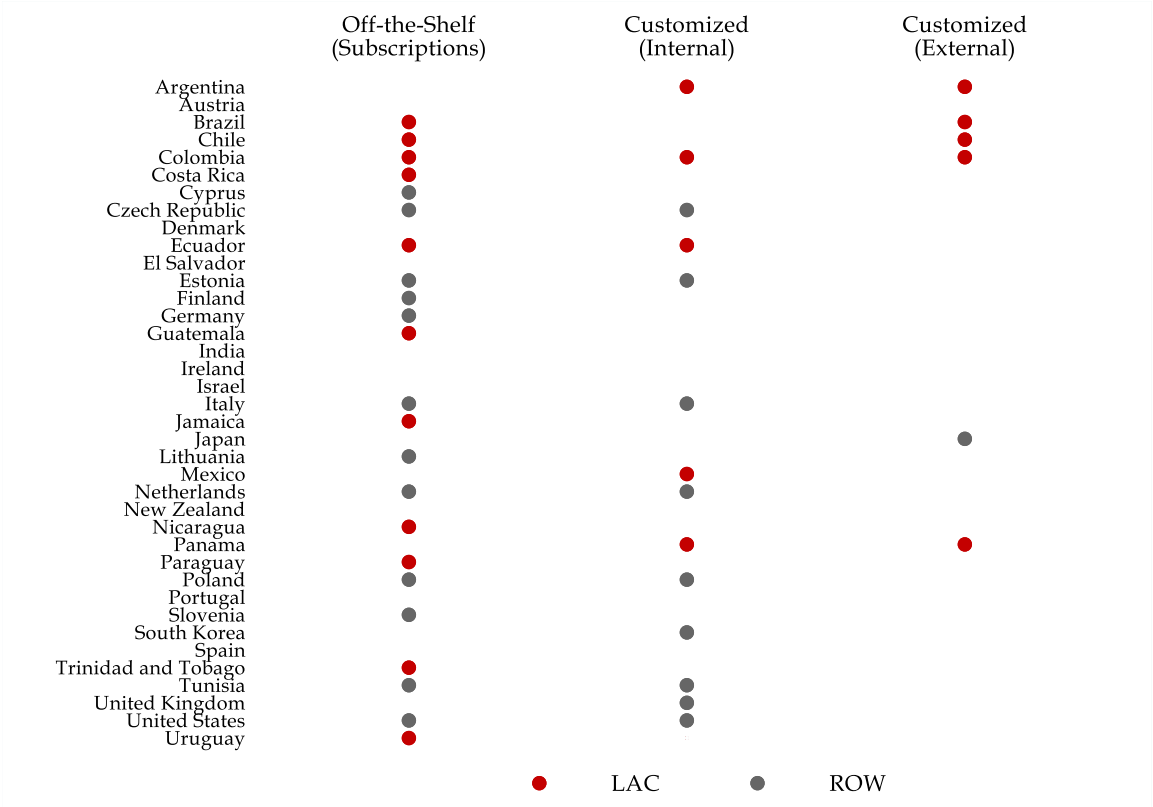
[38] A subscription is an arrangement in which a person or entity pays a recurring fee (typically monthly, annually, or at another regular interval) to receive access to a product, service, or content on an ongoing basis.
[39] This includes updates to keep up with functionalities and security.

Figure 458. Development of IPA Digital Tools, by Type and Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the percentage share of IPAs, by region, using different types of digital tools' development strategies depending on their type (i.e., subscription only, customized only, and customized and subscription), whereby Customized refers to a tool that has been developed from scratch either by the IPA or an external provider; and Subscriptions involve access to free or paid outside off-the-shelf tools and services; and source of those tools (i.e., internal, external, both).LAC countries are shown in red, whereas ROW countries are shown in black/dark gray.

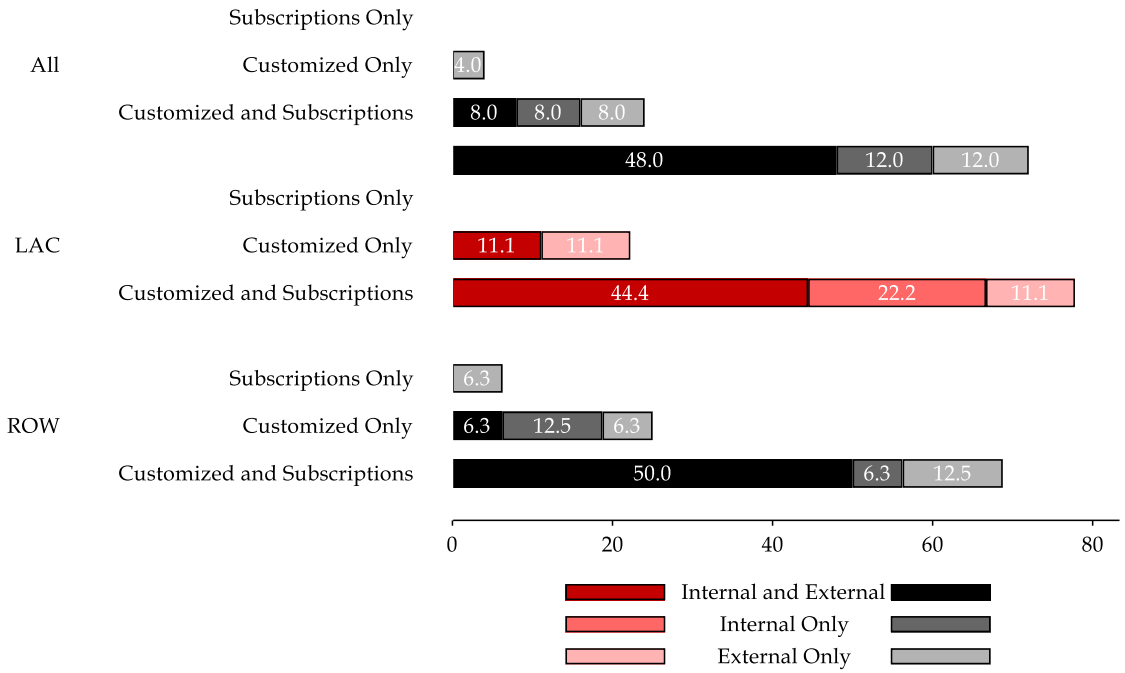
Figure 469. Development of IPA Digital Tools, by Type and Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the use of different digital tools' development strategies (i.e., subscriptions, internally developed customized solutions, and externally developed customized solutions) for each investment promotion agency. LAC countries are shown in red, whereas ROW countries are shown in black/dark gray.

This choice of digital tools' adoption strategy may vary over time and in particular circumstances. During the COVID-19 pandemic and compared to their general expansion strategy, IPAs relied more on a combination of off-the-shelf solutions, such as external (mostly paid) subscriptions, to quickly increase adoption and development of tailored tools for specific functions (see Figures 50). Given that they imply differences in the speeds at which digital tools can be added, the different strategies were associated with differences in the number of adopted digital tools across functions over such a limited period (see Box 21).

Figure 50. IPAs Digital Tools' Development Strategies During the COVID-19 Pandemic



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the percentage share of IPAs, by region, using different types of digital tools' development strategies used during the COVID-19 pandemic, depending on their type (i.e., subscription only, customized only, and customized and subscription), whereby Customized refers to a tool that has been developed from scratch either by the IPA or an external provider; and Subscriptions involve access to free or paid outside off-the-shelf tools and services; and source of those tools (i.e., internal, external, both). LAC countries are shown in red, whereas ROW countries are shown in black/dark gray.

Box 21 | Digital Tools' Adoption by IPAs During COVID-19: Does the Expansion Strategy Matter?

As shown above, IPAs relied on different strategies to add new tools to their digital toolkit during COVID-19. These different expansion strategies could have been associated with different outcomes in terms of the number of digital tools adopted. To establish whether this has been the case, it is necessary to account for a broad set of country-level characteristics such as their size and level of development that are likely to be correlated with both the number of adopted digital tools and the specific expansion strategies. When so doing, the evidence suggests that IPAs that have resorted to paid subscriptions adopted a larger number of digital tools during the COVID-19 pandemic across all the main functions. Yet, in investment generation –where solutions customized to the IPAs' specific business model are likely important– agencies that relied on internal development also incorporated more digital tools in this area (see Table B21.1).[40]

Table B21.1. Expansion Strategy and Adoption of New Digital Tools During COVID-19

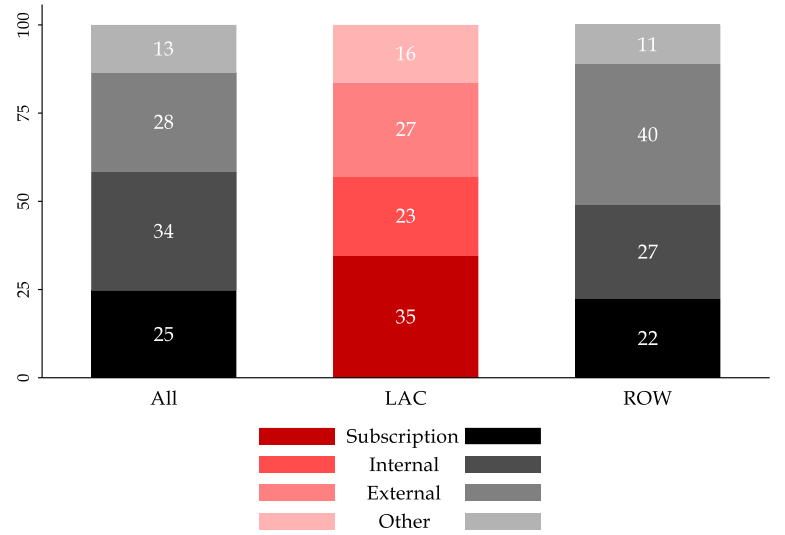
	Paid Subscriptions	Free Subscriptions	Internal Development	External Development
All	■			
General Organization				
Image-Building	■			
Investment Generation	■		■	
Investment Facilitation	■			
Policy Advocacy				

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure above shows the sign of the estimated coefficients (red=positive; dark gray=negative) on the interaction term between a binary variable that takes the value of one for the COVID-19 pandemic (i.e., years 2020 and 2021) and zero otherwise and a particular expansion strategy (i.e., via paid subscriptions, free subscriptions, internal or external development) from an OLS estimation of an equation whose dependent variable is the (natural logarithm of the) number of digital tools and whose control variables are the (natural logarithm of) countries' GDP, the (natural logarithm of) countries' GDP per capita along with country and year fixed effects. The sample period is 2000-2021. The results are robust to using alternative specifications and the PPML estimator (with the number of digital tools as the dependent variable). These results are available from the authors upon request.

[40] Given that less developed economies tend to use subscriptions more intensively, we also estimate a modified version of the estimating equation whereby the dependent variable is the (natural logarithm of the) number of digital tools and the independent variables are an interaction between a binary indicator that takes a value of one if the IPA used a specific expansion strategy and zero otherwise, a binary indicator that takes a value of one if the host country had below-the-median level of GDP per capita prior to the sample period and zero otherwise, and a binary indicator for the COVID-19 period that takes the value of one for the years 2020 and 2021 and zero otherwise; the (natural logarithm of) countries' GDP and the (natural logarithm of) countries' GDP per capita, along with country and year fixed effects. The estimates reveal that less developed countries that expanded via subscriptions adopted more digital tools in investment facilitation, while their more developed counterparts did so in image-building. Hence, the baseline interaction between the strategy type and the COVID-19 period would not be capturing merely the level of development of the adopting countries.

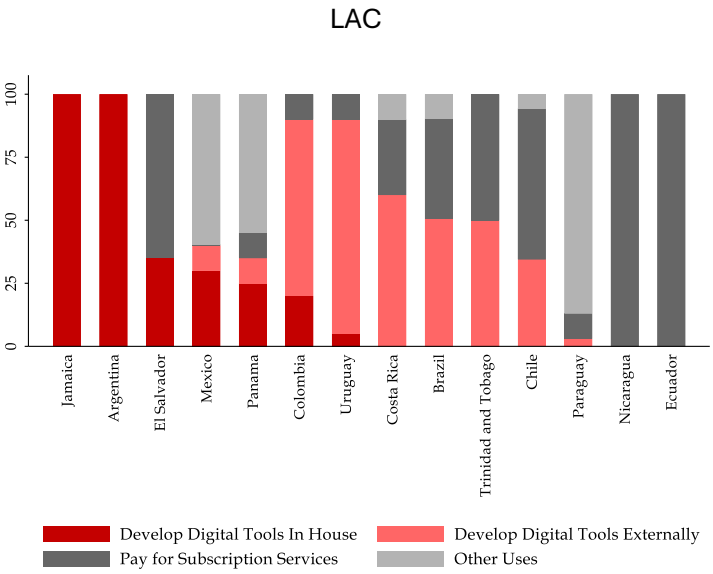
Given their greater reliance on off-the-shelf solutions, LAC IPAs also devoted a higher share of their digital tools budget towards purchasing subscriptions: 35% compared to 22% in ROW (see Figure 49). ROW IPAs, in turn, allocated higher shares of their budget to develop customized solutions externally: 40% compared to 25% in LAC. While there are significant differences across countries, LAC countries – which also tend to be smaller and less developed – tended to assign a larger share of their digital tools budget to subscriptions (see Figures 51-52).

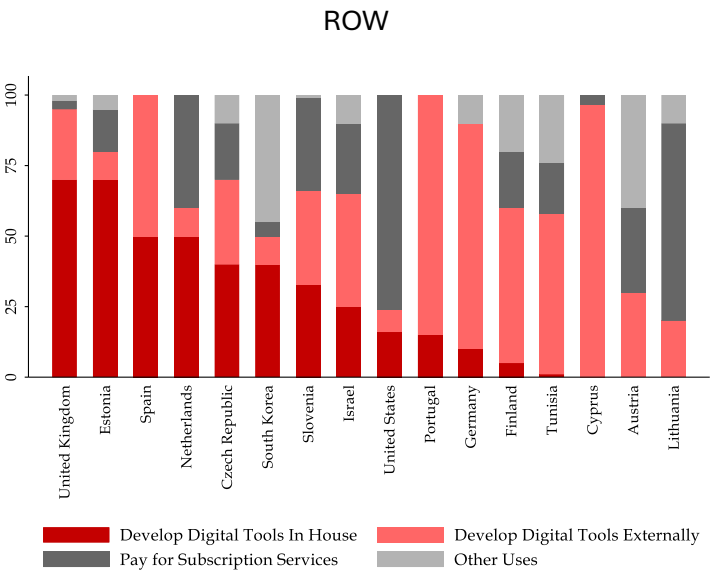
Figure 51. Budget for Digital Tools by Type and Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the distribution of the budget for digital tools' development strategies by region, for all investment promotion agencies, and for those in LAC and those in ROW.

Figure 52. Budget for Digital Tools by Type and Country





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the distribution of the budget for digital tools' development strategies by country, separately for those in LAC and those in ROW.

4.6. Digital Tools' Integration Strategies

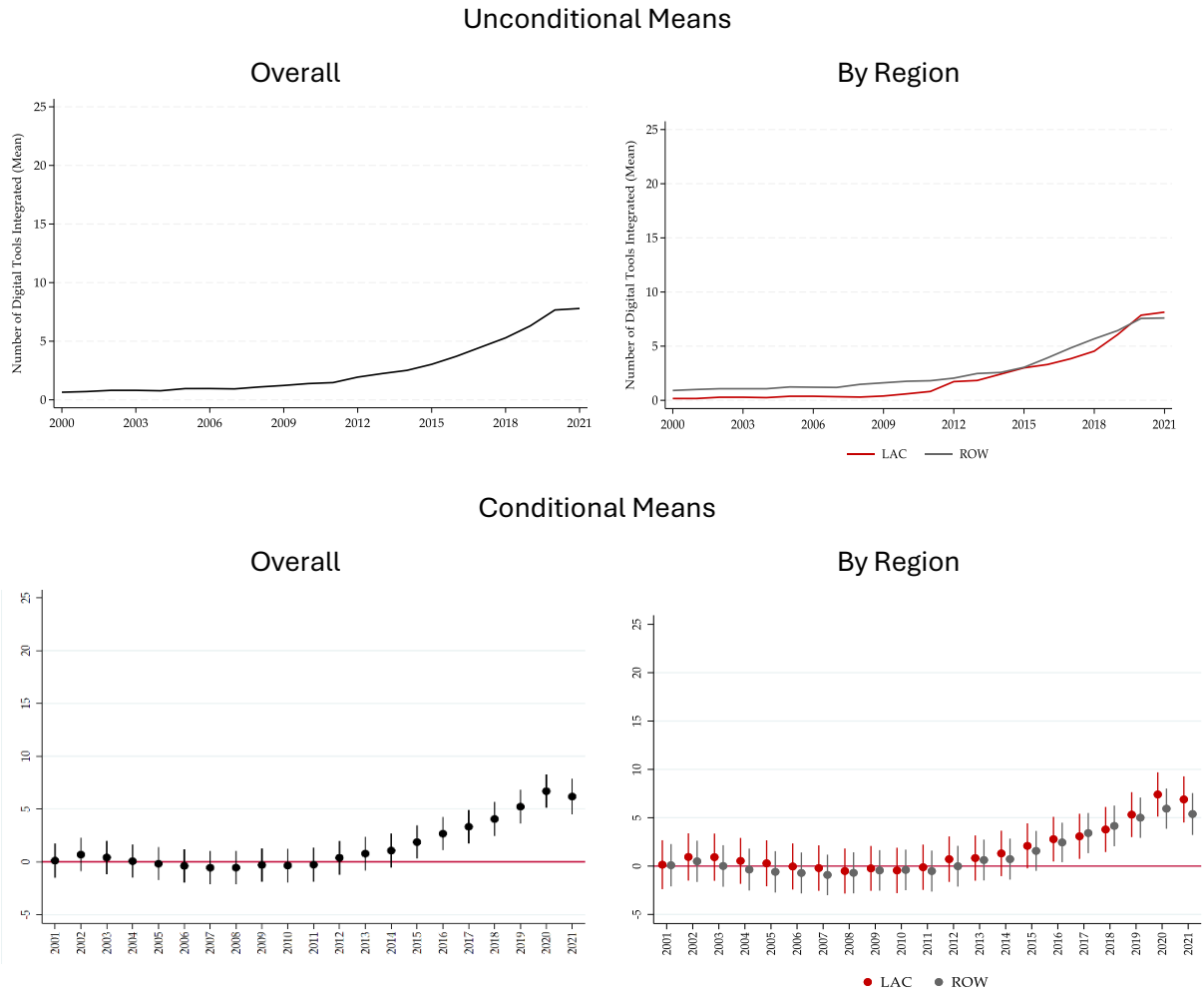
Another factor that may affect IPAs' choices is the level of integration of the digital new tools with their own systems and those of other government bodies.

In about half of the surveyed IPAs, interoperability is one of the requirements when commissioning a tool.[41] In some cases, wider government-level guidelines may exist regarding the minimal interoperability requirements. Yet, interoperability may be hard to achieve in practice. Thus, it may take a long time to achieve full integration with internal systems. Further, other factors, such as relative cost or speed of delivery, may induce IPAs to decide in favor of a particular solution at a given time, which may come at the expense of posing integration challenges in the future.

As such, it is not surprising that – conditional on basic country characteristics such as size and level of development – the level of interoperability of the digital tools used by IPAs has been increasing, but at a slower pace than the rate of adoption of new digital tools (see Figure 53). Interestingly, there are no stark differences between LAC and ROW in the evolution of the level of integration over time.

[41] Interoperability in this report refers to the ability of the agency to integrate a digital tool with its internal system.

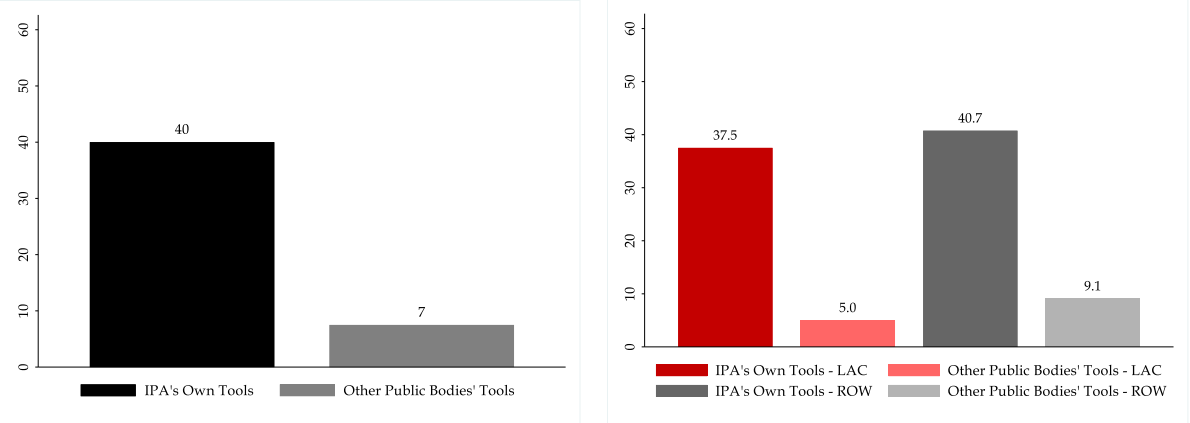
Figure 47. Evolution of Digital Tools Integration into IPA Internal System, 2000-2021



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and the World Bank's World Development Indicators.
Note: The figure on the left (right) shows the estimated coefficients on the year binary indicators along with the respective 10% confidence intervals from the OLS estimation of an equation whose dependent variable is the (natural logarithm of the) number of digital tools integrated with the IPA's internal systems (used by the IPA) and whose control variables are the (natural logarithm of) countries' GDP, the (natural logarithm of) countries' GDP per capita along with country fixed effects. The sample period is 2000-2021, and the omitted year category is 2000. A PPML estimation (with the number of digital tools as the dependent variable) yields very similar results, which are available from the authors upon request.

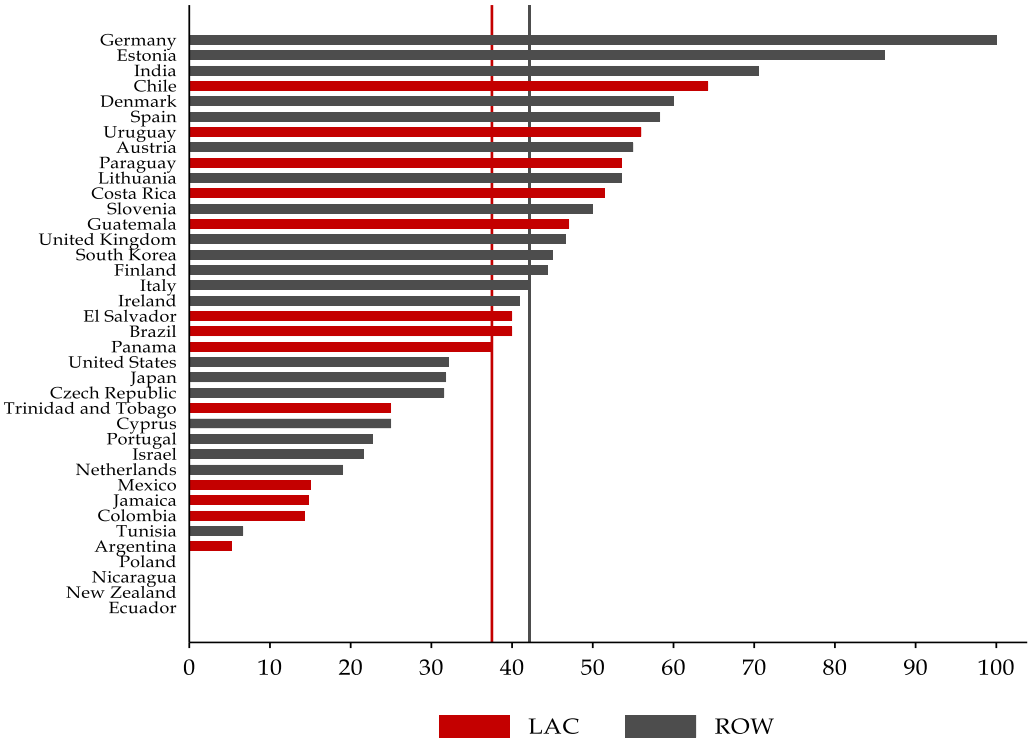
The median IPA had achieved integration of 40% of its digital tools with its own systems and 7% with those of other bodies (see Figure 54). The median agency in LAC had a slightly lower share of digital tools' integration than its ROW counterpart: 38.7% compared to 41.2%. This may be related to heavier reliance on external subscriptions and, to a lesser extent, internal development of tools by LAC IPAs or other factors, such as lower interoperability requirements of IPAs or their governments at large. Underneath these cross-region patterns, there are large differences across individual IPAs, with some agencies – such as Chile, Costa Rica, Paraguay, and Uruguay in LAC and Germany, Estonia, India, Spain, and Denmark—having high levels of tool integration with their internal systems (see Figure 55, top panel). The same applies to Estonia, South Korea, and the United States regarding integration with other public entities' tools (see Figure 55, bottom panel).

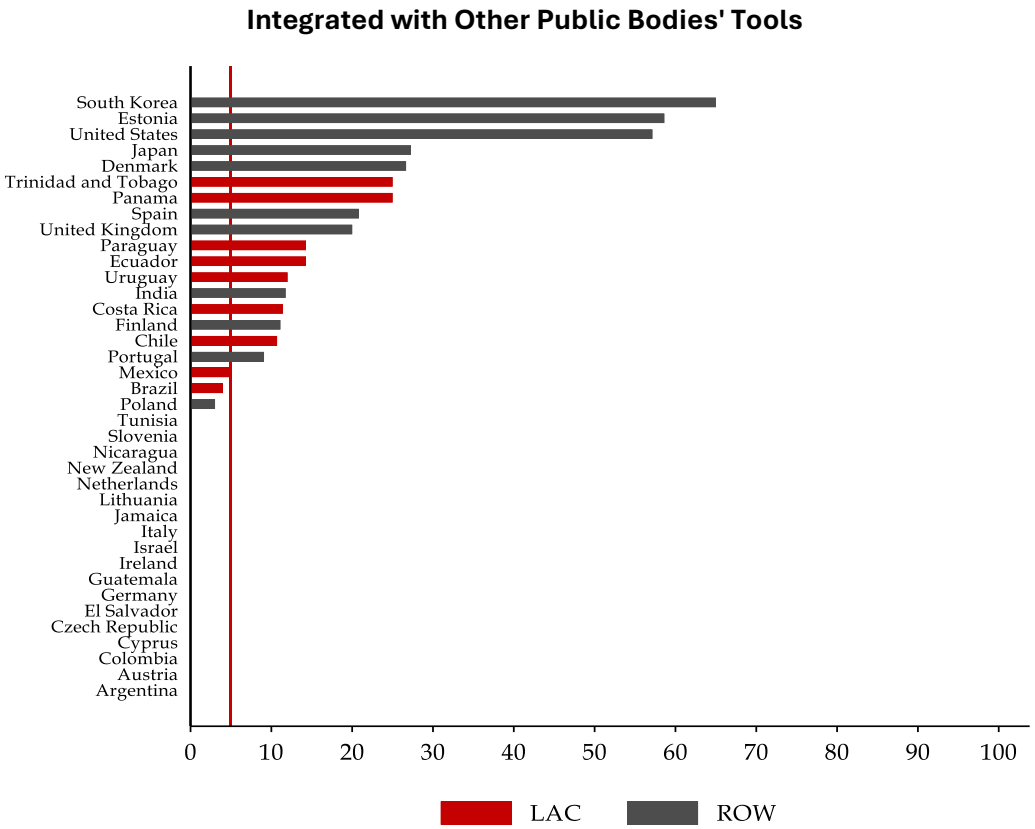
Figure 48. Median Share of Digital Tools' Integration with IPAs' Own Systems, Overall and by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures show the level of integration of digital tools by the median investment promotion agency within their own systems and with those of other public bodies, for all agencies and by region. In the figure on the right, LAC countries are shown in red, whereas ROW countries are shown in gray.

Figure 49. Percentage Share of Specific Digital Tools Integrated with IPAs' Own Systems Integrated with IPA's Own Systems

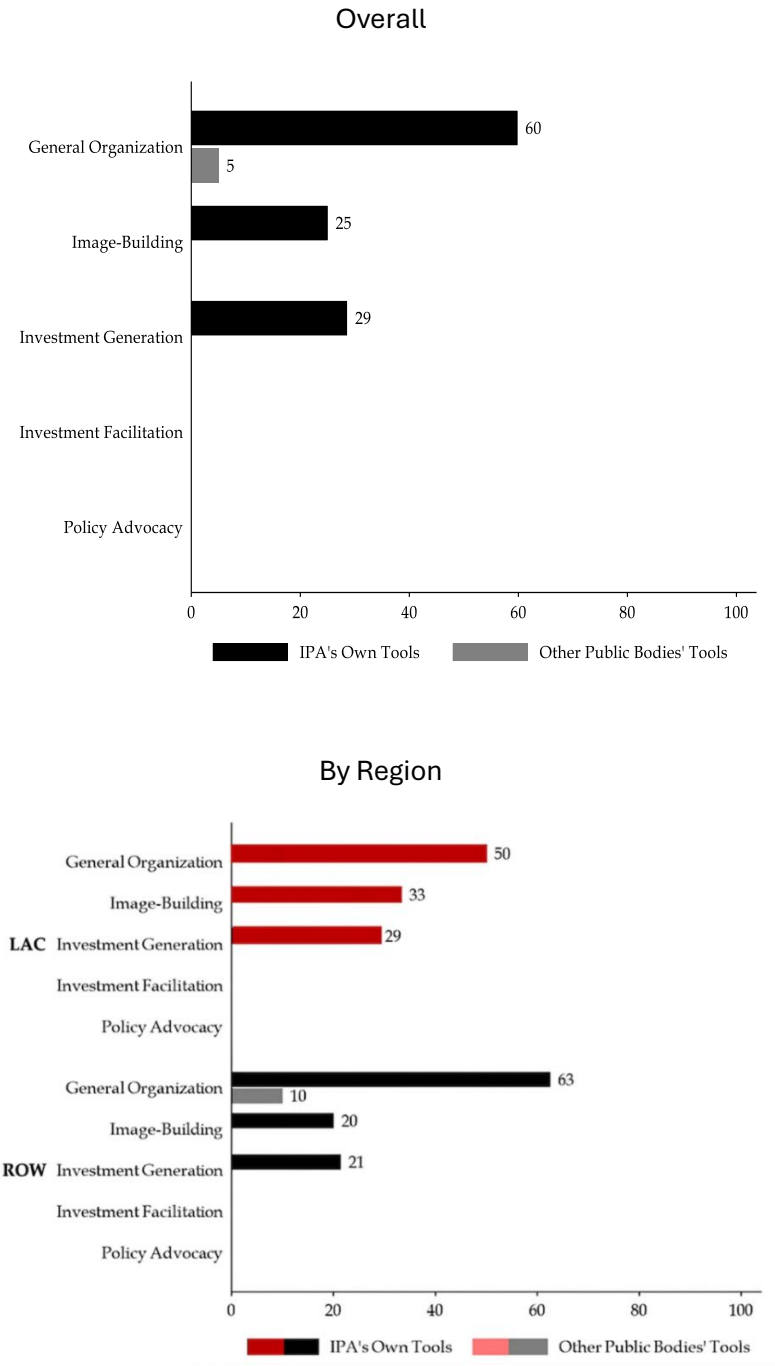




Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the degree of integration of digital tools with IPAs' own systems (top panel) and those of other public bodies (bottom panel) through horizontal bars. The vertical bars correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

General organization tools were most frequently integrated with IPAs' own systems, with interoperability being relatively low in other functions (see Figure 56). The median IPA had 60% of its general organization tools integrated with its own systems and 3% with those of other public bodies. This reflects the nature of the general organization function, which involves interactions with several internal departments and even external agencies, and hence requires horizontal functionality and shareability across units from digital tools. When it comes to specific investment promotion functions, the level of integration is substantially lower: 29% in the case of investment generation and 25% in the case of image-building for the median IPA. Notably, digital tools for investment facilitation and policy advocacy did not appear to be integrated with the median IPA's internal systems, reflecting their nascent adoption.

Figure 50. Median Percentage Share of Specific Digital Tools Integrated with IPAs' Systems, by Function



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the median share of integration of digital tools with IPAs' own systems and those of other public bodies by function through horizontal bars. For all agencies and by region. LAC countries are shown in red, whereas ROW countries are shown in black/dark gray.

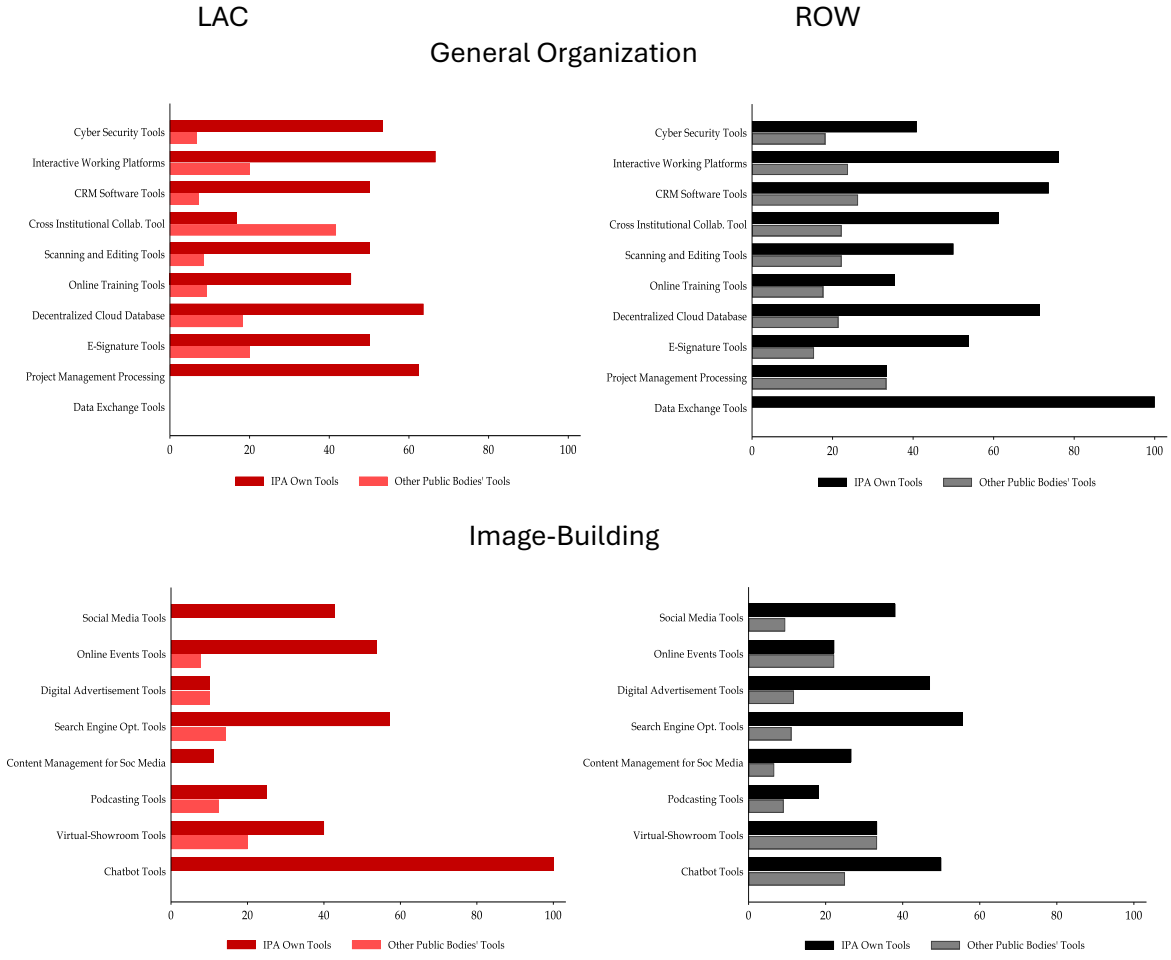
There were also large differences in interoperability of specific digital tools within each of those functions and across regions (see Figure 57):

- **General organization**: Interactive working platforms and decentralized cloud systems were among the most frequently integrated digital tools. This is consistent with the very

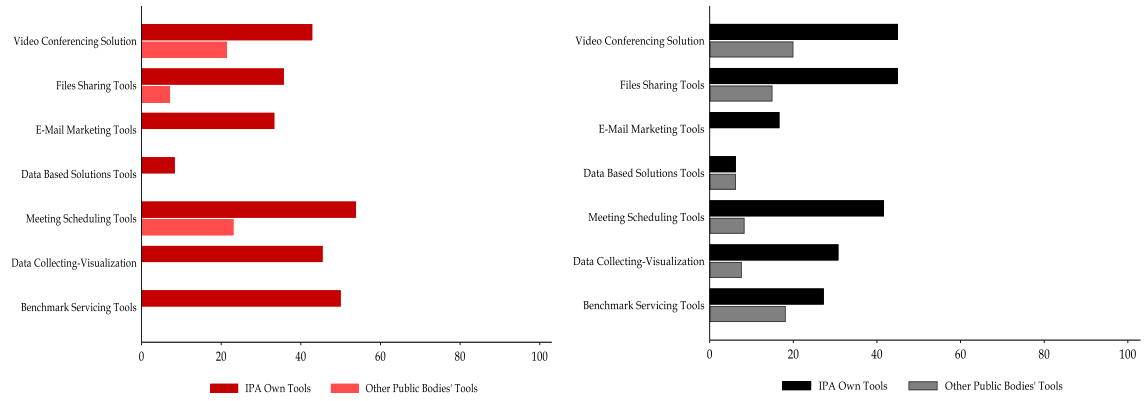
nature of these tools, which require integration to facilitate exchanges. Importantly, there remained large differences between LAC and ROW IPAs in the level of integration of the CRMs with their own other systems and those of other bodies. While approximately 50% of LAC IPAs with CRMs had these integrated with their systems, the share increased to about two-thirds for their ROW counterparts. The difference is even more pronounced for data exchange tools: 0% in the case of LAC agencies compared to 100% in the case of ROW agencies. LAC IPAs also had lower levels of interoperability with tools of other agencies outside of their own realm, including subnational IPAs, than their ROW peers: 10% compared to over 20%.

- **Image-Building: Social media tools and search engine optimization are relatively well integrated with other IPAs' tools.** This is natural considering that these activities require some level of integration at least with the agency's website and related digital branding. Online events had a higher degree of integration in LAC but less so in ROW. Meanwhile, virtual showrooms were less well integrated in both regions, which may reflect their relatively recent adoption.

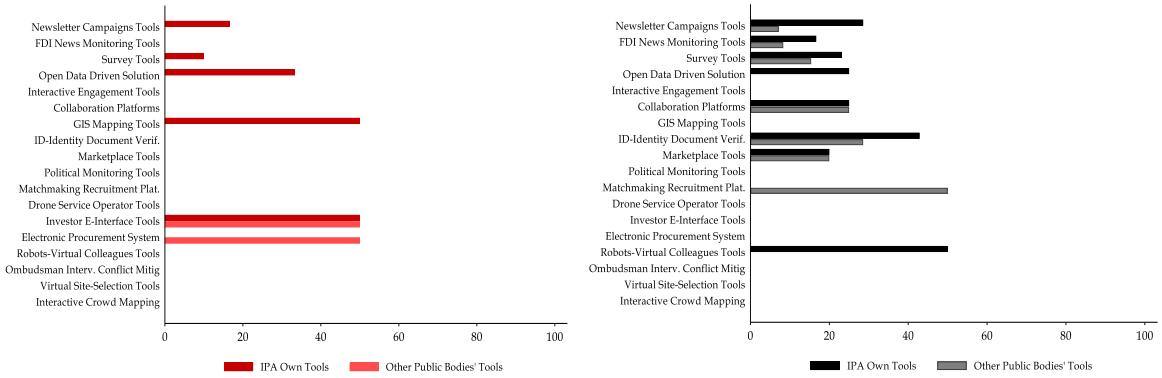
Figure 51. Share of IPAs with Internal Integration of Digital Tools by Type, Function and Region



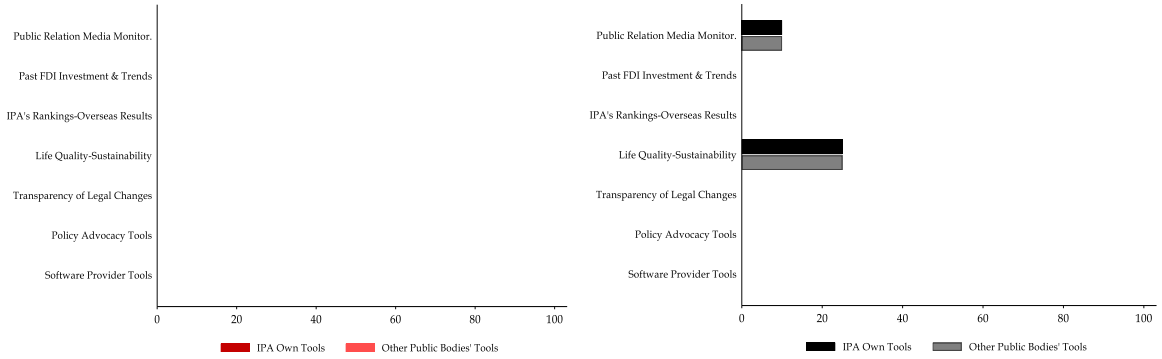
Investment Generation



Investment Facilitation



Policy Advocacy



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the share of integration of digital tools with IPAs' own systems and those of other public bodies through overlapping horizontal bars. The shade of color indicates which level of integration dominates – dark color refers to the share of integration with IPA's own systems, white color indicates integration with other public bodies' tools but not those of IPAs, and the intermediate color refers to the level of integration with both IPA's own systems and those of other bodies.

- **Investment Generation**: **Video conferencing solutions, file sharing tools, meeting-scheduling tools, and benchmark servicing tools all have similar levels of integration** (44%, 42%, 48%, and 36%, respectively). Meanwhile, innovative data-based solutions remained relatively unintegrated with the wider internal systems of IPAs. To achieve higher levels of automation and benefit from big-data solutions in the future, achieving such interoperability will be crucial.

- **Investment Facilitation and Policy Advocacy*:* The overall level of digital tools' integration was very low. Individual** IPAs –particularly those in ROW—have been piloting integration of specific tools. For example, and interestingly, about 25% of ROW IPAs using life-quality or sustainability indicators via digital means had them integrated with the wider internal systems.

4.7. Internal Access to Digital Tools

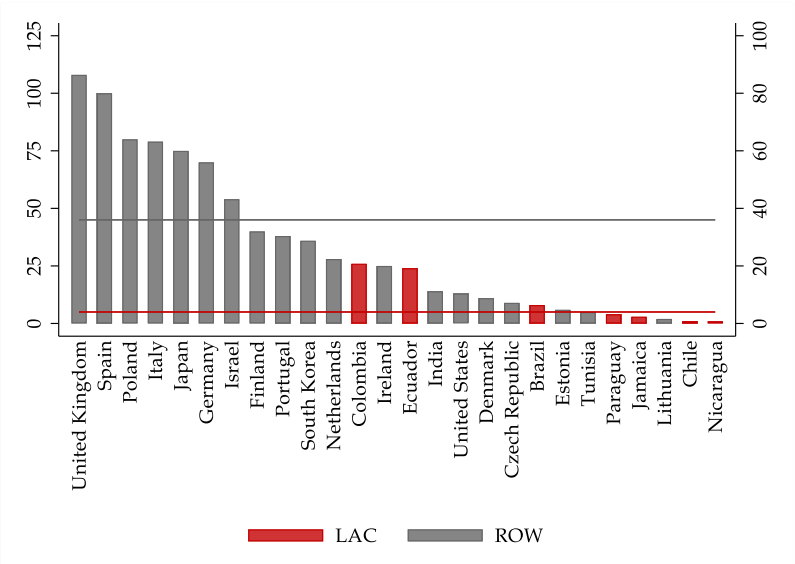
Besides interoperability of newly adopted tools with existing internal systems, IPAs may also differ in the extent to which they share access to their digital tools within their organization or outside with other public bodies or other relevant stakeholders. The degree of internal access is relevant, for example, in the case of agencies with subnational or foreign offices.

Some IPAs – mostly outside of the LAC region – had many foreign offices (see Figure 58)**.** The median IPA in LAC had 0 foreign offices, while their counterparts in ROW had 25 such offices. Still, some agencies in LAC had a network of offices abroad, including Colombia, Ecuador, and Brazil. This raises the question of what level of access those offices have to the digital tools used in the headquarters.

Over half of IPAs provided their foreign offices with all digital tools, with the share being higher in LAC (see Figure 59).[42] About one third of agencies shared with all foreign offices some but not all digital tools, particularly in ROW. Lastly, it is less frequent that only some offices are given access to all or some tools (14% in LAC and 5% in ROW) or that tools are not shared at all (see Figure 60).

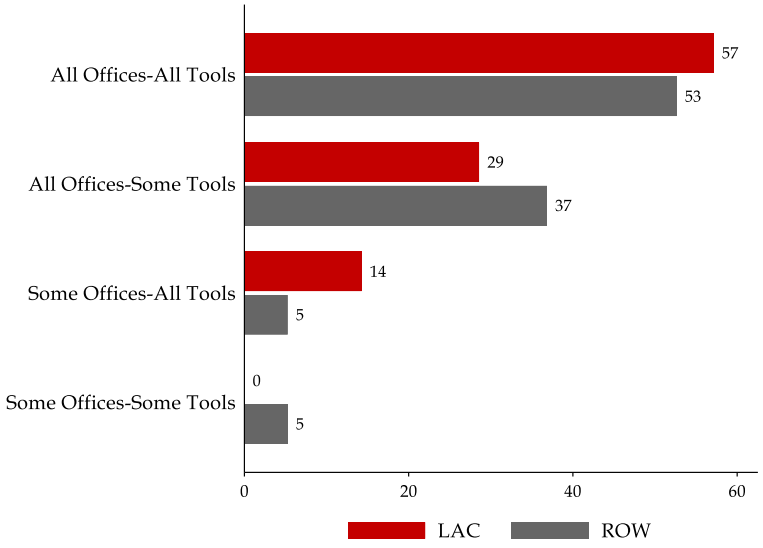
[42] IPAs also collaborate and share their tools with embassies and consulates.

Figure 52. Number of IPA Foreign Offices by IPA



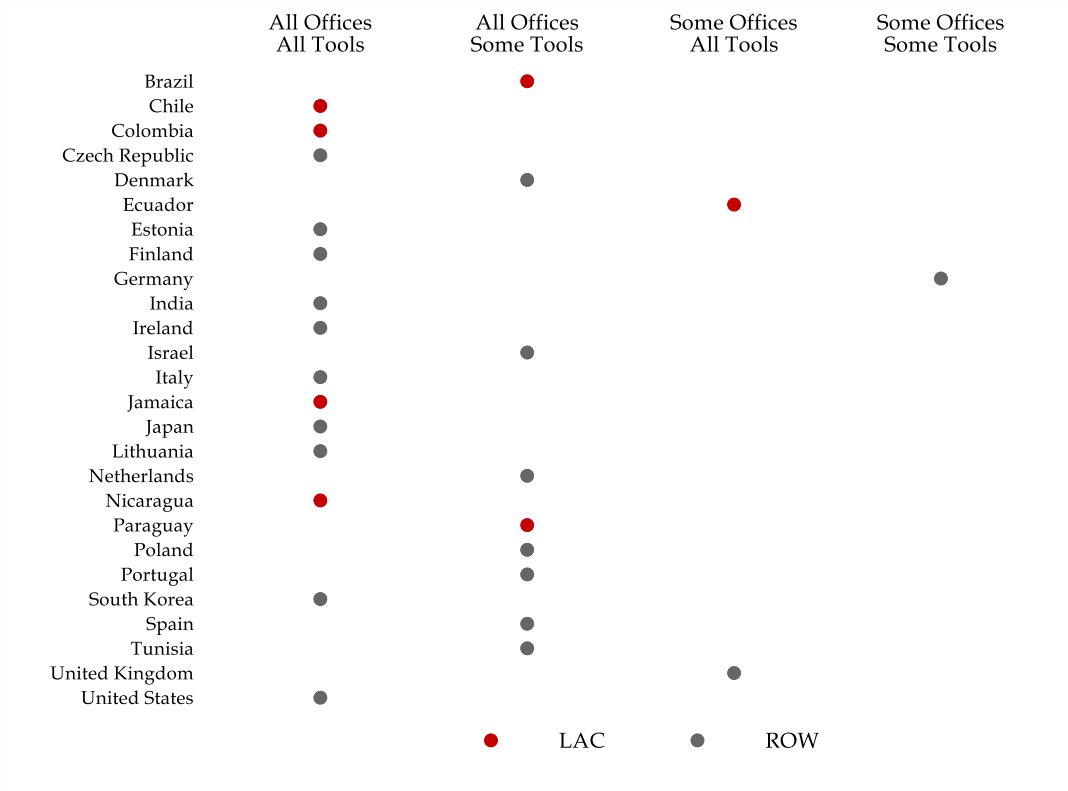
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the number of IPAs' foreign offices by region. Horizontal lines on the secondary axis correspond to the regional medians. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Figure 53. Percentage Share of IPAs by Type of Foreign Offices' Access to Digital Tools by Region



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: the figure shows the percentage share of IPA foreign offices' level of access to digital tools used in the respective headquarters by region. LAC is shown in red, whereas ROW is shown in dark gray.

Figure 60. IPAs by Type of Foreign Offices' Access to Digital Tools by Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the level of access of foreign offices of the IPA to the digital tools by country. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

5

Where IPAs Are with Digitalization and Why Does It Matter

5. Where IPAs Are with Digitalization and Why Does It Matter

5.1. Selected Indices

Digitalization has many facets. As shown in this report, IPAs differ along several dimensions in their path towards digitizing their activities: including the extent of resources they have available for this purpose, such as dedicated digital tools, budget, and IT staff; the external or internal allocation of those resources to develop or otherwise obtain digital tools; and the overall number of digital solutions and their distribution across IPA business functions.

This section proposes a set of new indices to capture these different aspects of IPA digitalization (see Box 22 for their description). They can be used for benchmarking by agencies as well as in econometric analysis to establish the link between the level of IPA digitalization and the effects of IPA assistance.

Box 22 | IPA Digitalization Indices

- *Digital Resources Index (DRI)* captures the size of financial resources per employee. The index is a simple ratio of the agency's digital tools budget per member of the agency's IT team (in thousand USD). The index combines information on the availability of funds and the human capital of IPA available for digitalization. It is calculated using the following formula:

$$DRI = \left(\frac{Budget_d}{Staff_{IT}}\right)$$

- *Digital Resources Intensity Index (DRII)* captures several dimensions of intensity of resource allocation towards digitalization. The index is a simple average of the agency's share of digital budget in total budget, share of IT staff in total employees, and share of digitally trained employees in total employees. It is calculated using the following formula:

$$DRI = \left(\frac{Budget_d}{Budget_{tot}} + \frac{Staff_d}{Staff_{tot}} + \frac{Staff_t}{Staff_{tot}}\right) * {}^1/_3$$

- *Digital External Reliance Index (DERI)* captures the share of an agency's resources devoted to external digital tools, and specifically the agency's share of budget dedicated to external development of digital tools and purchase of subscriptions:

$$DERI = \frac{Budget_d^{ex}}{Budget_{tot}}$$

- *Digital Solutions Index (DSI)* captures the extent of use of digital solutions. It captures the average level of use of digital tools across all IPA business functions.

$$DSI = \left(\sum_k^K \frac{Solutions_d^k}{Solutions_d^{k,max}} * 100\right) / K$$

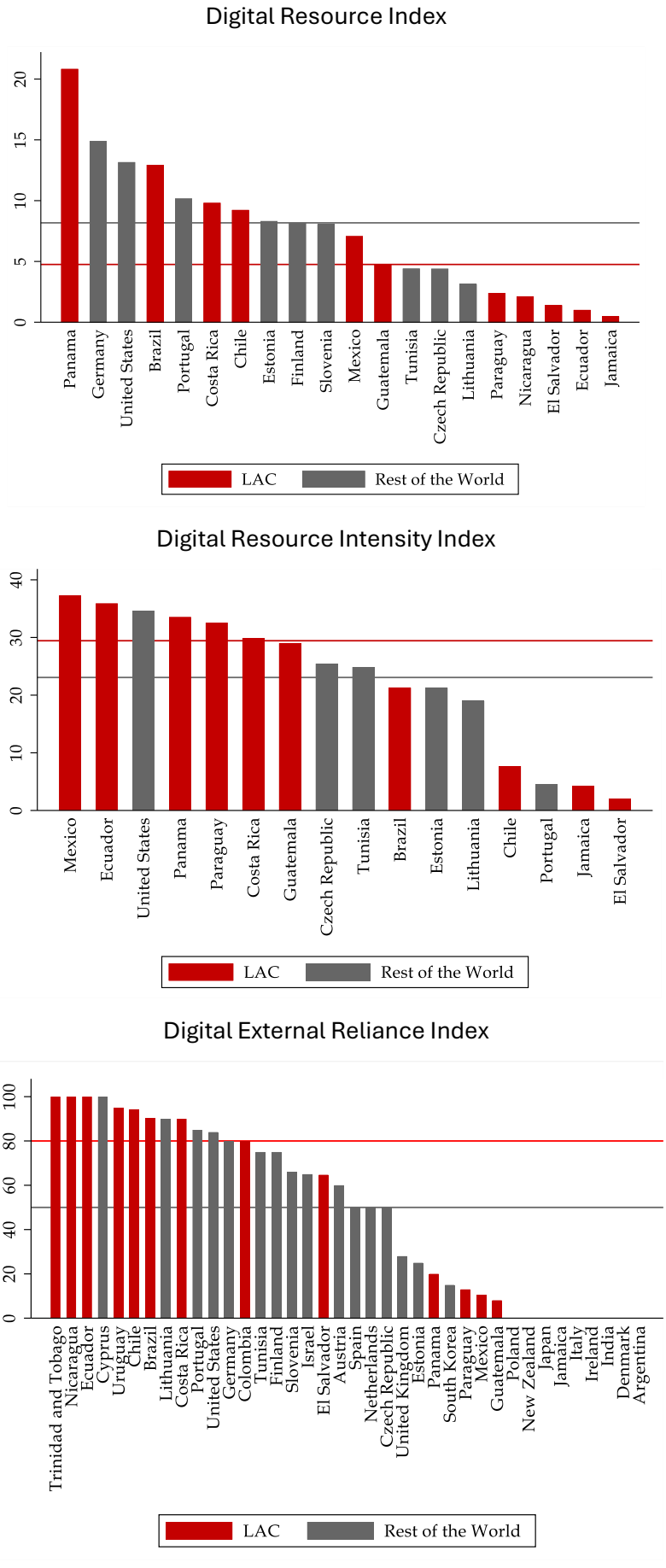
The key messages emerging from these metrics are the following (see Figure 61):

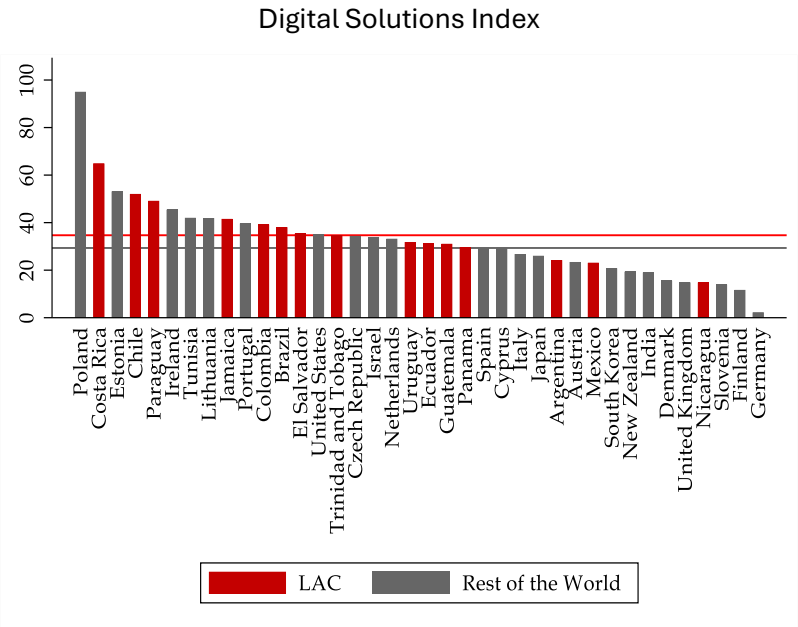
- *Digital Resources Index (DRI)* shows that ROW IPAs have the largest share of disposable resources per unit of staff to pursue digitalization.
- *Digital Resources Intensity Index (DRI)* shows that LAC IPAs tend to have higher resource intensity devoted to digitalization.
- *Digital External Reliance Index* shows a high reliance of LAC IPAs on external sources of budget for digitalization.
- *Digital Solutions Index* shows that a median LAC IPA uses a higher number of different digital solutions than ROW IPAs – both overall and in the core business functions.

What do these results tell us in light of the results earlier in this report? **LAC IPAs have been endowed with fewer resources for digitalization relative to ROW IPAs**, as reflected in the *Digital Resources Index* above, which combines the information on digital budget and IT staff. Considering that –as has been shown before— the size of IT teams is similar across the regions, most of the difference stems from digital budget differences. Still, **LAC IPAs have been devoting relatively higher shares of their own total budget and human capital resources towards digitalization, and it appears to have facilitated the adoption of new tools**.

In addition, **LAC IPAs rely more frequently on external sources of budget for digitization. This is also accompanied by a more frequent use of an internal IT team and external off-the-shelf solutions—such as subscriptions— to obtain access to relevant digital tools.** As shown earlier, the use of such solutions has been associated with a more rapid increase in new tool adoption during the COVID-19 pandemic and has played a similar role beforehand. These characteristics may explain how LAC IPAs were able to overcome the limitations of smaller digital budgets to adopt a large number of digital tools, as reflected in the *Digital Solutions Index*.

Figure 61. IPA Digitalization Indices





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: For the definitions and means of calculating different indices, see Box 22.

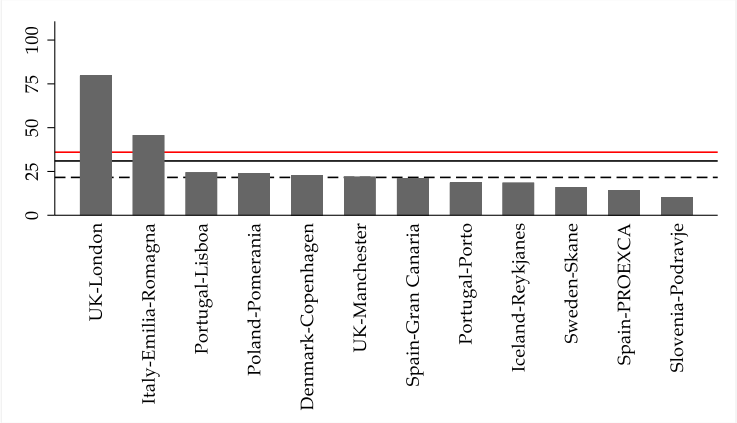
The construction of similar indices for sub-national IPAs in ROW reveals that they have lower levels of adoption of digital solutions than their national counterparts in ROW or LAC but display similar levels of digital specialization across functions (see Box 23). Given the particularly critical role of subnational IPAs in investment facilitation and accompanying investors during and post-establishment, it could be considered if further adoption of tools in that function – potentially in collaboration with national IPAs– could be particularly beneficial.

Box 23 | IPA Digitalization Indices for Subnational IPAs

Subnational IPAs may face unique digitalization challenges. Endowed with fewer resources (see Box 1), their digital tools' adoption patterns may differ from those of their national counterparts. The *Digital Solutions Index,* capturing the extent of adoption of different digital technologies, shows that, on average, surveyed subnational IPAs use fewer such solutions than their national-level peers (Figure B23.1). They also tend to have lower shares of digital solutions employed in core IPA functions (i.e., investment generation and facilitation).

There are large differences in approaches across individual agencies, reflecting the unique characteristics of regions. For example, a subnational IPA for London in the UK (London & Partners) and for Emilia Romagna in Italy (ART-ER) have high levels of digital tools adoption and use such tools relatively evenly across the different categories. Meanwhile, the subnational agency of Porto in Portugal (InvestPorto) uses fewer digital solutions but devotes them primarily to core business functions.

Figure B23.1. Digital Solutions Index for Subnational IPAs



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

5.2. Optimizing Investment Generation through Artificial Intelligence

These advances in digitization across different IPAs bear significant potential for the future. AI is expanding and will further expand this potential. With continuous progress in the accuracy and sophistication of digital tools and other technologies, including a rising role of AI, there is a scope to integrate them further into core IPA functions. Given more limited resources of IPAs in the LAC region –and other locations with fewer resources—, successful adoption of AI-technologies may be particularly beneficial if it allows for cost reductions in certain functions. An example of a project undertaken by the IDB with Costa Rica illustrates how advances in AI can be harnessed by agencies to improve the effectiveness of their lead generation efforts (see Box 24).

Box 24 | Harnessing the Power of AI for Effective Lead Generation: Insights from an IDB Project

Effectively helping domestic firms export and attract multinational firms requires accurately identifying those firms that are more likely to establish affiliates in the country. IPAs typically accomplish this task using available information (data) and the experience and technical expertise of the staff (human capital). In so doing, firms are generally selected based on manual and non-systematic processing of a limited subset of data. Such a strategy is suboptimal because it does not properly exploit all available relevant data, limits the cross-fertilization and the institutional learning (only involved personnel and is lost when they leave), and implies higher risks of (unconscious) personal biases.

Proactive targeting of potential foreign investors can be optimized using *Machine Learning*—the *Quantitative Intelligence* approach. Such an approach, which is implemented through state-of-the-art statistical methods (informed by economic theory) allows for a systematic use of all available relevant data to rigorously and accurately predict firms' investment decisions, building upon the expertise of the agency's staff and, importantly, an impact evaluation based on a randomization of the strategy.

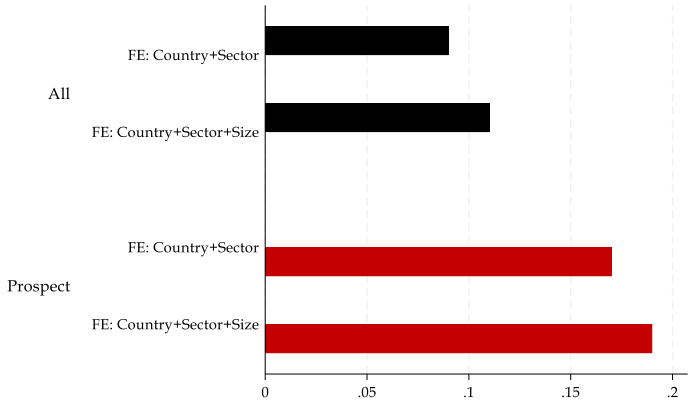
The approach involves several steps:

1. gathering and combination of several administrative and proprietary databases, including detailed information on multinational firms' location decisions (worldwide), attributes and performance (e.g., home country, sector, location, age, number of employees, sales), linkages, competitors, signals;
2. application of supervised ML models (in the training database);
3. identification of the model that most accurately predicts the outcome of interest (in the evaluation base);
4. generation of predictions: ranking of multinational firms that are more likely to establish an affiliate/expand an affiliate in the host country in question;
5. extensive reviews with the agencies, cross-validations, and revisions.

The approach has several advantages. It allows IPAs to have a consistent framework to prioritize firms (and potentially sectors and countries), identify the optimal timing to assist firms, accelerate response times, personalize assistance, and assign financial and human resources more efficiently.

The IDB has piloted this approach in collaboration with CINDE from 2020 to 2022. The first preliminary results of the exercise reveal that the probability of multinational firms identified based on this approach becoming pipeline (i.e., firms that have shown active interest in the location) was 10%-11% higher than those identified based on an alternative generic Machine Learning-based approach used by the agency. The difference increases to 17%-19% when it comes to prospects (i.e., leads) (see Figure B24.1). This is just the first iteration, and the approach can and needs to be refined and fine-tuned. The IDB is working with other IPAs in the region, such as *InvestChile* and URUGUAY XXI, in so doing.

Figure B24.1. Quantitative Intelligence for Investment Generation: Costa Rica Case Study



Source: Carballo and Volpe Martincus (2023).
Note: The figure shows the probability of multinational firms identified based on the Quantitative Intelligence approach becoming pipeline and prospect relative to those identified based on an alternative generic Machine Learning-based approach used by the IPA.

More generally, given the speed of adaptation in this area, regular monitoring and gauging relevance and quality of adopted solutions may be an essential emerging determinant of agencies' competitive advantage going forward.[43] Especially, as sizable fiscal incentives are being adopted in a number of regions, countries unable or unwilling to tap into such resources may consider investing in advanced information-friction-removing technologies of this kind.

5.3. What Impact Evaluations Reveal

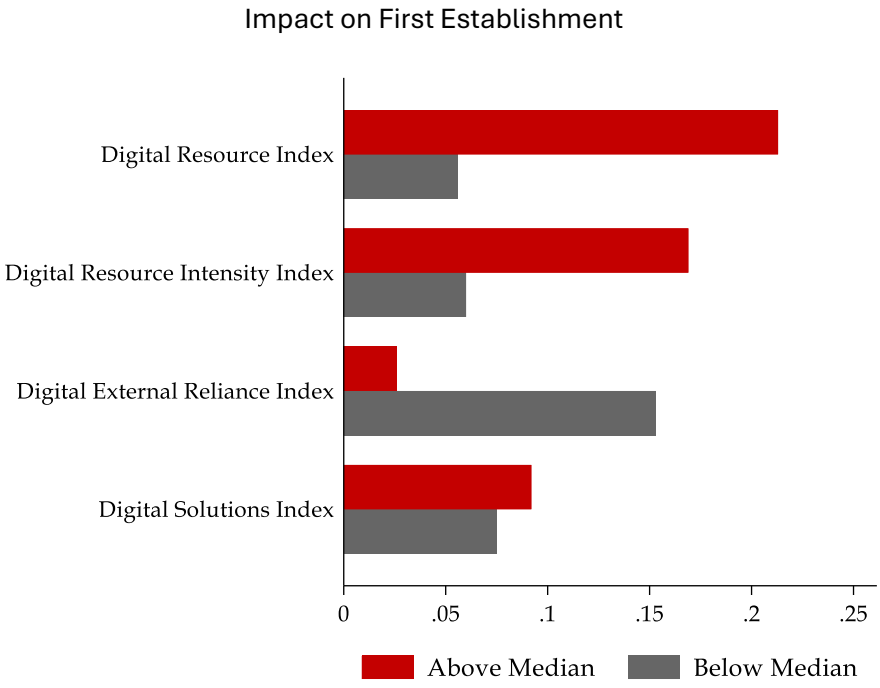
The extent to which adopted digital tools and the different approaches towards digitalization matter for IPAs' effectiveness in terms of their ability to help attract new multinational firms (first establishment) and favor their expansion in the respective territories (reinvestment) can be assessed through an econometric analysis. To do so, the approach explained in Box 25 is implemented.

The evidence suggests that digitalization makes a significant difference in how investment promotion assistance translates into first establishments by multinational firms (see Figure 59). IPAs scoring above the median on the *Digital Resource Index, the Digital Resource Intensity Index,* and *the Digital Solutions Index* generate significantly larger assistance effects on the probability of a firm opening its first foreign affiliate in a given country, sector, and year than IPAs below the median. This suggests that the size of the digital budget, the intensity of resource allocation to digitalization and the average number of digital tools used across functions are associated with a higher probability of MNE first entry. By contrast, IPAs that allocate a larger share of their digital budget to externally sourced tools, as captured by the *Digital External Reliance Index*, generate smaller entry effects, pointing to a potential downside of IPA dependence on outside sources for digitalization. This may be because in-house resources and ability to develop tools internally result in solutions better suited to IPAs' needs.

In contrast, none of these digital characteristics show statistically significant differences in their effects on reinvestments. One possible explanation behind these results could be that firms already operating in the country have a direct relationship with the IPA, allowing for alternative means of interaction, while digital tools may be particularly important for initial identification and reaching out to investors.

[43]As shown in this report, LAC agencies adopted quantitatively higher number of tools than agencies in ROW. However, the quality of tools adopted by agencies would also need to be evaluated.

Figure 54. The Role of Digitalization in IPA's Effectiveness



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools. For the definitions and means of calculating of different indices, see Box 25. For the details on the estimation approach, see Volpe Martincus et al. (2021). Sample countries include: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Mexico, Nicaragua, and Uruguay.

Box 25 | Impact Evaluation: Is There a Role for Digitalization?

To assess the effects of investment promotion on multinational firms' location decisions, the approach proposed in Volpe Martincus et al. (2021) and Carballo et al. (2025) can be used. The basic idea is that firm-level data on IPA assistance over time can be combined with information on firm decisions to establish affiliates in a given country in a given time, regardless of assistance, to construct relevant counterfactuals and permit the evaluation of IPA effects.[44]

The main economic outcomes are: (i) establishment of a first affiliate by multinational firms that are new to the country (*first establishment*—cross-country multinational production firms' extensive margin); (ii) the establishment of subsequent affiliates by multinational firms already present in the country (*reinvestment*—within-country multinational production firms' extensive margin).

[44] Combining these two datasets makes it possible to observe all four possible combinations of policy "treatments" and outcomes: (i) multinational firms that were assisted that locate to the host country, (ii) multinational firms that were assisted that never locate to the host country, (iii) multinational firms that were not assisted that locate to the host country, and (iv) multinational firms that were not assisted that never locate to the host country. The latter constitute the control group and are the basis for the counterfactual.

Thus, in the baseline specification, the dependent variable is a binary indicator takes the value of 1 if the (ultimate) parent firm operating in a sector from a home country establishes its first affiliate firm in the host country in the year in question, and 0 otherwise (*first establishment*); or a binary indicator that takes the value of 1 if the parent firm operating in a sector from a home country opens an additional affiliate firm in the host country in the year in question, and 0 otherwise (*reinvestment*).

The main explanatory variable is a binary indicator that takes the value of 1 if the parent firm was assisted by the country's national IPA in the year in question, and 0 otherwise. The covariates are a series of firm-destination-year variables that control for multinational firms' networks of affiliates, along with firm–host country fixed effects and host country–home country–sector–year fixed effects. The latter account for the country's IPA's total budget, sectoral and actual IPA prioritization, potential host country-specific information spillovers across parent firms in given sectors and home countries, and other factors.

In order to assess whether and how digitalization shapes the effect of IPA on first establishment and reinvestment, a similar type of regression can be rerun whereby the firm-level IPA assistance variable is interacted with binary versions of the different digitalization indices (see Box 21). More specifically, these are defined as binary indicators that take a value of 1 if an IPA scores above (at or below) the sample median on a given aspect of digitalization (in the earliest possible year) and 0 otherwise.

6

The Way Forward

6. The Way Forward

The results presented throughout this report indicate that IPAs have rapidly digitized their operations and adopted new digital tools across their different functions since the 2010s. This process has been especially intense in the LAC region, resulting in those agencies having a higher number of digital tools than their counterparts in ROW. While the COVID-19 pandemic has precipitated the adoption of selected digital tools in specific functions - mostly in image-building and investment generation functions – this upgrading process predates the crisis.

At the same time, the pandemic and the geopolitical tensions that have dominated the global trade and investment environment since then have brought on higher uncertainty. They have also increased the pressure on government budgets, and in the case of LAC, have meant shrinking resources for IPAs. As agencies elsewhere – in particular, advanced economies – have not seen the same reductions in their endowments and have in fact increased their overall resources and those devoted to digitalization during this time, LAC agencies may face increasing competitive pressures. As such, embracing smart technologies, which can permit cost-savings – including especially AI – offers a promising avenue for the region.

The IDB has already engaged in pilot projects with selected IPAs in the region to facilitate their transition and support capacity-building in this area. Early results are promising and point to an effectiveness premium associated with the adoption of Machine Learning-based solutions in investment generation. Further pilots and thorough impact evaluations can provide granular insights into the effects of specific interventions and changes in the use of digital tools by IPAs and the most suitable solutions available to countries.

Future research could build on the initial evidence presented in this report. Digital delivery of services increasingly improves information available on the type of service provided, its quality, firms or individuals using them, and whether and how they benefit from them. In particular, digitalization facilitates randomization of treatment and thus experimental evaluations, which could help further improve the design and implementation of public policies in this important realm.

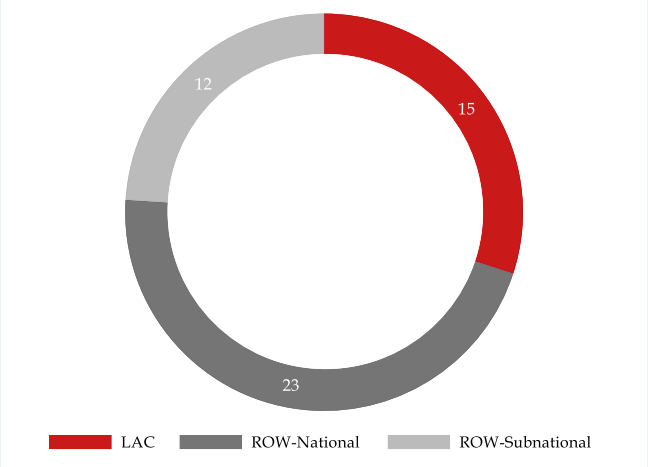
Annex 1:

IDB Survey on IPA Digital Tools

Annex 1: IDB Survey on IPA Digital Tools

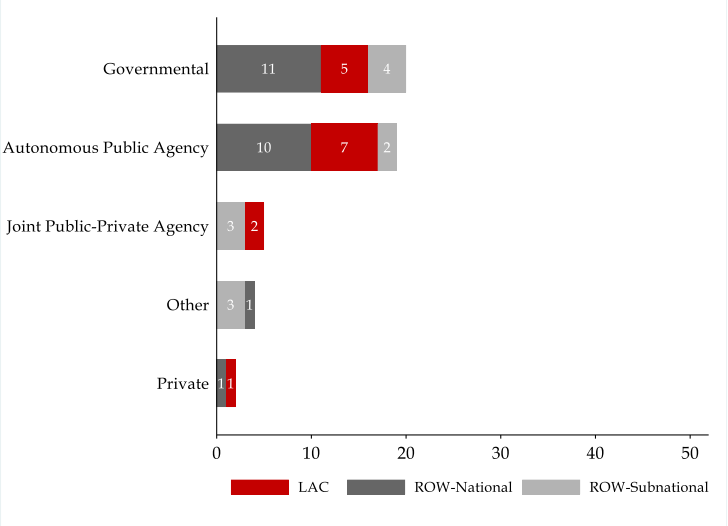
The Survey of IPA Digital Tools has been developed by the Integration and Trade Sector (INT) – currently the Productivity, Trade, and Innovation Sector (PTI)— at the IDB. It was circulated to all the national-level investment promotion agencies in Latin America and the Caribbean (LAC) in 2021-2022. It was also open to participation by agencies of other economies. Overall, 50 agencies participated in the survey: 15 from LAC and 35 from the rest of the world (ROW), including 23 national-level IPAs and 12 subnational IPAs. The full list of participating IPAs is provided in Table A1.

Figure A1. Number of surveyed IPAs by region and type



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the number of IPAs surveyed by region and type. LAC refers to Investment Promotion Agencies in Latin America and the Caribbean. ROW-National and ROW-Subnational refer to national and subnational agencies located outside the region, respectively.

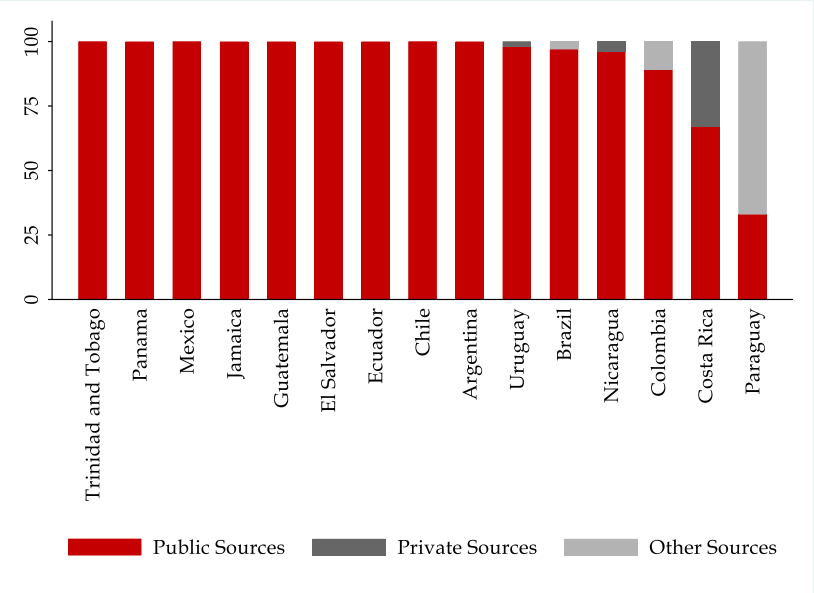
Figure A2. Number of surveyed IPAs by region and legal status



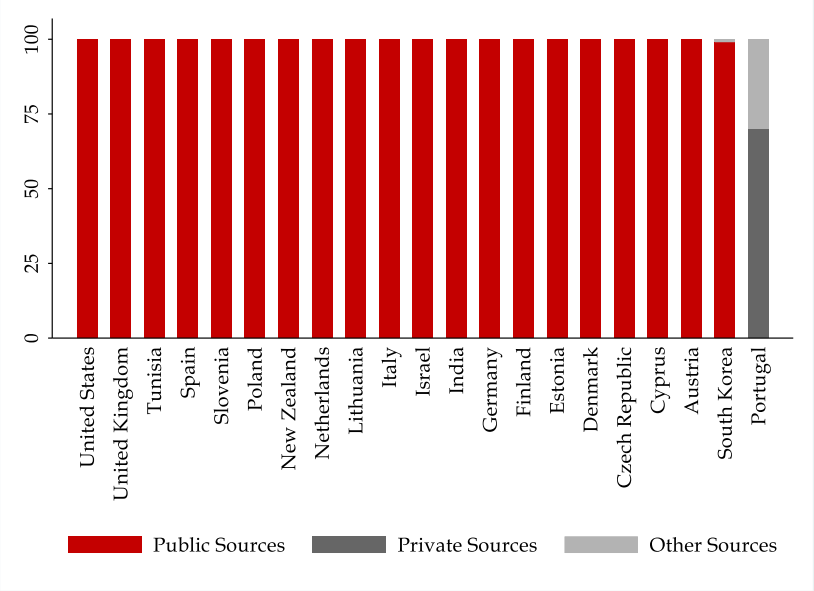
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the number of IPAs surveyed by region and legal status. LAC refers to Investment Promotion Agencies in Latin America and the Caribbean. ROW-National and ROW-Subnational refer to national and subnational agencies located outside the region, respectively.

Figure A3. Sources of IPA Budget

LAC



ROW



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures show the sources of IPA budget by region and country. Public Sources, Private Sources, and Other Sources refer to the share of total IPA budget funded by each type. LAC refers to countries in Latin America and the Caribbean. ROW refers to countries outside the region.

Table A1. List of IPAs that participated in the Survey of IPA Use of Digital Tools

Region	Country	IPA Name
National IPAs		
LAC	Argentina	Agencia Argentina de Inversiones y Comercio Internacional
LAC	Brazil	Apex-Brasil
LAC	Chile	InvestChile
LAC	Colombia	ProColombia
LAC	Costa Rica	CINDE
LAC	Ecuador	PRO ECUADOR - Ministerio de Producción, Comercio Exterior, Inversiones y Pesca
LAC	El Salvador	Organismo Promotor de Exportaciones e Inversiones de El Salvador
LAC	Guatemala	PRONACOM
LAC	Jamaica	JAMPRO Trade and Investment
LAC	Mexico	Unidad de Inteligencia Económica Global
LAC	Nicaragua	PRONicaragua
LAC	Panama	PROPANAMA
LAC	Paraguay	Red de Inversiones y Exportaciones (REDIEX)
LAC	Trinidad and Tobago	InvesTT
LAC	Uruguay	Uruguay XXI - Agencia de Promoción de Inversiones, Exportaciones e Imagen País
ROW	Austria	ABA - Austrian Business Agency
ROW	Cyprus	Invest Cyprus
ROW	Czech Republic	Business and Investment Development Agency CzechInvest
ROW	Denmark	Invest in Denmark
ROW	Estonia	Estonian Investment Agency
ROW	Finland	Business Finland
ROW	Germany	GTAI
ROW	India	Invest India
ROW	Ireland	IDA Ireland
ROW	Israel	Invest in Israel
ROW	Italy	Italian Trade Agency
ROW	Japan	Japan External Trade Organization (JETRO)
ROW	Lithuania	Invest Lithuania
ROW	Netherlands	Netherlands Foreign Investment Agency
ROW	New Zealand	New Zealand Trade & Enterprise
ROW	Poland	Polish Investment and Trade Agency
ROW	Portugal	AICEP - Agência para o Investimento e Comércio Externo de Portugal
ROW	Slovenia	SPIRIT Slovenia
ROW	South Korea	KOTRA (Korea Trade-Investment Promotion Agency)
ROW	Spain	ICEX-INVEST in Spain
ROW	Tunisia	Invest in Tunisia Agency - Foreign Investment Promotion Agency (FIPA Tunisia)

ROW	United Kingdom	Department for International Trade (now Department for Business and Trade)
ROW	United States	SelectUSA
		Subnational IPAs
ROW	Denmark	Copenhagen Capacity
ROW	Italy	ART-ER S. cons. p.a.
ROW	Iceland	Federation of Sudurnes Municipalities
ROW	Poland	Invest in Pomerania
ROW	Portugal	Invest Lisboa
ROW	Portugal	Invest Porto
ROW	Slovenia	Regional Development Agency for the Podravje region
ROW	Spain	Sociedad de Promoción Económica de Gran Canaria, S.A.
ROW	Spain	PROEXCA
ROW	Sweden	Invest in Skane
ROW	United Kingdom	London and Partners
ROW	United Kingdom	MIDAS

Annex 2:

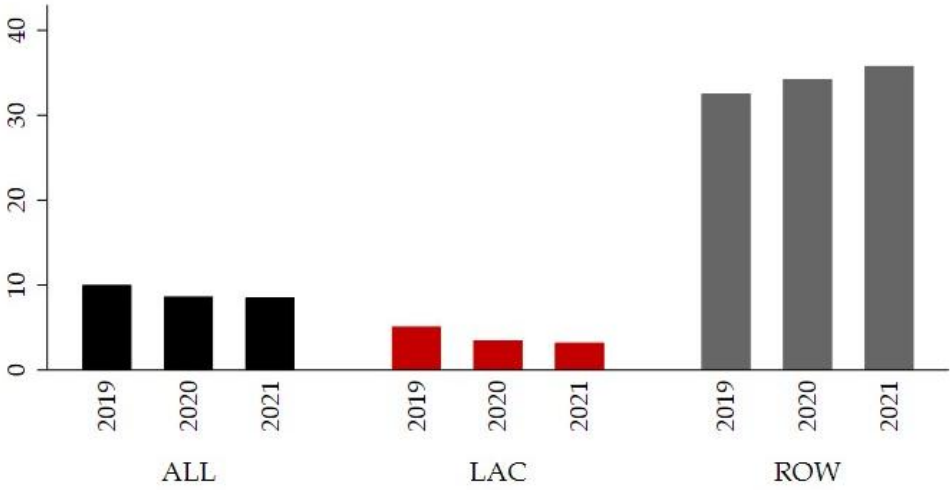
Additional Figures and Tables

Annex 2: Additional Figures and Tables

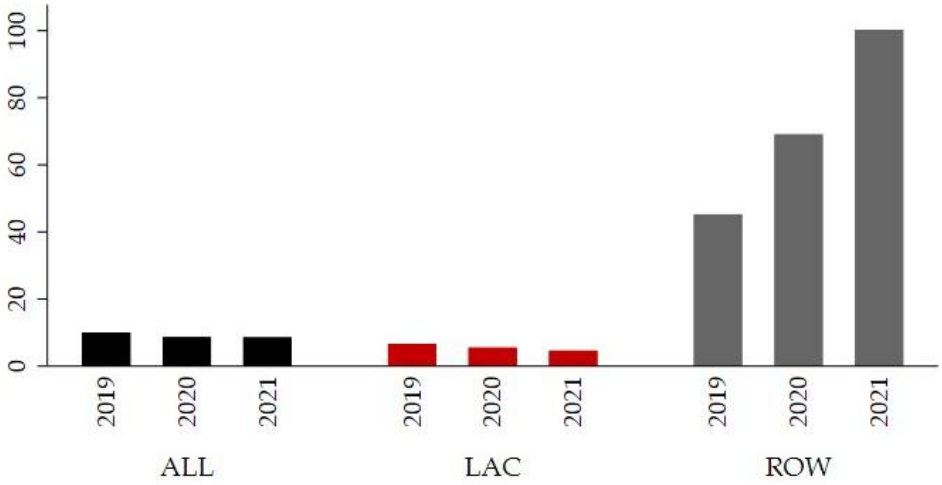
Figure A2.1. Size of National IPAs by Region and Sample

Total Budget (million US$)

Full Sample

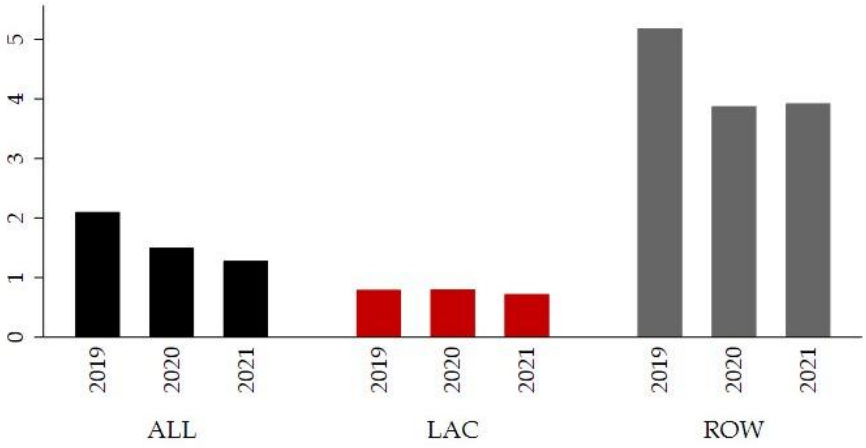


Sample of Countries that Responded to Both Surveys

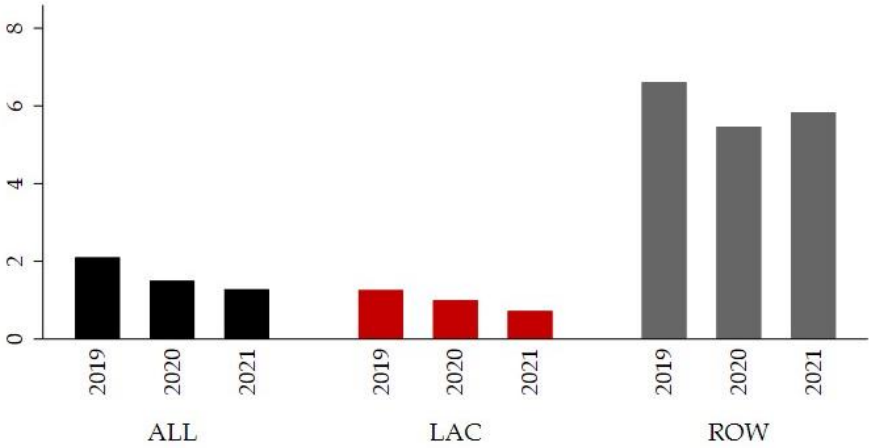


FDI Promotion Budget (million US$)

Full Sample

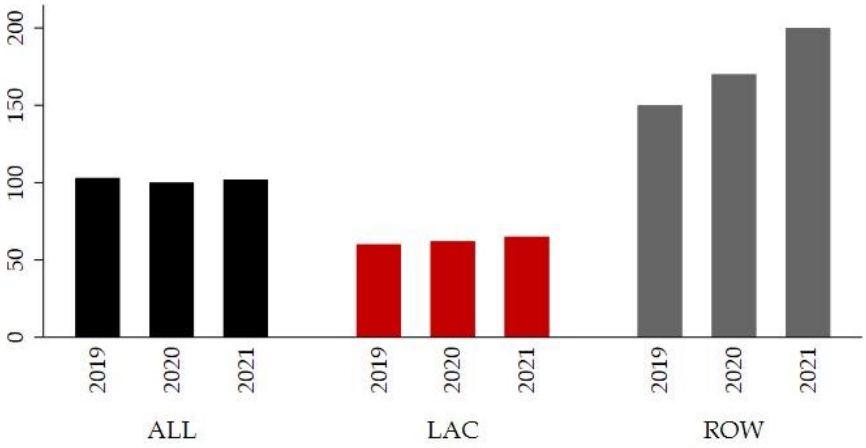


Sample of Countries that Responded to Both Surveys

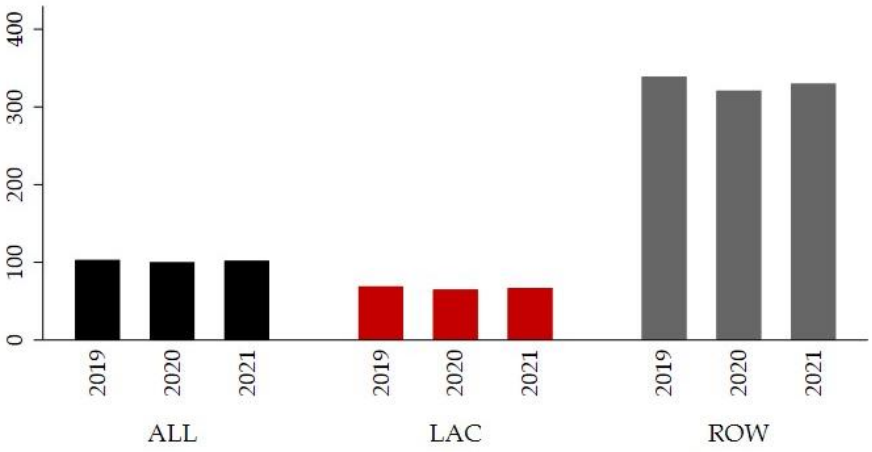


Total Number of Employees

Full Sample

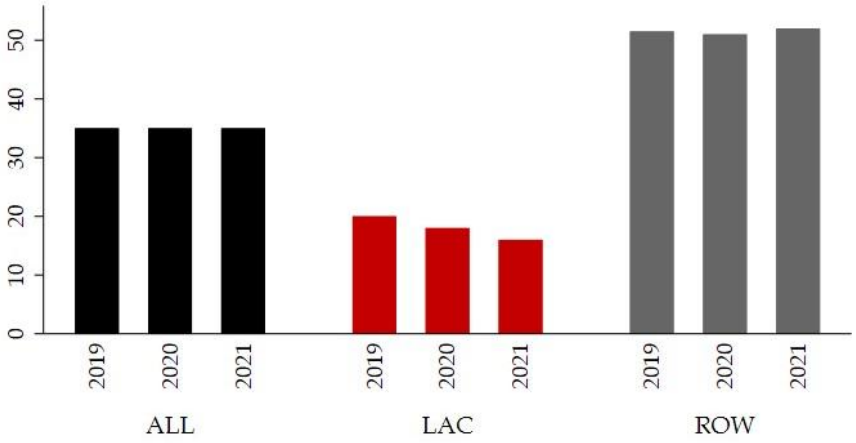


Sample of Countries that Responded to Both Surveys

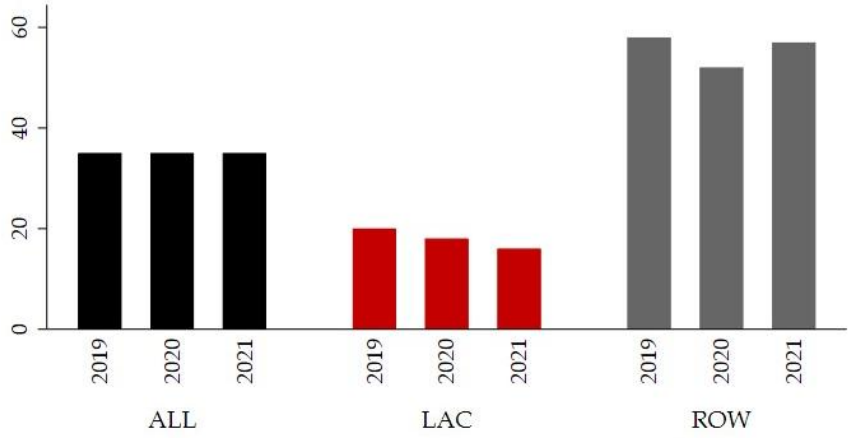


FDI Promotion Number of Employees

Full Sample



Sample of Countries that Responded to Both Surveys

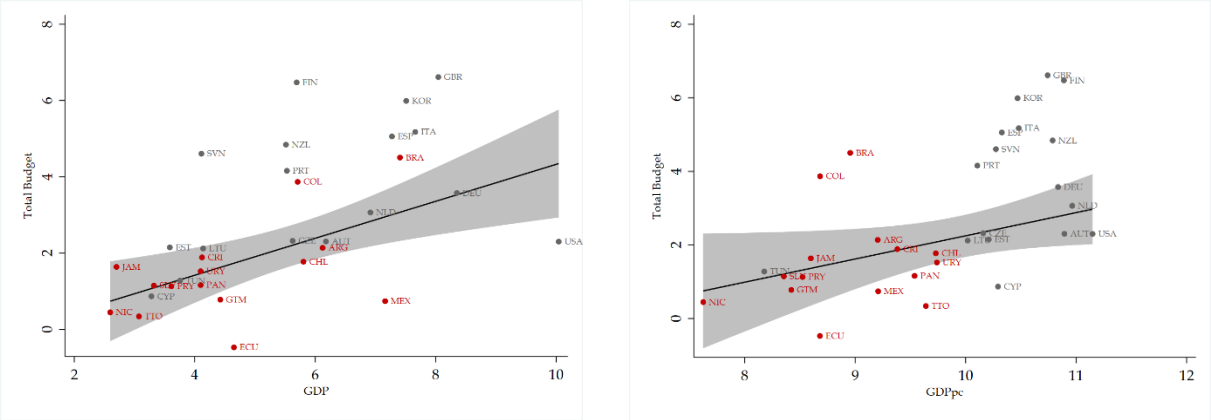


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools and Volpe Martincus and Sztajerowska (2019)

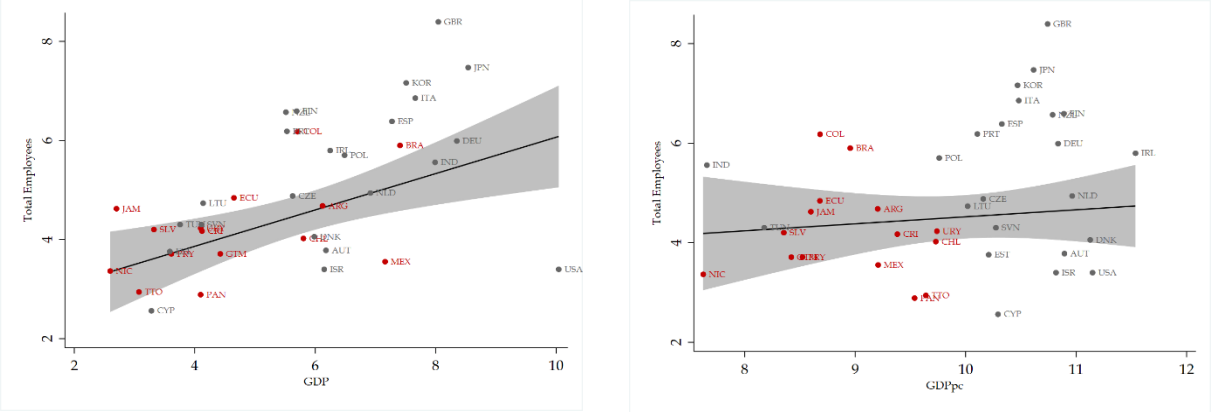
Note: The list of countries that responded to the current survey for which results are shown in the top panel is, of which countries marked with asterisk (*) also responded to the previous survey: ARG, AUT*, BRA*, CHL*, COL*, CRI*, CYP, CZE*, DEU*, DNK*, ECU*, EST*, ESP*, FIN*, GBR*, GTM, IND, IRL*, ISR*, ITA*, JAM*, JPN*, KOR*, LTU, MEX*, NIC*, NLD*, NZL*, PAN, POL*, PRT*, PRY*, SVN*, SLV*, TTO*, TUN, URY*, USA*

Figure A2.2. Total Budget and Employees - The Role of Size and Development of the Economy

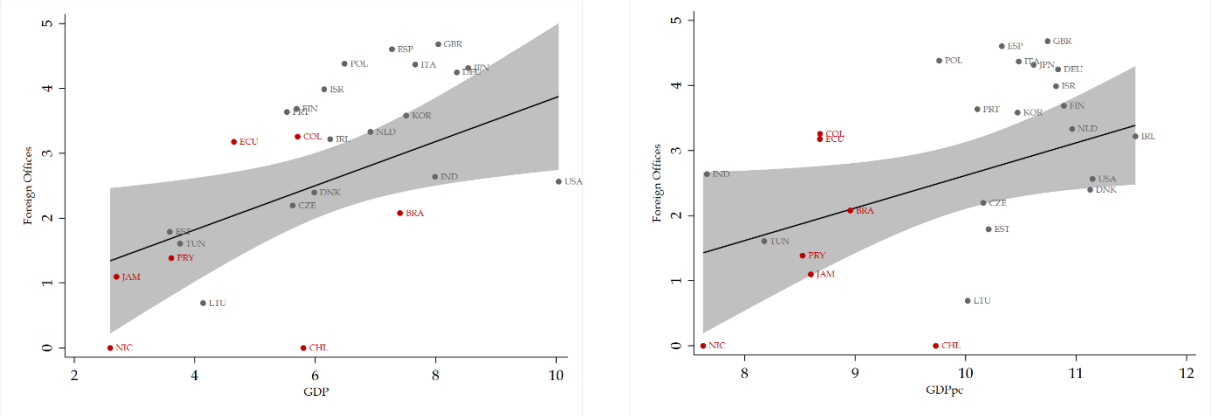
Total Budget



Total Employees



Foreign Offices



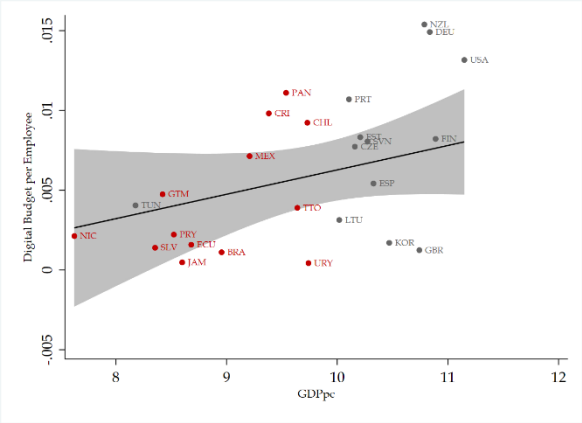
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the IPA's total budget (in natural logarithm), total employees (in natural logarithm), and the number of foreign offices, and their respective countries' GDP and GDP per capita, in natural logarithm (left and right panels, respectively). LAC countries are shown in red, whereas ROW countries are shown in dark gray.

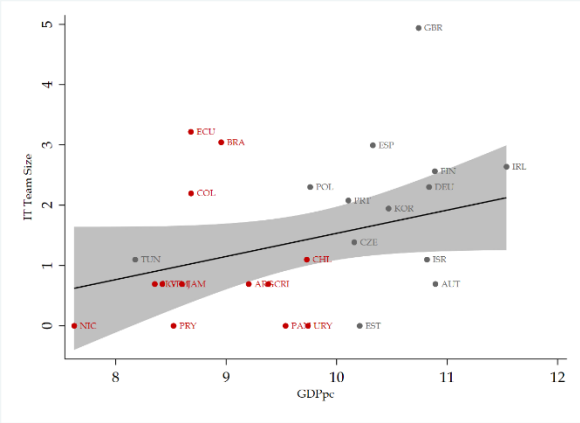
Figure A2.3. IPA Digital Budget and The Role of Size and Development of the Economy

Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the IPA's digital tools budget size, digital tools budget's share in total budget, and digital tools budget per employee, and their respective countries' GDP and GDP per capita, in natural logarithm (left and right panels, respectively). LAC countries are shown in red, whereas ROW countries are shown in dark gray.

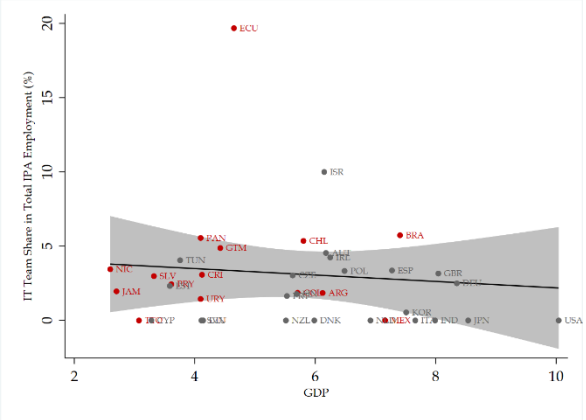
Figure A2.4. IPA Digital Budget and The Role of Size and Development of the Economy

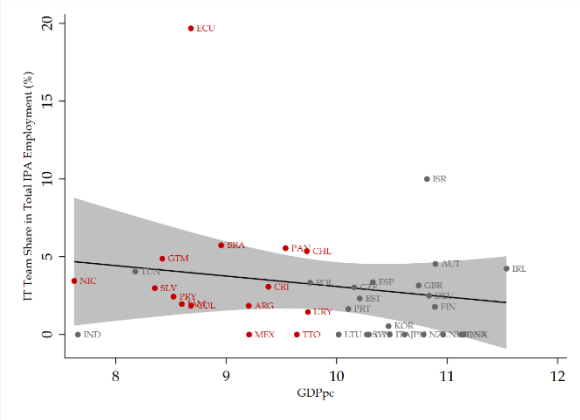
Size of IT Team



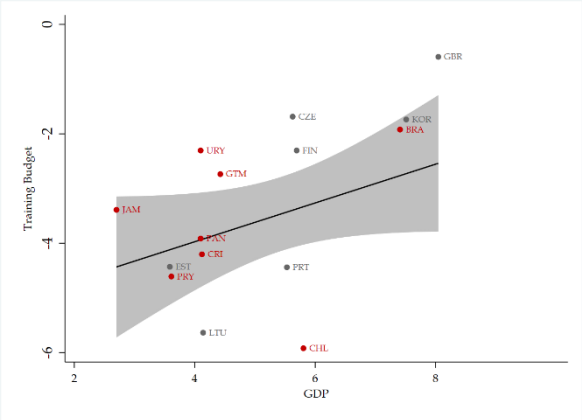


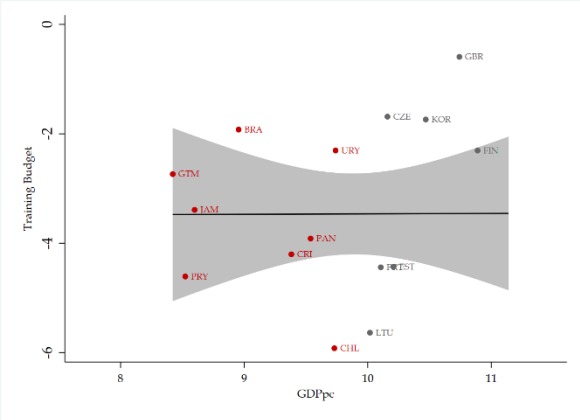
Share of IT Team in Total Staff



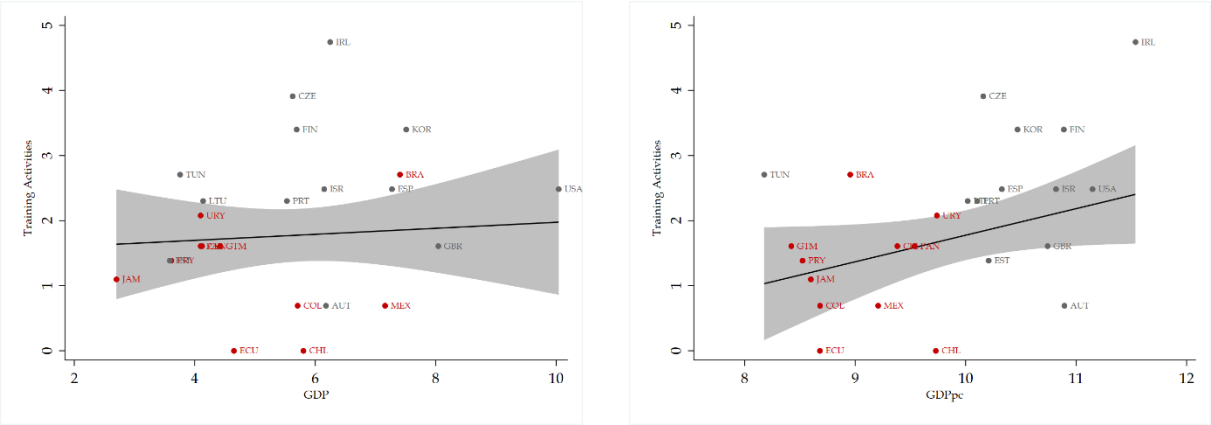


Training in New Technologies Budget Size

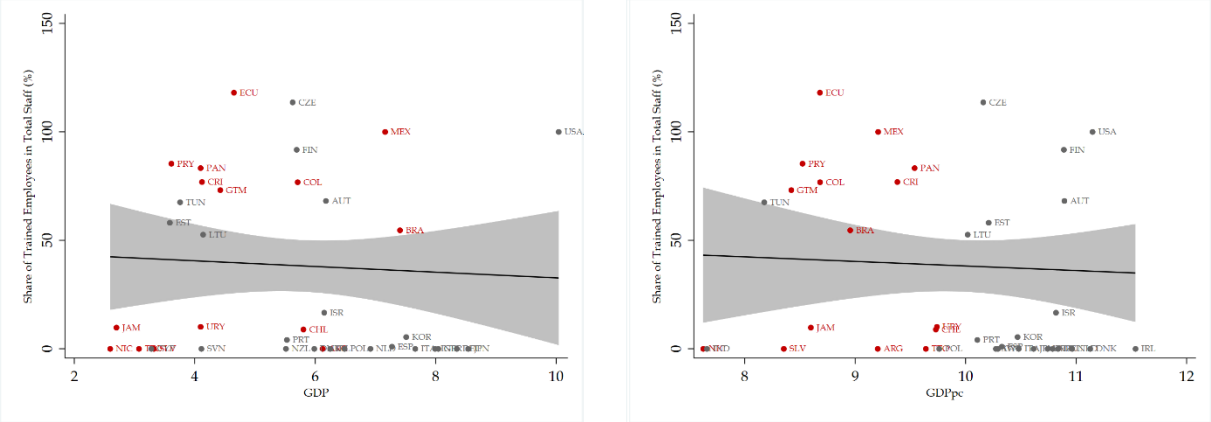




Number of Training Activities in New Technologies



Share of Trained Employees in Total Staff

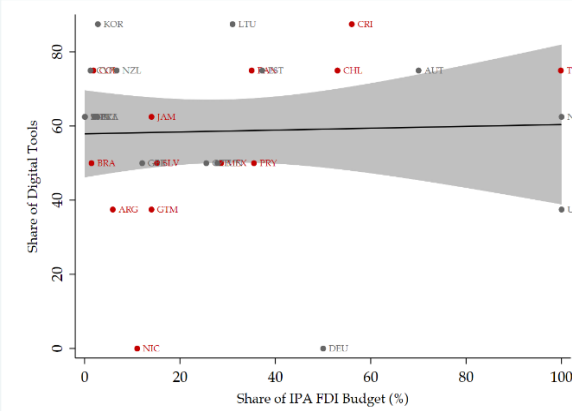


Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the IPA's size of IT team, share of IT team in total staff, training in new technologies budget size, number of training activities in new technologies, and share of trained employees in total staff, and their respective countries' GDP and GDP per capita, in natural logarithm (left and right panels, respectively). LAC countries are shown in red, whereas ROW countries are shown in dark gray.

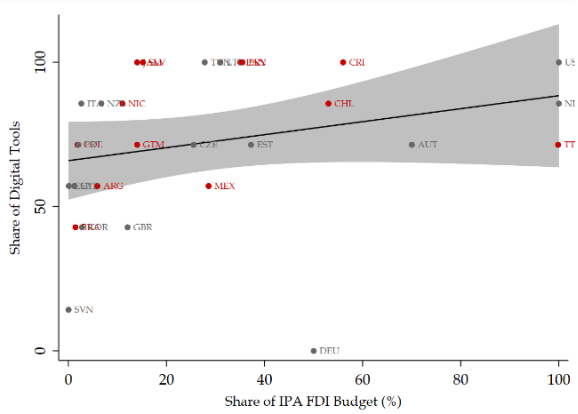
Figure A2.5. IPA's Resources for Investment Promotion and Share of Digital Tools

Investment Promotion Budget

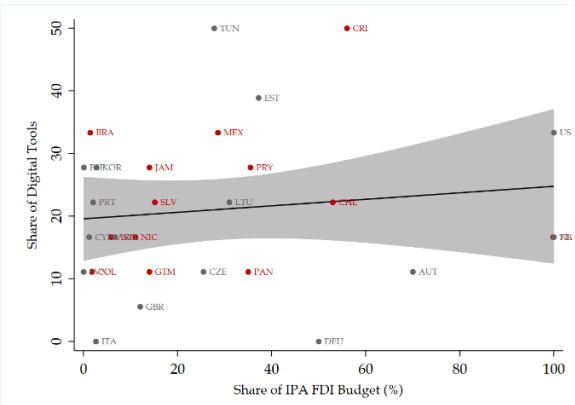
Image-Building



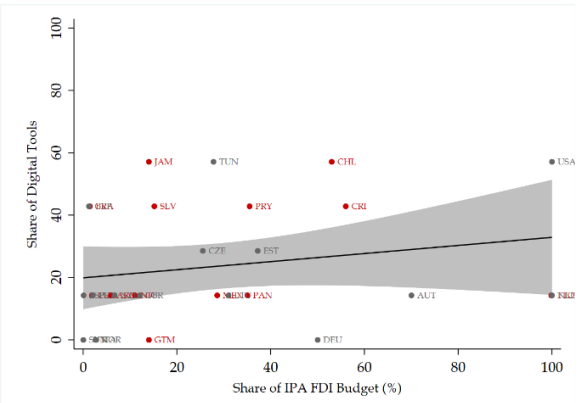
Investment Generation



Investment Facilitation

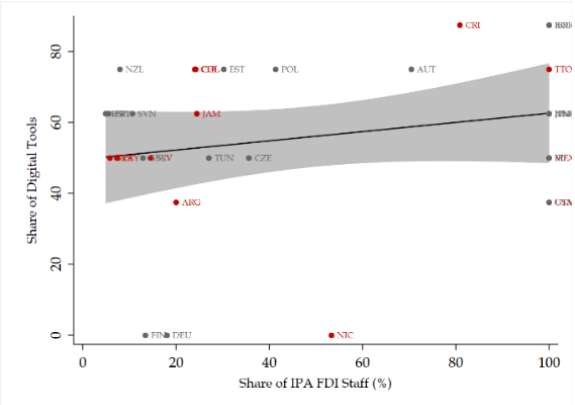


Policy Advocacy

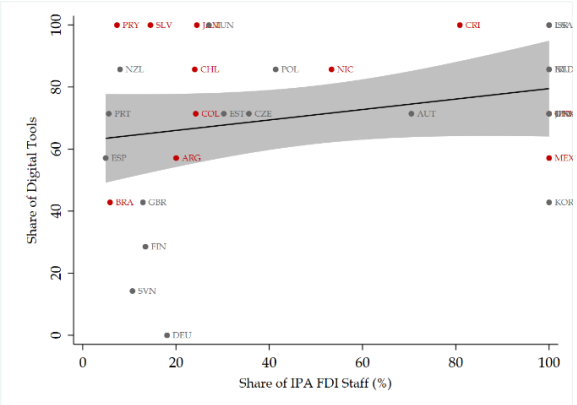


Investment Promotion Staff

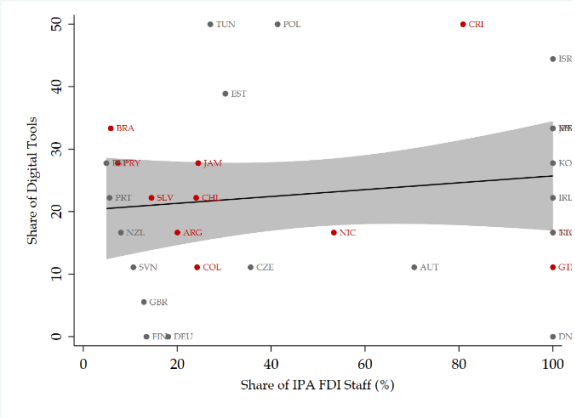
Image-Building



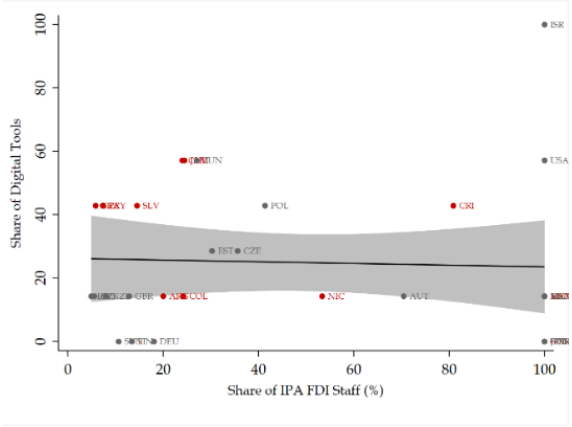
Investment Generation



Investment Facilitation

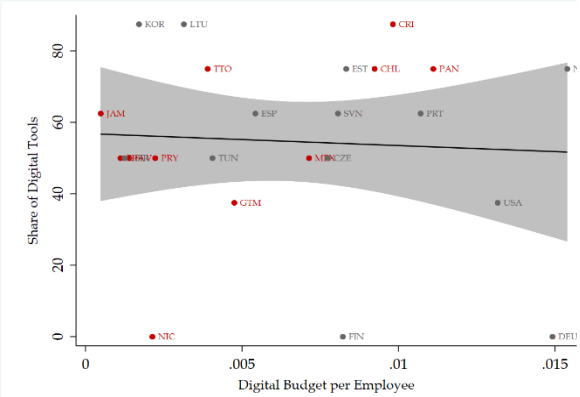


Policy Advocacy

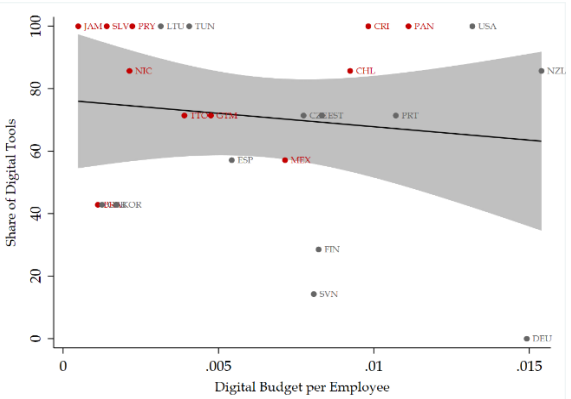


Digital Budget per Employee

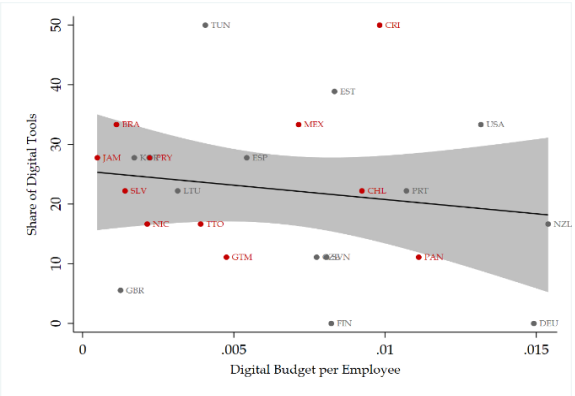
Image-Building



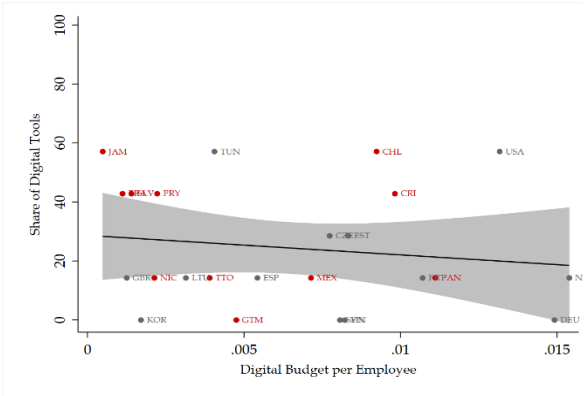
Investment Generation



Investment Facilitation

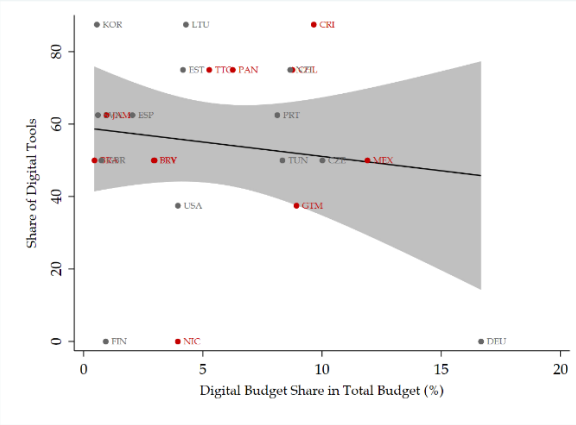


Policy Advocacy

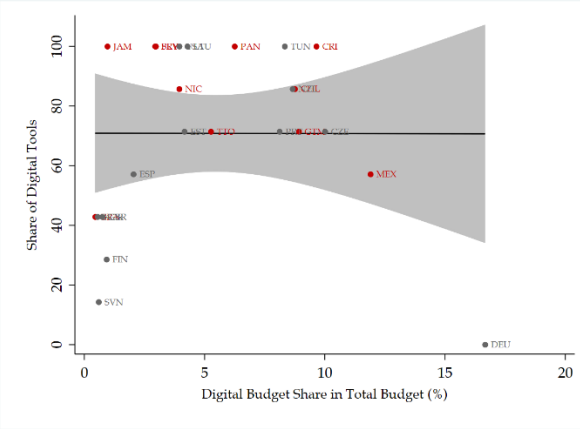


Digital Budget Share in Total Budget

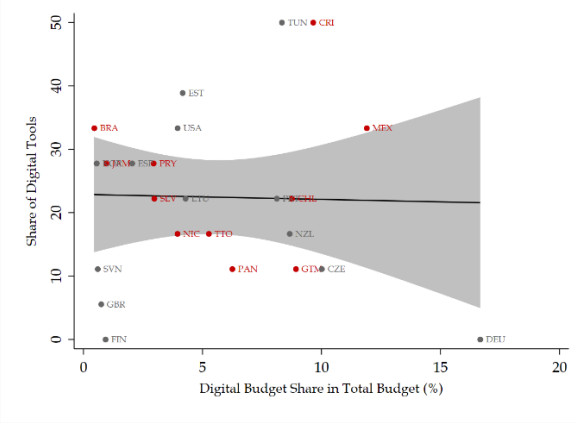
Image-Building



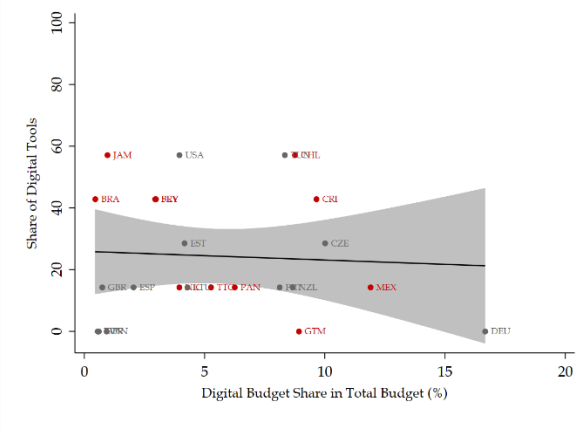
Investment Generation



Investment Facilitation

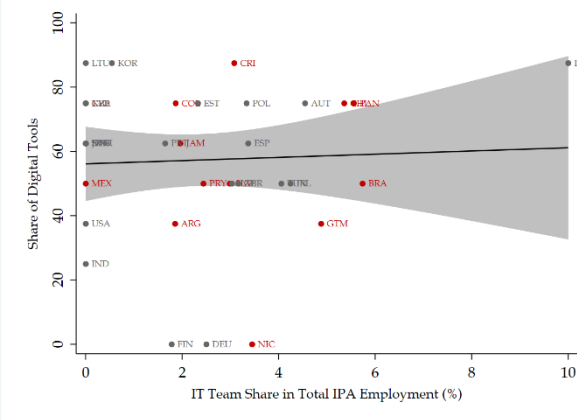


Policy Advocacy

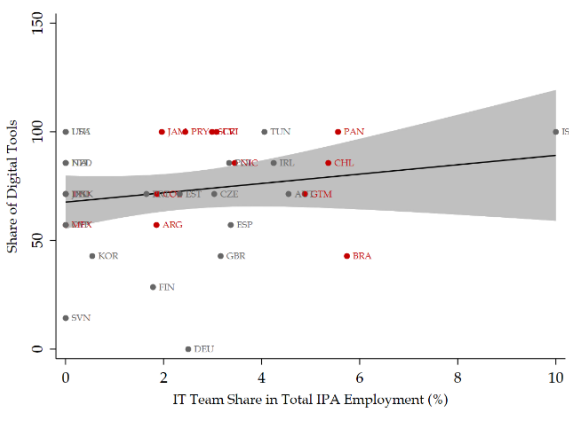


IT Team Share in Total IPA Staff (%)

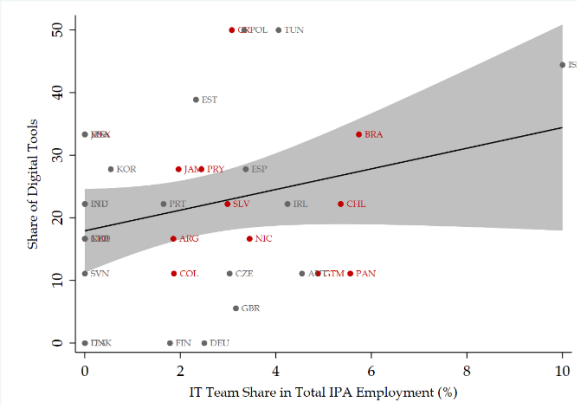
Image-Building



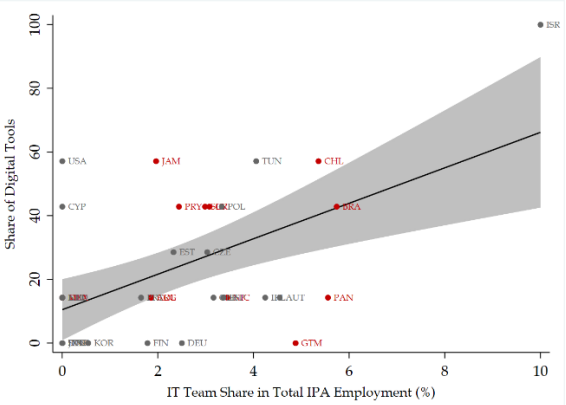
Investment Generation



Investment Facilitation

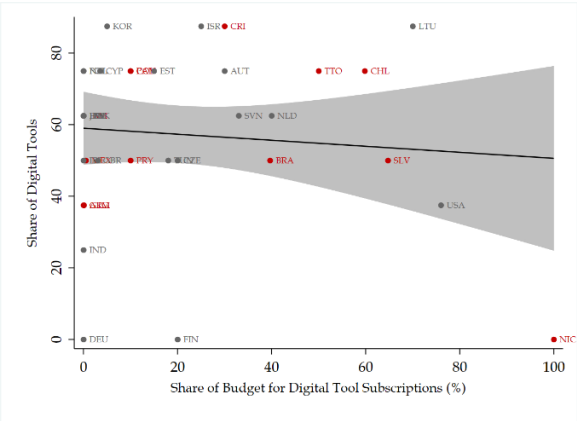


Policy Advocacy

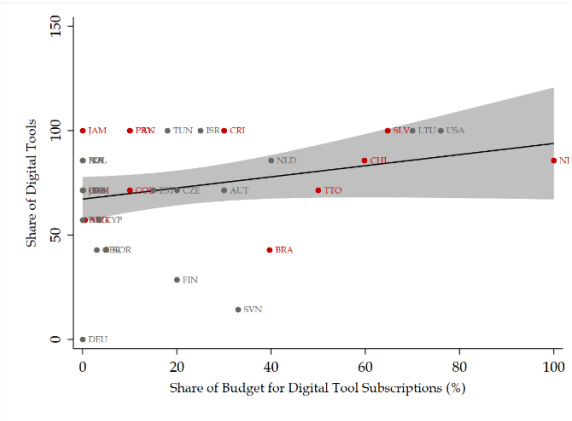


Share of Budget for Digital Tool Subscription (%)

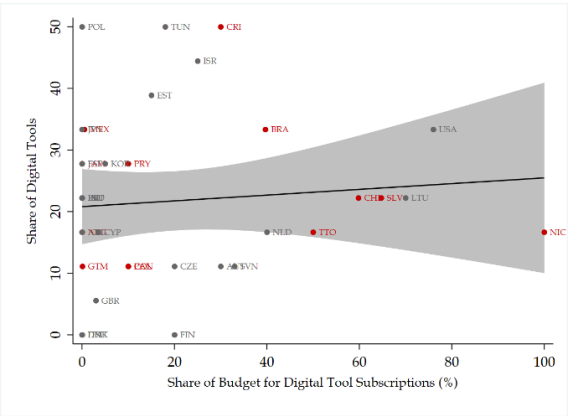
Image-Building



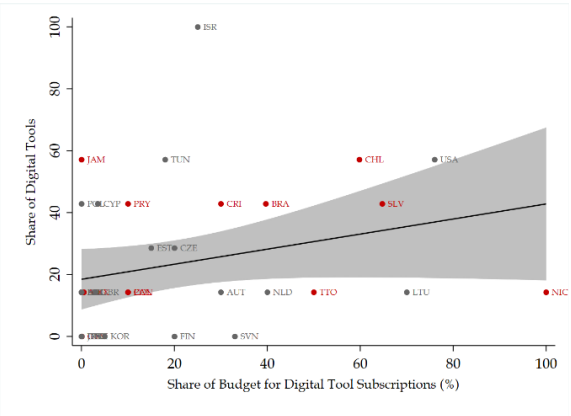
Investment Generation



Investment Facilitation

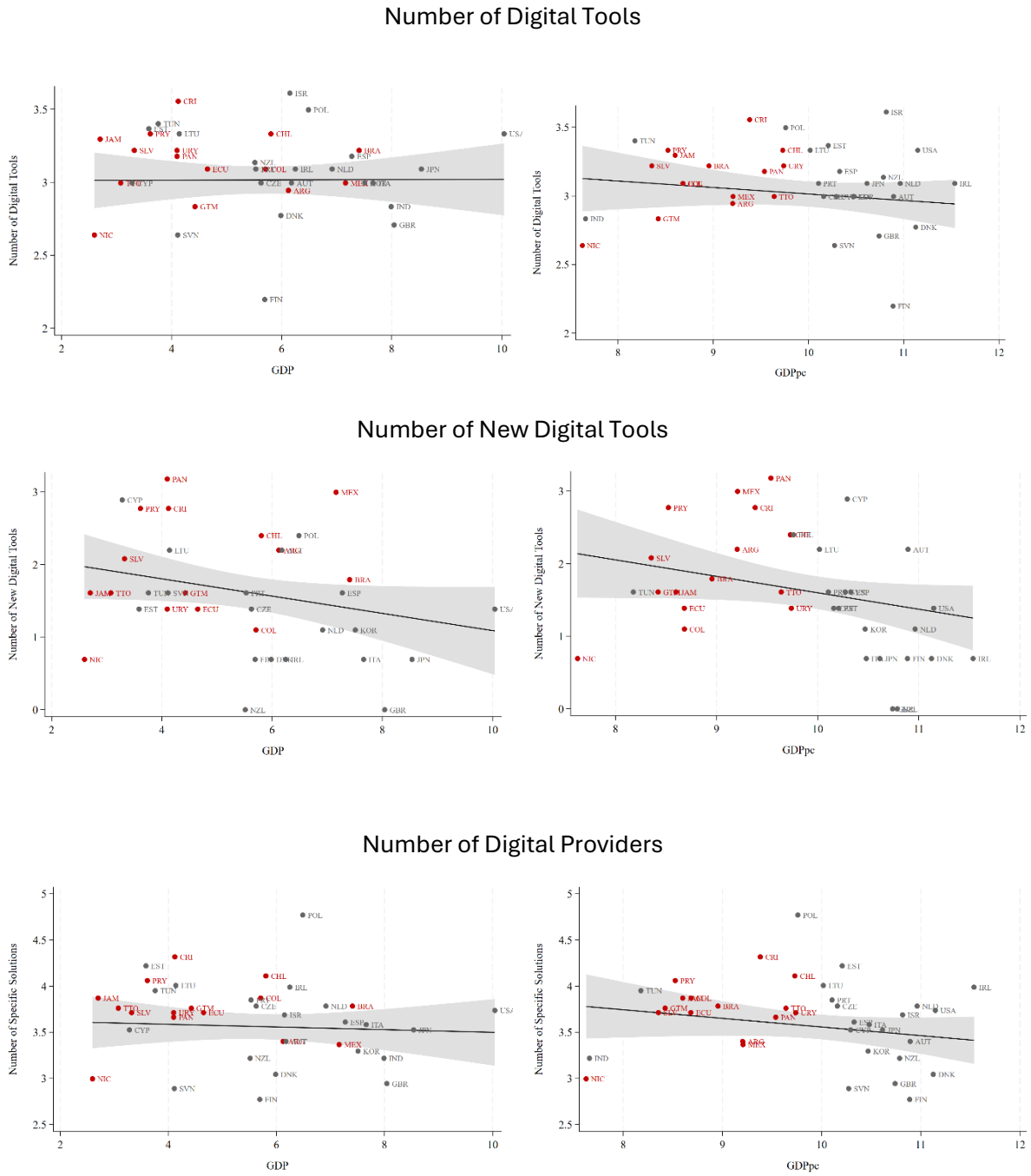


Policy Advocacy



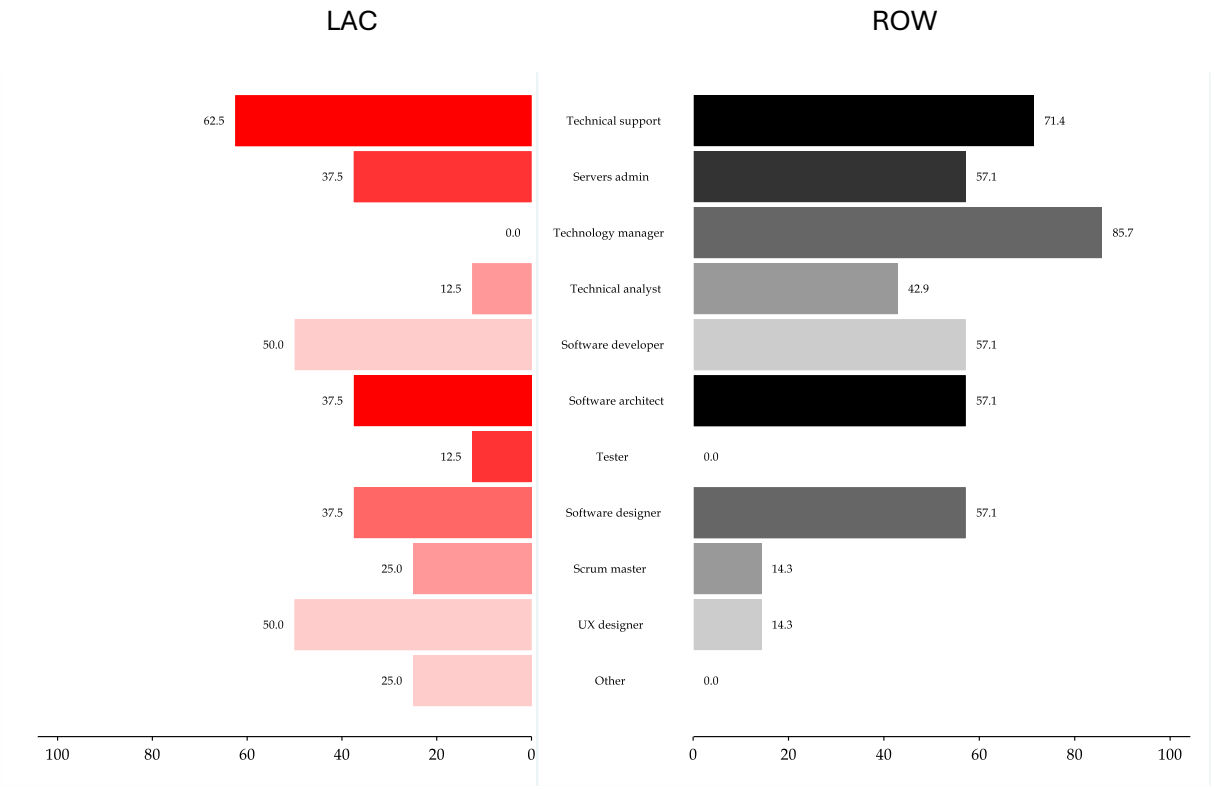
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the share of digital tools used by function and their respective countries' investment promotion budget, investment promotion staff, digital budget per employee, digital budget share in total budget, IT team share in total IPA staff, and share of budget for digital tools subscriptions, respectively. LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Figure A2.6. IPA Number of Digital Tools and The Role of Size and Development of the Economy



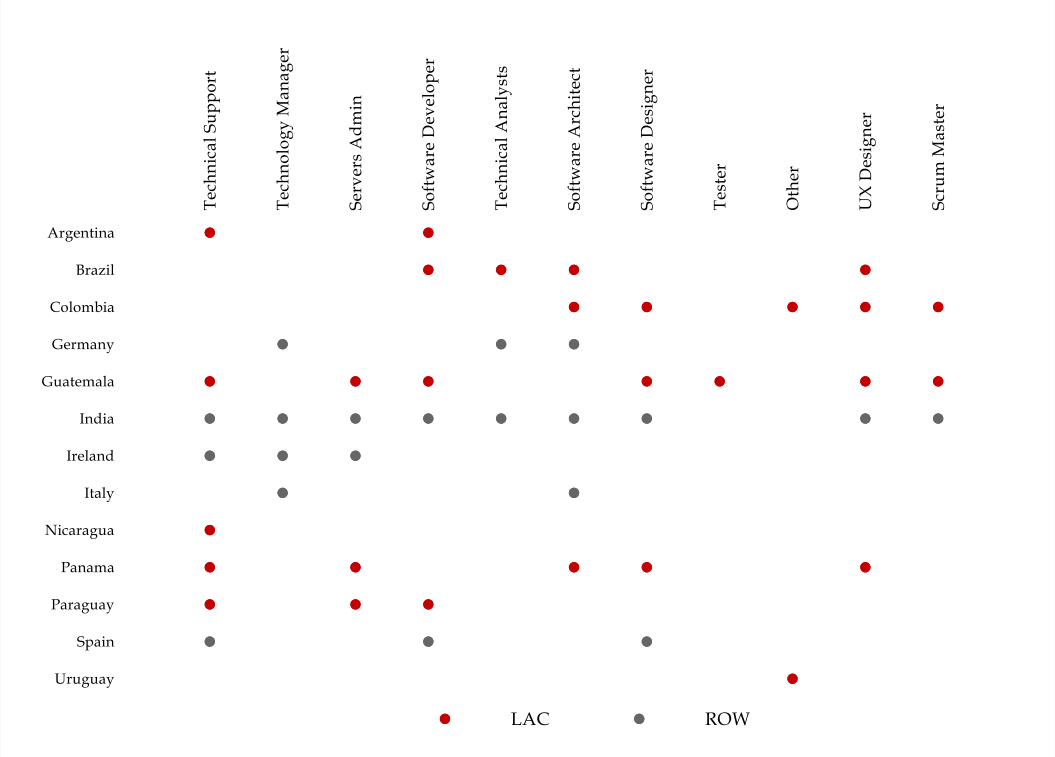
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure shows the relation between the number of digital tools used (in natural logarithm) and their respective countries' GDP and GDP per capita, in natural logarithm (left and right panels, respectively). LAC countries are shown in red, whereas ROW countries are shown in dark gray.

Figure A2.7. Share of IPAs Reporting a Given Function for Their IT Team Expansion by Region



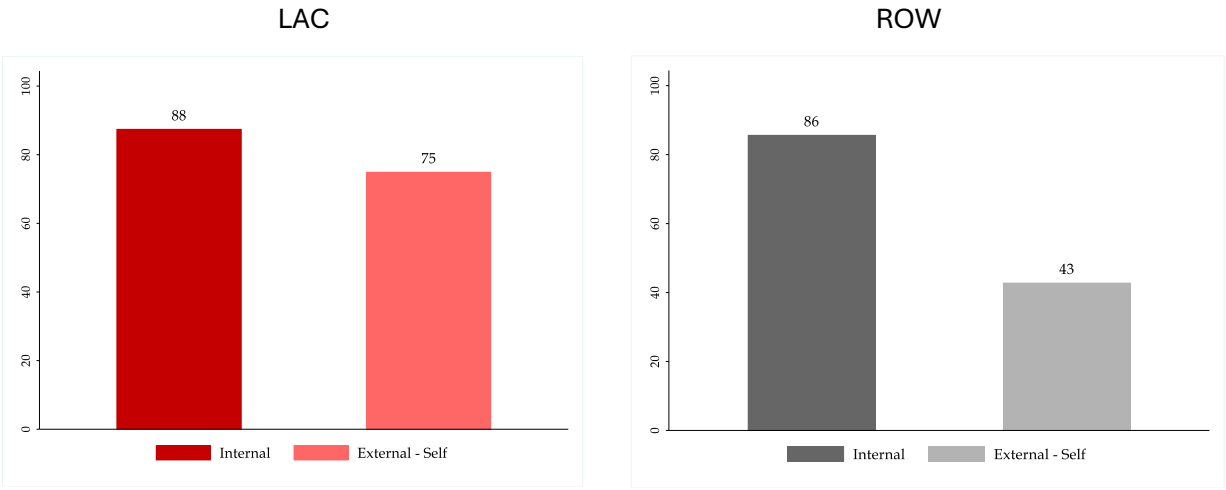
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure is sorted by the order of frequency of use of a particular function in LAC, as presented in Figure 17.

Figure A2.8. IPA's Planned IT Team Expansion by Type of Function and Country



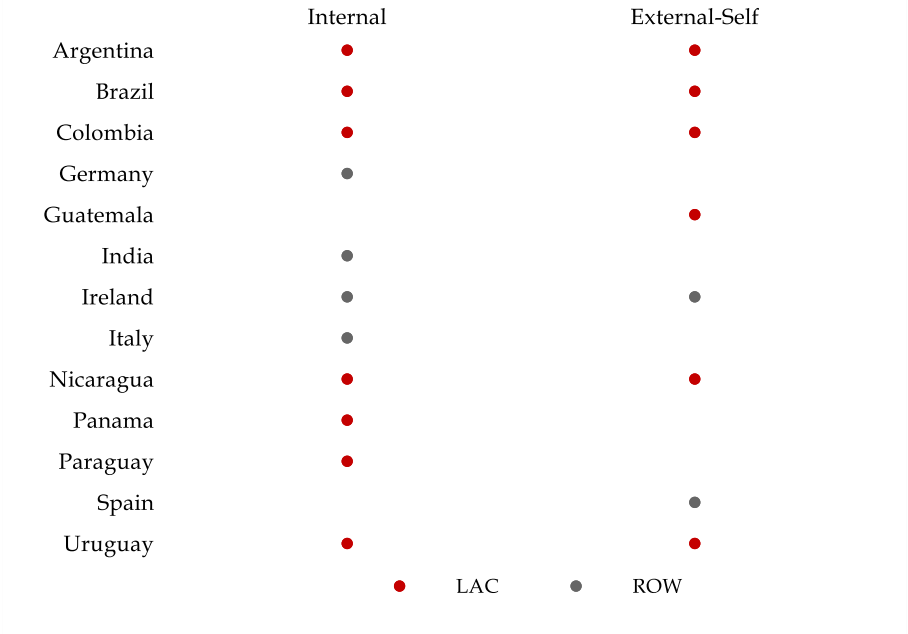
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

Figure A2.9. IPA's Planned IT Team Expansion by Contract Type and Region



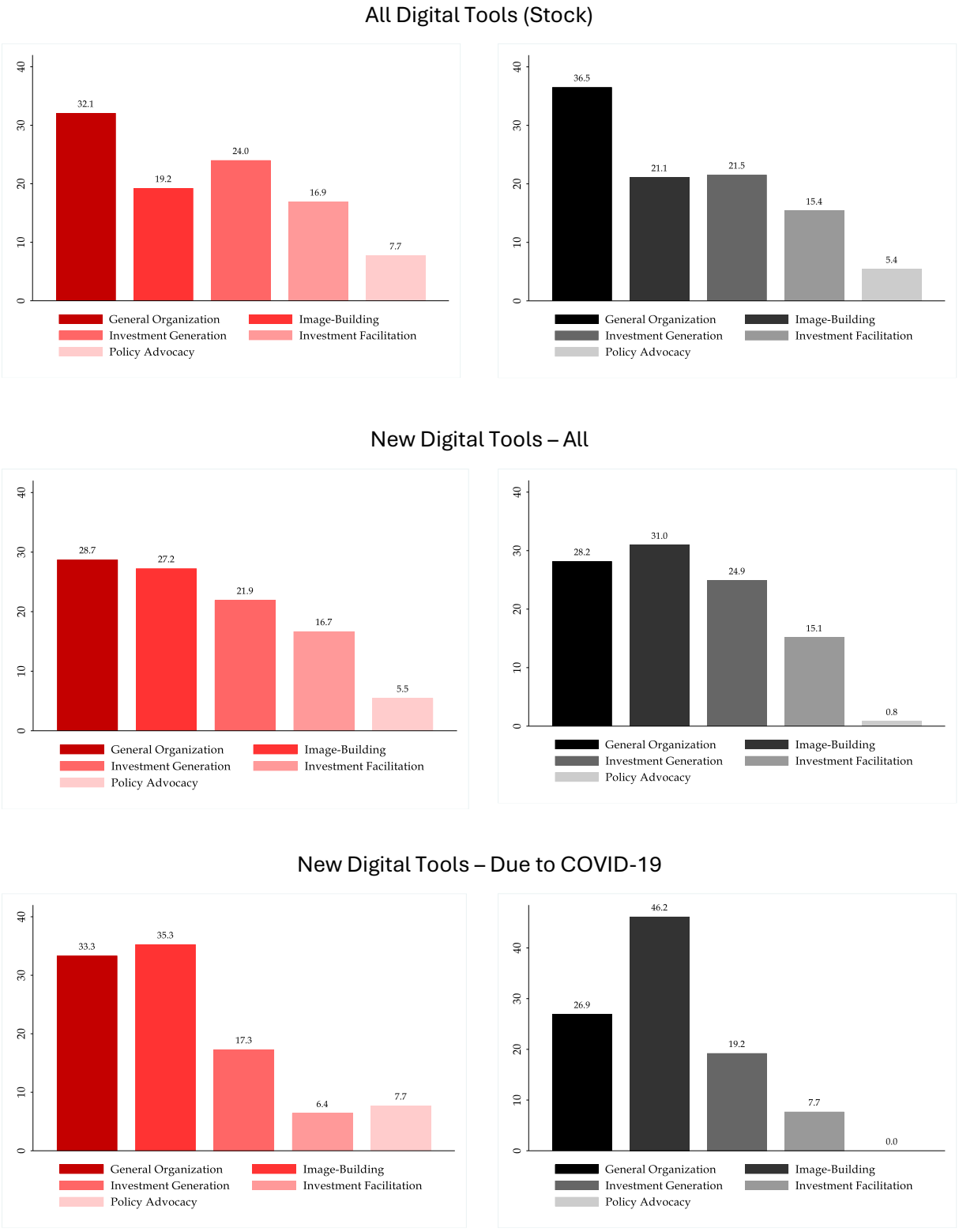
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figure reports the average planned IT team expansion by contract type. LAC is shown in red tones, whereas ROW is shown in dark gray tones.

Figure A2.10. IPA's Planned IT Team Expansion by Contract Type and Country



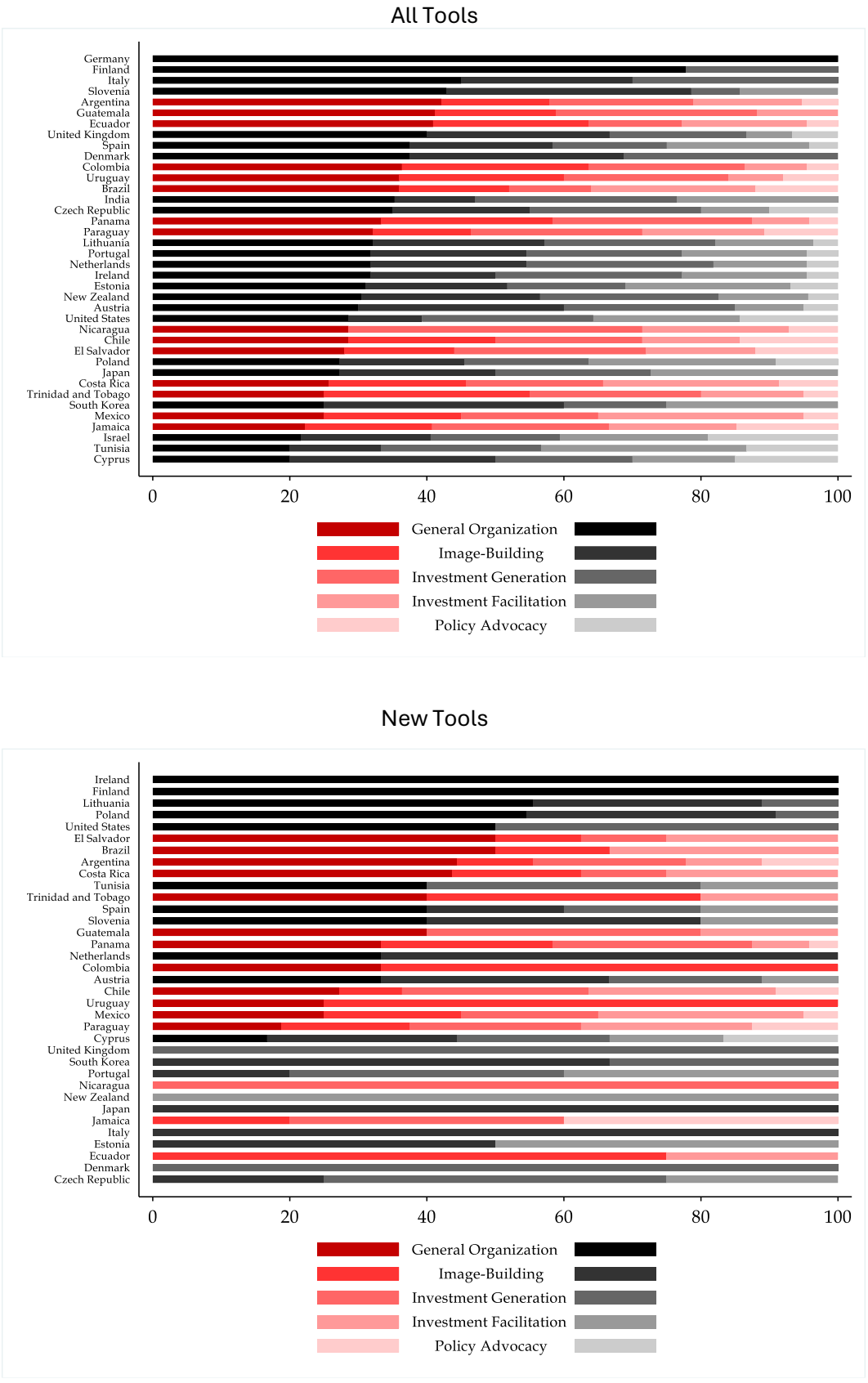
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.

Figure A2.11. Average Share of Digital Tools Used by IPAs for a Given Function in Total by Region



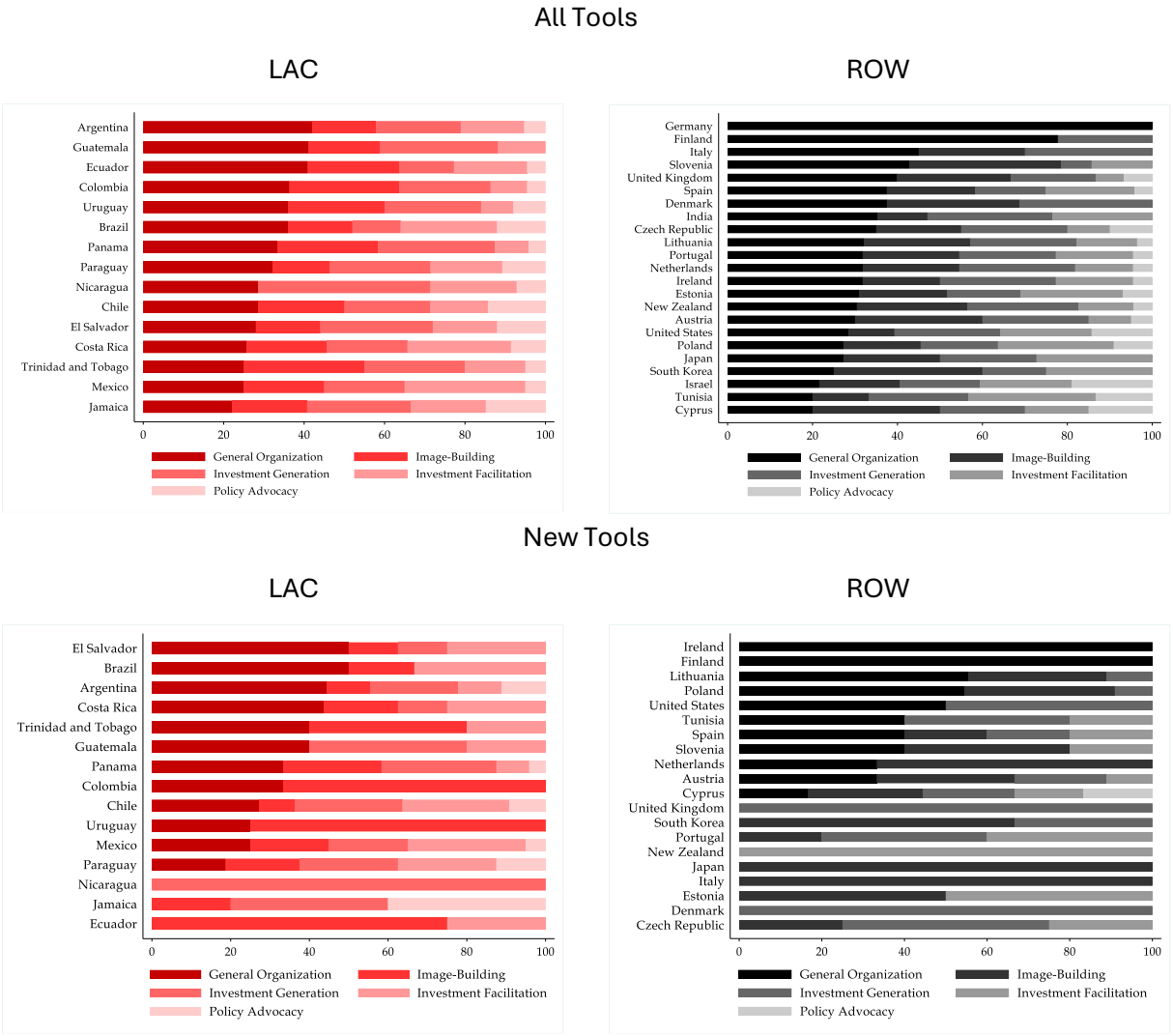
Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The top panel reports the average share of IPAs using digital tools by IPA function (Stock). The middle panel reports the average share of IPAs using digital tools by IPA function adopted. The bottom panel reports the average share of IPAs using digital tools by IPA function adopted due to COVID-19. LAC is shown in red, whereas ROW is shown in dark gray.

Figure A2.12. Share of IPAs Using Digital Tools by IPA Function and Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The top panel reports the share of IPAs using digital tools by IPA function (Stock). The bottom panel reports the share of IPAs using digital tools by IPA function adopted. LAC is shown in red tones, whereas ROW is shown in gray tones.

Figure A2.13. Share of IPAs Using Digital Tools by IPA Function and Country



Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The top panel reports the share of IPAs using digital tools by IPA function by country (Stock). The bottom panel reports the share of IPAs using digital tools by IPA function adopted by country. LAC is shown in red tones, whereas ROW is shown in gray tones.

Figure A2.14. IPA Share of IPAs Adopting Digital Tools by Type and Region Over Time

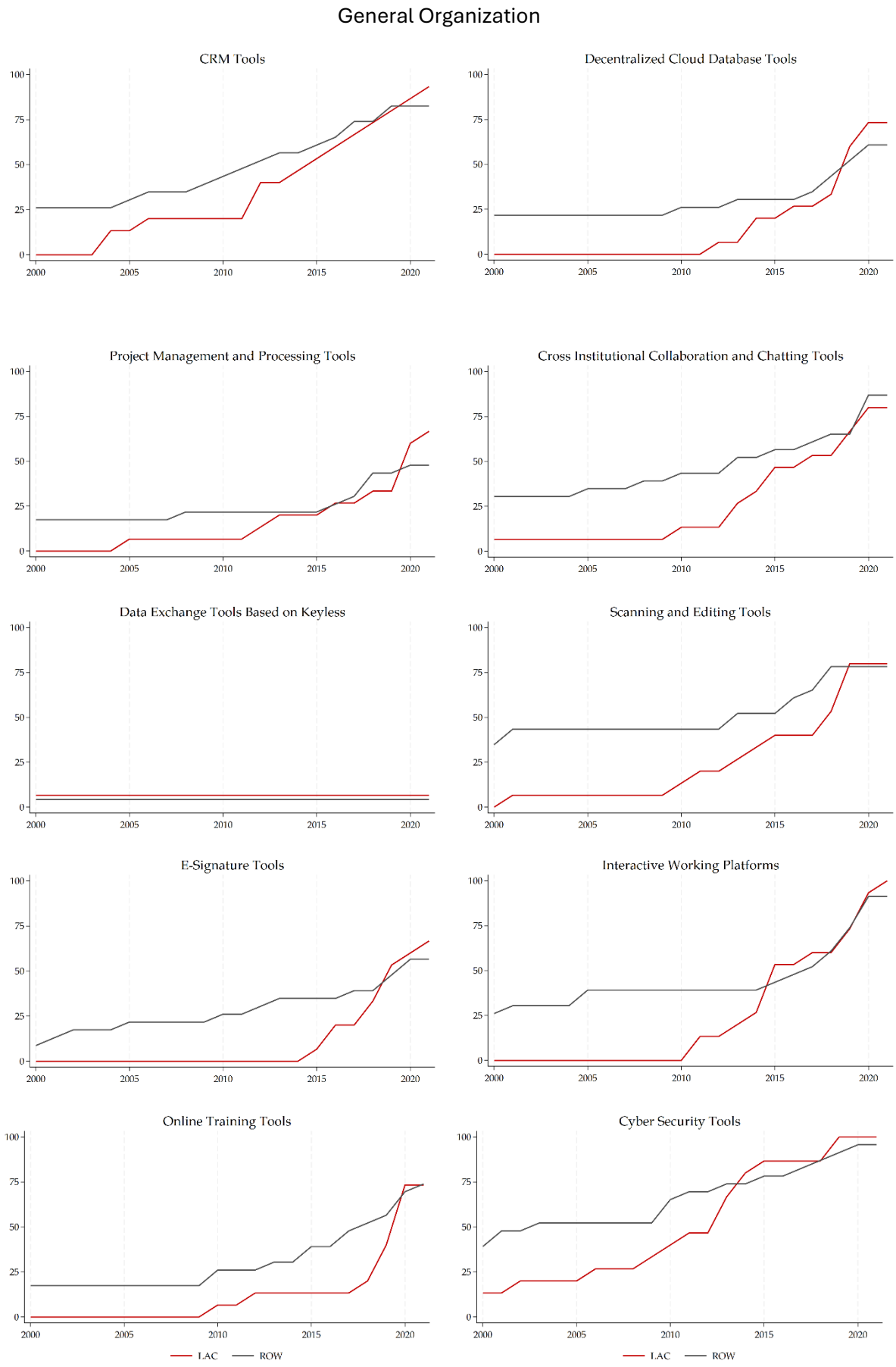
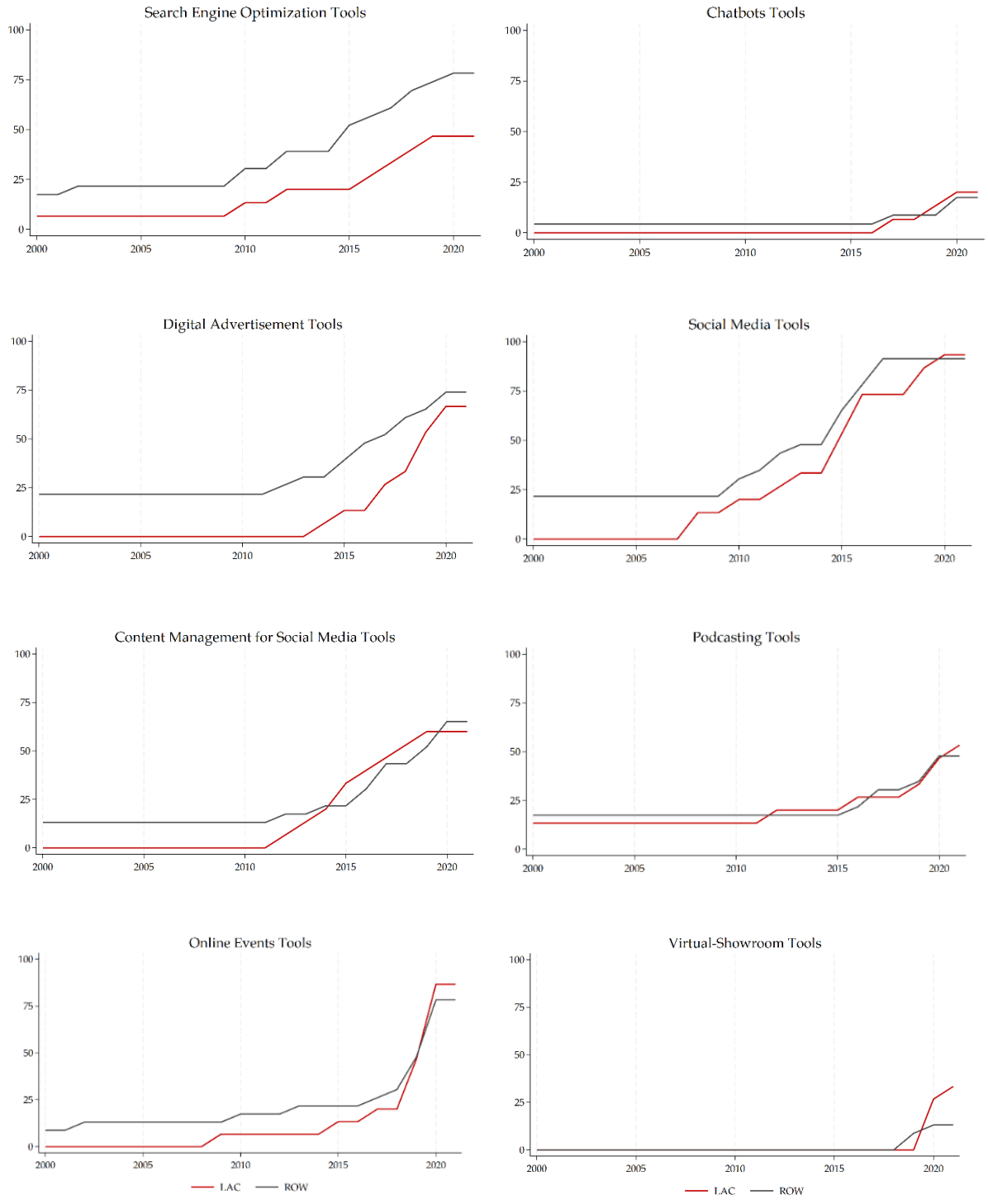
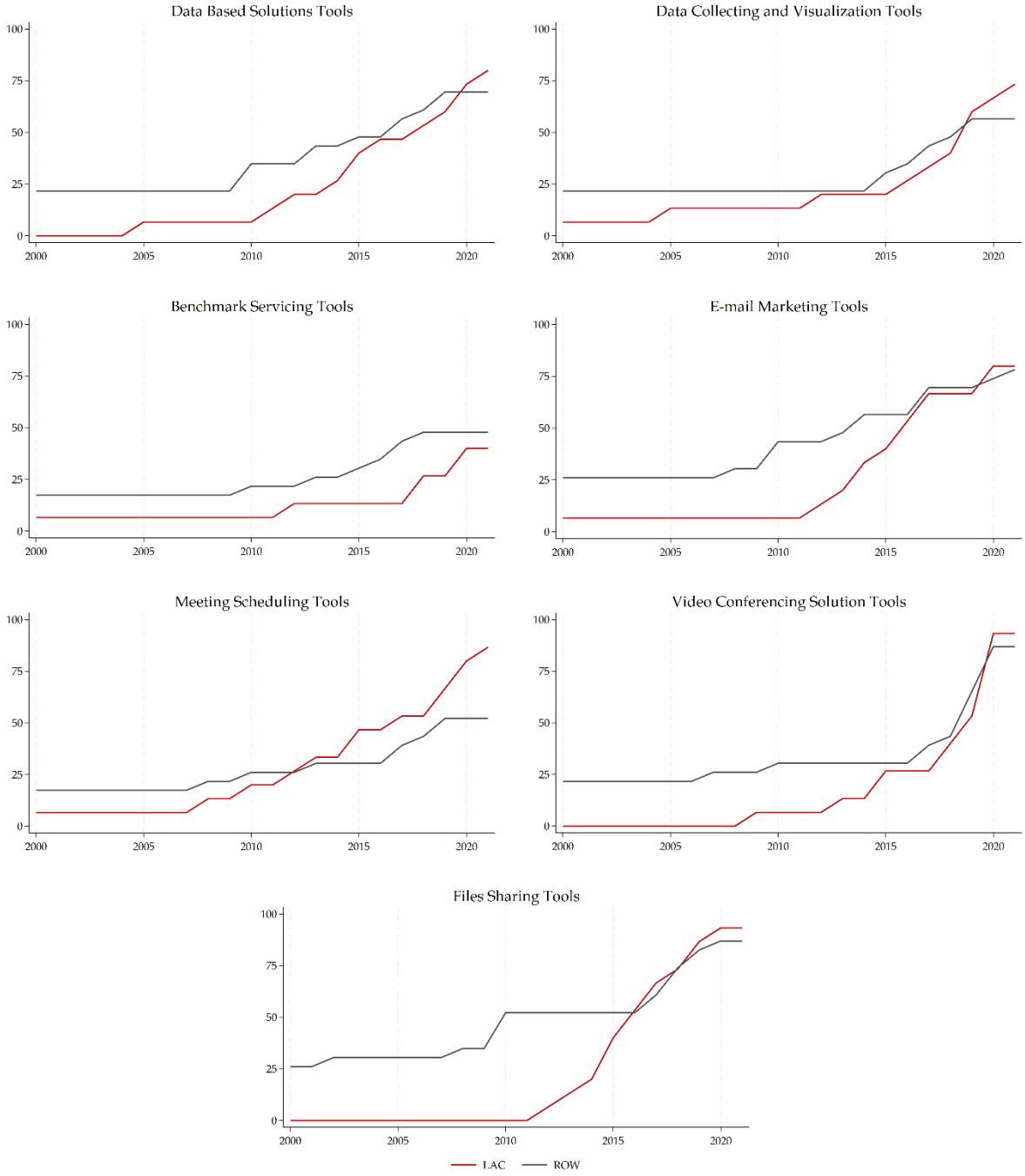


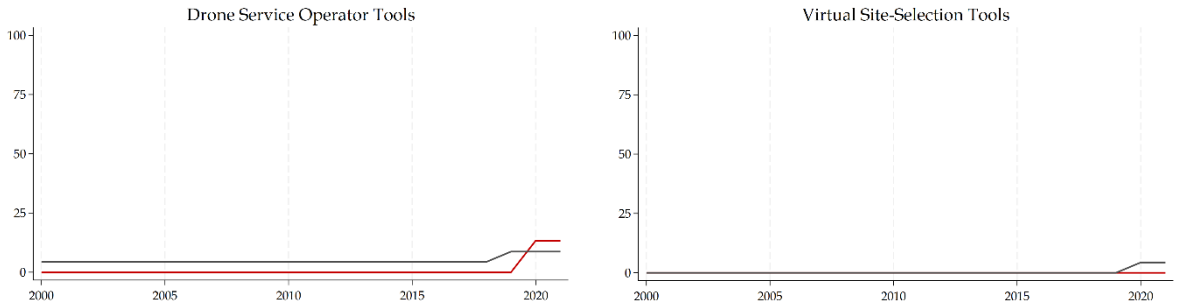
Image-Building

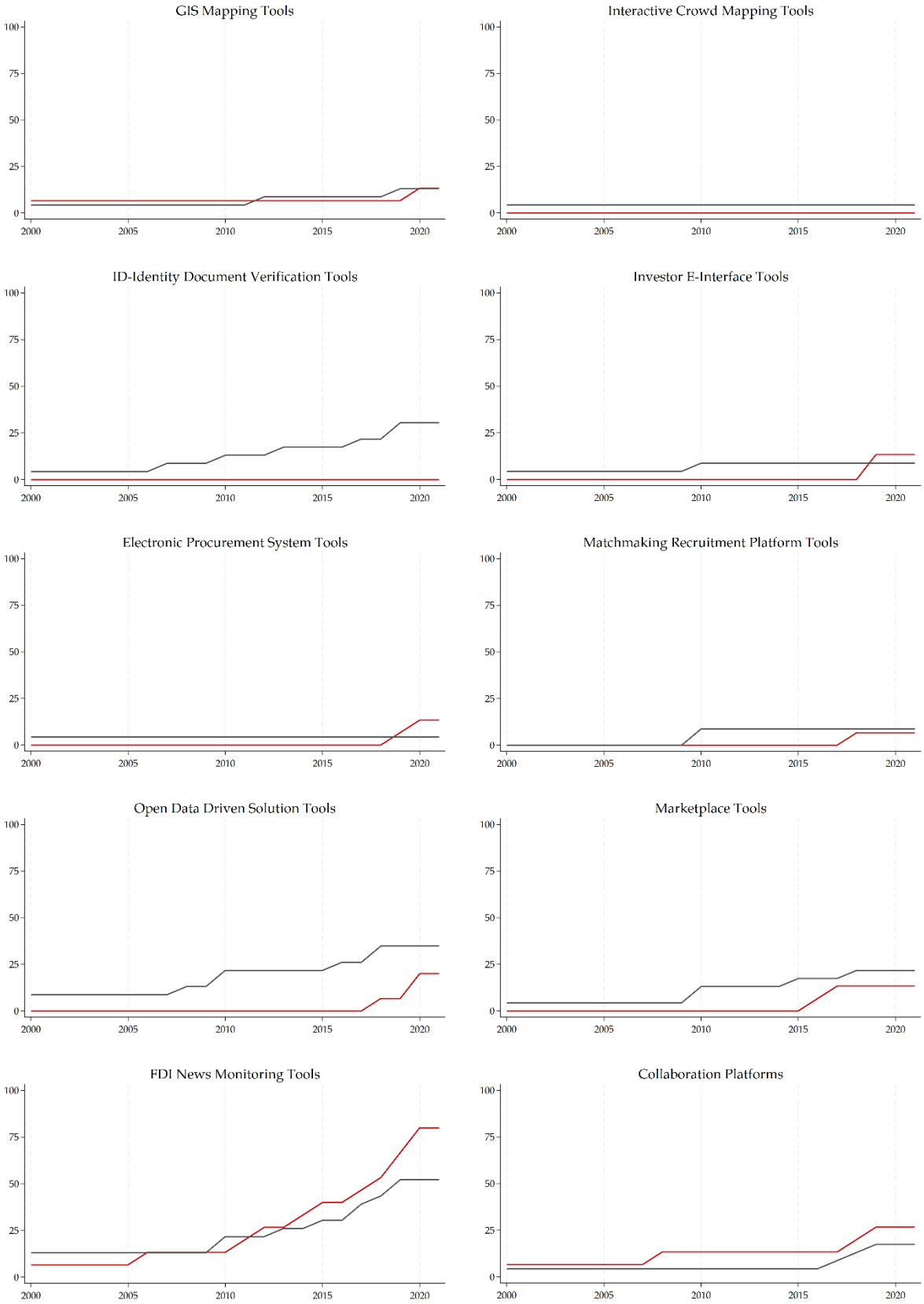


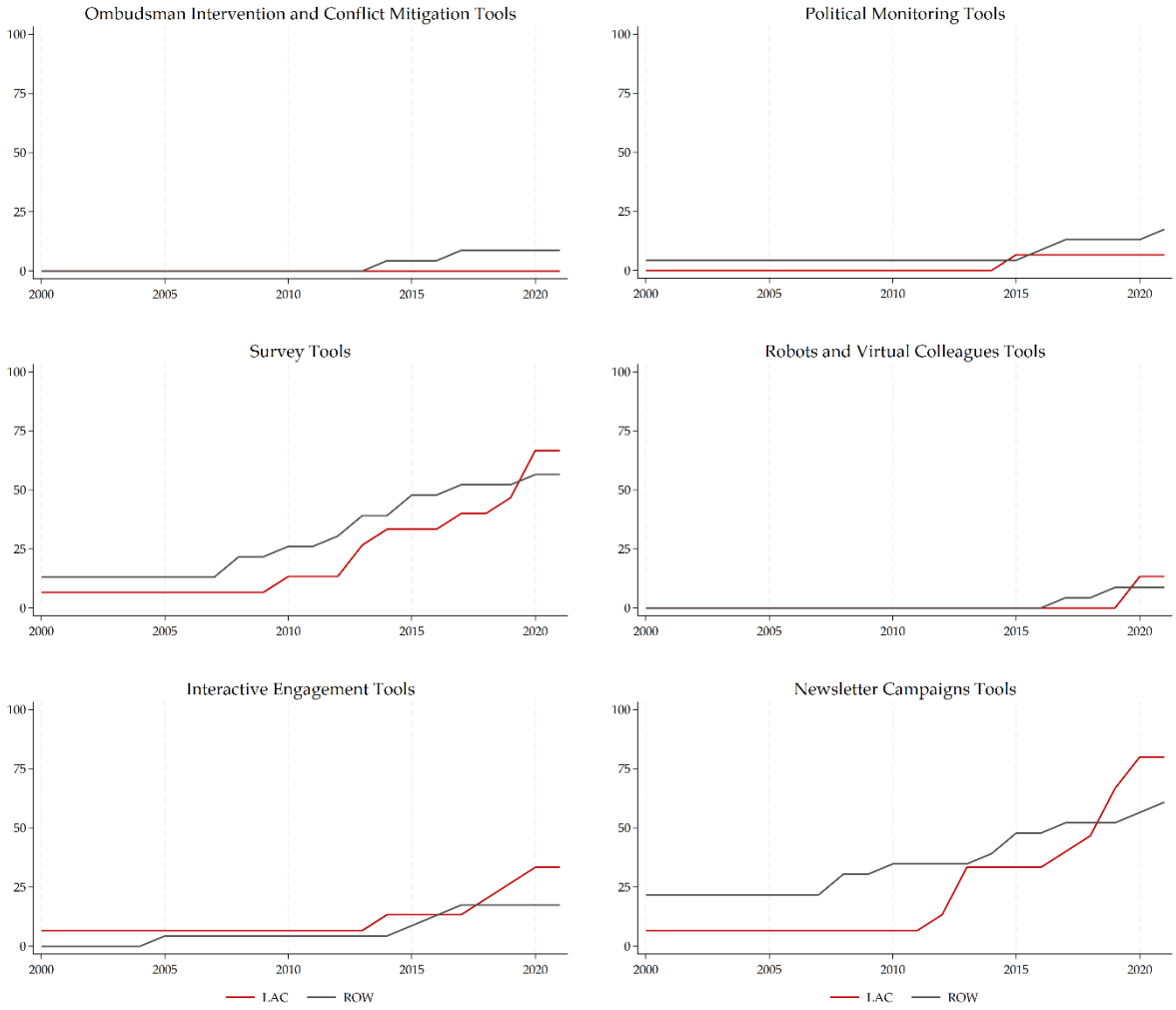
Investment Generation



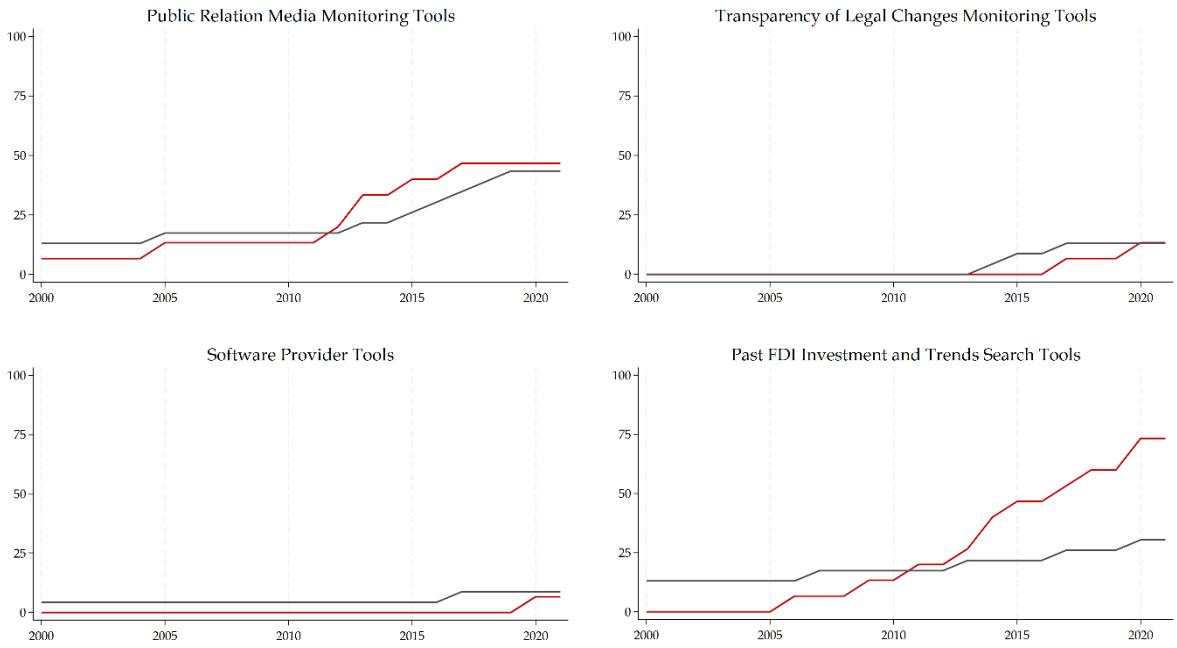
Investment Facilitation

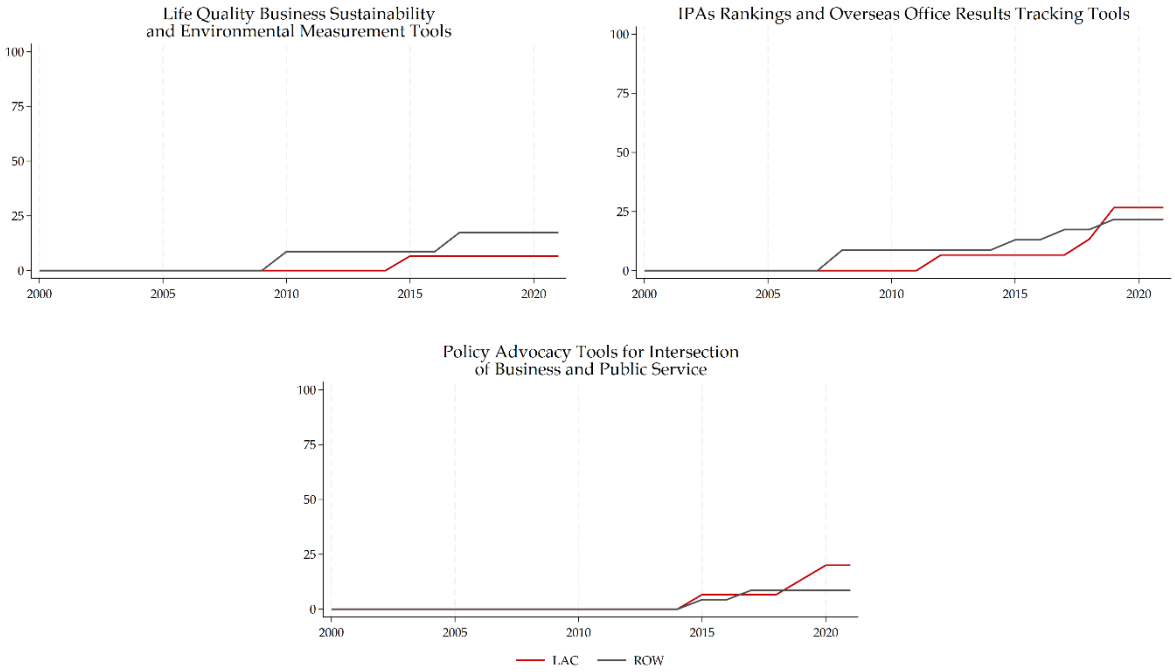



GIS Mapping Tools
Interactive Crowd Mapping Tools
ID-Identity Document Verification Tools
Investor E-Interface Tools
Electronic Procurement System Tools
Matchmaking Recruitment Platform Tools
Open Data Driven Solution Tools
Marketplace Tools
FDI News Monitoring Tools
Collaboration Platforms
0
25
50
75
100
2000
2005
2010
2015
2020



Policy advocacy





Source: Authors' calculations based on data from the IDB Survey on IPA Digital Tools.
Note: The figures report on the percentage of digital tools adopted by IPAs over the period 2000-2021. LAC is shown in red, whereas ROW is shown in dark gray.

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