

Unlocking the Potential
of GovTech Ecosystems
in Latin America,
Spain and Portugal

The GovTech Index 2020



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Prologue

The emergence of GovTech startups is probably one of the most promising trends in the public innovation landscape in recent years. GovTech ecosystems are made of a new brand of tech-based, data-driven startups with a public vocation that want to make a difference and have a social impact. It is an emerging sector with the potential of increasing government capabilities for service delivery, while detonating new data-driven economic sectors. In the new, intangible economy, data is, and will continue being, the most important resource.

To make this an actionable agenda, in 2018, the CAF -Development Bank of Latin America— created a new practice on Digital Innovation in Government to promote the use of data and digital technologies as enablers of effectiveness, efficiency, and transparency in the provision of public services. As a core part of our work, we have developed a special regional initiative, developing a suite of services and products to promote both the supply of and demand for GovTech innovation in the region.

As one of the first efforts in our GovTech portfolio, we identified the need to better understand the potential of national GovTech ecosystems in the Bank's member countries, as a way to focus our efforts in what governments and startups in each country require, based on their specific context, challenges, and opportunities.

The GovTech Index is a response to this need. This index analyses 28 indicators and primary sources to understand the potential for countries to act in 7 policy dimensions: innovation environment, digital environment, industry environment, policy environment, digital government, procurement frameworks, and procurement culture.

The result is the first comprehensive measurement of GovTech ecosystems in the world, and 19 specific action routes for member countries wishing to develop 21st century public-private partnerships, today.

We would like to thank Oxford Insights, our partner in the development of this index for their work and willingness to embark on this effort, as well as Idoia Ortiz de Artiñano of PublicTech Lab for her advice. Special recognition goes to Enrique Zapata, principal specialist in the Digital Innovation in Government practice who originated the idea, managed this project and currently leads our GovTech agenda.

We would also like to thank our allies in governments, startups, think tanks, civil society and venture investors who have volunteered comments and suggestions through structured interviews. Their collaboration and support have been key for this initiative.

Finally, although the GovTech Index 2020 is focused in Latin America, Spain, and Portugal, we want this to be a wider effort and encourage its expansion beyond the region. This is why we hope to continue working towards developing a global GovTech index in the future.

Carlos Santiso

Director, Digital Innovation in Government
CAF Development Bank of Latin America

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Executive Summary

Latin America is witnessing the widespread emergence of GovTech, a new digital ecosystem with immense potential for solving public challenges, whilst saving government an estimated USD1 trillion. The countries that will be able to get the most value out of it, will be those with the appropriate capabilities for welcoming innovation, whilst enabling a collaborative environment between startups and government. In light of this, as this new digital ecosystem is developing in Latin America, countries need to position themselves to allow the GovTech ecosystem to flourish.

The 'GovTech Index' report measures the maturity of the GovTech ecosystems across Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Mexico, Panama, Paraguay, Peru, Portugal, Spain, Uruguay, and Venezuela. In addition to this, we piloted our methodology at the city-level in Buenos Aires, Mexico City, and São Paulo. As a result of our research, we were able to produce extensive regional, as well as country-specific analyses and recommendations for providing an environment where the GovTech ecosystem can thrive.

This report was conceived, commissioned and funded by CAF -Development Bank of Latin America. It was developed by Oxford Insights with input from leading experts of the GovTech ecosystem across Latin America and Europe. The recommendations in this report are based on quantitative research combining existing datasets of existing indexes for scoring countries' maturity of their GovTech ecosystems; desk research assessing existing digital strategies, policies of focus countries, and procurement laws; primary research interviewing 15 experts within governments, venture capital firms, non-profit organizations, GovTech startups, and academia.

Findings

Based on the evidence gathered during our research, the GovTech Index consists of three pillars that are intimately connected with each other: startups industry, government policies, and procurement systems. These pillars are based on 7 policy dimensions: innovation environment, digital environment, industry environment, policy environment, digital government, procurement frameworks, and procurement culture; that were assessed drawing from 28 indicators.

Our index, desk research, and interviews revealed a number of regional patterns. On average, the startup pillar has the lowest score across the whole region. This is largely due to a low availability of venture capital, which is needed for the funding of startups and scaling. Similarly, we found a relatively low score for the industry environment including the number of GovTech startups. Given that the GovTech ecosystem has only started to emerge, however, we are expecting this number to significantly rise in the years to come.

Amongst governments, there is a growing recognition and appetite for using digital strategies for citizens and public sector innovation. Throughout Latin

America, Spain and Portugal, there has been a steep increase in digital strategies. However, only a handful of countries are currently acknowledging the importance of GovTech in their digital strategies, let alone establishing a GovTech specific fund or public challenge. The overall take from the government pillar is that whilst GovTech is slowly gaining traction, there is still significant room for improvement.

The procurement system functions as the nexus element between startups and government. A robust and transparent procurement environment enables startups to sell to government, and government to buy from those startups providing the best solutions to their challenges. Overall the degree to which governments put in place startups-friendly procurement regulations varies in the region. The main challenge seems to be in the procurement culture, in that frequently, whilst there are suitable procurement regulations in place, these are not always enforced. In addition to this, corruption in procurement processes remains a fundamental challenge. Solving these issues will be key for governments, as it will help build trust with startups, whilst signaling that doing good business with government is possible and taken seriously.

Recommendations

Based on the findings outlined above, we propose a number of country-specific as well as regional recommendations for allowing the GovTech ecosystem to thrive. For the startups' pillar, it will be key to create an environment where GovTech startups can be established, maintained, and potentially sold to larger corporations. This will require making sure that startups have the venue for meeting relevant investors, whilst operating in an environment with sufficient digital infrastructure and talent.

Governments, in turn, should create national GovTech strategies as well as GovTech specific challenge programs, funds, and incubators. As in the United Kingdom, an orchestrated policy effort coming from government would signal to startups that government has made a commitment to promoting the GovTech

ecosystem, and foster an environment of mutual trust and collaboration.

Finally, governments will need to update their procurement frameworks and establish rigorous mechanisms for ensuring that these regulations will be implemented thoroughly and transparently. Success cases of recent procurement reforms within the region could function as a model for neighbouring countries.



Below we have listed our recommendations in brief.

Startups

For fostering a better environment for GovTech startups, we suggest that countries:

- Create an annual GovTech conference where startups, government, and investors from the region can interact.
- Establish GovTech-specific incubators to target venture capital.
- Promote open data initiatives and invest in technological infrastructure.

Government

In order to support the development of the GovTech ecosystem government ought to:

- Establish high-level political commitments at the national and international levels to support GovTech initiatives.
- Produce a national GovTech strategy.
- Establish a government-backed GovTech fund.
- Create GovTech-specific public challenges paired with earmarked funds to pilot initiatives.
- Promote the re-use of government open data by GovTech startups.
- Roll out a national-identity system, allowing citizens to use the same credential for using government services. A single credential will hugely accelerate GovTech, as it allows data to be joined up between the different arms of government.

Procurement

In order to facilitate an environment where startups can sell to government and government can buy from startups, we recommend that governments:

- Consider establishing a specific target for the procurement of government technology through start-ups and SMEs.
- Update and adjust procurement laws to ensure that they are SME friendly and have procurement agencies reach out more actively to start-ups and SMEs.
- Invest in open contracting data initiatives to increase trust, transparency, and accountability within procurement processes.
- Establish rigorous procedures and mechanisms for enforcing procurement laws.
- Avoid being too prescriptive about the services sought in the tendering process – a problem first approach will allow smaller startups to pitch innovative solutions.
- Break up large contracts into smaller ones or consider allowing multiple companies to put together a bid, as GovTech startups may struggle to compete with larger technology firms.
- Establish a digital training academy for training public servants in digital skills.

Introduction

GovTech has the potential to transform public services in innovative ways, and help governments in Latin America, Spain, and Portugal pursue a long-overdue digital transformation. Current forecasts predict that the emerging GovTech industry is worth a staggering 1 trillion US dollars (Mulholland, 2010). What's more, a strong GovTech ecosystem will create the conditions for improving citizens' public life whilst providing cost-efficient solutions for making government more effective.

The 2019 GovTech Index, developed with the support of CAF -Development Bank of Latin America- assesses the potential of the GovTech ecosystems of countries in Latin America, Spain and Portugal, so as to unlock them. Based on this research, the GovTech ecosystem consists of three equally weighted pillars: startups industry, government policies, and procurement systems. The latter acts as the connecting element between the former two. This division is especially useful for policymakers, as it allows them to utilise the index as a tool for understanding areas of strengths and weaknesses within each country respectively. These three pillars should not be seen as entirely separate, but rather as interconnected elements that function symbiotically with each other.

We scored each country based on 28 indicators across 7 dimensions, which on aggregate formed the three pillars of the GovTech ecosystem. The majority of these indicators were created using public datasets, and existing indexes such as those from the World Economic Forum or the World Bank. For some indicators, we conducted desk research to create a quantitative score - for example, to score each country's procurement frameworks, we conducted research into each country's procurement laws. Finally, in order to give richness to our quantitative findings, we conducted extensive primary research, engaging leading GovTech experts across Latin America and the rest of the world. Their input was key for creating an index that reflects the ecosystem in its entirety.

The index highlights current disparities between countries' startup sector, government efforts to promote the GovTech ecosystem, and finally the quality and efficiency of their procurement environment. Based on our findings, Spain and Portugal (both Member States of the European Union) display the greatest maturity of their ecosystems. Within Latin America, the upper ranks are occupied mostly by the largest countries, with only small score differences between each of them. The worst performing countries are the smaller countries in Latin America, and in particular those which are currently undergoing political turmoil.

Our research suggested that within each national ecosystem, GovTech seems to have the most potential at the city-level. In some cases, this is because local governments have more autonomy than national governments, providing them with greater leeway for fostering innovation initiatives. More importantly, at the local level SMEs are more likely to have the capacity to meet the financial and human capacities and requirements set out by tender contracts.

Policymakers should aim to promote policies and regulations supporting the three pillars set out in our index. In some cases, minor improvements could create major benefits for creating the conditions where their GovTech ecosystem can flourish.

In many ways, GovTech has become a buzzword which isn't a buzzword yet - meaning it is in the initial stages of its development and widespread implementation. For countries in Latin America and the rest of the world creating the right environment where this new ecosystem can thrive will enable them to tap the incredible prosperity that GovTech will bring in the years to come.

GovTech ecosystem consists of three equally weighted pillars: startups industry, government policies, and procurement systems.

Measuring the Potential of GovTech Ecosystems

According to CAF, GovTech is “The ecosystem in which governments cooperate with startups, SMEs and other actors that use data intelligence, digital technologies, and innovative methodologies to provide products and services to solve public problems... They propose new forms of public-private-partnerships for absorbing digital innovations and data insights to increase the effectiveness, efficiency, and transparency in the delivery of public services.”

If the essence of GovTech is the collaboration between startups and governments to use innovative technologies, the GovTech ecosystem can be distilled into three questions:

Startups: Are there startups and SMEs able to provide these new technologies?

Government: Is there government demand for these products, especially when innovation can be disruptive to existing bureaucracies and ways of working?

Procurement: Can governments and startups easily work together in the existing procurement framework?

These three pillars that show the potential to reach mature GovTech ecosystems (supply from startups, demand from governments, and the framework that allows them to work together) drove the design of our GovTech Index.

Startups

Are there startups and SMEs able to provide these new technologies?

Government

Is there government demand for these products, especially when innovation can be disruptive to existing bureaucracies and ways of working?

Procurement

Can governments and startups easily work together in the existing procurement framework?

The GovTech Index

The index contains
28 indicators across 7 dimensions,
grouped in three pillars.

These components are summarised in
the table below.

Startups

What allows
GovTech startups to
emerge and to build
innovative products?

**Innovation
Environment**

GovTech is all about designing innovative technological solutions, and the key engine for producing these new tools are startups and SMEs. Therefore, one of the key enablers of GovTech is a healthy environment for innovation and entrepreneurship more generally that allows these startups and SMEs to emerge.

**Digital
Environment**

A developed technological infrastructure (e.g. wide availability of broadband) is a crucial enabler of GovTech. As is the availability of open government data, which GovTech companies use to identify public problems and design effective solutions.

**Industry
Environment**

This dimension measures how the two enabling dimensions in this pillar translate into the actual supply of GovTech, both in terms of the number of tech companies more generally and the number of GovTech companies specifically.

Government

What tells us that governments are ready for the innovative and disruptive effects of GovTech?

Policy Environment

Public policies are an important enabler of the uptake of GovTech in government. Through public policies, governments can create commitments to support and adopt innovative technologies. In the most mature GovTech ecosystems, policies such as a National GovTech Strategy signal that these governments are the most ready and eager to take advantage of GovTech.

Digital Government

This dimension measures the existing digital infrastructure in government, as well as existing demand for advanced technology products. This indicates the likely appetite of governments for GovTech products.

Procurement

Is there a procurement environment in which governments and GovTech companies can work together to solve public problems?

Procurement Frameworks

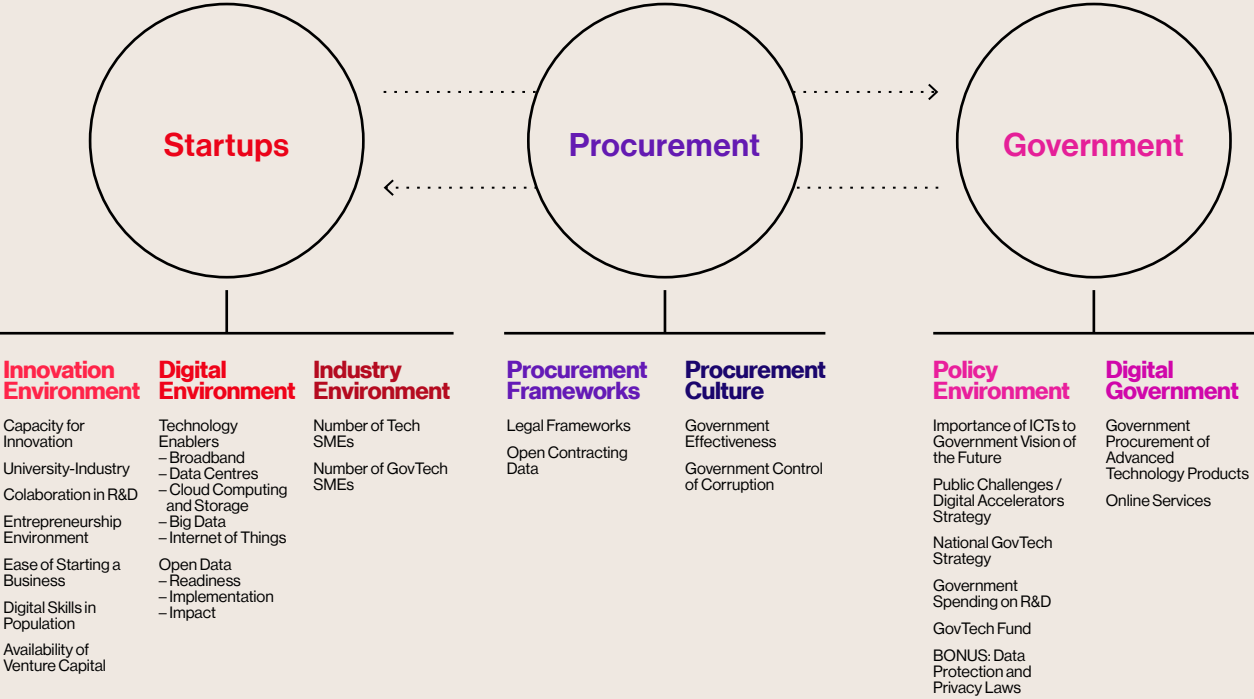
Procurement regulations and policies that are friendly to smaller companies and allow them to compete with larger firms for government contracts are essential to a mature GovTech ecosystem.

Procurement Culture

Procurement regulations are one element of a startup-friendly procurement environment, if these regulations are not enforced consistently due to corruption or ineffectiveness this will be a barrier for GovTech companies that want to contract with the government. The most mature GovTech ecosystems will have procurement cultures that encourage the enforcement of procurement laws and regulations.

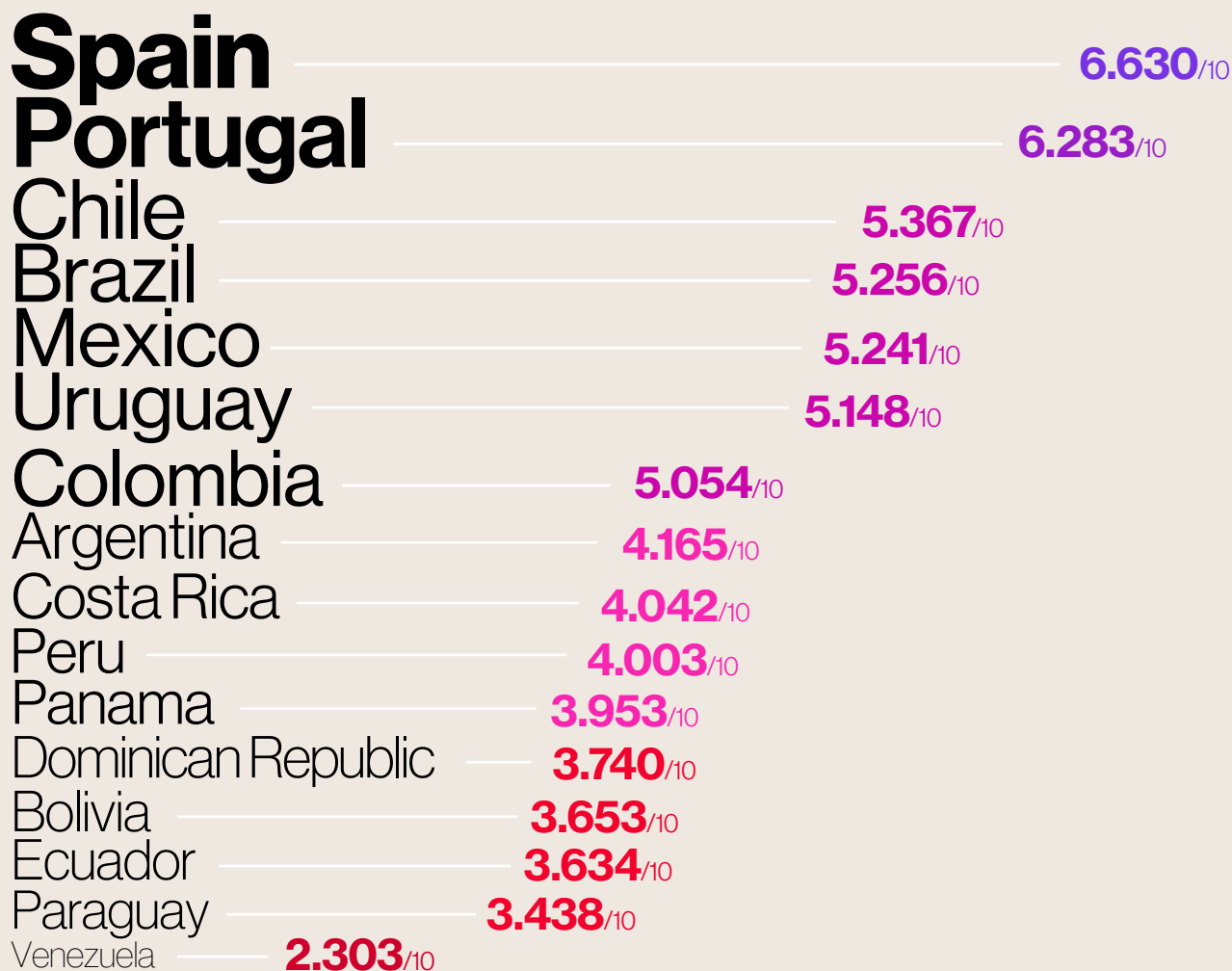
The structure and pillars of the Index can be appreciated in Figure 1, which shows how the indicators, dimensions, and pillars of the GovTech Index come together to form the GovTech ecosystem.

Figure 1
Structure of the GovTech Index
Source: Compiled by the authors



Index Ranking

Source: Compiled by the authors, based on data from...



The full dataset including sources, scores by pillar, dimension, and indicator can be accessed [here](#).

Figure 2
GovTech Index - Regional Scores
Source: Compiled by the authors





Regional Analysis

The Index comprises data from the countries in Latin America, Spain, and Portugal. And, based on the data collected, we've elaborated a ranking which shows the advance of GovTech. Figure 2 provides a visualisation of the regional rankings of the GovTech Index.

Across the region, especially in Latin America, countries could improve the maturity of their GovTech ecosystems in multiple areas. Below are two further charts that emphasise the importance of GovTech for the future of government and show why countries in the region should pay attention to this new phenomenon.

Figure 3

GDP per capita vs GovTech Index Scores

Source: Compiled by the authors.

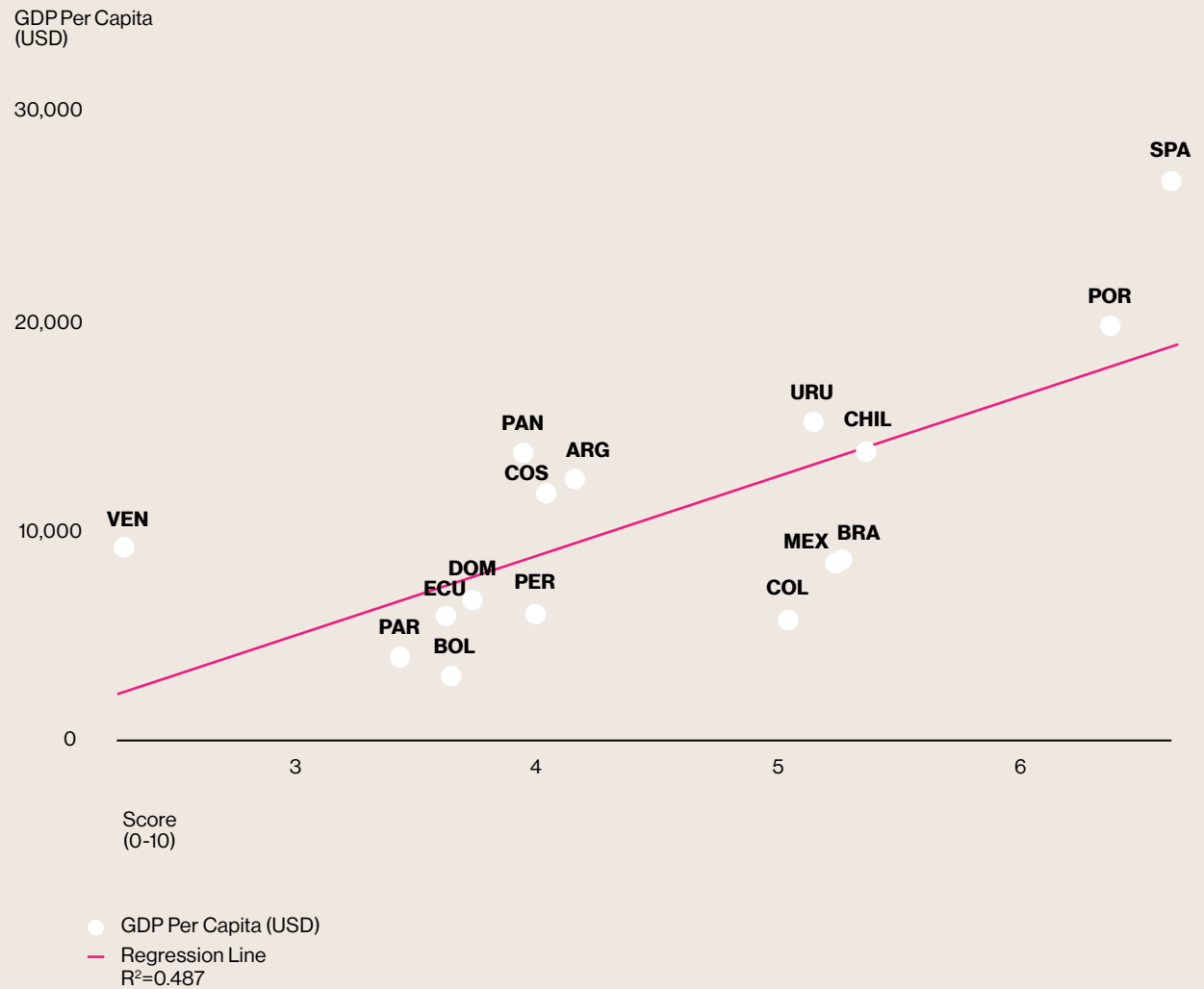
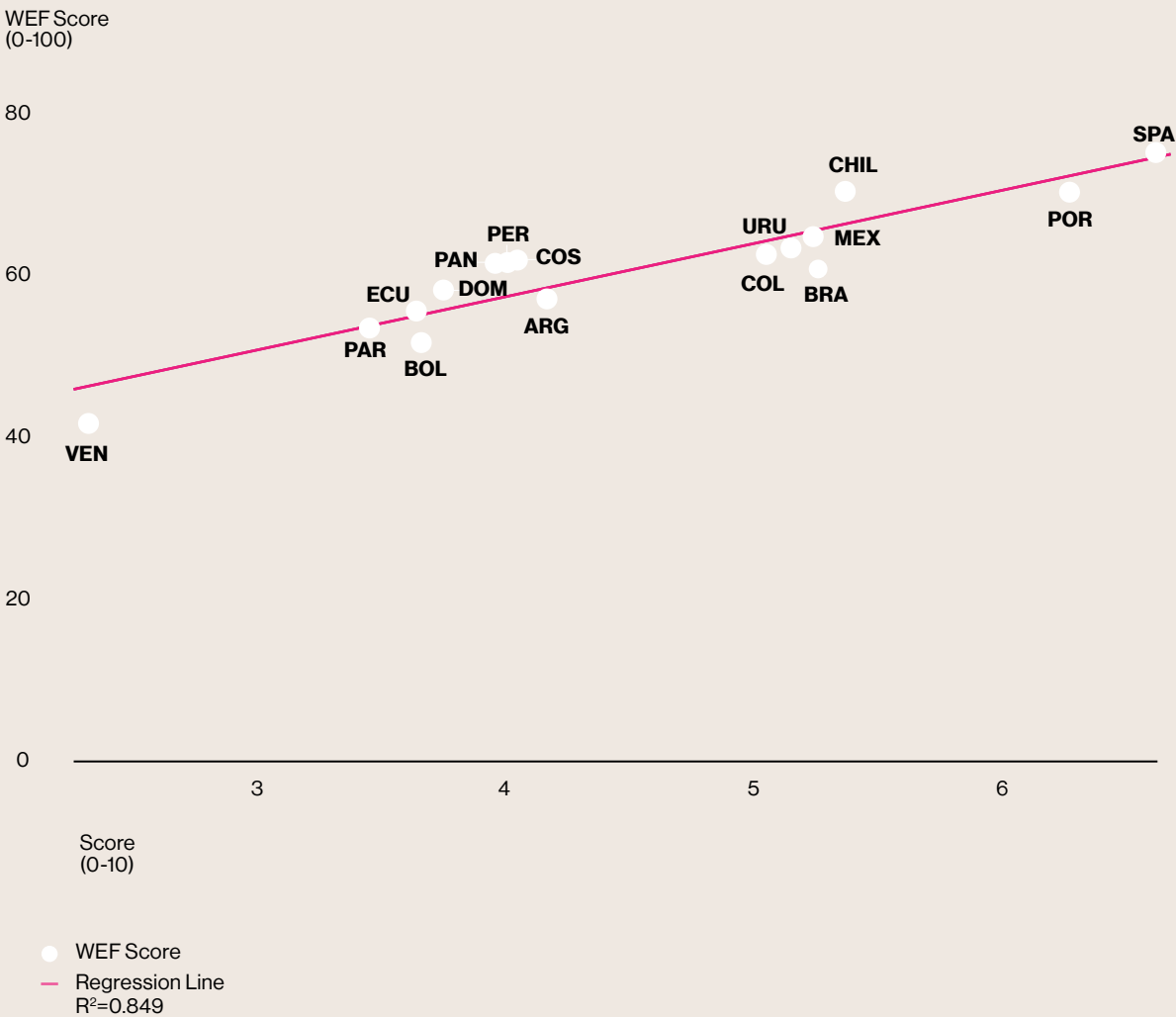


Figure 3 shows the relationship between the score of each country and its GDP per capita in USD. It shows a medium relationship between higher GDP per capita in USD and a higher score in the GovTech Index. This may reflect that richer countries are currently in a better position to take advantage of GovTech; but it may also show the economic opportunities that GovTech represents in countries that take advantage of it. Governments that invest in their GovTech ecosystems may well see an economic benefit.

Figure 4
WEF Global Competitiveness Index vs GovTech Index Scores
 Source: Compiled by the authors based on the WEF Global Competitiveness Index (WEF, 2019)



Across the region, we have identified some common themes and trends surrounding GovTech. Our regional findings are summarised below by pillar.

Startups

The startups pillar has the lowest average score for the region (3.42, compared to 4.62 for the government pillar and 5.45 for the procurement pillar). This is, in part, because of low scores in most countries for their industry environment. In most countries, there are currently only a small number of startups working in the GovTech space. This is perhaps to be expected given the emerging nature of the field of GovTech, but it does show that more needs to be done to develop mature GovTech ecosystems across the region.

Another common theme is the limited availability of venture capital. This problem is particularly acute for GovTech startups, as our research showed that many venture capitalists see selling to the government as risky and unlikely to yield significant rewards. This is in spite of the fact that, across the world, and Latin America, governments are significant buyers of technology products, with millions of dollars worth of contracts up for grabs. A lack of adequate funding for GovTech at present may be one of the factors limiting the number of GovTech startups operating in the region.

Government

Many governments in the region have already recognised the importance of technology and innovation in the public sector, developing National Digital Strategies and investing in the provision of online services. However, there are currently very few countries that recognise the importance of specific GovTech policies, such as a National GovTech Strategy or a public GovTech fund.

This lack of policy-making that is tailored to GovTech exacerbates some of the funding problems that startups in the region experience. Because governments do not yet seem firmly committed to GovTech, selling to government looks risky, and venture capitalists are less likely to back startups looking to break into the public sector market.

Procurement

As the medium that connects governments with startups, the procurement system in Latin America, Spain, and Portugal is key to the development of a mature GovTech ecosystem. Many of our primary sources confirmed that procurement systems can currently present a significant barrier to GovTech startups wanting to contract with the government. Although there are some areas in which procurement regulations could be improved (such as where countries do not have a minimum period for payment from supplier), most of our sources indicated that the main barriers come more from the culture surrounding procurement than from the procurement frameworks themselves.

One factor affecting procurement cultures in the region is the level of digital skills within governments. Some primary sources suggested that governments struggle to attract, train or retain digital talent, meaning that the level of digital skills in governments is fairly low. This means that public officials within procurement are poorly equipped to understand the technical proposals offered by innovative GovTech startups. This, in turn, can contribute to the perception that startups are too risky to make reliable partners in procurement, with governments instead favouring large technology companies such as IBM and Microsoft. If government officials are not able to understand the technological merits of innovative proposals submitted by startups, they are unlikely to take a risk and contract with a smaller company, even though these startups may offer higher quality, better value services than the larger firms.

Finally, corruption emerged as a concerning theme within procurement in Latin America. Our research indicated that corrupt practices, ranging from favouring companies with political connections through to bribery, can all lead to the lax enforcement of procurement laws. GovTech startups are unlikely to be successful in such an environment, as they cannot compete on an equal playing field with larger and better-connected firms. Promisingly, a number of countries in the region have started to publish open contracting data, meaning that corruption and the lax enforcement of procurement laws can be scrutinised and challenged. This increased transparency could have a beneficial effect on the GovTech ecosystem in the future.



Country Analysis

The countries we have analysed are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Spain, Mexico, Panama, Paraguay, Peru, Portugal, Spain, Uruguay and Venezuela.



The following section contains country-specific analyses, identifying the trends and potential of each respective GovTech ecosystem. The countries we have analysed are: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Spain, Mexico, Panama, Paraguay, Peru, Portugal, Spain, Uruguay, Venezuela.

Our country-specific analyses have been conducted by engaging local experts from governments (e.g. ministries for ICT, digitalisation, communications); regional GovTech startups, and consultants that CAF is already working with in the sector. We used the dimensions of the GovTech Index as the framework for determining the topics to focus on during our

primary research. In this way, we complemented our quantitative research with qualitative local expert opinions, helping us to establish country-specific narratives of the GovTech ecosystem. We also complemented our primary and quantitative research with desk research, to generate a full picture including multiple perspectives for each of the countries analysed.

Each country analysis identifies the strengths and weaknesses as well as the general trends within each pillar. It also includes a table with findings and recommendations for each of the dimensions.

Argentina

Index Score

Ranking

Ranking in WEF Global
Competitiveness Index

4.16 /10

8 /16

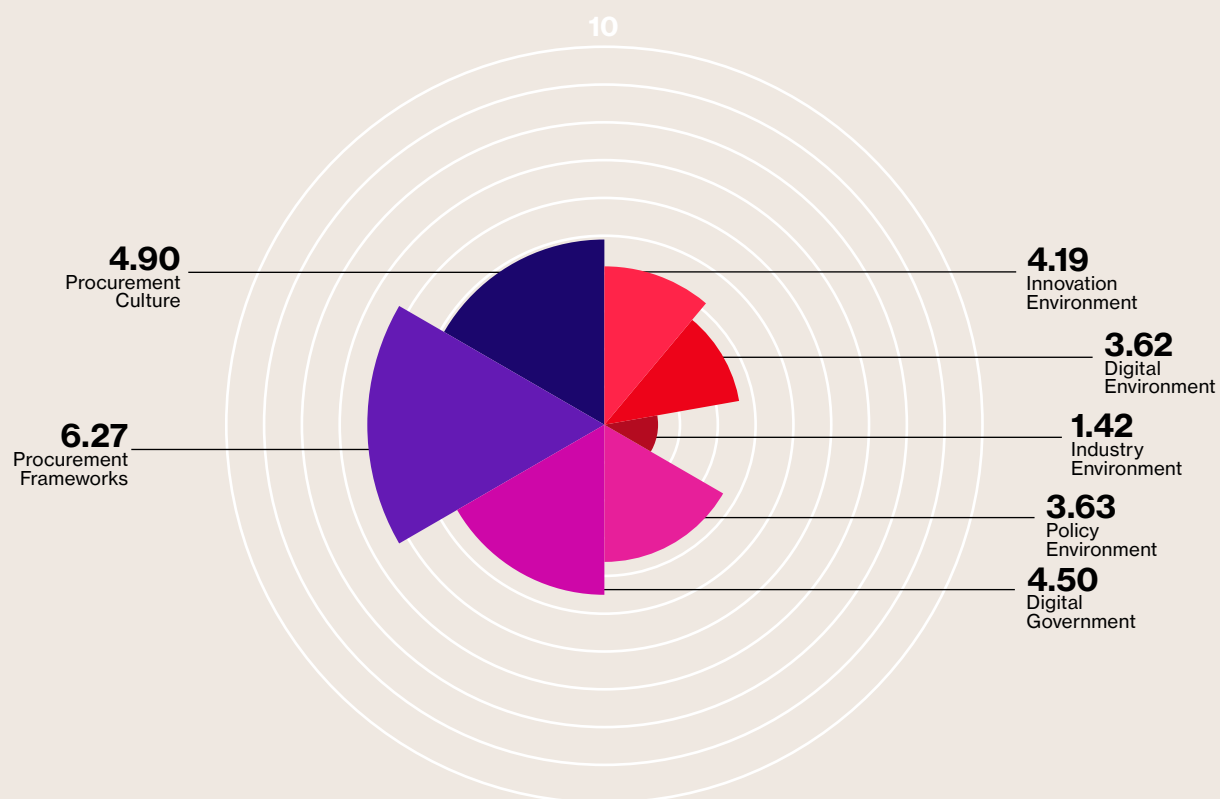
12 /16

Population

GDP per capita

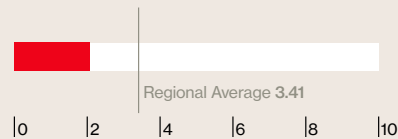
44,689,000

usd 12,449



Startups

3.08/10

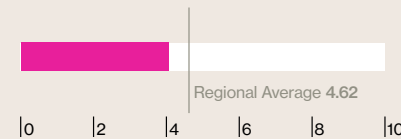


A major challenge for Argentina's startups is the low availability of venture capital, which is the lowest in the region. Given the status of Argentina's economy and current level of trust in government, investors are hesitant to free up capital for startups, and particularly those that are doing business with the government. Whilst the number of startups classified as GovTech is below the regional average, Argentina is home to a remarkable amount of tech startups and digital talent. Given the high digital skills among its population, as well as the potential for innovation, Argentina is perceived to have enormous potential for the development of a GovTech ecosystem - but so far it has made little out of it.

However, whilst at the national level the GovTech ecosystem is still in its infancy, urban areas such as Buenos Aires are witnessing the emergence of buzzing smart cities and open government initiatives, powered by GovTech companies. Argentina's cities are dynamic and more prepared for working and innovating with startups than the federal government. In light of this, Argentina's municipalities provide a promising ground for the development of a local GovTech ecosystem.

Government

4.06/10



Among startups, there is a perception that the development of GovTech and its startup community has been absent in digital government strategies. This is also reflected in its low score for the importance of ICT to the government's vision of the future; and its score for procurement of advanced technologies, which is the second lowest in Latin America.

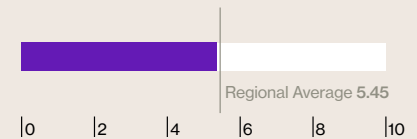
The country also has yet to develop a GovTech fund or strategy. Creating a national GovTech strategy could send a strong signal that the government is committed to establishing a strong linkage with the startup community and foster the development of the ecosystem. Additionally, freeing up resources through a specific GovTech fund and higher procurement of technologies, would help create confidence that doing business with the government could be profitable.

Given the nature of Argentina's government system, there seems to be competition between different branches, with different departments buying different technologies. As a result, technological products end up being used in silos rather than shared collaboratively. This suggests that rolling out GovTech related technologies might be more effective at a local level with manageable government structures.

Political and economic stability are factors that could be affecting the GovTech ecosystem, since they have resulted in cuts in public spending, as shown in its low R&D investment, as well as increased the risk perception of investors in investing into startups that work with government

Procurement

5.36/10



Argentina's score in the procurement dimension is in part due to regulations that are perceived to be unfriendly to startups. Startups have voiced complaints that time periods for submitting a bid tend to be extremely short and require significant amounts of paperwork. This is problematic for smaller sized companies, which have limited human resources to devote to the writing of bids. Modernizing its procurement systems and making it fit for buying in the knowledge economy will be a key challenge for Argentina.

Finally, in line with the overall regional trend, the government of Argentina lacks digital savviness around GovTech, making it difficult for public officials to understand the value and technical proposals provided by startups. This can result in imperfect assessments of these proposals, as well as a tendency to award contracts to bigger firms that are seen as lower risk.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.19/10	<ul style="list-style-type: none">– Low availability of venture capital.	<ul style="list-style-type: none">– Create a GovTech specific platform for connecting investors and startups.
Digital Environment	3.62/10	<ul style="list-style-type: none">– Medium availability of open government data.– Below-average scores for the five technology enablers (Broadband, Big Data, Cloud, IoT, and Data Centres).	<ul style="list-style-type: none">– Foster initiatives for promoting open data.– Invest in technology infrastructure.

Government

Policy Environment	3.63/10	<ul style="list-style-type: none">– No GovTech-specific policies such as a National GovTech Strategy or a GovTech Fund.– Low spending on R&D.– Low importance of ICTs for government vision of the future.	<ul style="list-style-type: none">– Create a National GovTech Strategy.– Use stimulus funds to establish a GovTech fund.
Digital Government	4.50/10	<ul style="list-style-type: none">– Limited willingness of government to digitise and innovate.– Low government procurement of advanced technologies.	<ul style="list-style-type: none">– Commission study for investigating benefits of GovTech and digitisation of government.

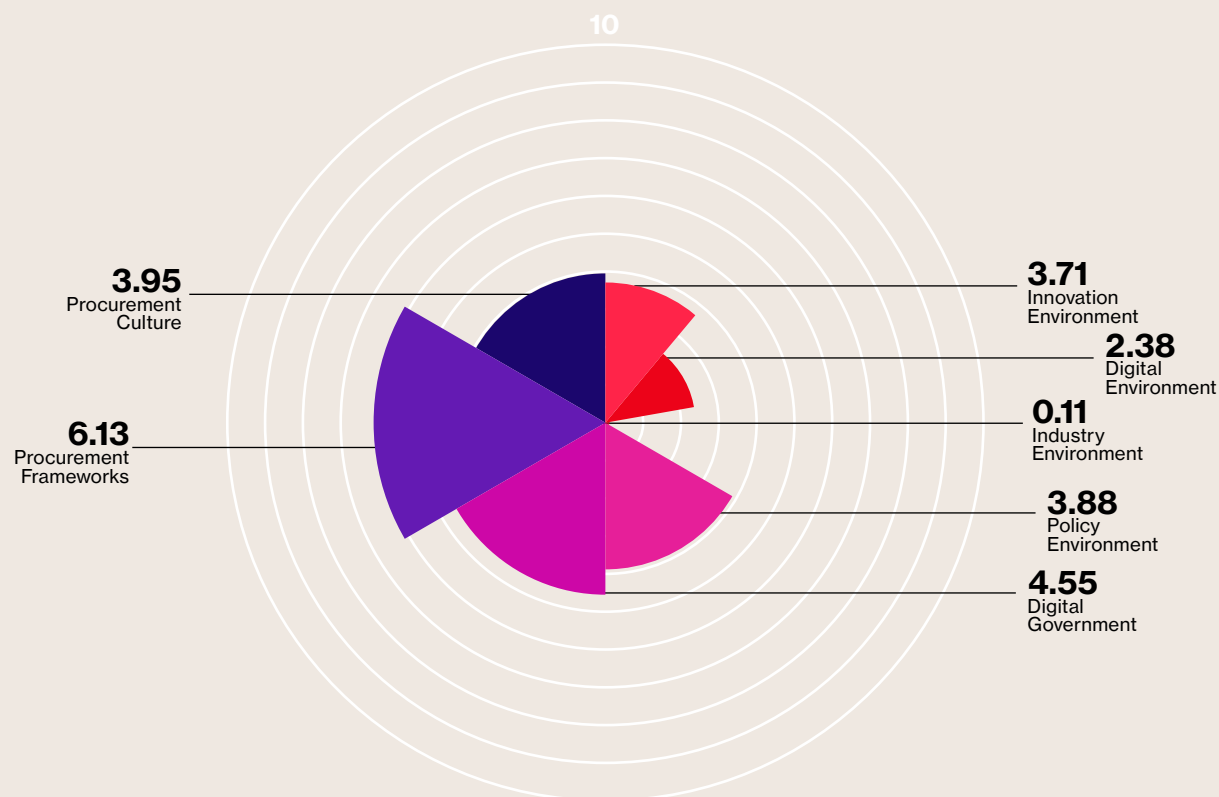
Procurement

Frameworks	6.27/10	<ul style="list-style-type: none">– No minimum bidding time for startups.– No policy regulation specifying a % of bids to be awarded to SMEs.	<ul style="list-style-type: none">– Introduce regulation that ensures minimum time for bidding.– Establish targets for % of contracts that will be awarded to SMEs.
Culture	4.90/10	<ul style="list-style-type: none">– Limited digital savviness within government which affects assessment of proposals.– Perception of corruption of government.– Partial enforcement of procurement laws.	<ul style="list-style-type: none">– Promote digital literacy within government.– Establish rigorous procedures for meeting procurement deadlines and enforcing regulations.



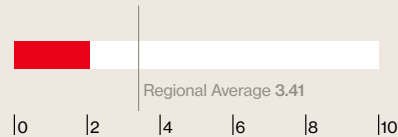
Bolivia

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
3.65 _{/10}	13 _{/16}	15 _{/16}
<hr/>		
Population	GDP per capita	
11,216,000	usd 3,860	



Startups

3.08/10



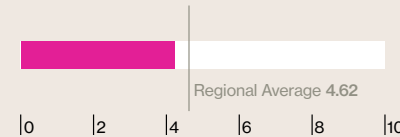
Bolivia's startup environment is largely unfavourable for the flourishing of a GovTech ecosystem. It scores below the regional average on every indicator within the startups pillar, with the exception of venture capital availability – but even in this case, investors are reportedly hesitant to support startups doing business with government, as it is considered to be a risky investment.

Entrepreneurs generally perceive it as difficult to start a business in the country. And similarly, the availability of digital talent among its population is low. In addition, university-industry collaboration in R&D, which could be an important channel for startups to recruit digital talent, is fairly limited. Overall, this has negatively impacted the entrepreneurship environment within Bolivia, but also its general capacity for innovation.

Furthermore Bolivia does not provide a sufficiently mature data and technology infrastructure. The levels of open data through which startups create technologies, as well its general degree of connectivity which enables technological development score poorly. Bolivia's challenges within the startups pillar, are also echoed in the number of its tech startups, which are the lowest in the region.

Government

4.06/10

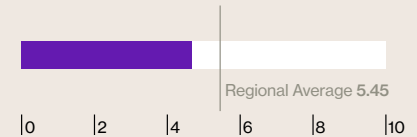


Bolivia's current administration has been in power since 2006. On the one hand, this has created a degree of political continuity which contributed to a period of sustained growth and a reduction in inequality (The World Bank, 2019). However, there is no clear strategy to promote government innovation in the same fashion.

To date, Bolivia's government displays little readiness to adopt and promote the development of these technologies. Bolivia does not have a national GovTech strategy, nor does it have a public GovTech fund. Similarly, Bolivia has one of the lowest levels of online services for e-government in the region. The current administration has made a commitment to foster government innovation, and increased its procurement of advanced technologies, but so far this has done little to improve its policy environment and digital government.

Procurement

5.36/10



One of Bolivia's main challenges remains in its perceived levels of corruption, and especially within its procurement processes. Bolivia has put in place a procurement framework which could be promising. However, the actual enforcement of this framework will be the main challenge. For startups this is problematic, as it creates the perception that engaging in bidding processes, and more generally doing business with government is risky.

In addition to this, Bolivia displays low levels of open contracting data. Increasing its levels of open contracting data could function as a mechanism for increasing accountability and scrutiny within procurement processes. Furthermore this would signal to startups that government is committed to enforcing its regulations as well as cracking down on corruption.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	3.71 _{/10}	<ul style="list-style-type: none"> – Low university-industry collaboration. – Low levels of digital skills in population. – Low entrepreneurship environment. 	<ul style="list-style-type: none"> – Invest in digital education at secondary and tertiary levels to boost digital skills. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	2.38 _{/10}	<ul style="list-style-type: none"> – Low availability of open government data. – Low score for the five technology enablers. 	<ul style="list-style-type: none"> – Foster initiatives for promoting open data. – Invest in technology infrastructure.

Government

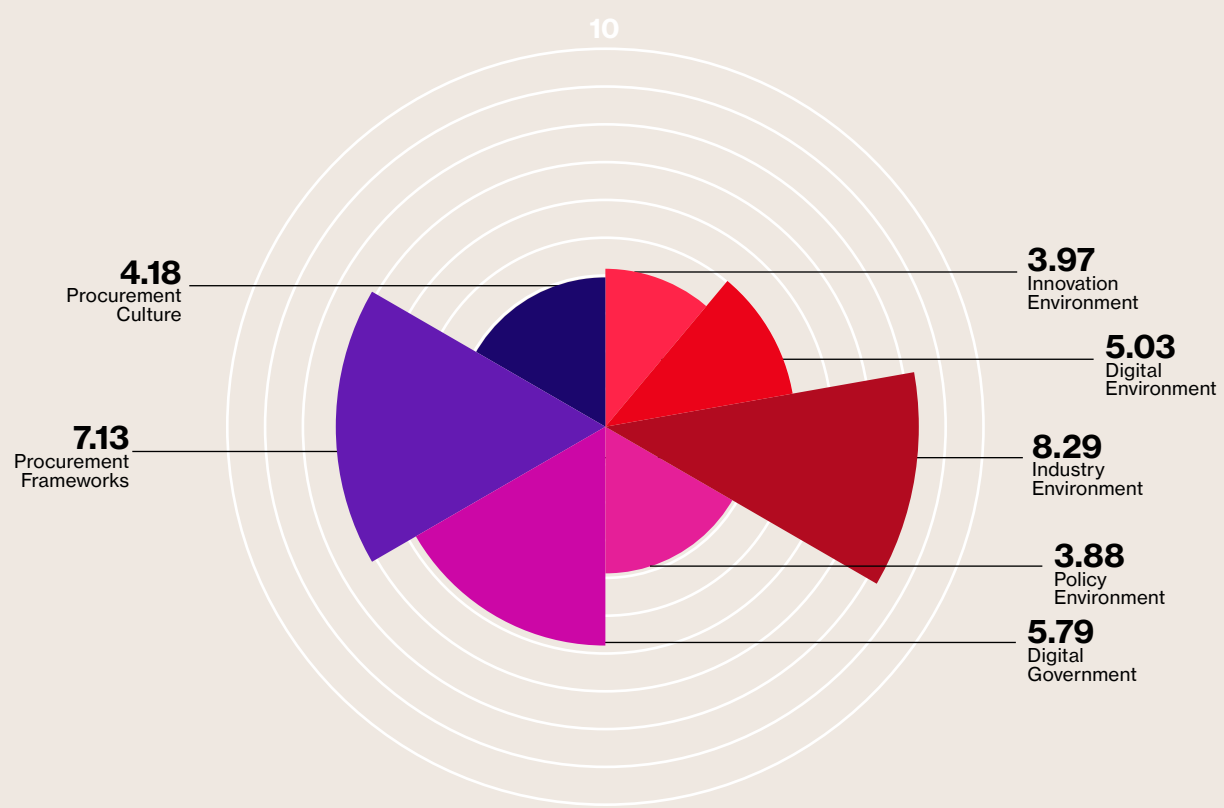
Policy Environment	3.88 _{/10}	<ul style="list-style-type: none"> – No GovTech-specific policies such as a National GovTech Strategy or a GovTech Fund. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund.
Digital Government	4.55 _{/10}	<ul style="list-style-type: none"> – Limited willingness of government to digitise and innovate. – Low provision of online services. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of government. – Work with GovTech startups to improve provision of online services.

Procurement

Frameworks	6.13 _{/10}	<ul style="list-style-type: none"> – Low levels of open contracting data. – No regulation on payment period. 	<ul style="list-style-type: none"> – Establish targets for % of contracts that will be awarded to SMEs. – Establish deadline for payment period of suppliers.
Culture	3.95 _{/10}	<ul style="list-style-type: none"> – Limited digital savviness within government which affects assessment of proposals. – High perception of corruption of government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Promote digital literacy within government. – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.

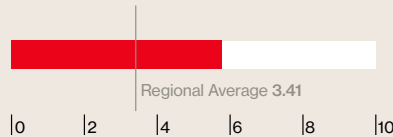
Brazil

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
5.26 _{/10}	4 _{/16}	10 _{/16}
<hr/>		
Population	GDP per capita	
210,868,000	usd 8,960	



Startups

5.77/10

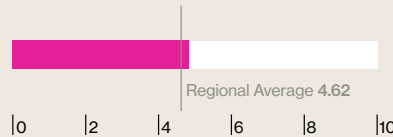


In the last few years, Brazil has experienced a real GovTech movement, making it home to the largest number of GovTech startups in Latin America. Brazil provides a promising technical infrastructure for startups, through its high availability of open data and technology enablers. But most importantly, within Latin America Brazil has created a regulatory environment where businesses can be started easily and absorb digital talent from university-industry collaborations.

The main challenge for startups within the Brazilian GovTech ecosystem is funding. There are several venture capital firms and funds available across different industries, but with no specific vertical for GovTech. This is largely because Brazil is currently experiencing a crisis of trust between the private and the public sector, and investors have expressed concern over being associated with government.

Government

4.84/10

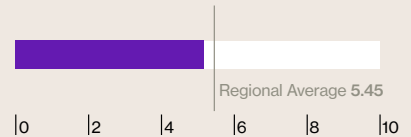


At present, suitable policies supporting the flourishing of a GovTech ecosystem are still in development. So far this has been a major point of concern for Brazil. The Brazilian government has historically been generous with its expenditure in R&D. Yet, in its most recent digital strategy, the 'Estratégia Brasileira Para a Transformação Digital' (Governo federal do Brasil, 2018), there was no mention of GovTech. Brazil's big opportunity here is to free up some of its R&D budget to create a fund and public challenges that are specifically and exclusively for GovTech.

Furthermore, the Brazilian government scores exceptionally high in the establishment and provision of online services, showing an overall willingness to digitise government. Following the election of president Bolsonaro there were speculations that the current digitisation trend would come to a halt. However, the new administration has kept in place previous leaders within the responsables of the digital agenda, showing commitment in continuing the adoption of new technologies and innovating public services.

Procurement

5.16/10



Brazil is making significant efforts to improve its procurement framework. The government is soon expected to pass a new procurement law, the 'Marco legal de startups', which seeks to create a friendlier environment for startups. However, given that Brazil is a federation consisting of several states, it will be necessary to harmonise these laws in order to eliminate present inefficiencies and legal deadlocks.

The most pressing issue remains a lack of trust in government. Recent corruption scandals have harmed public trust in Brazil's government and procurement system, as echoed in its low score in procurement culture. Amongst the startups and general population, there is a perception that government cannot be trusted, and thus, whilst the government might have suitable procurement policies in place, they are often not enforced.

This mistrust is also present within government itself, such that in cases where there is a direct procurement process, public authorities are quick to launch investigations into potential corruption affairs. Rebuilding that trust with domestic, as well international startups, will be the most important challenge for Brazil to maintain its position.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	3.97/10	<ul style="list-style-type: none">– Moderate availability of venture capital.– Medium digital skills in population.	<ul style="list-style-type: none">– Invest in digital education at secondary and tertiary level to boost digital skills.– Increase frequency of GovTech specific events connecting investors, startups, and government.
Digital Environment	5.03/10	<ul style="list-style-type: none">– Extend technology infrastructure to cover more rural areas in the country.	<ul style="list-style-type: none">– Extend technology infrastructure to cover more rural areas in the country.

Government

Policy Environment	3.88/10	<ul style="list-style-type: none">– Lack of a GovTech strategy.– Lack of a GovTech specific fund.	<ul style="list-style-type: none">– Extend technology infrastructure to cover more rural areas in the country.
Digital Government	5.79/10	<ul style="list-style-type: none">– High score for provision of online services.– Ongoing process of government digitisation.– Moderate government procurement of advanced technologies.	<ul style="list-style-type: none">– Free up resources to create a fund exclusively for GovTech.– Create a national GovTech strategy.

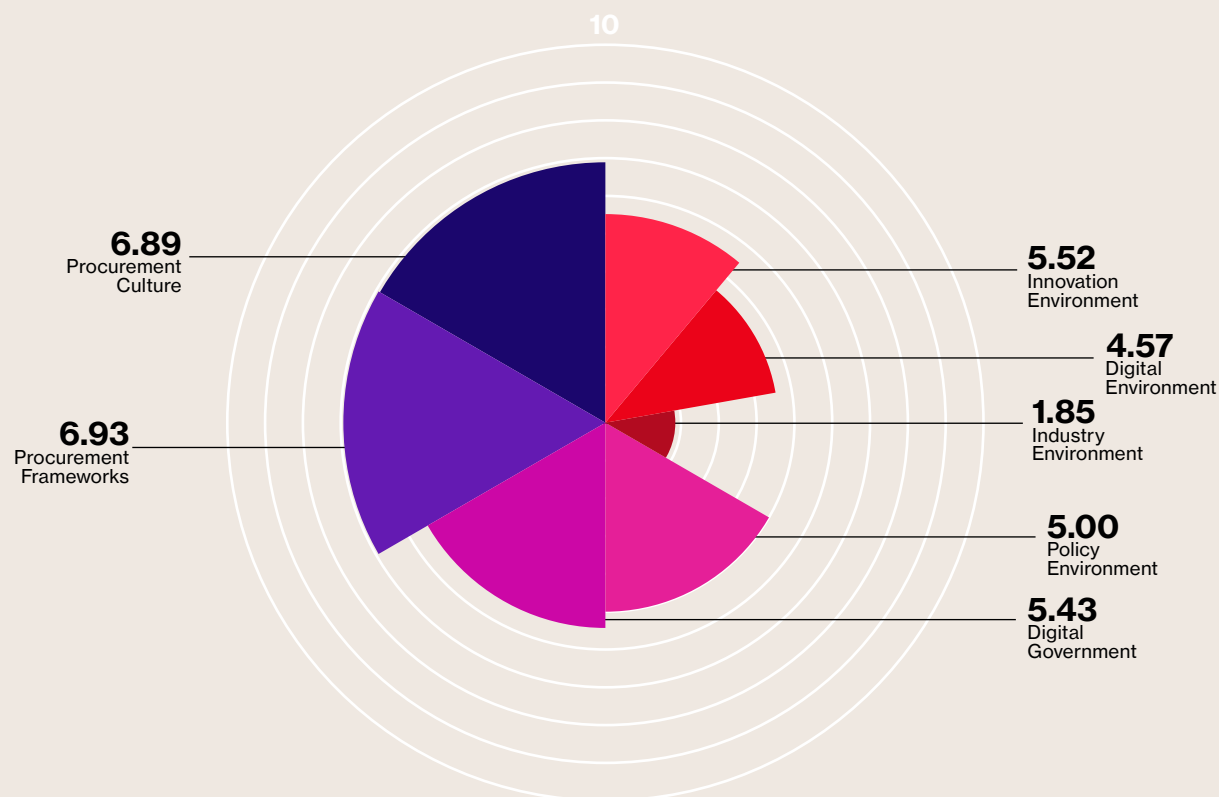
Procurement

Frameworks	7.13/10	<ul style="list-style-type: none">– No policy for payment period for suppliers.– No set % of bids that are awarded to SMEs.	<ul style="list-style-type: none">– Establish deadline for payment period of suppliers.– Investigate whether it could be beneficial to set a % of bids that need to be awarded to SMEs.
Culture	4.18/10	<ul style="list-style-type: none">– Perception of corruption in government.– Partial enforcement of procurement laws.	<ul style="list-style-type: none">– Establish rigorous procedures for meeting procurement deadlines and enforcing regulations.– Tackle government corruption and build public trust.



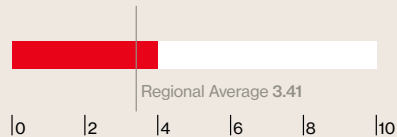
Chile

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
5.37 /10	3 /16	2 /16
Population	GDP per capita	
18,197,000	usd 15,850	



Startups

3.98/10

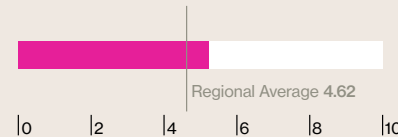


In Latin America, Chile displays the highest level of readiness for developing a strong GovTech ecosystem. The ease of starting a business in the country, as well as the high digital skills of its population, make it a promising environment for innovation. Chile provides a strong technological infrastructure through which GovTech startups can develop their products.

However, there is limited evidence proving that open data policies have had a positive impact. Investing in research into these benefits could incentivise government to further open up its data and create a more tech-friendly mentality. At present, the country is home to a moderate number of GovTech startups, but with the right policies and regulations in place, Chile could build the strongest GovTech ecosystem in Latin America.

Government

5.21/10

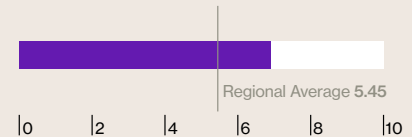


Chile's government has made advanced technologies a core component of its vision of the future. It has established a robust e-governance infrastructure, and procurement of technology has been on a constant climb. However, whilst Chile officially acknowledges the importance of GovTech, it does not have a national strategy to systematically promote the development of this ecosystem.

Furthermore, Chile does not have a fund that is specifically and exclusively for GovTech startups. Freeing up capital for such fund, as well as creating a national strategy would signal to startups and investors that the government is willing and able to foster the development of its ecosystem.

Procurement

6.90/10



Chile's procurement system counts as one of the most effective ones within Latin America. Since establishing its e-procurement system ChileCompra, the country has managed to establish a platform that has become an example for the whole region. This has benefited especially SMEs which have seen the number of contracts (in value) awarded rise from 24% to 44% between 2003 and 2015 (Timm, 2015).

In addition to this, Chile is the country with the lowest levels of corruption in Latin America. In procurement processes, ChileCompra has contributed to creating a degree of transparency and accountability through a mix of open contracting data standards, startup-friendly regulations, and rigorous prosecution of corruption cases. This has increased trust for startups that want to do business with government. Both its procurement framework and culture thus provide a particularly fertile ground for Chile's GovTech ecosystem to flourish.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	5.52/10	– Startups friendly innovation environment.	– Establish events where entrepreneurs, investors, and government can connect.
Digital Environment	4.57/10	– Medium levels of open data availability. – Medium levels of technology enablers.	– Foster initiatives for promoting open data. – Increase investments in technological infrastructure.

Government

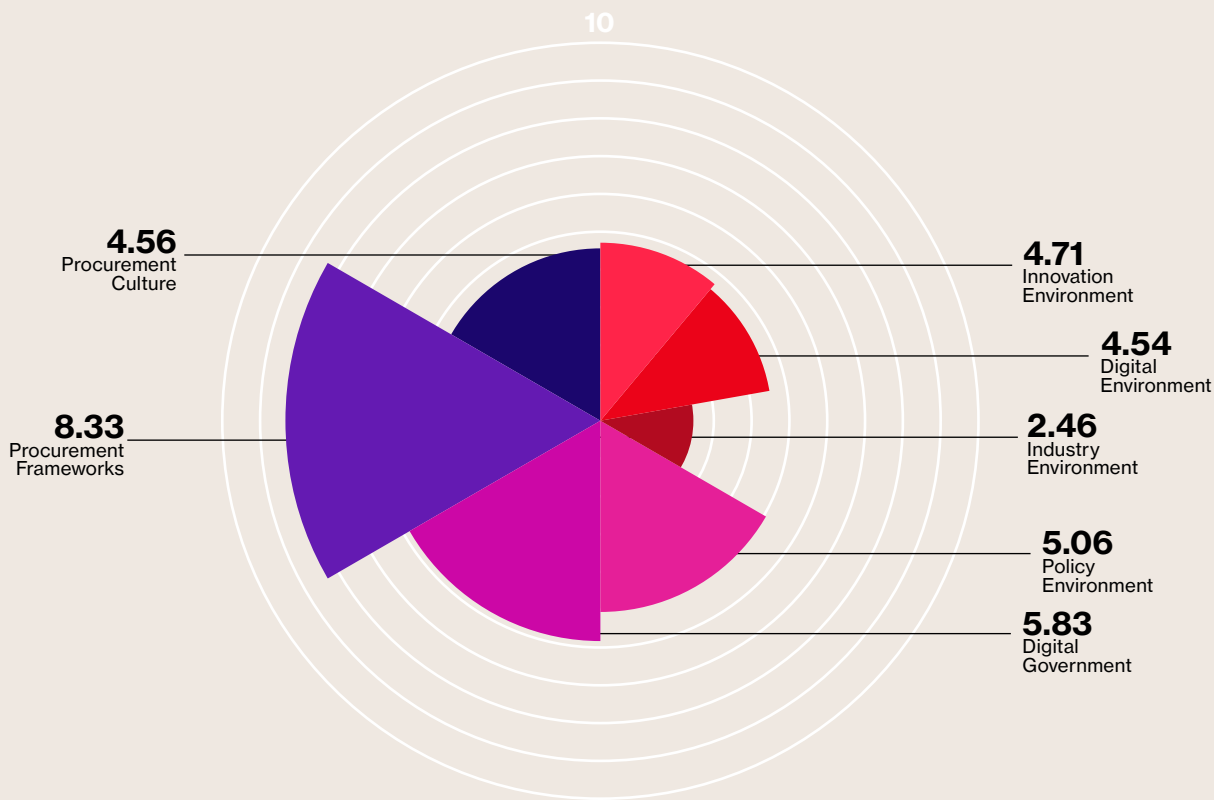
Policy Environment	5.00/10	– GovTech strategy available but only as part of a larger programme. – Lack of a GovTech fund.	– Extend GovTech strategy to the whole of government. – Create fund exclusively for GovTech.
Digital Government	5.43/10	– Strong online services for e-governance.	– Extend online services for e-governance.

Procurement

Frameworks	6.93/10	– Robust procurement framework, but with no set % of bids that are awarded to SMEs.	– Investigate whether it could be beneficial to set a % of bids that need to be awarded to SMEs.
Culture	6.89/10	– Low levels of corruption in procurement procedures.	– Maintain and engrain rigorous procedures for tackling corruption within procurement processes.

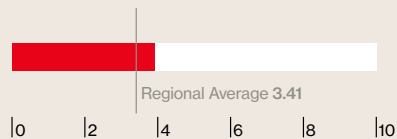
Colombia

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
5.05 /10	7 /16	6 /16
Population	GDP per capita	
49,465,000	usd 6,740	



Startups

3.90/10



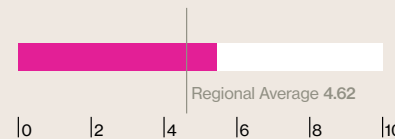
Colombia has created a robust innovation environment, scoring above the regional average on most indicators of this dimension. In particular, the ease of starting a business has made the Colombian startup scene particularly competitive, as administrative hurdles to found a company have been removed.

Colombia also provides a stable technological infrastructure through its high availability of open data and connectivity, which is ideal for GovTech SMEs to develop their technologies.

In spite of this, GovTech in Colombia has only just started to emerge as an entrepreneurial field. This is echoed in its comparatively low number of GovTech startups. Nevertheless, given its favourable circumstances, this field is growing at a rapid pace. Furthermore, Colombia can take advantage of skills and knowledge from other entrepreneurship ecosystems, such as Fintech, where it is a leader within the region.

Government

5.45/10

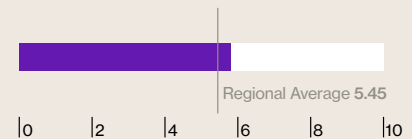


Colombia's government has shown commitment to foster the development of its GovTech ecosystem, as shown in its high score in importance of ICT to government's vision of the future. The current administration launched the public innovation lab last year. As a requirement, it set forth that public bodies need to launch a prerequisite number of public challenges. Their main challenge here, however, is that these bodies at times lack the financial resources, making it difficult for them to meet these goals. Freeing up resources for enabling R&D and prototyping could help these public bodies enable the creation of these public challenges.

Furthermore, whilst Colombia does not have a comprehensive stand-alone GovTech strategy, they have acknowledged its importance in their upcoming development plan. At present, the public innovation team is also exploring opportunities to establish a GovTech fund. All in all, the Colombian government is opening pathways for the successful development of its GovTech ecosystem, and among SMEs there is a perception that the current government is very supportive. If its policy efforts prove to be successful, Colombia could become one of the main leaders in the region.

Procurement

5.82/10



An important challenge lies in Colombia's procurement environment. Colombia is making progress in tackling corruption. Its high openness of contracting data has particular potential for establishing transparency and accountability within its procurement processes. However, corruption still remains a fundamental challenge for ensuring that startups feel confident that government is a reliable business partner. Furthermore, startups reported that whilst Colombia has a robust procurement framework in place, it frequently fails to enforce its regulations, creating uncertainty for startups aiming to sell to government. This particularly affects the payment periods for startups after completing the terms of the contract, as well the time startups have to submit a bid.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.71/10	<ul style="list-style-type: none"> – Medium capacity for innovation. – Moderate availability of venture capital. 	<ul style="list-style-type: none"> – Create a GovTech specific platform and events for connecting investors, startups, and government. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	4.54/10	<ul style="list-style-type: none"> – High levels of open data and technological infrastructure. 	<ul style="list-style-type: none"> – Increase implementation of open data and investigate its beneficial impact to further promote open data culture.

Government

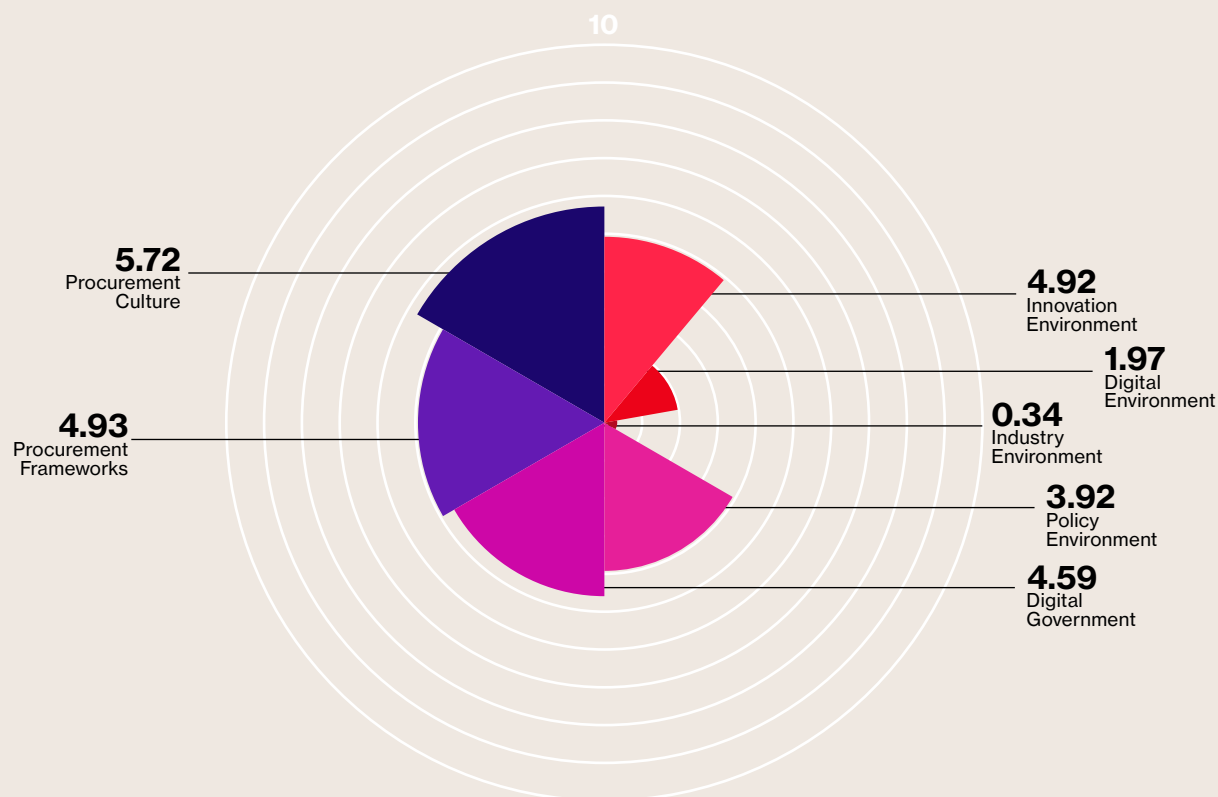
Policy Environment	5.06/10	<ul style="list-style-type: none"> – GovTech mentioned within wider development programme. – Lack of a GovTech fund. – Limited funding for public bodies to create public challenges. 	<ul style="list-style-type: none"> – Create a national GovTech strategy. – Create a fund exclusively for GovTech startups. – Increase funding for public bodies to be able to meet public challenges targets set by the current administration.
Digital Government	5.83/10	<ul style="list-style-type: none"> – Strong online services. – High demand of government for tech products. 	<ul style="list-style-type: none"> – Extend online services. – Increase availability of funds for public bodies to purchase tech products.

Procurement

Frameworks	8.33/10	<ul style="list-style-type: none"> – No set deadline for payment period of suppliers. – No set % of bids awarded to SMEs. 	<ul style="list-style-type: none"> – Investigate whether it could be beneficial to set a % of bids that need to be awarded to SMEs.
Culture	4.56/10	<ul style="list-style-type: none"> – Moderately high perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.

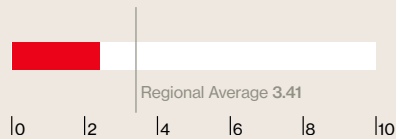
Costa Rica

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
4.04 /10	9 /16	7 /16
Population	GDP per capita	
4,953,000	usd 12,690	



Startup

2.41/10

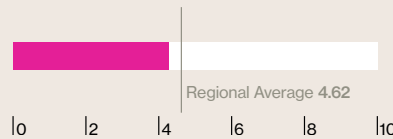


Costa Rica's low score in this pillar is mainly due to its industry environment score, reflecting its small number of tech startups generally and GovTech startups specifically compared to elsewhere in the region.

However, the scores in its innovation environment indicates potential for future growth, especially as it has the highest score in the region for the digital skills of its population. The fact that it is legal to pay workers in Costa Rica in cryptocurrency may be one future drivers of GovTech innovation around blockchain and other cryptocurrency projects (Launchway Media, 10 Ways Costa Rica is Becoming a Thriving Technology Hub, 2019).

Government

4.26/10

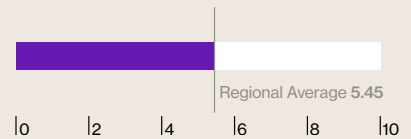


The government of Costa Rica has already taken steps to encourage tech innovations through incentives such as free trade zones and hubs in San José (Legal Team Costa Rica, 2019).

However, the country currently lacks public policies tailored to GovTech specifically, such as a GovTech strategy or a GovTech fund. Such targeted policies would improve the country's readiness for GovTech.

Procurement

5.46/10



Costa Rica scores close to the regional average for its procurement environment, and there is room for improvement in making the system more open to bidding by GovTech startups. The Costa Rican Union of Chambers and Associations of the Private Business Sector (UCCAEP) issued a statement in July 2019 expressing concern at the regularity (over 40% of total public procurement) with which government institutions use the exception from competitive bidding provided in law to issue a large number of direct contracts. These direct contracts are often awarded to public sector entities (Central America Data, 2019), discouraging the kind of private sector activity in which GovTech can flourish.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.92/10	<ul style="list-style-type: none">– Limited availability of venture capital.– Medium scores for ease of starting a business and entrepreneurship environment.	<ul style="list-style-type: none">– Create a GovTech specific platform for connecting investors and startups.– Improve regulations for starting a business.– Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	1.97/10	<ul style="list-style-type: none">– Low availability of open government data.	<ul style="list-style-type: none">– Foster initiatives for promoting open data.

Government

Policy Environment	3.92/10	<ul style="list-style-type: none">– Medium importance of ICTs to government vision of the future.– Lack of a GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy.– Medium spending on R&D.	<ul style="list-style-type: none">– Create a National GovTech Strategy.– Invest in a GovTech Fund.
Digital Government	4.59/10	<ul style="list-style-type: none">– Low score for online services.– Low score for government procurement of advanced technology products.	<ul style="list-style-type: none">– Commission study for investigating benefits of GovTech and digitisation of government.– Work with GovTech startups to improve provision of online services.

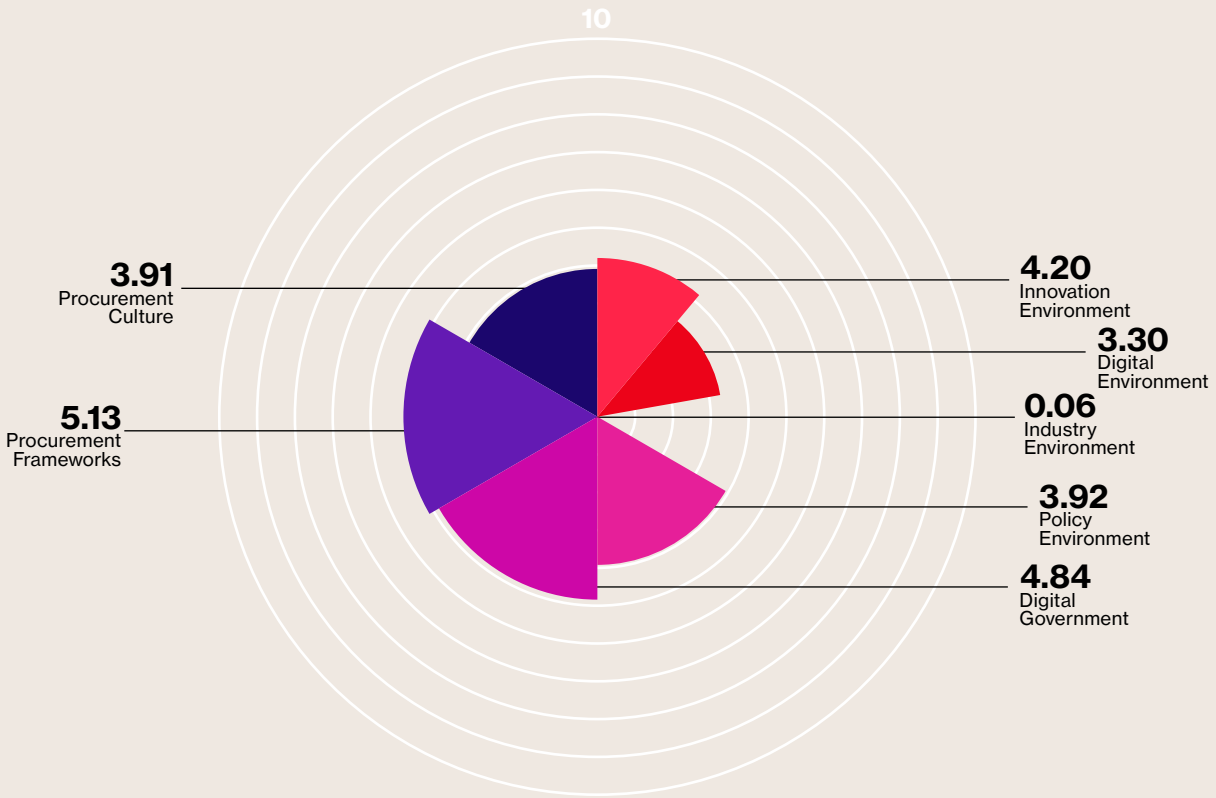
Procurement

Frameworks	4.93/10	<ul style="list-style-type: none">– No strategy/policy for procurement of innovative services.– No regulation on payment period.– No international bidding.– Medium score for open contracting data.	<ul style="list-style-type: none">– Make more contracting data available to aid procurement reform.– Improve procurement regulations by introducing a policy for procurement of innovative services.– Establish deadline for payment period of suppliers.
Culture	5.72/10	<ul style="list-style-type: none">– Above-average scores for government effectiveness and control of corruption.	<ul style="list-style-type: none">– Continue to improve in these areas by promoting more digital literacy in government.



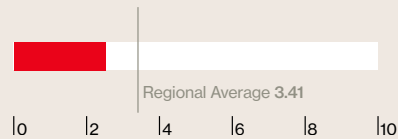
Dominican Republic

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
3.74 /10	12 /16	11 /16
Population	GDP per capita	
10,880,000	usd 9,190	



Startups

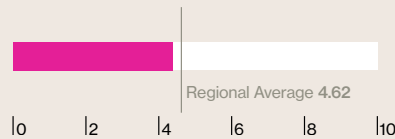
2.52/10



The Dominican Republic has a low supply of tech startups generally and GovTech startups specifically, resulting in a low overall score for its industry environment. However, there are signs of potential for growth in the future. The country scores high in terms of the ease of starting a business, with those in the country able to open a business in around half the time (14.5 days) of those in the rest of the region (30 days). The government has also taken steps to foster the nascent startup ecosystem, launching an official network of mentors for entrepreneurs.

Government

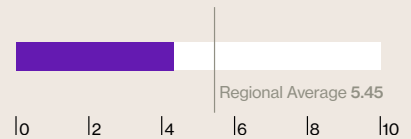
4.38/10



The Dominican Republic scores slightly below the regional average for the government pillar. Like many other countries in the region, it lacks public policies specifically targeted at fostering GovTech, such as a National GovTech Strategy. However, the government has shown its commitment to digital innovation generally through its [Digital Republic programme](#) (Dominican Today, 2017), which aims to improve public services with technology. This shows a promising trend towards using technology to improve the public sector, on which GovTech companies could capitalise.

Procurement

4.32/10



The procurement environment is a definite area of improvement for the Dominican Republic. In particular, low scores for government effectiveness and government control of corruption mean that public procurement is not always fair or transparent. In May 2017, [12 government officials, including the former director of the national water authority, were arrested and brought to court over bribes given to state officials in exchange for public works contracts \(GAN Integrity Inc., 2018\)](#). For GovTech companies to be able to bid competitively for government contracts, this corruption needs to be tackled.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.20/10	<ul style="list-style-type: none"> – Low university-industry collaboration. – Medium digital skills in population. – Low entrepreneurship environment. – Low availability of venture capital. 	<ul style="list-style-type: none"> – Invest in digital education at secondary and tertiary level to boost digital skills. – Create a GovTech specific platform for connecting investors and startups – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	3.30/10	<ul style="list-style-type: none"> – Medium availability of open government data. 	<ul style="list-style-type: none"> – Foster initiatives for promoting open data.

Government

Policy Environment	3.92/10	<ul style="list-style-type: none"> – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. – Medium importance of ICTs to government vision of the future. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund.
Digital Government	4.84/10	<ul style="list-style-type: none"> – Medium score for provision of online services. 	<ul style="list-style-type: none"> – Work with GovTech startups to improve provision of online services.

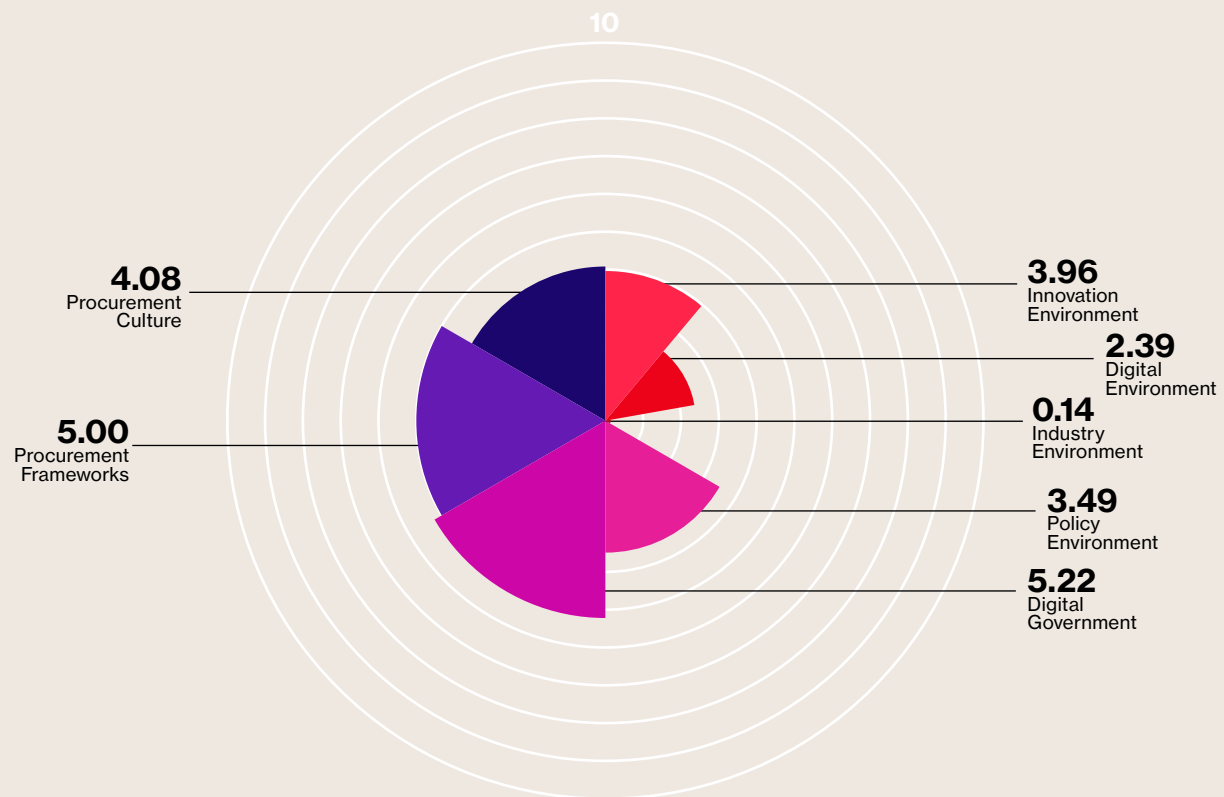
Procurement

Frameworks	5.13/10	<ul style="list-style-type: none"> – No policy for procurement of innovative services at the central level. – No policy for payment period for suppliers. – Low availability of open contracting data. 	<ul style="list-style-type: none"> – Make more contracting data available to aid procurement reform. – Improve procurement regulations by introducing a policy for procurement of innovative services at the central level. – Establish deadline for payment period of suppliers.
Culture	3.91/10	<ul style="list-style-type: none"> – Perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.



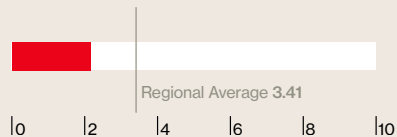
Ecuador

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
3.63 _{/10}	14 _{/16}	13 _{/16}
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Population	GDP per capita	
16,863,000	usd 6,250	



Startups

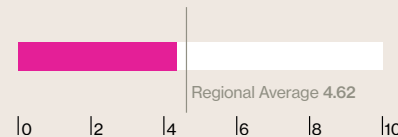
2.16/10



Ecuador scores significantly below the regional average for the startups pillar. This reflects the low supply of tech startups and GovTech startups. The country's low score on a number of technology enablers (Broadband, Cloud, Data Centers, IoT, and Big Data) suggests that strengthening this infrastructure could be a way to facilitate the growth of GovTech. However, Ecuador is showing progress and a willingness to innovate especially within the field of open data. This has been shown through its adoption of a new Open Data Strategy but also through its recent hosting of the Open Data Conference. Through these initiatives Ecuador is signalling that notwithstanding room for improvement it is committed to supporting and promoting the innovation agenda, which gives reasons to expect that its score in this dimension will rise in the years to come.

Government

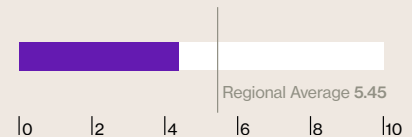
4.35/10



Ecuador's score for the government pillar is close to the regional average. The government's existing interest in digitalisation to improve public services, such as their pioneering [2018 ActiVaR program](#) (Angel-Urdinola, 2018) that used VR technology to help train students in public technical and technological training centres, does show a potential for GovTech to thrive. To improve their GovTech readiness, the government should focus on specific policies related to GovTech, such as a National GovTech Strategy.

Procurement

4.39/10



Ecuador also scores below the regional average for procurement, mainly because of their below-average score for their procurement frameworks. There are signs that the government is taking the issue of opening up their procurement system more seriously, which would improve their readiness for GovTech and their ability to work with startups. In 2018, the National Public Procurement Service (Sercorp) carried out a [study with the World Bank](#) (CPI, 2018) and concluded that many government entities were abusing the legal provision for direct contracting, when entering into competition would have saved considerable amounts of money. The government responded with restrictions to contracting through special regimes. Furthermore, the Ecuadorian government has also committed to the implementation of Latin American Anti-corruption Open Data Programme, which could prove to be of decisive help in this area.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	3.96/10	<ul style="list-style-type: none"> – Medium score for ease of starting a business. – Low score for entrepreneurship environment. – Low availability of venture capital. 	<ul style="list-style-type: none"> – Improve regulations for starting a business. – Create a GovTech specific platform for connecting investors and startups. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	2.39/10	<ul style="list-style-type: none"> – Low availability of open government data. – Low or medium scores across the five technology enablers. 	<ul style="list-style-type: none"> – Foster initiatives for promoting open data. – Invest in technology infrastructure.

Government

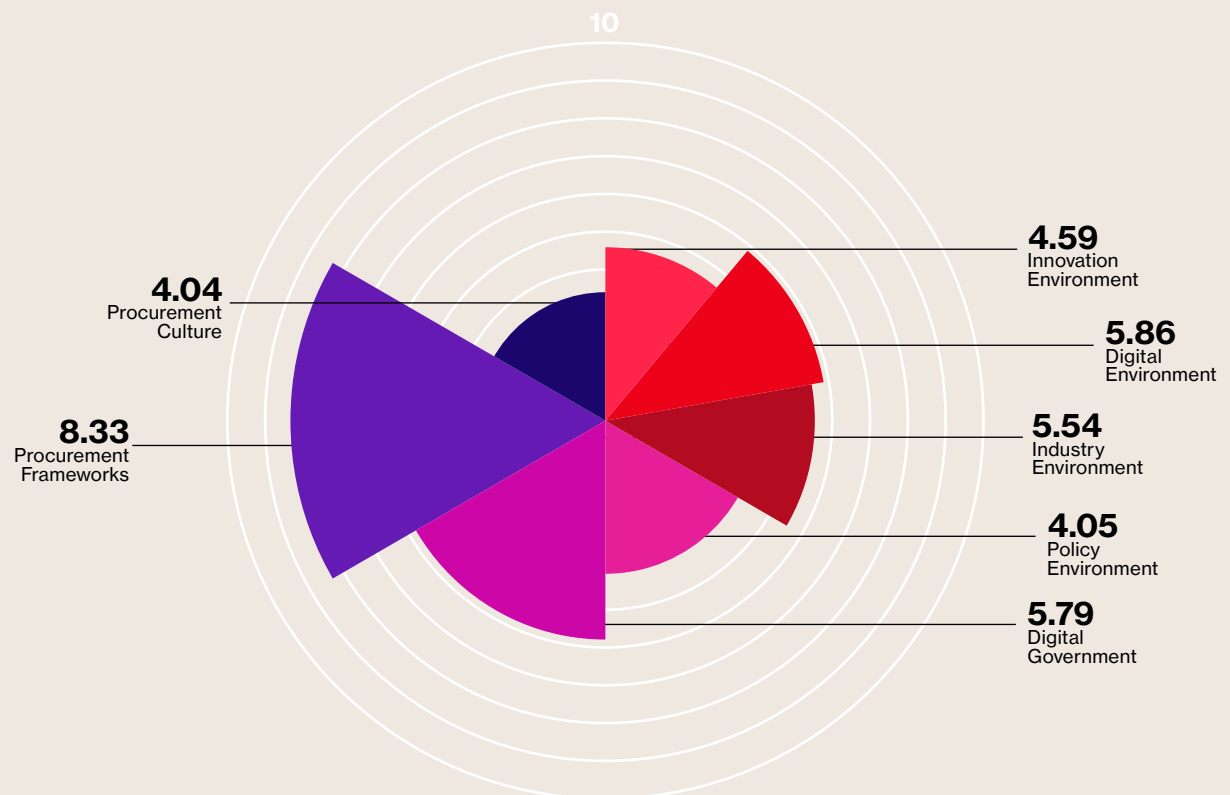
Policy Environment	3.49/10	<ul style="list-style-type: none"> – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund.
Digital Government	5.22/10	<ul style="list-style-type: none"> – Medium scores for both provision of online services and government procurement of advanced technology products. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of government. – Work with GovTech startups to improve provision of online services.

Procurement

Frameworks	5.00/10	<ul style="list-style-type: none"> – No policy setting the minimum time of bidding cycle. – No regulation on payment period for supplier. 	<ul style="list-style-type: none"> – Improve procurement regulations by introducing a policy for the payment period from suppliers, and by setting a minimum time for the bidding cycle.
Culture	4.08/10	<ul style="list-style-type: none"> – Perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.

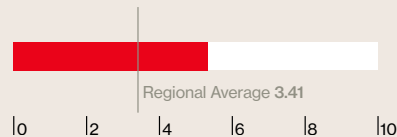
Mexico

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
5.24 /10	5 /16	4 /16
Population	GDP per capita	
130,759,000	usd 10,410	



Startups

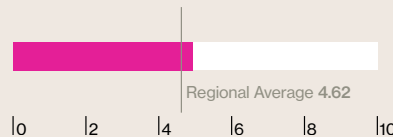
5.33/10



Mexico scores well above the regional average on the startups pillar, reflecting its high number of existing tech and GovTech startups. There are a high number of socially engaged citizens who are keen to solve existing public problems. The country also scores well for its digital environment due to its progress in the open data agenda so far, though it has room for improvement in developing some of the key technology enablers. GovTech startups in Mexico may also struggle to attract venture capital because of suspicion surrounding the public sector market.

Government

4.92/10

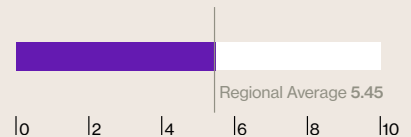


Mexico scores just over the regional average for the government pillar, suggesting that this could be an area to develop if it wants to improve its readiness for GovTech.

On the one hand, the government has one of the highest scores for its online services, showing an existing commitment to digitalisation. The government has also used public policy to drive technological innovation within the government and the wider economy: in 2013, it became the first country to introduce a [constitutional right to internet access](#) (Filer, 2019); and the government of Mexico City launched an [innovation lab in 2014](#) (Arana, 2014), connecting the city government with technological innovators. On the other hand, Mexico's federal system can often leave state governments competing against each other rather than collaborating, which can limit the potential for GovTech companies to scale their products. In the future, Mexico could benefit from federal government leadership on fostering GovTech, through policies such as a dedicated GovTech Fund or a National GovTech Strategy.

Procurement

5.47/10



Mexico's overall score for procurement is a little over the average for the region, but there is a significant gap between its score for the frameworks dimension, one of the highest in the region, and its below-average score for procurement culture. The ways that existing legislation are enforced make it harder for smaller GovTech companies to compete with bigger firms and secure government contracts. In 2014, for instance, contracts awarded to SMEs amounted to merely 16% of the total value of contracts awarded.

However, the government has, in the past, shown a will to increase the participation of SMEs in the federal procurement system: after implementing significant procurement reforms in 2009, Mexico set itself a target that it would gradually aim to award [~35% of its public contracts to SMEs](#) (Hug Silva & Scott, 2015). Furthermore, in 2013 Mexico also established the Instituto Nacional del Emprendedor aiming to promote competitiveness and innovation by supporting SMEs with information and financing.

Going forward, Mexico should continue to make their procurement culture friendly to small GovTech startups.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.59/10	<ul style="list-style-type: none"> – Medium digital skills in population. – Medium score for entrepreneurship environment. – Medium availability of venture capital. 	<ul style="list-style-type: none"> – Invest in digital education at secondary and tertiary level to boost digital skills – Create a GovTech specific platform for connecting investors and startups. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	5.86/10	<ul style="list-style-type: none"> – Good availability of open government data. – Most scores for technology enablers above average. 	<ul style="list-style-type: none"> – Continue commitment to open data. – Invest in technological infrastructure to compete with global leaders in GovTech.

Government

Policy Environment	4.05/10	<ul style="list-style-type: none"> – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. – Medium spending on R&D. 	<ul style="list-style-type: none"> – Invest more in R&D. – Create a National GovTech Strategy. – Invest in a GovTech Fund.
Digital Government	5.79/10	<ul style="list-style-type: none"> – Good provision of online services. – Medium government procurement of advanced technology products. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of government. – Promote use of innovative technology throughout government to boost procurement.

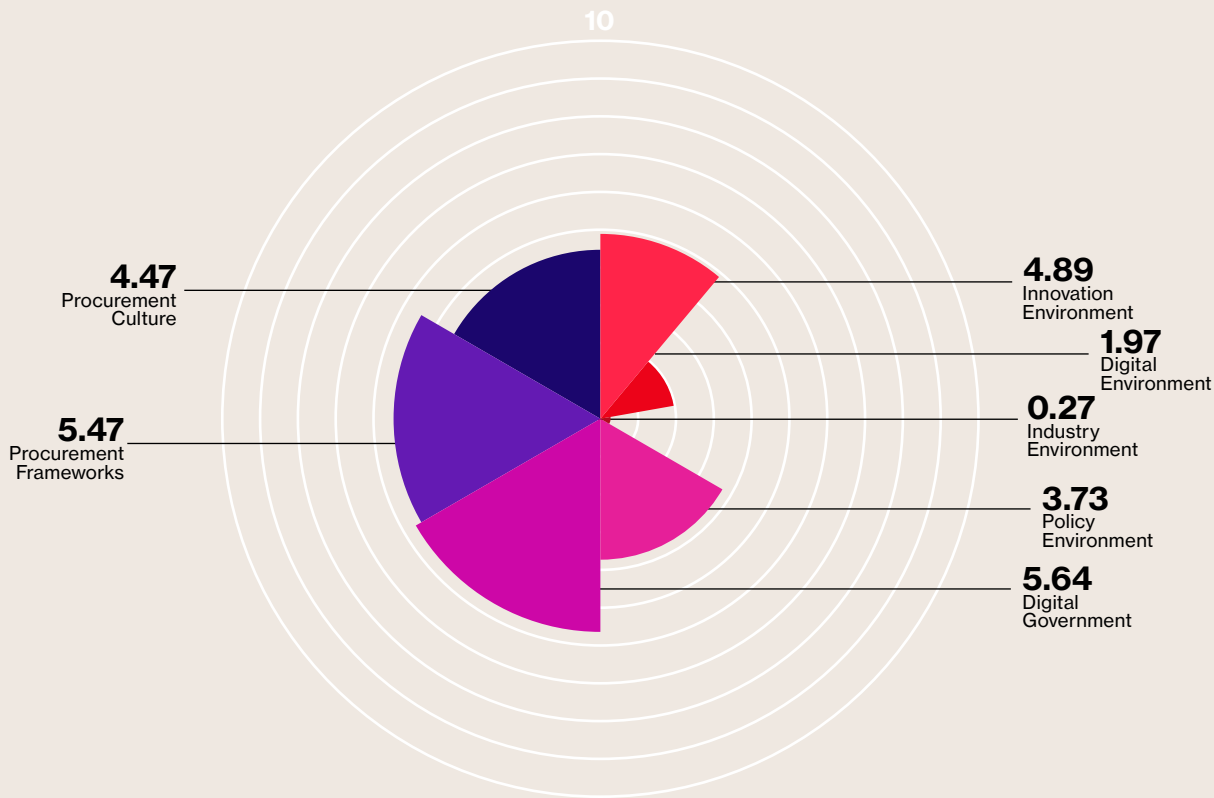
Procurement

Frameworks	8.33/10	<ul style="list-style-type: none"> – No regulation on minimum time of bidding cycle. 	<ul style="list-style-type: none"> – Introduce minimum length of bidding cycle.
Culture	4.04/10	<ul style="list-style-type: none"> – High perception of corruption within government. – Procurement culture hasn't been sensitive to differences between procuring GovTech products and services and buying other traditional products. 	<ul style="list-style-type: none"> – Promote digital literacy within government so they understand the needs of GovTech companies within procurement. – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations.



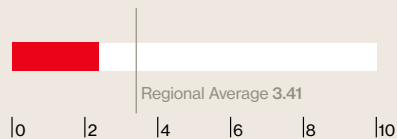
Panama

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
3.95 _{/10}	11 _{/16}	9 _{/16}
Population	GDP per capita	
4,163,000	usd 17,150	



Startups

2.37/10

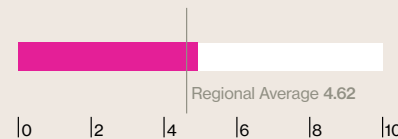


Panama scores low in the startup pillar due to a small supply of GovTech startups, as well as few tech startups generally. However, it has a high score for its innovation environment, with high scores in capacity for innovation, ease of starting a business, and the availability of venture capital, suggesting that there may be opportunities for growth in its tech sector.

Efforts to foster entrepreneurship such as *La Ciudad del Saber* (the City of Knowledge) (Ciudad del Saber, 2019), run by a non-profit foundation as a space for entrepreneurs, scientists, government entities, and NGOs to work together for social change, could also prove critical for furthering the GovTech ecosystem in the future.

Government

4.68/10

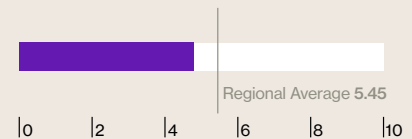


Panama scores close to the regional average for the government pillar. It has yet to adopt specific policies for GovTech such as a National GovTech Strategy. However, the government has signaled its readiness for technological innovation in other areas, such as the [2017 Smart Nation initiative](#) (Pérez Sánchez, 2018) to turn Panama City into a smart city.

The government has also issued its [Agenda Digital Panamá 4.0](#) (Launchway Media, An Entrepreneur's Guide to Panama's Business and Tech Scene, 2019), which seeks to advance the state of technology in the country by getting more people online and developing a smart, digital identity card. Furthermore, the current government committed itself to increase the availability of open data as stipulated in its [2019-2021 National Action Plan](#) (Gobierno de Panamá, 2019). These developments, reflected in Panama's above-average score for the digital government dimension, suggest a degree of existing readiness for GovTech that could be further fostered with targeted policy-making.

Procurement

4.80/10



Panama scores below the regional average for the procurement pillar. This is in part due to a below-average score for government control of corruption, suggesting a culture in which small companies find it hard to compete in an open and fair way for contracts. It is promising that Panama's newly elected President has [pledged to fight corruption](#) (Moreno, 2019), and such efforts will hopefully have a positive effect on Panama's future readiness for GovTech. One solution could be publishing more open contracting data. The country currently scores below average for this indicator, and greater availability of this data could help make procurement more transparent for smaller GovTech companies. The government of Panama made some initial commitments in its 2019-2021 National Action Plan for promoting open government in which aims to promote increased access to public information as well as increased quality of related data.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.89/10	<ul style="list-style-type: none">– Medium university-industry collaboration in R&D.– Medium digital skills in population.– Medium score for entrepreneurship environment.	<ul style="list-style-type: none">– Invest in digital education at secondary and tertiary levels to boost digital skills.– Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	1.97/10	<ul style="list-style-type: none">– Low availability of open government data.	<ul style="list-style-type: none">– Foster initiatives for promoting open data.

Government

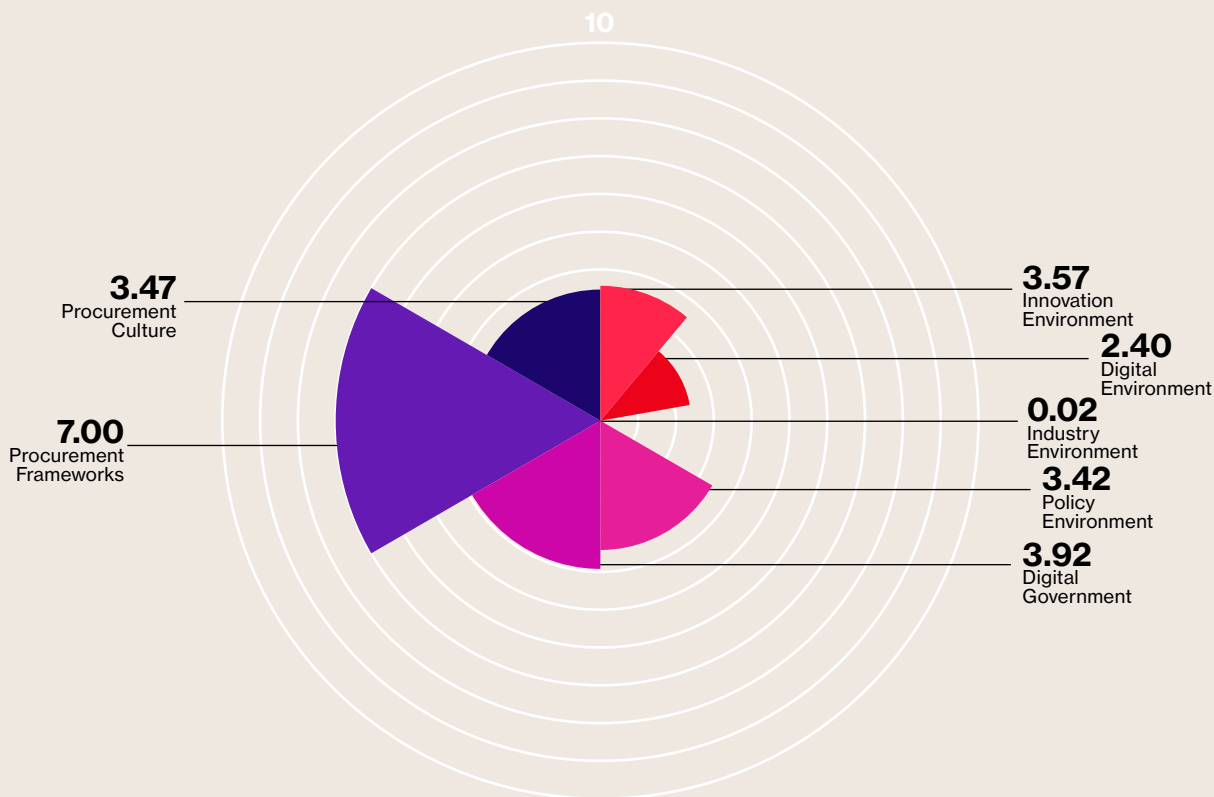
Policy Environment	3.73/10	<ul style="list-style-type: none">– Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy.	<ul style="list-style-type: none">– Create a National GovTech Strategy.– Invest in a GovTech Fund.
Digital Government	5.64/10	<ul style="list-style-type: none">– Medium provision of online services.	<ul style="list-style-type: none">– Work with GovTech startups to improve provision of online services.

Procurement

Frameworks	5.47/10	<ul style="list-style-type: none">– Low availability of open contracting data.– No regulation payment period for supplier.	<ul style="list-style-type: none">– Make more contracting data available to aid procurement reform.– Establish deadline for payment period of suppliers.
Culture	4.47/10	<ul style="list-style-type: none">– Perception of corruption in government.	<ul style="list-style-type: none">– Establish rigorous procedures for meeting procurement deadlines and enforcing regulations.– Tackle government corruption and build public trust.

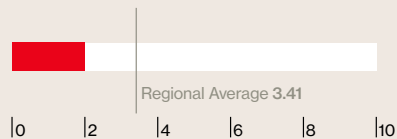
Paraguay

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
3.44 /10	15 /16	14 /16
Population	GDP per capita	
6,897,000	usd 5,900	



Startups

2.00/10

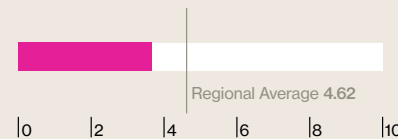


Paraguay's low score in this pillar reflects the fact that its technology startup sector is fairly young, and, at present, the country has very few tech startups. Part of the problem lies in its digital environment: the country scores significantly below average in the five technology enablers and in the availability of open government data. [Access to credit for starting a business is also low](#) (World Bank, 2019), especially since 2017, when the government limited the distribution of historical data on borrowers.

However, there have been recent developments to boost innovation and entrepreneurship, such as the creation of the government's [National Directorate of Entrepreneurship](#) in 2016 (Vera, 2016), and the work of nonprofits such as [Jóvenes Empresarios del Paraguay](#) (Young Entrepreneurs of Paraguay) (Jóvenes Empresarios del Paraguay, 2019).

Government

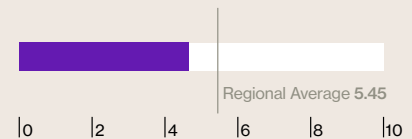
3.67/10



Paraguay also scores below the regional average in this pillar. In general, digital government in Paraguay is less developed than elsewhere in the region, with lower-than-average scores for online service provision and the importance of ICTs to the government vision of the future. The government also has one of the lowest rates of R&D spending in the region, but did in 2017 make a [commitment to double to budget for technological research](#) (ADN Paraguay, 2017). Other future commitments to technological innovations will improve the government's readiness for GovTech.

Procurement

4.65/10



Part of the reason for Paraguay's low score in this pillar is its low score for its procurement culture. It scores low for both government effectiveness and control of corruption, both of which hinder the participation of small GovTech firms in the procurement process.

However, Paraguay's 100% score on the availability of open contracting data means that it is possible to scrutinise the workings of their procurement procedures, in ways that could help aid future reforms. For example, [a study by the Open Contracting Partnership](#) (Salazar, 2019) found that from 2011 to 2017, around 80% of public contract invoices were paid late. Late payments can be very hurtful for smaller GovTech firms that rely on the capital from government contracts, and so this is one area in which an improvement would do much to aid the maturity of the country's GovTech ecosystem.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	3.57/10	<ul style="list-style-type: none"> – Low university-industry collaboration. – Low digital skills in population. – Low score for entrepreneurship environment. – Low availability of venture capital. 	<ul style="list-style-type: none"> – Invest in digital education at secondary and tertiary levels to boost digital skills. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals. – Create a GovTech specific platform for connecting investors and startups.
Digital Environment	2.40/10	<ul style="list-style-type: none"> – Low availability of open government data. – Low scores for the technology enablers. 	<ul style="list-style-type: none"> – Foster initiatives for promoting open data. – Invest in technology infrastructure.

Government

Policy Environment	3.42/10	<ul style="list-style-type: none"> – Low importance of ICTs to government vision of the future. – Low spending on R&D. – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund. – Increase spending on R&D.
Digital Government	3.92/10	<ul style="list-style-type: none"> – Low provision of online services. – Low government procurement of advanced technology products. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of government. – Work with GovTech startups to improve the provision of online services.

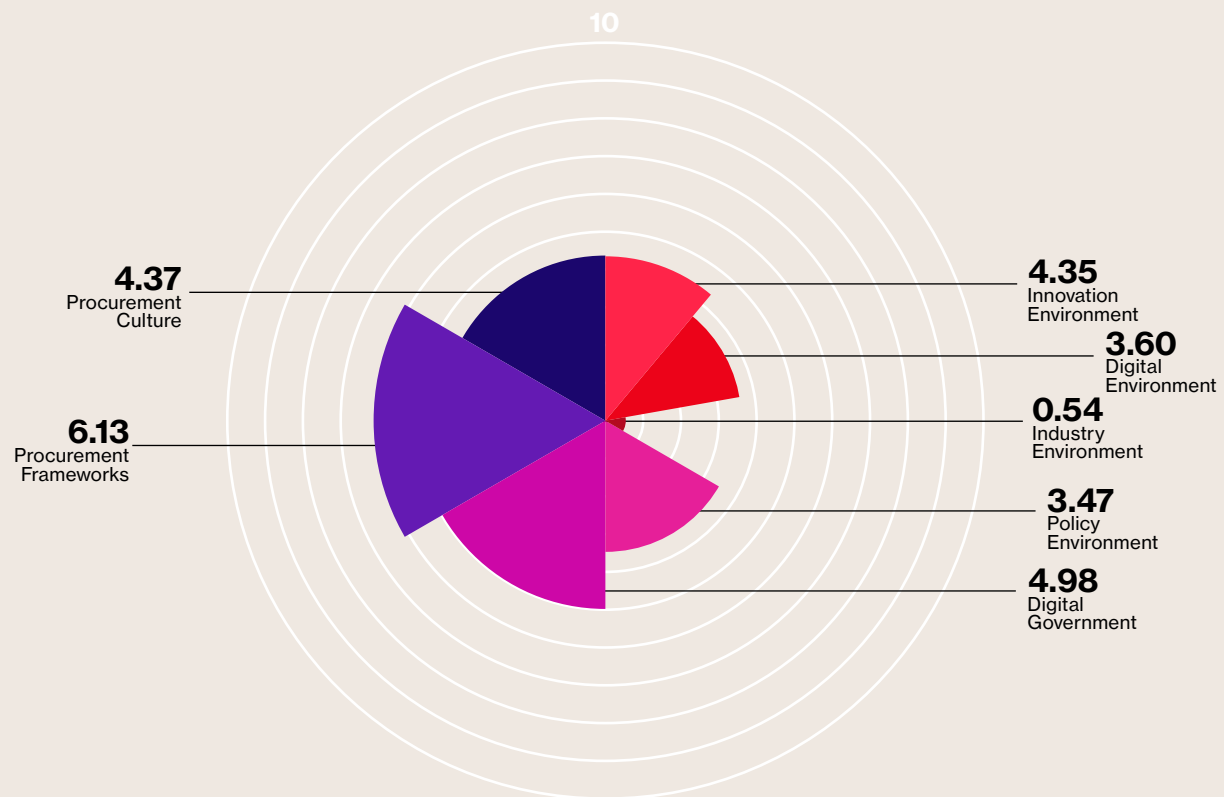
Procurement

Frameworks	7.00/10	<ul style="list-style-type: none"> – No strategy for procurement of innovative services. – No policy on payment period for supplier. 	<ul style="list-style-type: none"> – Introduce a strategy for procurement of innovative services. – Establish deadline for payment period of suppliers.
Culture	3.47/10	<ul style="list-style-type: none"> – Perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.



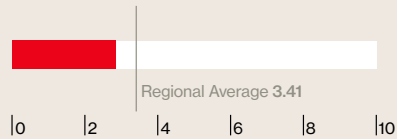
Peru

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
4.00 /10	10 /16	8 /16
Population	GDP per capita	
32,552,000	usd 7,320	



Startups

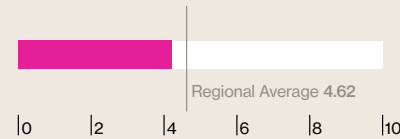
2.83/10



Peru scores close to the regional average in both its innovation environment and its digital environment, but ends up with a below-average score overall in this pillar, due to its low score for its industry environment. However, initiatives to incentivise innovation and the creation of startups (Stunt, 2017), such as the 2012 Startup Peru initiative by the Ministry of Production, as well as the 2014 initiative Innovate Peru, launched by the Ministry of Innovation, could help boost the tech sector in future.

Government

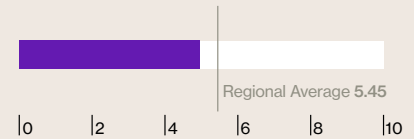
4.22/10



Peru scores close to the regional average for the government pillar, with a stronger score in digital government than in its policy environment. Although the government's commitment to digital innovation generally is evident through initiatives like Innovate Peru, which had grown to provide USD100 million of funding for micro, small and medium-sized enterprises by 2017 (Stunt, 2017), it currently lacks specific public funding for GovTech. More targeted policies would help improve its readiness for GovTech.

Procurement

4.96/10



Peru scores close to the regional average for the procurement pillar. Its procurement frameworks do provide mechanisms for procuring specifically from SMEs such as targets for the percentage of contracts going to SMEs. An OECD report in 2017 (OECD, 2017) found that levels of SME participation in procurement were in line with these targets, and this is a positive foundation which could benefit GovTech companies. However, the country has the most room for improvement in its procurement culture, with scores below the regional average for both government effectiveness and control of corruption threatening the ability for GovTech startups to contract with the government.



Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.35/10	<ul style="list-style-type: none"> – Medium ease of starting a business. – Medium digital skills in population. – Medium score for entrepreneurship environment. 	<ul style="list-style-type: none"> – Improve regulations for starting a business. – Invest in digital education at secondary and tertiary levels to boost digital skills. – Invest in initiatives that promote entrepreneurship, such as platforms that allow collaboration between entrepreneurial individuals.
Digital Environment	3.60/10	<ul style="list-style-type: none"> – Medium availability of open government data. – Medium scores for the five technology enablers. 	<ul style="list-style-type: none"> – Foster initiatives for promoting open data. – Invest in technology infrastructure.

Government

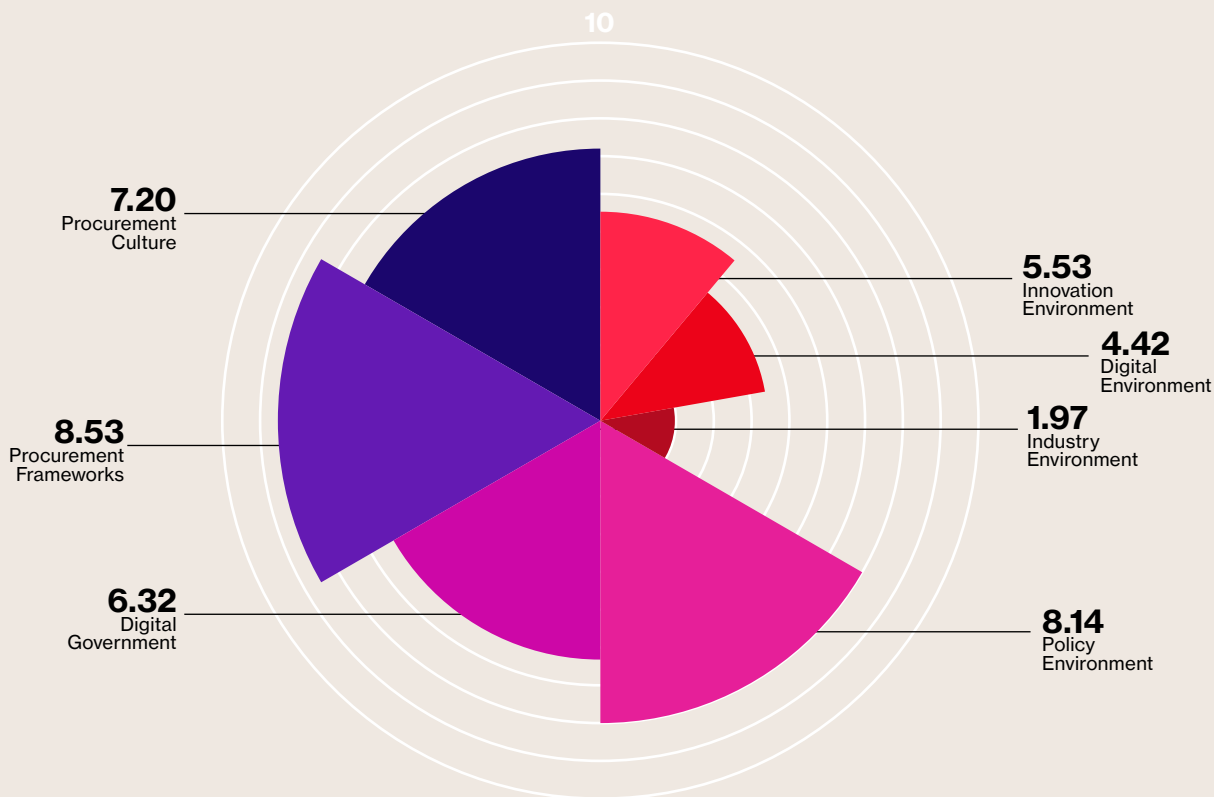
Policy Environment	3.47/10	<ul style="list-style-type: none"> – Medium importance of ICTs to government vision of the future. – Low spending on R&D. – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund. – Increase spending on R&D.
Digital Government	4.98/10	<ul style="list-style-type: none"> – Low government procurement of advanced technology products. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of government. – Promote use of innovative technology throughout government to boost procurement.

Procurement

Frameworks	6.13/10	<ul style="list-style-type: none"> – No strategy for procurement of innovative services. 	<ul style="list-style-type: none"> – Develop a strategy for procurement of innovative services.
Culture	4.37/10	<ul style="list-style-type: none"> – High perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.

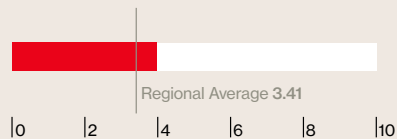
Portugal

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
6.28 _{/10}	2 _{/16}	3 _{/16}
<hr/>		
Population	GDP per capita	
10,291,000	usd 23,730	



Startups

3.97/10

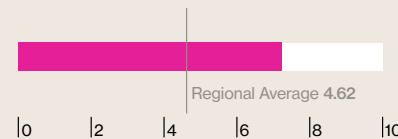


Although Portugal scores above the average for all three pillars, it is in the startups pillar that its score shows the greatest room for improvement. It has significantly fewer tech startups generally and GovTech startups specifically than the other top-ranking countries such as Spain and Brazil, giving it a below-average score for its industry environment.

However, Portugal's GovTech sector may well enjoy growth in the future, given public policies such as Made of Lisboa (an online directory for entrepreneurs in Lisbon, launched in 2016)¹ and Startup Lisboa (a non-profit association that supports new businesses, founded in 2011)² (Lewin, 2019). Besides initiatives in Lisbon, at the end of 2018 Porto was named as Europe's 3rd fastest growing tech hub (Atomico, 2018). These trends suggest that in future Portugal's score in this pillar could improve. Meanwhile, there is also room to improve its score in open data and in some of the key technology enablers, in order to foster a globally-competitive digital environment and support tech innovation.

Government

7.23/10

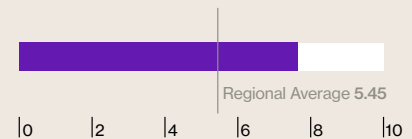


Portugal is the highest-scoring country in the government pillar, in part thanks to being the highest-scoring country for its policy environment by over 3 points. This reflects the work the government has done to promote GovTech through specific policies (Hinchliffe, 2018) such as their EUR 30,000 GovTech fund, awarded to the winners of the country's "GovTech for humanity" contest. Launched in 2018, the contest rewards startups with a product that fits into the UN's Sustainable Development Goals for 2030.

Portugal also scores highly because it has the highest rates of R&D spending in the region, the highest score for the importance of ICTs to government vision of the future, as well as the second-highest score for online services. The work done by the government to foster GovTech innovation should have a positive effect on the number of GovTech startups in future.

Procurement

7.64/10



Portugal is also the highest-scoring country in the procurement pillar. Their legal frameworks, based on EU regulations, are the second-highest-scoring after Spain, lacking only a policy for procurement of innovative products at the central government level (there is one adopted by some procuring entities) and a specific quota for procurement from SMEs.

¹ See: Made of Lisboa in <https://madeoflisboa.com/>

² See: Startup Lisboa in <https://www.startuplisboa.com/>

Startups

	Score	Interpretation	Recommendation
Innovation Environment	5.53/10	– Medium availability of venture capital.	– Create a GovTech specific platform for connecting investors and startups
Digital Environment	4.42/10	– Medium availability of open government data.	– Foster initiatives to promote open data.

Government

Policy Environment	8.14/10	– Mention of GovTech in existing policies and strategies, but as yet no National GovTech Strategy.	– Create a National GovTech strategy.
Digital Government	6.32/10	– Above-average procurement of advanced technology products. – Above-average provision of online services.	– Continue to work with GovTech startups to use innovative technologies in government, to challenge other world-leaders in GovTech.

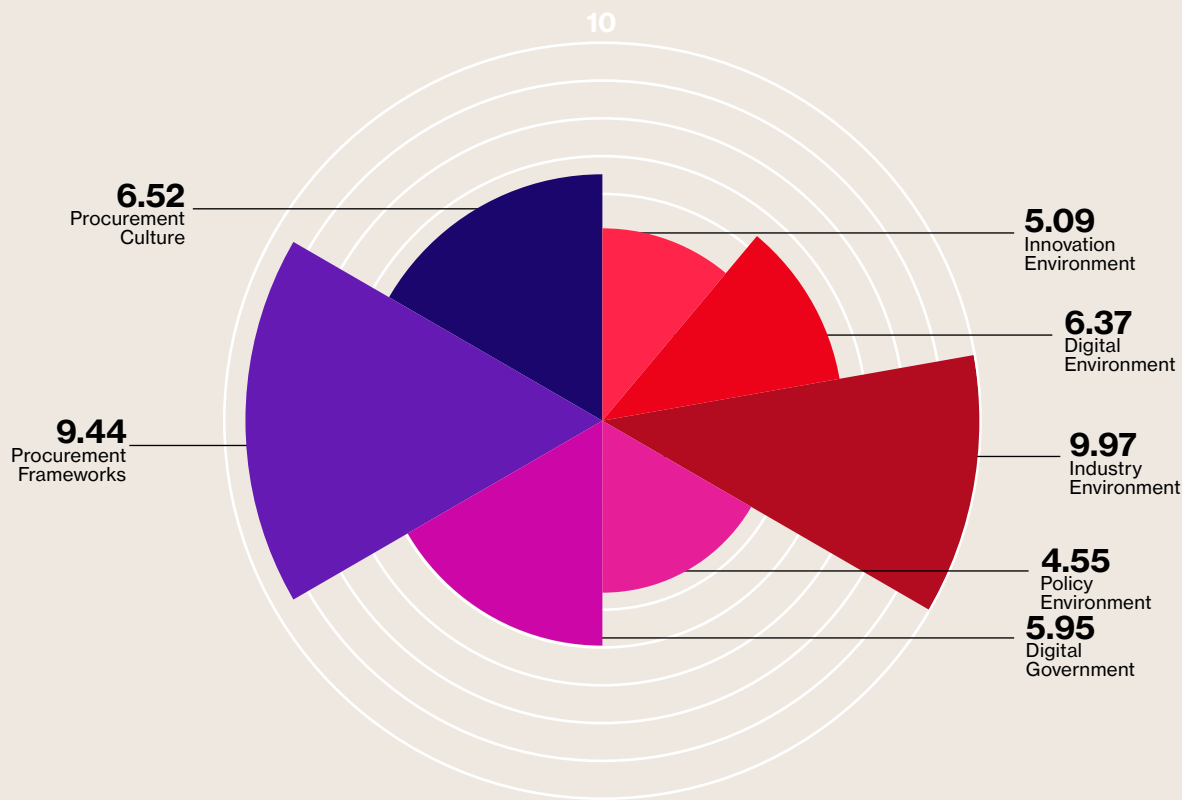
Procurement

Frameworks	8.53/10	– No strategy for procurement of innovative services at the central level.	– Develop a strategy for procurement of innovative services at the central level.
Culture	7.20/10	– Above-average scores for government effectiveness and control of corruption.	– Continue to improve in these areas by promoting more digital literacy in government.



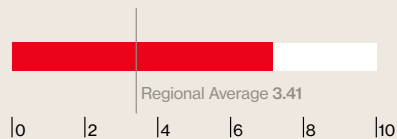
Spain

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
6.63/10	1/16	1/16
Population	GDP per capita	
46,398,000	usd 30,730	



Startups

7.15/10

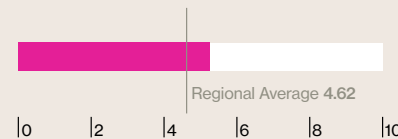


Spain has the highest score in the region for the startups pillar, mainly due to a very high score for its industry environment. The Spanish startup scene has experienced rapid growth in the last decade, with investment in tech startups growing by 45% in 2017 to EUR 780 million. This compares with investments of EUR 207 million in 2013. 2017 also saw an increase in the number of startups by a fifth.

Although Spain's industry environment is booming compared with the rest of the region, it has only the fourth-highest score for its innovation environment, suggesting this is an area to target if the country wants to become a world-leader in GovTech. It scores fourth in the region for digital skills in the population, and its score for the availability of venture capital is equal to the regional average, and so these present two opportunities for future improvement.

Government

5.25/10

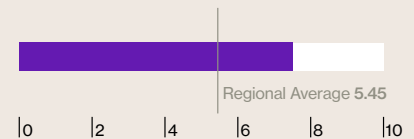


Spain scores behind second-ranked Portugal for both dimensions in the government pillar, suggesting that this is an area in which the country could do more to improve its readiness for GovTech and become a global leader in the field. In a [2018 report in the Financial Times](#) (AUTOR, Spain's start-up scene begins to lift off, 2018) on Spanish tech startups, one entrepreneur interviewed suggested that the government should be doing more to promote innovation.

The country has the top score for its provision of online services, but scores close to the regional average for the importance of ICTs to government vision of the future, as well as government procurement of advanced technology products. The government should, therefore, target its support for innovation within government and public services in order to improve its readiness for GovTech.

Procurement

7.49/10



Spain has the highest score in the region for its procurement frameworks, and the fourth-highest for its procurement culture, leaving it second in this pillar overall after Portugal. An improvement in its scores for government effectiveness and government control of corruption would see its overall score in this pillar rise, and help it to adopt a procurement environment that is more friendly to GovTech startups.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	5.09/10	<ul style="list-style-type: none">– Medium score for university-industry collaboration in R&D.– Medium availability of venture capital.	<ul style="list-style-type: none">– Create a GovTech specific platform for connecting investors and startups.
Digital Environment	6.37/10	<ul style="list-style-type: none">– Good availability of open government data.– Above-average scores in the five technology enablers.	<ul style="list-style-type: none">– Invest further in technological infrastructure to challenge world-leaders in GovTech.– Continue commitment to open data.

Government

Policy Environment	4.55/10	<ul style="list-style-type: none">– Lack of GovTech-specific policies such as a GovTech Fund or National GovTech Strategy.	<ul style="list-style-type: none">– Create a National GovTech Strategy.– Invest in a GovTech Fund.
Digital Government	5.95/10	<ul style="list-style-type: none">– Good provision of online services.– Medium government procurement of advanced technology products.	<ul style="list-style-type: none">– Promote use of innovative technology throughout government to boost procurement.

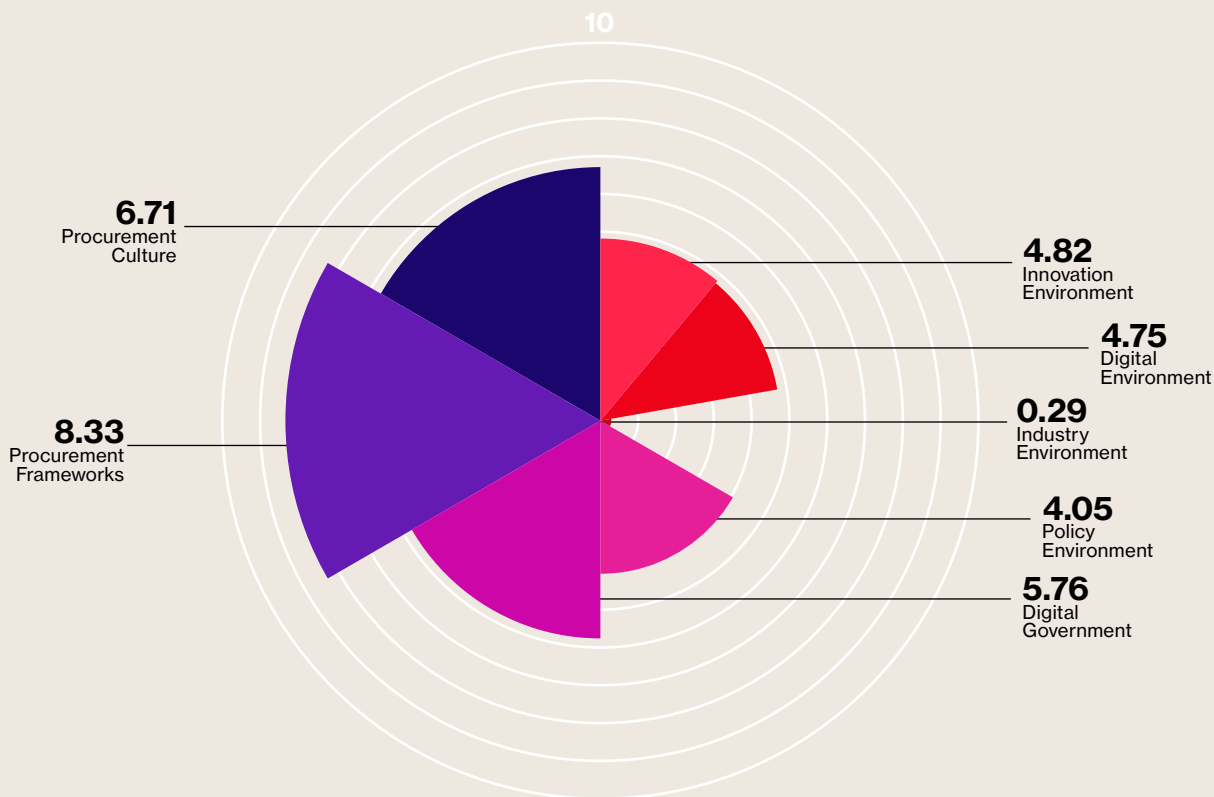
Procurement

Frameworks	9.44/10	<ul style="list-style-type: none">– Good legal framework for procurement.	<ul style="list-style-type: none">– Consider working with startups to make procurement processes as friendly as possible to smaller companies.
Culture	6.52/10	<ul style="list-style-type: none">– Above-average score for government effectiveness and control of corruption.	<ul style="list-style-type: none">– Continue to improve in these areas by promoting more digital literacy in government.



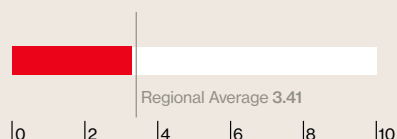
Uruguay

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
5.15 /10	7 /16	5 /16
Population	GDP per capita	
3,470,000	usd 17,820	



Startups

3.29/10

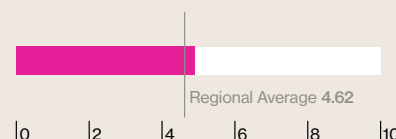


Uruguay scores close to the regional average for this pillar. It has above-average scores for its digital environment and its innovation environment, suggesting good underlying enablers for GovTech startups. However, it scores low for the industry environment dimension, due to a low number of tech and GovTech startups.

This score may be likely to rise in the future, due to Uruguay's high concentration of tech talent – it is currently the third leading software exporter per capita in the world, and its universities have shown a propensity to develop technological talent, being one of the first in the world to offer degrees in video game design. Like many other countries in the region, Uruguay has a low availability of venture capital at present, but government initiatives such as Uruguay XXI that aim to attract global investors may have a positive effect on this score in the future.

Government

4.90/10



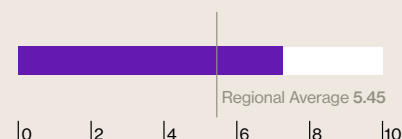
Uruguay has an above average-score for this pillar, and the government has shown that it is willing to support innovation in ways that will aid its readiness for GovTech. The National Agency for Investigation and Innovation (ANII)³ funds research projects, postgraduate scholarships and incentive programmes for entrepreneurship, both in the private and public sectors. These efforts have been boosted by Uruguay's political stability (Launchway Media, 2019).

However, Uruguay still scores below average for its R&D spending, so could do more to increase public funding, especially funding targeted at GovTech specifically.

The government's 2020 Digital Agenda (República Oriental del Uruguay, 2019) outlines an ambitious programme to foster innovative technology throughout the country, including in the public sector, which also suggests that Uruguay is well positioned to encourage the adoption of GovTech in the future.

Procurement

7.25/10



Uruguay scores above the regional average for both its procurement frameworks and its procurement score. It is rated as the least corrupt country of those surveyed in the index, and also scores well for its provision of open contracting data. This creates a good culture for the transparent and fair enforcement of procurement regulations.

Although corruption in Uruguay is low, it is reportedly slightly more prevalent in public procurement than in other areas. The diversion of public funds is rare, but GAN Integrity's Business Anti-Corruption Portal reports that well-connected companies are sometimes treated more favourably when it comes to awarding public contracts (GAN Integrity, 2016). This suggests that in order to further the country's readiness for GovTech, the government should ensure that the procurement system does not disadvantage smaller GovTech firms who want to sign contracts with the government.

3 See: The National Agency for Investigation and Innovation (ANII) in <https://www.anii.org.uy/>



Startups

	Score	Interpretation	Recommendation
Innovation Environment	4.82/10	– Medium availability of venture capital.	– Create a GovTech specific platform for connecting investors and startups.
Digital Environment	4.75/10	– Medium scores in most of the technology enablers.	– Invest in technology infrastructure.

Government

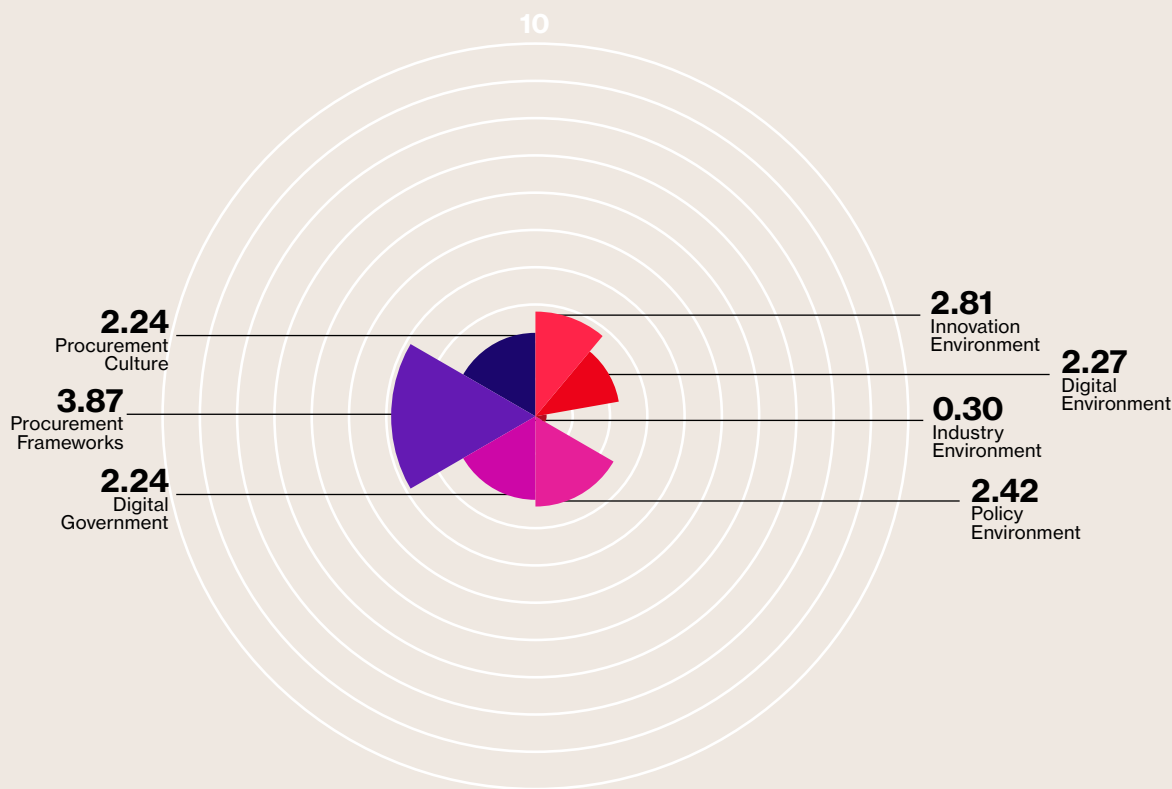
Policy Environment	4.05/10	– Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy.	– Create a National GovTech Strategy. – Invest in a GovTech Fund.
Digital Government	5.76/10	– Good provision of online services. – Medium government procurement of advanced technology products.	– Promote use of innovative technology throughout government to boost procurement.

Procurement

Frameworks	8.33/10	– Good availability of open contracting data. – No policy for procurement of innovative services. – No regulation on payment period for suppliers.	– Develop a strategy for procurement of innovative services. – Establish deadline for payment period of suppliers.
Culture	6.71/10	– Above-average scores in government effectiveness and control of corruption.	– Continue to improve in these areas by promoting more digital literacy in government.

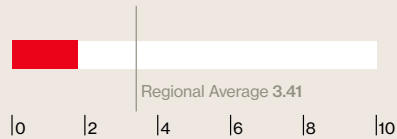
Venezuela

Index Score	Ranking	Ranking in WEF Global Competitiveness Index
2.30 /10	16 /16	16 /16
Population	GDP per capita	
32,381,000	usd 2,430	



Startups

1.80/10

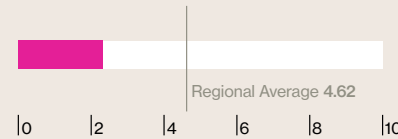


Venezuela's scores below the regional average in the startups pillar, in part due to a low number of tech and GovTech startups. [The country's current economy has hurt its tech sector, with many of those with technological skills choosing to migrate to other countries in Latin America](#) (Harindranath, 2019).

The country's regulations also make it difficult to start a business: it takes an average of 230 days to open a business, compared to 6 days in neighbouring Colombia. Improving the country's score for open data will also help foster GovTech, as companies often rely on such data to design their products. There is some evidence for optimism in the country's above-average scores for some of the technology enablers (Cloud and Big Data), and this technological infrastructure could offer the foundation on which to develop a more mature GovTech ecosystem in future.

Government

2.33/10



Venezuela scores low in almost all the indicators for both dimensions in this pillar, suggesting more could be done to improve its readiness for GovTech. Its low scores in both importance of ICTs to government vision of the future and government procurement of advanced technology products suggest that before moving on to specific GovTech policies such as a National Strategy for GovTech, the government needs to prioritise support for all forms of innovation and technology within public services.

Procurement

2.78/10



In order to foster a procurement environment more favourable to public procurement from GovTech startups, Venezuela needs to focus both on improving its underlying frameworks and on improving the enforcement of these laws, given that it scores low in both the procurement frameworks and culture dimensions. Improving its score in open contracting data could help with these reforms, because it would allow domestic and international groups to scrutinise the processes involved in contracting with the government and recommend improvements that would aid startups.

Startups

	Score	Interpretation	Recommendation
Innovation Environment	2.81/10	<ul style="list-style-type: none"> – Low ease of starting a business. – Low score for entrepreneurship environment. – Low availability of venture capital. 	<ul style="list-style-type: none"> – Improve regulations for starting a business. – Create a GovTech specific platform for connecting investors and startups. – Invest in initiatives that promote entrepreneurship, such as platforms that allows collaboration between entrepreneurial individuals.
Digital Environment	2.27/10	<ul style="list-style-type: none"> – Low availability of open government data. – Medium scores for the five technology enablers. 	<ul style="list-style-type: none"> – Invest in technology infrastructure. – Foster initiatives that promote open data.

Government

Policy Environment	2.42/10	<ul style="list-style-type: none"> – Low importance of ICTs to government vision of the future. – Low spending on R&D. – Lack of GovTech-specific policies such as a GovTech Fund or a National GovTech Strategy. 	<ul style="list-style-type: none"> – Create a National GovTech Strategy. – Invest in a GovTech Fund. – Invest in R&D. – Introduce data protection and privacy laws to protect citizens' data.
Digital Government	2.24/10	<ul style="list-style-type: none"> – Low provision of online services. – Low government procurement of advanced technology products. 	<ul style="list-style-type: none"> – Commission study for investigating benefits of GovTech and digitisation of the government. – Work with GovTech startups to improve the provision of online services.

Procurement

Frameworks	3.87/10	<ul style="list-style-type: none"> – No strategy for procurement of innovative services. – No policy for payment period for suppliers. – No measures for prioritising SMEs within procurement. 	<ul style="list-style-type: none"> – Develop a strategy for procurement of innovative services. – Develop policies to prioritise SMEs within procurement. – Establish deadline for payment period of suppliers.
Culture	2.24/10	<ul style="list-style-type: none"> – High perception of corruption in government. – Partial enforcement of procurement laws. 	<ul style="list-style-type: none"> – Establish rigorous procedures for meeting procurement deadlines and enforcing regulations. – Tackle government corruption and build public trust.



Conclusions and Recommendations

Summary

GovTech presents significant opportunities for governments across Latin America, Portugal, and Spain to become more effective and deliver better services to their citizens. In spite of significant differences between some of the countries covered in our Index in terms of the potential of their GovTech ecosystems, our findings do suggest some common themes across the region, and some common areas in which governments should focus their attention in order to reap the benefits of GovTech in the future. In the previous section, we produced country-specific recommendations. However, the following recommendations should thus be seen as addressing the overall regional trends complementing the country specific analyses.

Startups

The dimension that consistently sees the lowest scores in the GovTech Index is the industry environment. This reflects the fact that in most countries, there are currently only a small number of startups working in the GovTech space. This is perhaps to be expected given the emerging nature of the field of GovTech. Future iterations of the Index could see these scores improve as more and more entrepreneurs begin to see the opportunities in this new sector.

Another common theme in the region is the limited availability of venture capital. This problem is particularly acute for GovTech startups, as our research showed that many venture capitalists see selling to the government as risky and unlikely to yield significant rewards. In order to create an environment of trust, in which GovTech startups can flourish, governments should ensure that there is sufficient public, private and hybrid funding for new companies to launch and scale their products.

For supporting a more favourable startup environment, we recommend that countries:

- Create an annual GovTech conference where startups, government, and investors from the region can meet and interact.
- Establish GovTech-specific incubators to target venture capital.
- Promote open data initiatives and invest in technological infrastructure.

Government

Many governments in the region have already recognised the importance of technology and innovation in the public sector, developing national digital strategies and investing in the provision of online services. However, there are currently very

few countries that recognise the importance of GovTech-specific policies and strategies, as a force to innovate and disrupt existing bureaucracy and make government better overall.

Policies more tailored to GovTech specifically will help governments improve their readiness for GovTech, and signal to startups in the region that they are serious about taking advantage of this emerging field. This is also likely to have a beneficial effect on the availability of venture capital for GovTech, by indicating that there is a viable government market for their products.

Thus, our recommendations related to the government pillar are as follows:

- Produce a national GovTech strategy.
- Establish a government-backed GovTech fund.
- Create GovTech-specific public challenges.
- Roll out a national-identity system, allowing citizens to use the same credential for using government services. A single credential will hugely accelerate GovTech, as it allows data to be joined up between the different arms of government.
- Consider establishing a specific target for the procurement of government technology through start-ups and SMEs.
- Update and adjust procurement laws to ensure that they are SME friendly and have procurement agencies reach out more actively to start-ups and SMEs.
- Invest in open contracting data initiatives to increase trust, transparency, and accountability within procurement processes.
- Establish rigorous procedures and mechanisms for enforcing procurement laws.
- Avoid being too prescriptive about the services sought in the tendering process. A problem based approach will allow smaller startups to pitch innovative solutions.
- Break up large contracts into smaller ones or consider allowing multiple companies to put together a bid, as GovTech startups may struggle to compete with larger technology firms.
- Establish a digital training academy for training public servants in digital skills.

Procurement

Procurement consistently came up in our research as one of the key contributors to a mature GovTech ecosystem. Our findings showed some areas in which many countries could improve their legal frameworks, such as introducing regulation that sets a deadline for the payment period from suppliers. However, the main way in which governments can improve their ability to work with GovTech startups is through the culture surrounding their procurement practices. A number of factors limit the opportunities for GovTech startups to contract with the government, including the level of digital skills within government; the perception that startups are too risky to make reliable partners in procurement; and the existence of incumbent relationships with large technology companies that make it harder for GovTech companies to contract with the government. In addition, tackling corruption and ensuring the strict enforcement of procurement laws is an important prerequisite for developing a mature GovTech ecosystem.

For strengthening the procurement environment we, therefore, recommend that governments:

In addition to the policy recommendations for the national level set out above, we strongly recommend policymakers to explore how GovTech initiatives can be supported at city-level. During our research, we were made aware of several startups making tremendous positive impact at the local level, especially in cities. All evidence that we have gathered seems to point to the cities as the level where GovTech has the greatest potential. However, at the same time, some of our primary sources pointed out that if cities disproportionately reap the rewards of GovTech, this could exacerbate existing urban-rural inequalities. We recommend that governments approach the city-level potential for GovTech as a way to create equitable wealth and opportunities for all their citizens - for example, by reinvesting the money saved through the use of innovative GovTech products in rural infrastructure and rural public services.

A pilot testing of our methodology at city-level, including some preliminary research, can be found in Annex II.

Final Thoughts: Building Community

To conclude, perhaps the most important recommendation is *building community*. It should be stressed again that whilst we conducted our analysis based on three pillars, we fundamentally view GovTech as an ecosystem whereby indicators, dimensions, and pillars are intimately connected with each other. This was also confirmed by several of our experts, who argued that ultimately the highest potential is found in ecosystems where different actors and stakeholders collaborate with each other, based on a relationship of mutual trust and purpose.

For this, the Latin American GovTech ecosystem can draw valuable lessons from its European counterparts. Across the EU, several GovTech hubs and programs have started emerging which are contributing to the development of the ecosystem. Poland has the new cutting-edge programme 'GovTech Polska', and similar hubs have started emerging in Lithuania and Denmark. Likewise, the UK government has established the GovTech Catalyst, and, at the city-level, there is the GovTech programme of the Greater London Authority. The emergence of these initiatives echoes the great potential already seen in the nascent GovTech industry, and these programmes already contribute significantly to the flourishing of the GovTech ecosystem across the EU.

For countries across Latin America, Spain and Portugal, creating a GovTech hub that brings together startups, government, and investors could significantly accelerate the development of their ecosystems. Building a GovTech community has the potential to help startups by allowing them to build relationships between different arms of government; advising them on how to target sales; and guiding them around the complex environment of government. It would also allow government and startups to understand each other's needs and desires.

There are several ways this could be achieved. Creating an annual GovTech summit, where investors and startups can meet, interact, exchange ideas, and build relationships, could be one way to connect stakeholders in the ecosystem on a sporadic basis. A more systematic approach could be to establish GovTech programmes and GovTech specific funds across countries that support promising new startups in their efforts. Finally, the most comprehensive solution could be the creation of a 'GovTech Chamber of Commerce' which would function as the central meeting point for stakeholders in the GovTech ecosystem, and could bring together all of the options listed above. A GovTech Chamber of Commerce could signal to the ecosystem that the government recognises the potential of GovTech, and that efforts are underway to support stakeholders. For future research, a fundamental question will be how to build such an institution, and what its role should be.



Annex I: Methodology

The GovTech Index consists of 28 indicators across 7 dimensions. The majority of these indicators were taken from existing datasets, but some were calculated on the basis of our own desk research.

The table below summarises all the indicators and how they were calculated.

Dimension	Indicator	Source	Description
Innovation Environment	Capacity for Innovation	<u>WEF Networked Readiness Index</u> (World Economic Forum, 2019)	Do companies in that country have the capacity to innovate? This indicator gives a general overview of the country's innovation environment.
	University-Industry Collaboration in R&D	<u>WEF Global Competitiveness Index</u> (World Economic Forum, 2019)	Do universities collaborate with businesses for researching and developing new products? The majority of innovation ecosystems emerge through academic involvement, and so this indicator captures an important aspect of a healthy innovation environment.
	Entrepreneurship Environment	<u>Global Entrepreneurship Index</u> (Global Entrepreneurship Development Institute, 2018)	Are the people of that country generally entrepreneurial? This indicator gives a picture of whether a country is generally friendly to being an entrepreneur, and whether people have the skills and support to start innovative businesses.
	Ease of Starting a Business	<u>World Bank Ease of Doing Business Score</u> (World Bank, 2019)	How easy is it to start a business in that country? This indicator adds depth to the measurement of how entrepreneurial a country is generally, by looking at the regulatory procedures governing how to start a business. This gives an impression of whether it is easy to launch an innovative startup.
	Digital Skills in Population	<u>WEF Global Competitiveness Index</u> (World Economic Forum, 2019)	Do the people of that country possess the digital skills needed to design new technological products? The population needs good digital skills in order to design innovative GovTech products.
	Availability of Venture Capital	<u>WEF Networked Readiness Index</u> (World Economic Forum, 2019)	How easy is it for startups with innovative but risky projects to obtain equity funding? This gives a measure of the availability of private (rather than public) funding for GovTech. GovTech companies need access to capital to finance their technologies and scale their businesses.

Dimension	Indicator	Source	Description
Digital Environment	Technology Enablers	Global Connectivity Index (Huawei, 2019)	<p>Are the right advanced technologies available for GovTech companies to innovate? This indicator consists of five sub-indicators:</p> <ul style="list-style-type: none"> – Broadband. – Data Centres – Cloud Computing and Storage. – Big Data. – Internet of Things (IoT).
	Open Data	Open Data Barometer (World Wide Web Foundation, 2016)	<p>Do GovTech companies have access to open government data? This indicator is important because GovTech companies rely on this data to develop their products. This indicator consists of the three sub-indicators from the Open Data Barometer:</p> <ul style="list-style-type: none"> – Readiness. – Implementation. – Emerging Impact.
Industry Environment	Number of Tech SMEs	AngelList (AngelList, 2019) and Crunchbase (Crunchbase, 2019)	<p>How many tech SMEs generally are there in the country? This gives us a measure of the general tech startup environment from which GovTech could emerge.</p> <p>To estimate this value, we searched two large databases of technology startups, AngelList and Crunchbase. We took the total number of companies listed for each country across both databases. We then took the simple average of these two numbers to get an overall estimate.</p>
	Number of GovTech SMEs	AngelList (AngelList, 2019), Crunchbase (Crunchbase, 2019), Startupxplore (Startupxplore, 2019) and Latin American Startup Directory (LAVCA, 2017).	<p>How many GovTech companies are there in the country? This indicator gives a more precise measure of the existing supply of GovTech.</p> <p>To estimate this value, we used four databases of technology startups: AngelList, Crunchbase, Startupxplore and the Latin American Startup Directory.</p> <p>We first compiled a list of search terms based on how the existing GovTech companies of which we were aware (e.g. O.S. City⁴) described themselves in existing databases. The exact terms varied from database to database as each website had slightly different search filters, but the full list we used across all four websites was:</p> <ul style="list-style-type: none"> – GovTech. – Government. – Government Innovation. – Federal Government. – Open Government. – Smart Cities. – Smart Citizens. – Open Data. – Civic Tech. – Governance. – Government Hospitals. – Government Schools. – Politics. <p>For each country, we compiled a list of all the companies that came up under each filter. We then removed any duplicates to find the total number of listed startups across all four databases.</p>

4 See: O.S. City <https://os.city/>

Dimension	Indicator	Source	Description
Policy Environment	Importance of ICTs to Government Vision of the Future	WEF Networked Readiness Index (World Economic Forum, 2019)	Does the government of a country have a clear plan for using technological innovation to improve their overall competitiveness? This indicator gives a picture of the government's attitude towards technological innovation more generally.
	Public Challenges / Digital Accelerators Strategy	Desk Research	<p>Does the government have a Public Challenges or a Digital Accelerator Strategy? This indicator also measures the appetite for digital innovation within government.</p> <p>To measure this indicator, we conducted desk research into the existing policies and strategies of each country. Those with public challenges or digital accelerators policies scored a 1 and those without scored 0.</p>
	National GovTech Strategy	Desk Research	<p>Does a country have a National Strategy for GovTech? This gives a more precise measure of whether a government is interested in the opportunities for innovation presented by GovTech and especially whether there is an orchestrated policy effort.</p> <p>To measure this indicator, we conducted desk research into the existing policies and strategies of each country. If the country had a National GovTech Strategy, it scored a 1; if other policies such as digital strategies mentioned GovTech, it scored 0.5; otherwise, it scored 0.</p>
	Government Spending on R&D	UNESCO (UNESCO, 2019)	How much does the government spends on R&D as a percentage of its GDP? This indicator gives a general picture on how much public funding is available for researching and developing innovative technologies.
	GovTech Fund	Desk Research	<p>Is there a public fund available specifically for GovTech companies? This indicator measures public funding for GovTech in particular.</p> <p>To measure this indicator, we conducted desk research into existing public funding for technology in each country, and whether any was GovTech-specific. If a country had a GovTech fund, it scored a 1, and if not, it scored 0.</p>
	BONUS: Data Protection and Privacy Laws	UN Data Protection and Privacy Legislation Worldwide (UNCTAD, 2019)	<p>Does the country have legislation addressing data protection and privacy? Data protection and privacy laws are not necessarily indicative of a mature GovTech ecosystem, and they may in fact pose administrative and legal hurdles to startups obtaining data. However, these laws are an important regulatory prerequisite for GovTech companies using citizens' data in an ethical manner.</p> <p>For this reason, we included the data protection and privacy laws indicator as a 'bonus', so that countries with laws would be rewarded but those without would not be penalised.</p> <p>Countries with data protection and privacy laws received a 1, or 0.5 if they had only draft legislation. Their overall score for the policy environment dimension was then calculated as a weighted average including the data protection and privacy laws indicator. If a country did not have any legislation, its score for the policy environment dimension was calculated as the weighted average of the other five indicators and did not include the data protection and privacy laws indicator.</p>

Dimension	Indicator	Source	Description
Digital Government	Government Procurement of Advanced Technology Products	WEF Networked Readiness Index (World Economic Forum, 2019)	To what extent do government purchasing decisions foster innovation? This gives us a general picture of the government demand for innovative technology products.
	Online Services	UN E-Government Index (UN, 2018)	How developed is the existing provision of online government services? This also gives a general picture of government demand for new technology, by measuring the existing digital infrastructure governments have already implemented. These online services can be an important target for innovation by GovTech startups.
Procurement Frameworks	Legal Frameworks	Desk Research	<p>What kind of procurement framework does a country have, and is it favourable to SMEs? This indicator measures whether the regulatory frameworks for procurement are harder or easier for GovTech SMEs to navigate.</p> <p>To measure this indicator, we conducted desk research into the procurement laws of each country. Countries were scored as follows:</p> <ul style="list-style-type: none"> – Open bidding (yes = 1, no = 0). – International Bidding (yes = 1, no = 0). – Competitive dialogue (yes = 1, no = 0). – Most convenient bid: multiple criteria (price, quality, bidder suitability etc.) weightings (points and percentages) in the bid terms and conditions (yes = 1, no = 0). – Strategy / policy for procurement of innovative services (at the central level = 1; some procuring entities have a policy = 0.5; no = 0). – Policy / regulation on payment period for suppliers (yes = 1, no = 0). – Policy / regulation on minimum time of bidding cycle (yes = 1, no = 0). – Policy / regulation on how long company needs to exist before being able to bid (yes = 0, no = 1). – Policy / regulation on whether % of bids needs to go to SMEs (specified quota = 1; other measures that prioritise SMEs = 0.5; no = 0).
	Open Contracting Data	Global Open Data Index (Global Open Data Index, 2016)	Is contracting data available for companies to view and scrutinise? The availability of contracting data allows fairer competition between companies, which can benefit startups seeking government contracts.
Procurement Culture	Government Effectiveness	World Bank World Governance Indicators (World Bank, 2018)	Is the government perceived to be effective? This indicator shows how likely the government is to enforce procurement regulation, to pay suppliers on time, and to respect contracts. GovTech startups are likely to find it harder to contract with governments who are less effective, as they are more vulnerable to, for example, late payments from the supplier.
	Government Control of Corruption	World Bank World Governance Indicators (World Bank, 2018)	Is the government perceived to be in control of corruption? Public procurement can be a key vehicle for corruption, with bribery as well as favouritism expressed to be an issue. Corruption hurts smaller firms that are likely to be less-well connected by making it harder to win government contracts.

Weightings

Whilst all of the dimensions and indicators that we have identified are key for assessing the maturity of the GovTech ecosystem, some indicators tend to be more important than others. During our qualitative research we asked local experts to comment on the importance and weight of the dimensions and indicators that we included in the index.

Based on our primary research the three pillars (startups, government, and procurement environment) that form our GovTech index, are of equal importance, and we have therefore weighted them equally. The greatest variation lies in the weighting of the indicators within the specific dimensions. The overall weighting can be found in the table below.

Startups	1
Innovation Environment	1
Capacity for innovation	1
University-Industry collaboration in R&D	1
Entrepreneurship environment	1.5
Ease of starting a business	1.5
Digital skills in population	2
Availability of venture capital	2
Digital Environment	1
Broadband	1/5
Data centres	1/5
Cloud computing storage	1/5
Big Data	1/5
Internet of Things	1/5
Readiness (Open Data)	1/3
Implementation (Open Data)	1/3
Emerging impact (Open Data)	1/3
Industry Environment	1
Number of tech SMEs	1
Number of GovTech SMEs	1

Government

	1
Policy Environment	1
Importance of ICTs to government vision of the future	2
Public challenges / Digital accelerators strategies	1.5
National GovTech Strategy	2
Government spending on R&D	1
GovTech Fund	2
Data protection and privacy laws	1
Digital government	1
Government procurement of advanced technology products	1.5
Online services	1

Procurement

	1
Procurement frameworks	1
Legal frameworks	1.5
Open contracting data	1
Procurement culture	2
Government effectiveness	1
Government control of corruption	1

Calculation

To calculate the overall scores for each country, we normalized each indicator to give a score between 0 and 1. We then found the weighted average for each of the seven dimensions and converted these into scores between 0 and 10. We then took the weighted average for each pillar, giving a score between 0 and 10 for each of the three pillars. The overall score is the simple average of the three pillars, giving a score from 0 to 10.

Limitations of Methodology

When devising the methodology for the Index, we came up with a number of challenges. These are outlined below, along with the solutions we adopted to address these challenges.

Availability of Data

As GovTech is an emerging field, there were some cases in which data simply was not available to obtain the kind of GovTech-specific insights we would have liked. For example, within the digital government dimension, we would have liked to measure the amount spent by governments on GovTech products specifically, but this is something that is not yet measured in most countries. In order to address this limitation, we chose indicators that could serve as a proxy for missing data (e.g. we measured the procurement of all advanced technology products by governments). We also used our qualitative research to gain more specific insights about the state of GovTech in the region.

The availability of data also presented problems in cases where datasets did not cover all countries. When possible, we tried to find datasets that covered all countries, but in some cases we made the decision that the data was valuable enough for the countries that were represented to justify using an incomplete dataset. In cases where a country had no data for a particular indicator, we calculated the average for the dimension in which the missing indicator(s) featured by using only those indicators for which data was available.

Finally, in some cases, datasets were only available for previous years, and the oldest data we used was from 2016. As GovTech is such a fast-moving field, this data may not be the best reflection of the state of GovTech ecosystems today. To overcome this problem, we used our qualitative research to evaluate and supplement the quantitative scores and ensure the most up-to-date analysis of GovTech in Latin America.

Estimating the Number of GovTech Startups

A key aspect of the GovTech ecosystem is the supply of innovative products from startups that governments can deploy to improve public services. However, as GovTech is such a new field, there is not yet any existing dataset that measures the number of GovTech startups in each country. In order to overcome this problem, we decided to design our own method for measuring the number of GovTech startups in a country. Based on our primary research, we identified four useful startup directories on which to base this measurement: AngelList, Crunchbase, Startupxplore and the Latin American Startup Directory.

Estimating the number of GovTech startups is also challenging because the term 'GovTech' has only recently attracted attention. As such, many companies that we might classify as GovTech would not necessarily describe themselves as such. We met this challenge in two ways: first, we split the overall dimension (industry environment) into two indicators, the total number of tech startups and the number of GovTech startups. In this way, we had a general measure of the tech sector of each country, which mitigates against missing tech companies offering GovTech but not describing themselves as such. Second, we came up with a list of search queries (outlined above) related to GovTech to make sure we got the best possible estimate of the number of GovTech firms.

A further problem is that existing startup directories are often skewed towards certain countries (e.g. Crunchbase is skewed towards the United States, and Startupxplore is skewed towards Spain), meaning that their coverage is not always even. This presented a particular challenge when estimating the total number of tech companies in a country. To counteract this problem, we decided to use multiple directories rather than relying on just one. In the case of the total number of tech companies, we used only the two largest directories, AngelList and Crunchbase, because the number of companies listed for each country on the other two directories was significantly lower than for either AngelList or Crunchbase, suggesting that the larger directories had better coverage. The Latin American Startup Directory

and Startupxplore were, nevertheless, still useful for estimating the number of GovTech companies in a country because they listed some companies not present on the larger databases. The discrepancy in the companies listed across the four directories suggests that the more directories used, the closer the estimate of the number of GovTech companies will be to the true value, but due to time constraints, we were not able to identify and search any further directories.

Overall, our methodology gives us a fair estimate of the industry environment within each country. However, there is a need for more data collection on the GovTech sector in the future to obtain further insight into this dimension. For example, data on the market share of GovTech companies in each country would be a good way to assess the growing supply of GovTech products to which governments have access.

Measuring Procurement

Our research highlighted how central procurement is for the GovTech ecosystem, as it is the most important point of collaboration between governments and startups. However, measuring the procurement environment in each country was not straightforward, as we could not find any existing quantitative sources that covered all countries and that concerned procurement of technology products rather than of some other good or service. We, therefore, created our own score for procurement in each country. We based our framework on existing studies on public procurement such as the Inter-American Development Bank's 'Public Procurement in Latin America and the Caribbean' (IDB, 2016), as well as on the areas of procurement regulation highlighted by our interviewees as especially important to procuring from startups. This resulted in 9 elements of procurement (weighted equally) on which countries were scored. We evaluated each element based on: existing procurement studies such as the IDB study; desk research into each country's procurement laws; and insights from our interviewees.

A further challenge in measuring procurement was that many of our interviewees pointed to a gap between the theory and practice of procurement law. A country with good procurement laws will not necessarily have a mature GovTech ecosystem if those laws aren't enforced in practice. This meant that a score for procurement regulations alone

would not be sufficient to make the procurement pillar a precise measure as possible. To overcome this problem, we split the procurement pillar into two dimensions, with four indicators. The first dimension, procurement frameworks, includes the score for procurement regulations, as well as a score for the availability of open contracting data. The provision of open contracting data is important because it makes procurement systems more transparent, which can help smaller companies compete with larger ones. It also allows non-government actors to scrutinise unfair procurement practices, and so acts as a mechanism to ensure that regulations are enforced.

The second dimension, procurement culture, is a measure of how likely procurement regulations are to be enforced given the background government culture. Based on our qualitative research, we identified two problems in the procurement culture that are especially damaging to startups. First, ineffective governments may fail to make payments on time, and as GovTech startups often rely on governments as their only or their main buyer, this irregularity can cause serious cash-flow problems. Second, high levels of corruption make it harder for GovTech startups to win contracts, as they do not have the money or connections to compete with larger firms. We, therefore, used two of the World Bank's World Governance Indicators (World Bank, 2018) (World Bank, 2019) to score each of these issues, and give an overall measure of whether the procurement culture in a country is favourable to GovTech.

As with the issue of estimating the number of tech and GovTech startups in a country, this methodology for scoring a country's procurement environment is a fair estimate, but there is a need to study the specific issue of procurement for SMEs generally, and for GovTech companies specifically. Given its centrality to the GovTech ecosystem, better data on the procurement environment in each country will help tailor policymaking to support GovTech firms in contracting with the government.

Annex II: Piloting the Methodology at City-Level

The Case for GovTech at City-Level

During our research, we were made aware of several GovTech success stories taking place across major cities in Latin America.

- In Guadalajara, Mexico, Visor Urbano is facilitating the processing of licenses for business or construction projects entirely on the web, whilst helping citizens obtain information on the urban development of Guadalajara.
- In the municipalities of La Rioja, Alta Gracia, and Rosario, in Argentina, MuniDigital provides a cloud-based and real-time data system enabling citizens to send alerts, file complaints, and obtain news on recent developments in their municipality.
- In Teresina, Brazil, OS City has been using blockchain and artificial intelligence to create a more efficient public transport system by digitising passenger's data.

Overall, it seems that GovTech ecosystems could be particularly impactful at the city level, and our research indicated that city governments are well placed to tap into the USD ~1 trillion value of GovTech. This is for a number of reasons: first, as municipalities have a more direct contact with the citizens they

serve, and vice versa, citizens may feel closer to their local governments.

Secondly, city-level contracts tend to be more feasible for startups with limited resources. Our primary research shows that a major challenge startups face is the problem of scaling. Projects that are taking place at a national level require extensive financial, technical, and human resources - not to mention time. Especially for startups, this may represent a significant challenge in that whilst they might be perfectly able to provide the technical solutions specified in a government contract, they may not have enough staff for completing large-scale projects. By a similar token, GovTech startups might also find it limiting that, given their limited resources, they may just be able to devote themselves to a reduced number of projects at a time, even though they would be capable to offer their services for more government work. A number of countries allow startups to join together for bids at a national level in order to be able to have enough capacity, but for startups, the desire is to be able to scale and be able to take projects on by themselves.

In addition to this, throughout Latin America major cities tend to have greater autonomy and less

regulatory restrictions on procurement processes and how their funds are being spent. This can be particularly useful for 'direct procurement' processes where a particular startup might have a unique technology product or service that local municipalities want to buy. It should be mentioned, however, that to an extent this could increase the risk of corruption with procurement processes as preferential treatment may be given to particular companies. Nonetheless, increased autonomy of cities is reportedly also accompanied by a more tech and innovation-friendly mentality. As one of our interviewees explained:

"The most interesting things are happening at the local level. National states are much slower, cities are more dynamic and more ready for innovation and to work with startups. At the municipal level you get the most interesting developments in smart cities or open government."

In the following sections, we will apply our methodology for assessing the maturity of the GovTech ecosystem at a national level, for conducting an analysis across cities.

Applying our Methodology across Cities

As the index methodology uses datasets that involve countries rather than cities, we will need to adapt it to the city level to see whether our analysis can be extended.

The cities on which we will try this methodology will be: Buenos Aires, Mexico City, and São Paulo. There are several options for creating a score for each of the cities presented.

1. **City-level score from existing datasets:** In some cases, the existing datasets we have used for each indicator can be used to get a score at the city level.
2. **City-level score from new quantitative data:** In some cases, there may be new datasets that cover cities instead of countries that we can use to supplement or replace existing datasets.

3. **Country score covers city:** In some cases, the country scores of our indicators will also be applicable to cities, e.g. when the city government follows the same regulations as the federal government.
4. **City-level score from new primary and desk research:** In some cases, neither existing index scores nor other quantitative data will exist. In this case, we may be able to create a score from our own desk research, as we did for some indicators at the country level (e.g. National GovTech Strategy).

Dimension	Indicator	Possible Method of Scoring	Description
Innovation Environment	Capacity for Innovation	City-level score from new quantitative data	Explore alternative datasets such as the Innovation Cities Index (2thinknow, 2019).
	University-Industry Collaboration in R&D and Digital Skills in Population	City-level score from new quantitative data	Potential to use world rankings of universities such as the QS World University Rankings (QS, 2019) to establish performance of universities in each city for science. A simple scoring methodology would be to take the top ranked university in each city and to take the average of the scores it gets across the ranking criteria for the subject Computer Science and Information Systems.
	Ease of Starting a Business	City-level score from existing dataset / Country score covers city	Dataset has some city-level scores (e.g. for São Paulo and Mexico City). Otherwise, use country score, as regulations are often the same across cities.
	Entrepreneurship Environment	Country score covers city	Use country score, as entrepreneurial ecosystems are likely already to be concentrated in cities.
Digital Environment	Venture Capital Availability	City-level score from new quantitative data	Potential to estimate the availability of venture capital in a specific city based on the number of VC firms listed for each city on AngelList .
	Open Data	Country score covers city / City-level score from new desk research	Use country score to establish the base commitment to open data. Potential to add more granular city insight by investigating which cities are members of the Open Government Partnership.
	Technology Enablers	Country score covers city / City-level score from new quantitative data	Use country score to establish basic technological infrastructure. Potential to add more refined city score for the broadband enabler by investigating broadband speed using tools such as Broadband Speed Checker ⁵ .
Industry Environment	Number of GovTech SMEs and Number of Tech SMEs	City-level score from existing dataset	Use the same directories to estimate the number of GovTech / tech SMEs in each city.
Policy Environment	Importance of ICTs to Government Vision of the Future and National GovTech Strategy	City-level score from new primary and desk research	Instead of investigating national GovTech strategies, we could look into whether cities have Smart City Strategies or other legislation relating to GovTech. This would also relate to the importance of ICTs to each municipal government's vision of the future.
	Public Challenges / Digital Accelerator Strategy, GovTech Fund and Spending on R&D	City-level score from new primary and desk research	Potential to quantify city-level funding and support available for GovTech by researching specific tech and/or GovTech incubators and accelerators in each city.
	Data Protection and Privacy Laws	Country score covers city	Cities will have to abide by national data protection and privacy laws.

⁵ See: Broadband Speed Checker in <https://www.broadbandspeedchecker.co.uk/>

Dimension	Indicator	Possible Method of Scoring	Description
Digital Government	Government Procurement of Advanced Technology Products	City-level score from new quantitative data / City-level score from new desk research	In some cases, city government will have published open contracting data that provides information on their budget for technology products. For example, this study on Buenos Aires by the Open Contracting Partnership resumes initiatives on public contracts information in Argentina (Lisnichuk, 2019).
	Online Services	City-level score from new desk research	Potential to create a simple framework for evaluating city government's online services by seeing which municipal tasks can be performed online.
Procurement Framework	Legal Framework	Country score covers city	Procuring entities at the municipal level will have to abide by the national regulations for procurement.
	Open Contracting Data	City-level score from new desk research	Potential to score cities according to whether they follow the Open Contracting Data Standard ⁶ .
Procurement Culture	Government Effectiveness and Government Control of Corruption	City-level score from new primary and desk research	<p>This may well be the most challenging dimension to quantify, and will probably rely on qualitative insights from primary research.</p> <p>One different way to measure startup-friendly procurement cultures in cities could be to use open contracting data to see the average size of contracts awarded. Our interviewees for the GovTech Index made us aware that, at the national level, a problem for GovTech startups is that the scale of procurement opportunities is too large for them to undertake on their own. At the city level, however, smaller contracts would be more accessible to GovTech startups.</p>

6 See: Open Contracting Data Standard map in <https://www.open-contracting.org/why-open-contracting/worldwide/#/>

Creating a City-Level Score

We have created a pilot score for each of the three cities, based on the methodology of the GovTech Index. The pilot score comprises 19 indicators across

5 dimensions, with similar weights to the GovTech Index. The scores for each indicator were calculated as described in the table above.

Dimension	Indicator	Weight	Source
Innovation Environment	Capacity for Innovation	1	Innovation Cities Index (2thinknow, 2019)
	Ease of Starting a Business	1.5	World Bank Ease of Doing Business Score (World Bank, 2019)
	Digital Talent	2	QS World University Rankings (QS, 2019)
	Entrepreneurship Environment	1.5	Global Entrepreneurship Index (Global Entrepreneurship Development Institute, 2018)
	Number of Venture Capital Firms	2	AngelList ⁷
Digital Environment	Country Open Data Score	1	Open Data Barometer (World Wide Web Foundation, 2016)
	Open Government Partnership	1	Open Government Partnership ⁸ (member = 1, non-member = 0)
	Broadband Speed	0.2	Broadband Speed Checker ⁹ (download speed)
	Advanced Technology Enablers	0.2 each	Global Connectivity Index (Huawei, 2019) – Data Centres – Cloud – Big Data – IoT
Industry Environment	Number of GovTech SMEs	1	Crunchbase ¹⁰ , AngelList ¹¹ , Startupxplore ¹²
	Number of Tech SMEs	1	Crunchbase and AngelList
Policy Environment	Smart City Strategy	2	Desk Research (yes = 1, no = 0)
	Digital Accelerators	1.5	Desk Research (yes = 1, no = 0)
Procurement Frameworks	BONUS: Data Protection and Privacy Laws	1	UN Data Protection and Privacy Laws (UNCTAD, 2019)
	Legal Frameworks	1.5	Desk Research
	Open Contracting Data Standard	1	Open Contracting Partnership ¹³ (yes = 1, no = 0)

7 See: [AngelList](https://angel.co/) (<https://angel.co/>)

8 See: [Open Government Partnership](https://www.opengovpartnership.org/our-members/) list here (<https://www.opengovpartnership.org/our-members/>)

9 See: [Broadband Speed Checker](https://www.broadbandspeedchecker.co.uk/) in <https://www.broadbandspeedchecker.co.uk/>

10 See: [Crunchbase](https://www.crunchbase.com/) (<https://www.crunchbase.com/>)

11 See: [AngelList](https://angel.co/) (<https://angel.co/>)

12 See: [Startupxplore](#) ([Startupxplore](#))

13 See: [Open Contracting Partnership](#) ([Open Contracting Partnership](#))

We then used a similar method to the GovTech Index to calculate an overall score, taking the weighted average for each dimension, using that to find the average for each pillar, and then using the result to find an overall score out of 10.

The full dataset for our calculations can be found [here](#).

Limitations of Methodology at City-Level

In its current form, the main limitation of this pilot test is the coverage of the Index. Due to time and resource constraints, we were not able to cover all of the indicators and dimensions in the Index, as some would require further primary research. In particular, the dimensions for digital government and procurement culture would both require desk research and engagement with local experts to score each city.

However, as outlined above, it is possible to cover all the indicators at the city level with further research, and to give a complete index score for each city.

Buenos Aires

City Score

5.82 /10

City Ranking

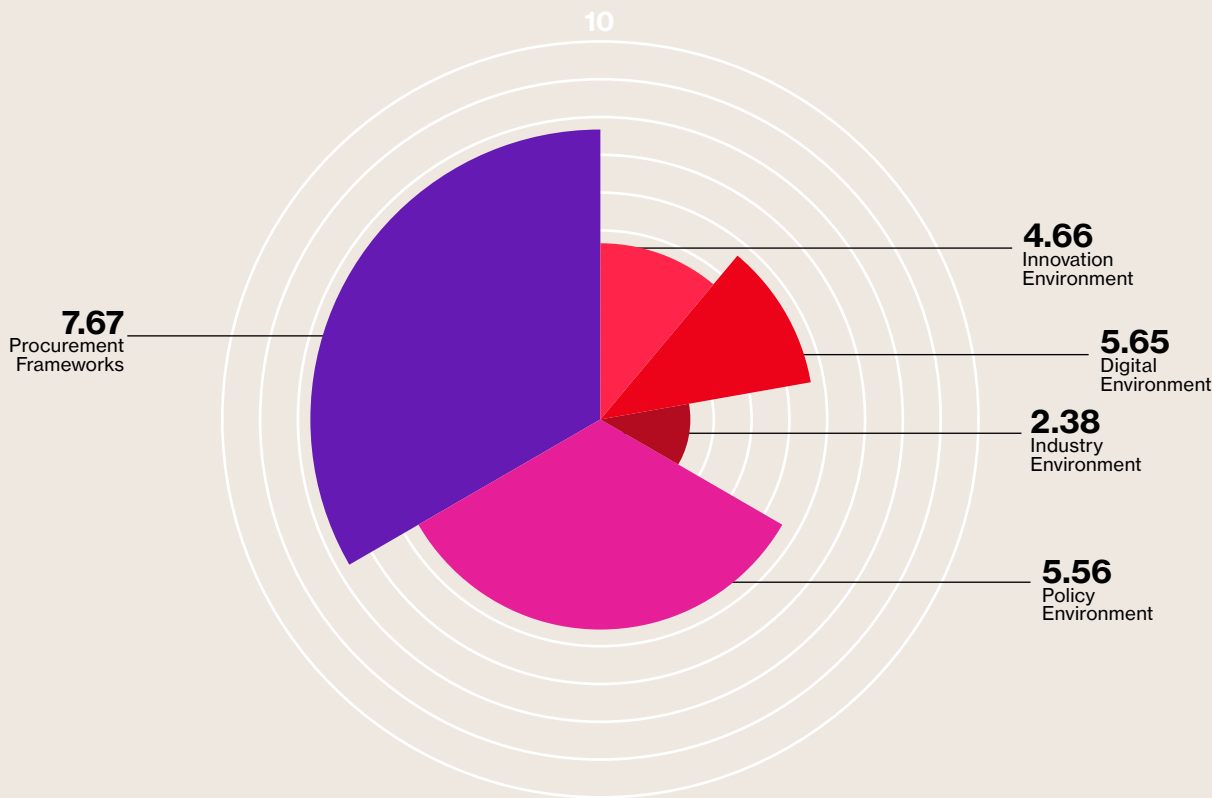
2 /3

Country Index Score

4.17 /16

Population

15,057,000



Startups

4.23/10

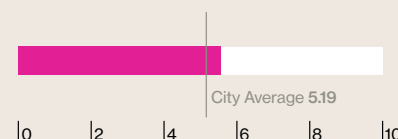


Buenos Aires has had a bustling technology district since 2009 (Mander, 2017) as part of the government's investment in innovation and technology in the city. Initiatives such as Startup Buenos Aires and IncuBAte offer mentoring and funding to new and innovative companies, contributing to a favourable innovation environment for GovTech.

The city launched its open data portal in 2012, and this commitment to open data will help to boost the GovTech ecosystem. Furthermore, some of the information available, including lists of the companies in the Technology District, as well as a list of entrepreneurs, is likely to foster collaboration between companies to further boost innovation.

Government

5.56/10

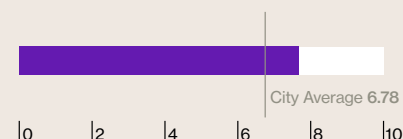


Buenos Aires was named as an autonomous city in 1994, giving it a degree of independence that could be helpful in establishing a strong GovTech ecosystem and leading by example for the other regions in Argentina. The municipal government's commitment to the modernisation of its services already indicate a willingness to make use of innovative technologies, and its innovation laboratories offer a point of collaboration between the government and the private sector.

One of the key factors affecting the adoption of GovTech is the willingness of government bureaucracies to work in new and innovative ways, and Buenos Aires' strategy for allowing small scale testing of innovative public policies and services could promote a culture within government that improves its readiness for GovTech¹⁴. In addition, by providing workshops on public innovation in conjunction with the Higher Career Institute (ISC), the municipal government also helps train public servants to be open to innovation¹⁵.

Procurement

7.67/10



Buenos Aires follows the Open Contracting Data Standard to share information about its procurement processes. This can help companies scrutinise the process and identify evidence of corruption, and so is ultimately beneficial for making procurement more open and transparent and allowing GovTech firms a better chance of contracting with the government.

¹⁴ See: Buenos Aires Project Incubator (<https://www.buenosaires.gob.ar/educacion/ciencia-tecnologia-e-innovacion/laboratorio-de-innovacion/incubacion-de-proyectos>)

¹⁵ See: Formación de innovadores públicos Initiative (<https://www.buenosaires.gob.ar/educacion/ciencia-tecnologia-e-innovacion/laboratorio-de-innovacion/formacion-de-innovadores>)

Mexico City

City Score

6.68/10

City Ranking

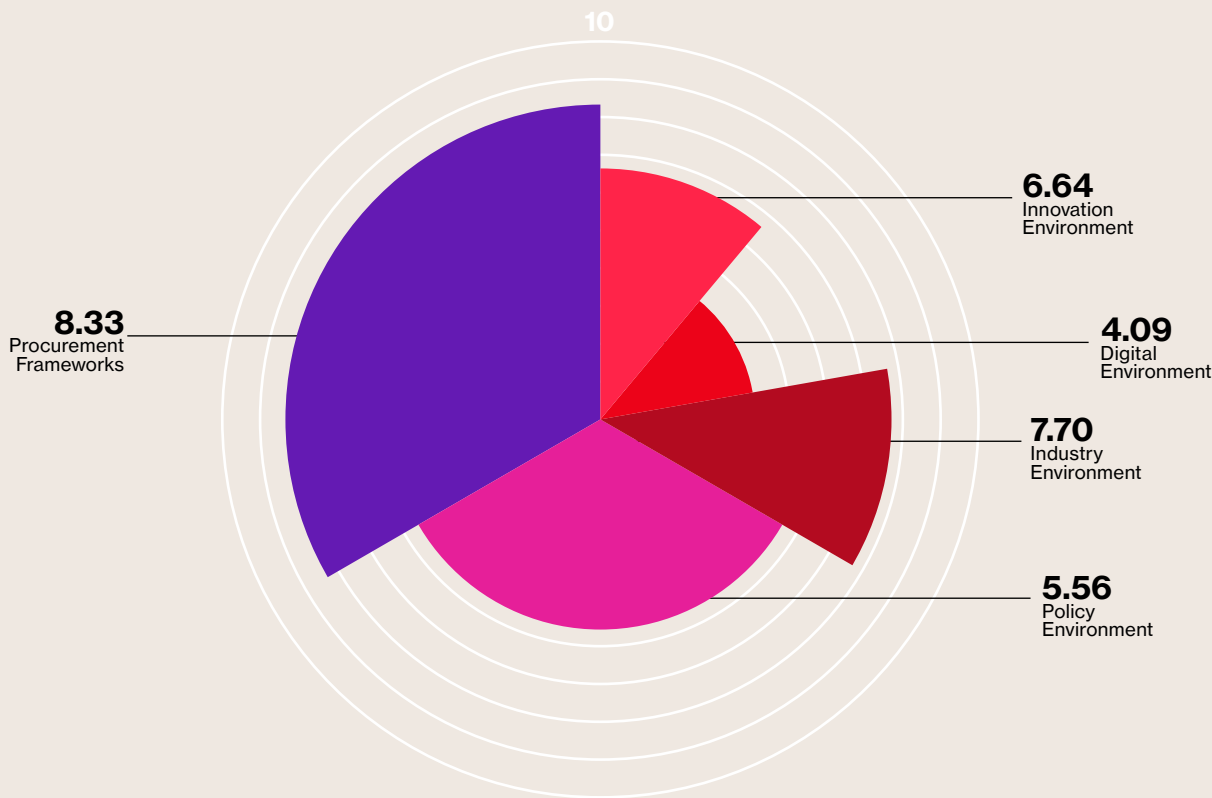
1/3

Country Index Score

5.24/16

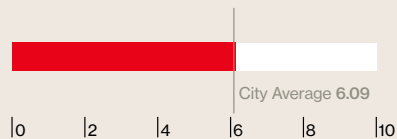
Population

21,672,000



Startups

6.14/10

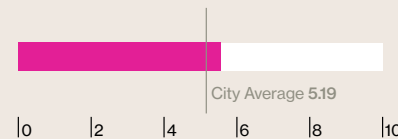


Mexico City's efforts to boost digital innovation and become a smart city has created a good environment for GovTech startups to flourish. Innovation labs such as the Laboratorio para la Ciudad (LabPLC) create opportunities for entrepreneurs to create citizen-focused technology products (such as the taxi-hailing app Traxi, created in the lab).

As well as a good innovation environment, Mexico City also has a digital environment favourable to GovTech due to its commitment to open data. [The city government's transparency portal](#)¹⁶ provides easy access to public information, which is likely to have a beneficial effect on the GovTech ecosystem in the future. In terms of the technology enablers for GovTech, the 2016 '[Connectivity Master Plan for Mexico City](#)' (SEDECO, 2016), set out the city's plans to improve its connectivity infrastructure, a project that will have a beneficial effect on its GovTech ecosystem.

Government

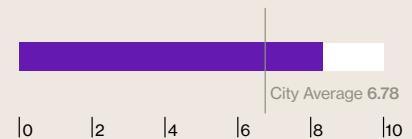
5.56/10



The city government in Mexico City has demonstrated its commitment to making the city a leader in innovation and technology. Public policies such as the LabPLC, as well as the [ECOs Network of Education, Science, Technology and Innovation](#) (SECTEI, 2019) aim to make the city a key generator of new innovative services show that the government cares about harnessing new technologies to solve public problems, which will greatly improve its readiness for GovTech. The government's efforts to make its website open and transparent also suggests a commitment to e-government and the provision of online services that provide the foundation for a good appetite for GovTech.

Procurement

8.33/10



Mexico City implements the Open Contracting Data Standard, and has an online portal where citizens can view information about city government contracts. This commitment to transparency is likely to benefit GovTech firms that want to contract with the government, allowing them to scrutinise the process and ensure that they can compete fairly with larger organisations.

16 See: Portal de Transparencia de la Ciudad de México (<https://www.transparencia.cdmx.gob.mx/>)

São Paulo

City Score

5.55/10

City Ranking

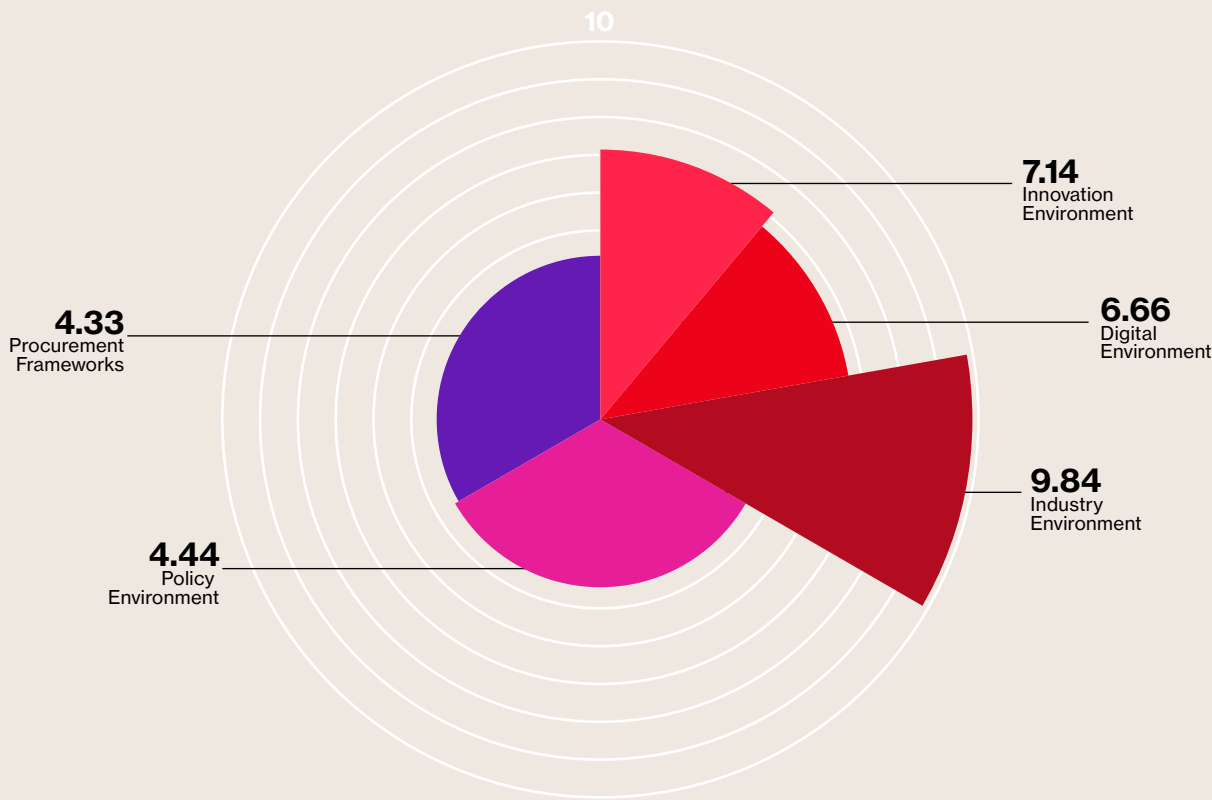
3/3

Country Index Score

5.26/16

Population

21,947,000



Startups

7.88/10

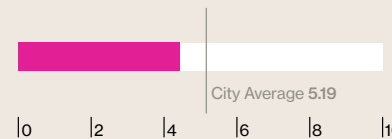


The city government of São Paulo is working to create a positive ecosystem in which GovTech startups could flourish. In the city's [Strategic Master Plan of 2014](#) (Prefeitura de São Paulo, 2014), it outlines a plan to create technology parks across the city as a way to foster innovation. [These parks are a way to foster university-industry collaboration by bringing companies and knowledge centres together](#)¹⁷. Furthermore, the strong performance of São Paulo's universities in world rankings (with two of them ranked in the top three universities in Latin America) suggests that the city may have a good pool of digital talent on which it can draw.

As a member of the Open Government Partnership, the city also provides a good digital environment for GovTech by sharing valuable open government data.

Government

4.44/10

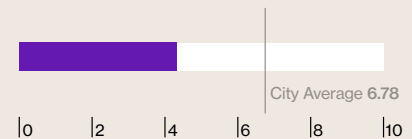


The municipal government has struggled with growing budget deficits, which provides both opportunities and constraints for developing a mature GovTech ecosystem. On the one hand, the city has pushed a 'smart city' agenda to increase the quality and efficiency of their services while reducing costs. As part of this push, the government has pursued [citizen-focused projects](#) such as online methods for starting a business, reducing the overall time from over 100 days to around 5; and a mobile app that allows people to book appointments at healthcare centres (Mari, 2018). On the other hand, budget constraints limit the money available for the government to spend on innovation, which may lead to a more conservative attitude towards risks and working with smaller firms.

As well as its smart city agenda, the government's 'São Paulo Aberta' (Open São Paulo) initiative has also created a culture within government that could be favourable to GovTech-driven innovation in future. The Agents of Open Government programme, part of this initiative, is a peer-to-peer learning platform where citizens can develop courses for government employees. This programme fosters knowledge sharing between those outside and within government, which establishes a good precedent for GovTech. It also presents an opportunity to develop digital skills in government, which was raised in our interviews as a key factor affecting the uptake of GovTech.

Procurement

4.33/10



São Paulo currently publishes data about procurement across different portals, but this information is not always complete or up-to-date, making scrutinising the bidding process more difficult. In response to this problem, the government committed in its [2018-2020 Open Government Action Plan](#) (São Paulo City, 2019) to improve the contracting data it provides. This should help GovTech firms in the future by making procurement more transparent.

A possible challenge for GovTech companies in the future is the close relationships the government has established with large technology firms as part of its modernisation project. [Cisco has donated a number of computers to City Hall](#) (Mari, 2018) to help upgrade the government's technology infrastructure. Such relationships may make it harder for GovTech startups to break into the government market.

¹⁷ See: List of Technology Parks (Parques Tecnológicos) available in <http://www.desenvolvimentoeconomico.sp.gov.br/programas/parques-tecnologicos/>



Key Takeaways

The methodology that we have developed for assessing the maturity of the GovTech ecosystem at a national level applies also at city-level. For most indicators datasets are available either as city-level score from existing datasets, city-level scores from new datasets, or from country scores covering also cities. For some indicators we recommend conducting additional desk and primary research. The reasons for this are twofold. To begin with, this will help us fill the gaps where current datasets are not available. Secondly, speaking with additional local stakeholders would help us further deepen our understanding on whether and how the dynamics within the ecosystem differ at a city-level vs the national level. This is key in order to make sure that the GovTech index addresses all the key elements relevant for assessing the maturity of its ecosystem at a city-level.

We recommend that municipalities conduct a discovery and alpha for developing a bespoke city-level GovTech strategy. The GovTech index provides an ideal research framework for creating a city-level strategy. During the course of our research, it became evident that GovTech has enormous potential,

especially when applied at city level. For national government this insight is of particular importance as they might be home to cities with a particularly mature GovTech ecosystem. In fact, based on our primary research, it seems that cities such as Buenos Aires would achieve exceptionally high scores in our index, even though comparatively Argentina just performs around the regional average. Furthermore, due to their technological infrastructure and entrepreneurial spirit of their population, in particular Latin American cities are uniquely positioned to become global GovTech leaders. Creating a GovTech strategy that seeks to develop the dimensions and indicators within each pillar of the GovTech index - especially those with a heavier weighting - could be a powerful way for getting the most out of the largely still untapped potential of GovTech. This should include conducting research with key stakeholders within the cities, including government officials, citizens, and startups, to be able to understand the local dynamics and create an environment where the GovTech ecosystem can flourish.

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