

# Asian Index of Digital Entrepreneurship Systems 2021

Erkko Autio, Éva Komlósi, László Szerb, and  
Mónika Tiszberger

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# THE ASIAN INDEX OF ENTREPRENEURSHIP SYSTEMS 2021

## **Erkko Autio**

University Professor, Management and Entrepreneurship Department,  
Imperial College Business School, London, United Kingdom

## **Éva Komlósi**

Assistant Professor, Department of Economics and Econometrics,  
Faculty of Business and Economics, University of Pécs, Hungary

## **László Szerb**

University Professor, Director of the Department of Management Science,  
Faculty of Business and Economics, University of Pécs, Hungary

## **Mónika Tiszberger**

Assistant Professor, Department of Economics and Econometrics,  
Faculty of Business and Economics, University of Pécs, Hungary

## HIGHLIGHTS

Digitalization, or the widespread application of digital technologies in business and society, is transforming societies. In addition to society and the economy, digitalization is also transforming entrepreneurial opportunity landscapes and the practices that entrepreneurs use to pursue entrepreneurial opportunities. This is a complex systemic phenomenon that calls for systemic indicators. The Asian Index of Digital Entrepreneurship Systems (AIDES) has been developed to provide quantitative metrics of this phenomenon to inform policymakers, as these seek to enhance the quality and productivity potential of the entrepreneurial resource allocation dynamic in their countries. AIDES adopts a “penalty of bottleneck” approach, which helps policymakers to spot strengths and weaknesses in their countries’ digital entrepreneurship systems and enhance the effectiveness of entrepreneurship policies through a better targeted allocation of policy resources. AIDES provides a comprehensive set of indicators of the digital entrepreneurship systems of 21 Asian countries for which sufficient data was available. In addition, AIDES includes 92 countries from other world regions to allow benchmarking. AIDES combines the physical and the digital conditions for stand-up, start-up, and scale-up of new entrepreneurial businesses, and it presents simulations that inform how policy efforts could be optimized to alleviate bottlenecks in national systems of digital entrepreneurship.

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## LIST OF COUNTRIES

Albania  
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Australia  
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Bahrain  
[Bangladesh](#)  
Belgium  
Benin  
Bolivia  
Bosnia and Herzegovina  
Botswana  
Brazil  
Bulgaria  
Burkina Faso  
[Cambodia](#)  
Cameroon  
Canada  
Chile  
[China, People's Republic of](#)  
Colombia  
Costa Rica  
Croatia  
Cyprus  
Czech Republic  
Denmark  
Dominican Republic  
Ecuador  
Egypt, Arab Republic of  
El Salvador  
Estonia  
Finland  
France  
[Georgia](#)  
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Greece  
Guatemala  
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Hungary  
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Jordan  
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Namibia  
[Nepal](#)  
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Nigeria  
North Macedonia  
Norway  
Oman  
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Panama  
Paraguay  
Peru  
[Philippines](#)  
Poland  
Portugal  
Qatar  
Romania  
Russian Federation  
Rwanda

Saudi Arabia  
Senegal  
Serbia  
[Singapore](#)  
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Slovenia  
South Africa  
Spain  
[Sri Lanka](#)  
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Switzerland  
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Tanzania  
[Thailand](#)  
Tunisia  
Turkey  
Uganda  
Ukraine  
United Arab Emirates  
United Kingdom  
United States  
Uruguay  
[Viet Nam](#)  
Zambia  
Zimbabwe

Note: Asian developing countries are written in blue.

## PREFACE

The Asian Index of Digital Entrepreneurship System (AIDES) adapts the calculation method of the European Index of Digital Entrepreneurship Systems (EIDES) (Autio et al. 2018, 2019, and 2020) and extends its scope to cover more world regions. The primary focus of AIDES is on the national digital entrepreneurship systems of 21 member countries of the Asian Development Bank. In addition, AIDES also includes 92 countries in other world regions for benchmarking purposes.

AIDES 2021 captures general, systemic, and digital framework conditions for entrepreneurship at the country level. Its methodology builds on the Systems of Entrepreneurship Theory<sup>1</sup> (Acs et al. 2014) and provides a way to profile digital entrepreneurship systems at the country level. An important feature of the AIDES's methodology is the penalty of bottleneck algorithm that helps pinpoint the elements of digital entrepreneurship systems that are most likely to hold back system performance. AIDES' policy portfolio optimization analysis helps policymakers target policy actions to elements of the digital entrepreneurship system that are most likely to lead to an improvement in the performance of their digital entrepreneurship systems.

AIDES builds on two central premises. First, it recognizes that entrepreneurship is a highly heterogeneous phenomenon, which ranges from low-productivity self-employment (e.g., street vendors) to knowledge-intensive services (e.g., legal, financial services), manufacturing, digital startups, and the development and commercialization of research and development-intensive high-technology products and services. Also, it follows that the productivity potential of entrepreneurs, defined as their ability to contribute to total factor productivity (TFP) in their countries, can also vary tremendously. From an economic development perspective, the quality of the country's entrepreneurial resource allocation dynamic, therefore, should be a central consideration. Second, AIDES assumes that national framework conditions for entrepreneurship can play an important role in influencing the quality of a country's entrepreneurial resource allocation dynamic, i.e., the ability of this dynamic to channel resources, such as human capital, social capital, financial capital,

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<sup>1</sup> We distinguish between "systems of entrepreneurship", a country-level dynamic, and "entrepreneurial ecosystems", a regional-level dynamic. Systems of entrepreneurship are composed of country-level general and systemic framework conditions for entrepreneurship and regulate the ability of the country's entrepreneurial dynamic to allocate resources to productive uses in the economy, thereby contributing to its total factor productivity. Entrepreneurial ecosystems are regional constellations of entrepreneurial stakeholders and related resources, which facilitate an entrepreneurial experimentation-driven learning process regarding what works in terms of harnessing advances in digital technologies and infrastructures in innovative business models. In short, systems of entrepreneurship advance the country's total factor productivity through its effect on its entrepreneurial dynamic. Entrepreneurial ecosystems advance digital transformation in the economy by facilitating entrepreneurial experimentation with digitally enhanced business models.

and other resources, to high-productivity uses. Ultimately, the launch of any given entrepreneurial business is triggered by a decision of an individual, or a team of individuals, to allocate their human, social, and financial capital to the pursuit of a perceived entrepreneurial opportunity. When making this decision, the individual or team has to weigh trade-offs between alternative occupational choices. For the individual to decide to allocate their human, social, and financial capital to the pursuit of an entrepreneurial opportunity, they need to see this opportunity as promising to provide a higher return to this capital allocation than what they might expect to receive in alternative occupational pursuits. AIDES assumes that country-level framework conditions for entrepreneurship are important regulators of the trade-offs that individuals face when deciding between entrepreneurship and alternative occupational pursuits. AIDES focuses on non-digitalized and digitalized versions of its general and systemic framework conditions for entrepreneurship, the digitalized versions of which we call the country's digital framework conditions.

To successfully enhance the ability of the national entrepreneurial dynamic to allocate resources to high-productivity uses, it is important to have high-quality data that informs on countries' framework conditions for entrepreneurship. AIDES has been designed to provide this data. We hope that policymakers and researchers will find AIDES a useful resource to inform entrepreneurship policy design.

## **I. EXECUTIVE SUMMARY**

### **A. What is Asian Index of Digital Entrepreneurship Systems 2021?**

The Asian Index of Digital Entrepreneurship Systems (AIDES) 2021 covers 113 economies and relies on 103 different indicators to capture the quality of the country's Digital Framework Conditions (DFCs) for entrepreneurship. The primary focus of the index is upon 21 member countries of the Asian Development Bank (ADB). However, the index also covers 92 countries in other world regions for benchmarking purposes.

AIDES is designed to emulate the digitalization of society and economy. Digital technologies are infrastructural: digital infrastructures are ubiquitous, and digital devices, therefore, can be connected to these infrastructures virtually anywhere. As digital components can be added to virtually any device, the ubiquitous digital connectivity means that digital technologies are able to permeate virtually any function or component of the society, thereby digitalizing them.

AIDES captures the degree of digitalization of society and economy. The index is composed of eight pillars, which capture societal conditions relevant to entrepreneurship (section III). For each pillar, we have calculated a corresponding digital weight, which captures the country's relevant digital conditions for that pillar. For each pillar, we calculate a non-digitalized version and a digitally weighted, i.e., digitalized version. The non-digitalized versions of the eight pillars we call Country-level Framework Conditions for entrepreneurship. The digitalized (i.e., digitally weighted) versions of pillars we call Digital Framework Conditions for entrepreneurship. AIDES is then calculated as the bottleneck-corrected average of the eight Digital Framework Conditions to reflect the state of the country's digital entrepreneurship system.

AIDES scores range from 0 (low) to 100 (high). The country's framework conditions for entrepreneurship, as captured in the eight pillars of the index, are divided into General Framework Conditions and Systemic Framework Conditions. For each of these, a non-digitalized and a digitalized version are calculated:

- General Framework Conditions describe the country's general context of entrepreneurship and include (i) Culture and Informal Institutions; (ii) Formal Institutions, Regulation, and Taxation; (iii) Market Conditions, and (iv) Physical Infrastructure. Each framework condition is then digitalized with a corresponding digital weight.
- Systemic Framework Conditions describe the country's resource provision for entrepreneurship and include (1) Human Capital; (2) Knowledge Creation and Dissemination; (3) Finance, and (4) Networking and Support. These resource conditions directly connect with different stages of the entrepreneurial process, namely, entrepreneurial stand-up, start-up,



and scale-up stages. Each framework condition is then digitalized with a corresponding digital weight.

A given country's digital entrepreneurship system is described by its General and Systemic Framework Conditions, as captured in the eight pillars of AIDES. Of these, the general framework conditions regulate how the country's systemic framework conditions can facilitate different stages of the entrepreneurial process, which together define the country's national entrepreneurial dynamic. The country's overall AIDES score is the bottleneck-corrected average of the digitalized versions of its general and systemic framework conditions.

An earlier version of the AIDES methodology, the European Index of Digital Entrepreneurship Systems (EIDES) was developed as a part of a 3-year research project (2018–2020) for the European Commission's Joint Research Centre. The EIDES was the first attempt to measure both physical and digital conditions for entrepreneurial stand-up, start-up, and scale-up in the 27 European Union countries and the United Kingdom. As an evolution of EIDES, AIDES has the same index structure, but its indicator set has been adjusted according to data availability.<sup>2</sup>

## **B. Asian Index of Digital Entrepreneurship Systems 2021 Overview**

- According to the AIDES 2021 ranking, Singapore features the world's best performing Digital Entrepreneurship System in 2021, followed by the United States, Sweden, Denmark, and Switzerland.
- Most of the countries in the AIDES top 30 are European countries.
- In addition to Singapore, three Asian economies also rank among the top 30 countries: Japan (20th), Republic of Korea (ROK) (22nd), and Malaysia (27th).
- In the AIDES 2021 ranking, 15 countries top the list as leaders: Singapore, United States, Sweden, Denmark, Switzerland, Netherlands, Finland, Norway, Luxembourg, United Kingdom, New Zealand, Germany, Canada, Australia, and Austria. Singapore ranks first for start-up and scale-up sub-indices, and second for stand-up. United States ranks first for stand-up and second for scale-up sub-index, but only fourth for the start-up sub-index. Sweden ranks second for the start-up system, third for the scale-up and fourth for the start-up sub-index.
- Behind the leaders, at some distance, are the innovation-driven, high-income followers: Israel, Ireland, Belgium, Estonia, Japan, United Arab Emirates, the ROK, France, Malta, and Spain.

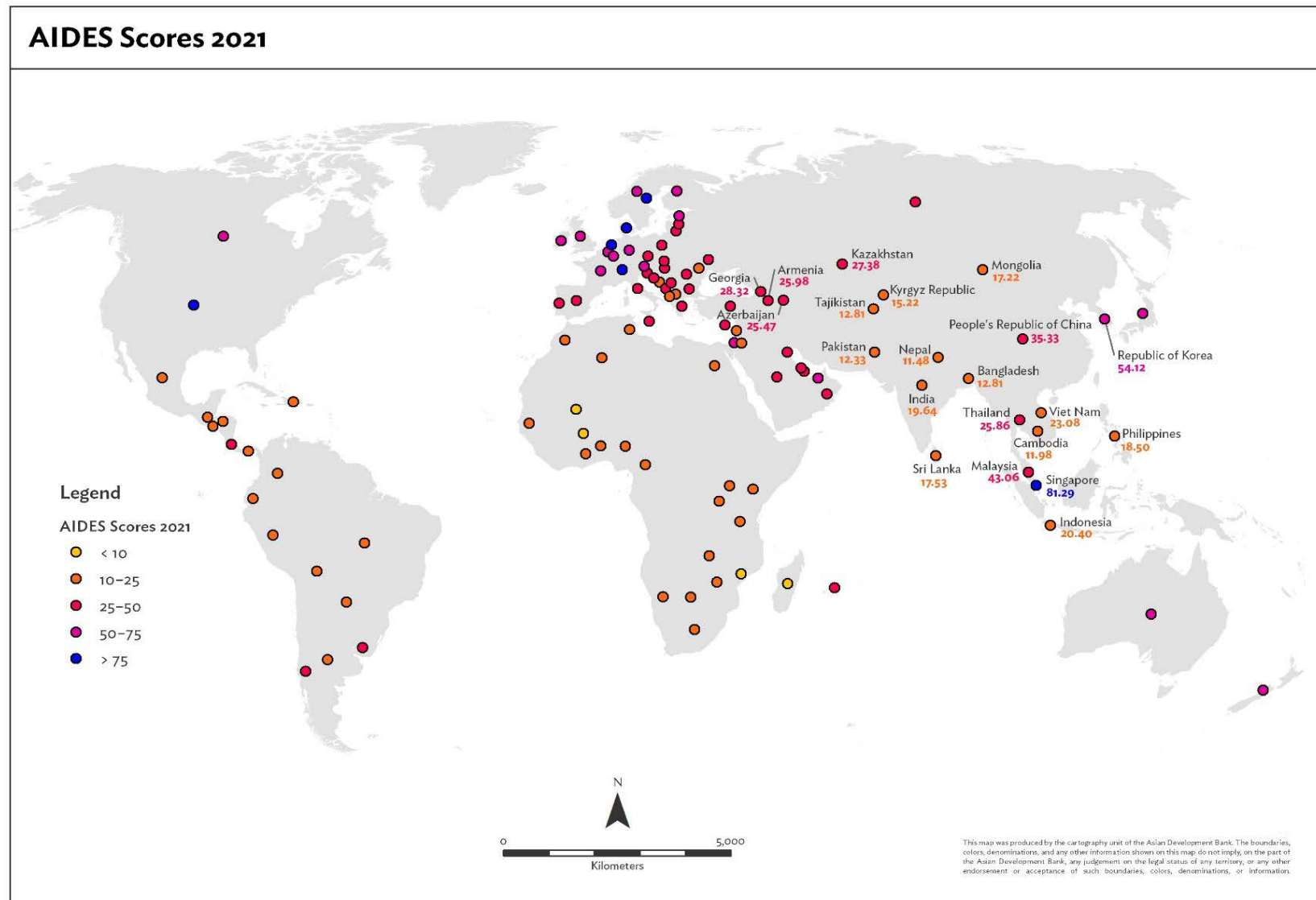
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<sup>2</sup> The details are in Appendix 2.

- A third cluster consists of 15 catchers-up: Czech Republic, Malaysia, Slovenia, Bahrain, Saudi Arabia, Lithuania, Italy, Cyprus, Latvia, Portugal, Qatar, Slovak Republic, Poland, the People's Republic of China (PRC), and Chile. This is a mixed group, as six countries belong to innovation-driven economies, eight countries are among transition economies and one country belongs to the efficiency-driven category.

Figure 1 shows the AIDES 2021 performances for each of the 113 countries.

Figure 1: The Asian Index of Digital Entrepreneurship Systems 2021 Scores



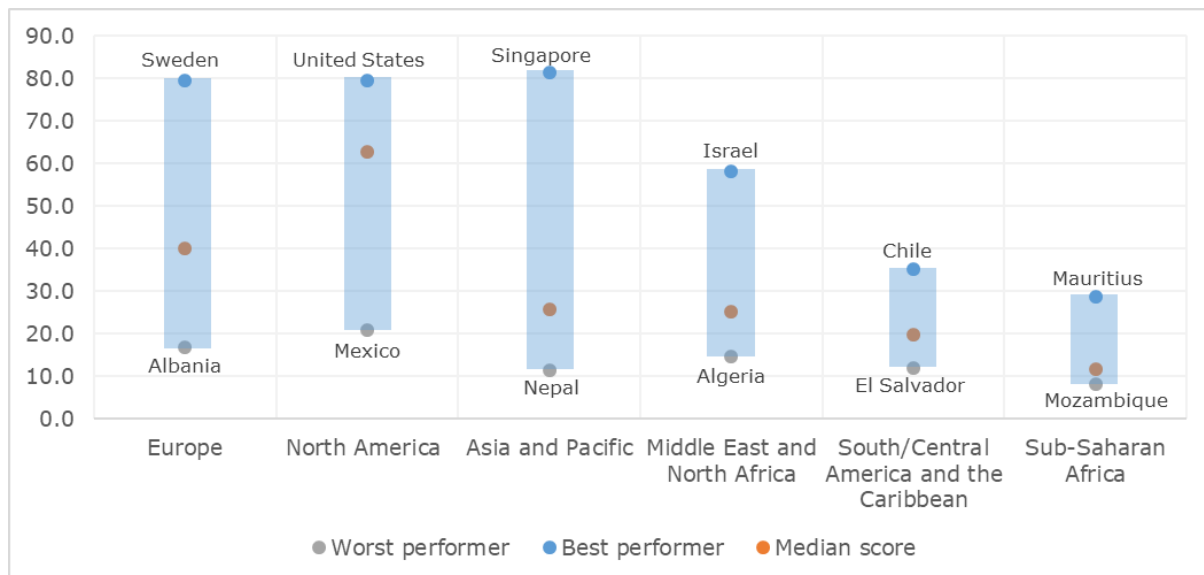
Note: The overall AIDES scores range on a scale from 0 (low) to 100 (high).

Source: Own edition.

- The laggards group comprises 32 countries. The AIDES scores for this group range from 20.1 (Namibia) to 33.4 (Russian Federation). The laggard group includes mainly upper middle-income countries.
- Finally, the tailenders include the remaining 41 countries. With the exception of nine upper middle-income countries (Lebanon, Bosnia and Herzegovina, Peru, Dominican Republic, Botswana, Albania, Ecuador, Paraguay, and Guatemala), the tailenders group includes low-income or lower middle-income economies.

Combining the AIDES scores at the regional level reveals significant differences in both the median performance across world regions, as well as dispersion of performance within world regions (Figure 2).

**Figure 2: Digital Entrepreneurial Ecosystem Gaps within Macro Regions** (the best, median, and worst Asian Index of Digital Entrepreneurship Systems 2021 scores by macro region)



Source: Own edition.

- The results show that the North America region (the macro region contains three countries: United States, Canada, and Mexico) has the highest median score (62.7) among all macro regions, followed by Europe (40.1, based on 38 countries). The Asia and Pacific macro region (25.7, 26 countries) and South/Central America and the Caribbean (25.2, 15 countries)

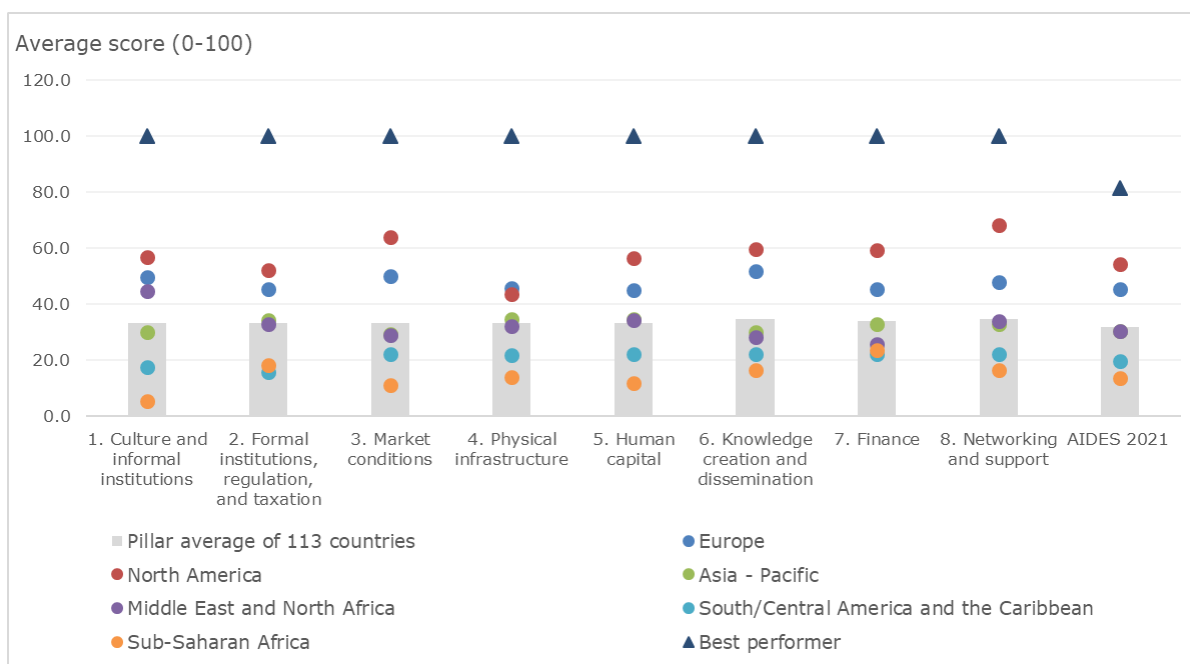
have similar regional median scores. The Sub-Saharan Africa (11.6) has the lowest regional median, where 16 of the 19 economies count among the tailenders group.

- Interestingly, in the Asia and Pacific macro region and Europe the gap between the best and worst performers in terms of digital entrepreneurial ecosystem is significantly larger than in other macro regions (69.8 and 62.9, respectively). This shows that, while some countries in the Asia and Pacific region, have developed their digital entrepreneurship systems to a high level (notably, Singapore, New Zealand, Australia, Japan, and the ROK), there are still many countries in this region that need to make significant progress to close the gaps.

The differences between regions are more evident across the different pillars (Figure 3):

- The average AIDES score (last column) for the 113 economies surveyed is 31.9, measured on a scale of 0–100, where 100 representing the “frontier”: an ideal—and hypothetical—situation in which a country scores perfectly on every pillar of the index.
- The North American and European regions consistently outperform the rest of the world, but they still score 45 and 55 points below the perfect score, respectively. The Asia and Pacific region’s average lag is more than 70 points.
  - In all pillars, even the best-in-class still have room for improvement. Singapore, for example, is the best performer overall, but it still scores 19 points below the perfect score.

**Figure 3: Digital Entrepreneurial Ecosystem Gaps Across Macro Regions** (the average scores across regions by pillars)



Source: Own edition.

- In North America, the United States leads with a score of 79.7, while Mexico scores the lowest (20.8). The region shows the greatest strength in networking and Support, while the lowest average scores for the region are found in Physical Infrastructure. The United States and Canada score the highest averages for North America, while Mexico peaks only in Physical infrastructure.
- In Europe, Sweden leads with a score of 79.6, while Albania posts the weakest digital entrepreneurship system performance (16.7). European nations post high average scores on Knowledge Creation and Dissemination, while the region's greatest weaknesses are found in Human Capital and Formal Institutions, Regulation, and Taxation pillars. Overall, Europe's performance is relatively balanced across all components of the AIDES.
- On average, the Asia and Pacific region performs relatively well in Human Capital and Physical Infrastructure. The region shows weaknesses in Market Conditions. Overall, the region's scores are relatively balanced across all pillars. Singapore far outperforms the rest of the region (81.3), and its score is 16% higher than that of the second-best performer in the region (New Zealand).

- The Middle East and North Africa region shows the greatest strength in the areas of Culture and Informal Institutions, but Israel and the United Arab Emirates raise the average in this regard. The lowest average scores in the region are found in Finance.
- In the South and Central America and the Caribbean region, Chile leads with an AIDES score of 35.3. The country performs significantly better than the pillar averages. The region performs best on average in Knowledge Creation and Dissemination and Finance, but it still lags 37% below the average for the North America region.
- Sub-Saharan Africa's greatest strength is in Finance, and the region has the lowest average scores in Culture and Informal Institutions. Mauritius leads the region with a score of 28.8, while Mozambique exhibits the weakest digital entrepreneurship system performance (8.0). There is a nearly fourfold difference in the average performance of the digital ecosystem between the North America region and the Sub-Saharan Africa region.

The 2-page country outlines in this report provide an overview of the AIDES data for 30 countries, including the solutions of the policy optimization simulation. The data and the simulation provide a good starting point for designing digital entrepreneurship system policies in different countries. Policy attention should be focused on the pillars identified in the simulation, as they are found to be the most significant bottlenecks. In some countries, numerous pillars are identified as particularly important bottlenecks, while in others only a few pillars are flagged as bottlenecks. As digital entrepreneurship systems require inputs from all pillars, the overall policy objective should be to achieve a good balance across all index pillars. Attention should be paid to the assessment of both digitalized and non-digitalized pillars. This also implies the need for coordination between digitalization policy and entrepreneurship policy.

### **C. Key Takeaways for 21 ADB Member Countries**

In our analysis, the group of ADB member countries includes all 21 countries for which complete data was available (Figure 4).

Of these, based on the AIDES ranking, Singapore far outperforms the rest (81.3, first both regionally and globally). Although the ROK ranks second in the region, it is one of the followers, as it ranks 22nd globally. Based on the AIDES ranking, there are only two countries in the Asian region, Malaysia and the PRC, that belong to the group of follower countries.

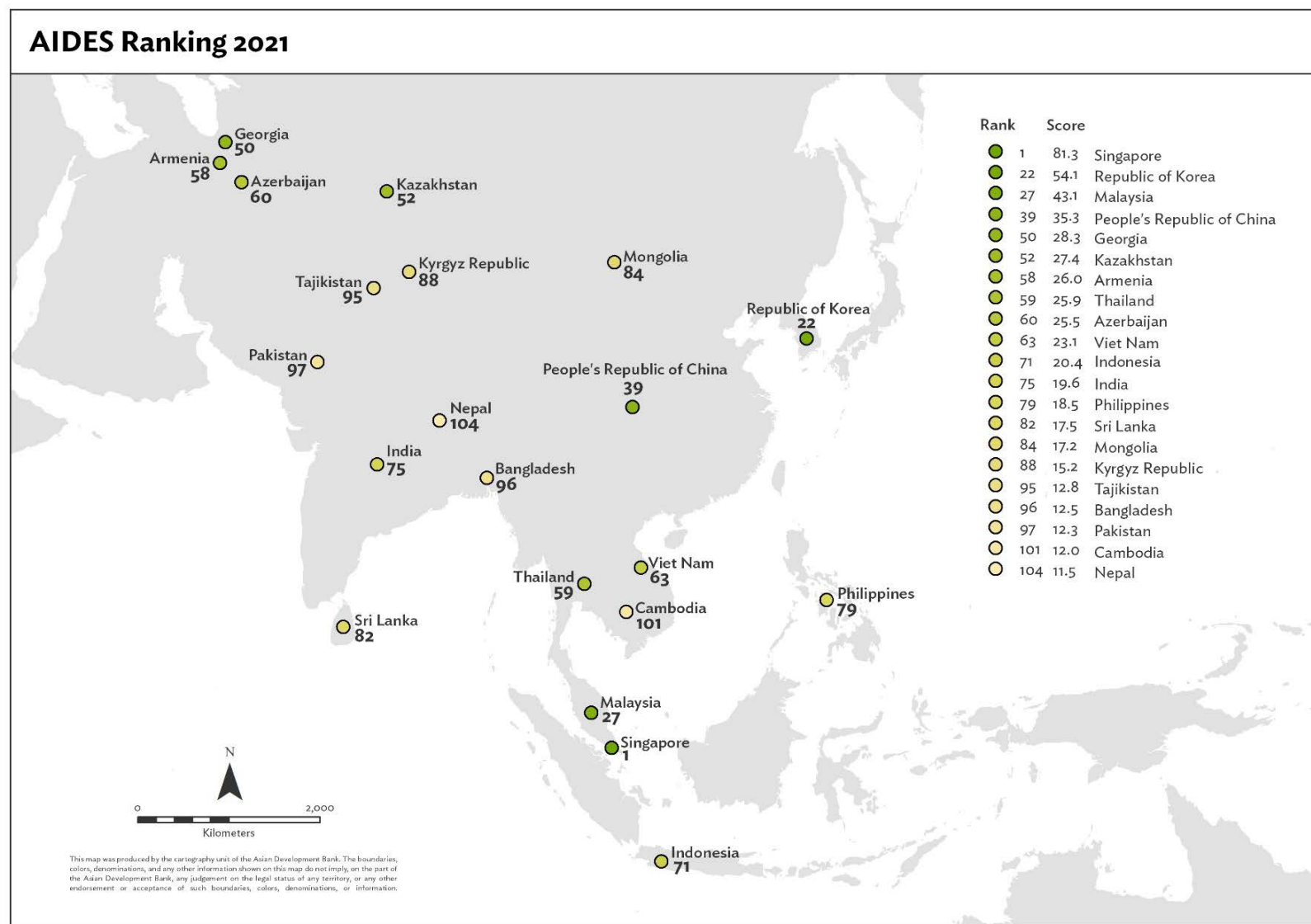
The next seven countries on the list (from Georgia to Indonesia) are among the laggards, while the last 10 (from India to Nepal) belong to the group of tailenders with a weak digital entrepreneurship system performance. The gap between the best (Singapore) and worst-performing (Nepal) countries in the region is significant (69.8 index points):

- Singapore's greatest strengths are in Human Capital, Financing, and Culture and Informal Institutions, while its lowest scores are in Market Conditions pillar. Its digital entrepreneurship system is very balanced: Singapore outperforms the pillar averages of the leaders group. If we look solely at Singapore's non-digitalized entrepreneurship system (pillar values without digital weights), it is strong in the same pillars, but its entrepreneurship system shows some weaknesses in the Networking and Support pillar.
- The weakest-performing country in the group is Nepal, whose digital entrepreneurship system is hampered by its Culture and Informal Institutions, Human Capital, and Market Conditions pillars. Nepal scores well below the average of the 21 countries for all pillars.

The 21 countries have very different digital entrepreneurship system profiles. Therefore, each country needs to develop its own tailored policies for digitalization and entrepreneurship and improve their system performance by addressing the identified bottlenecks.

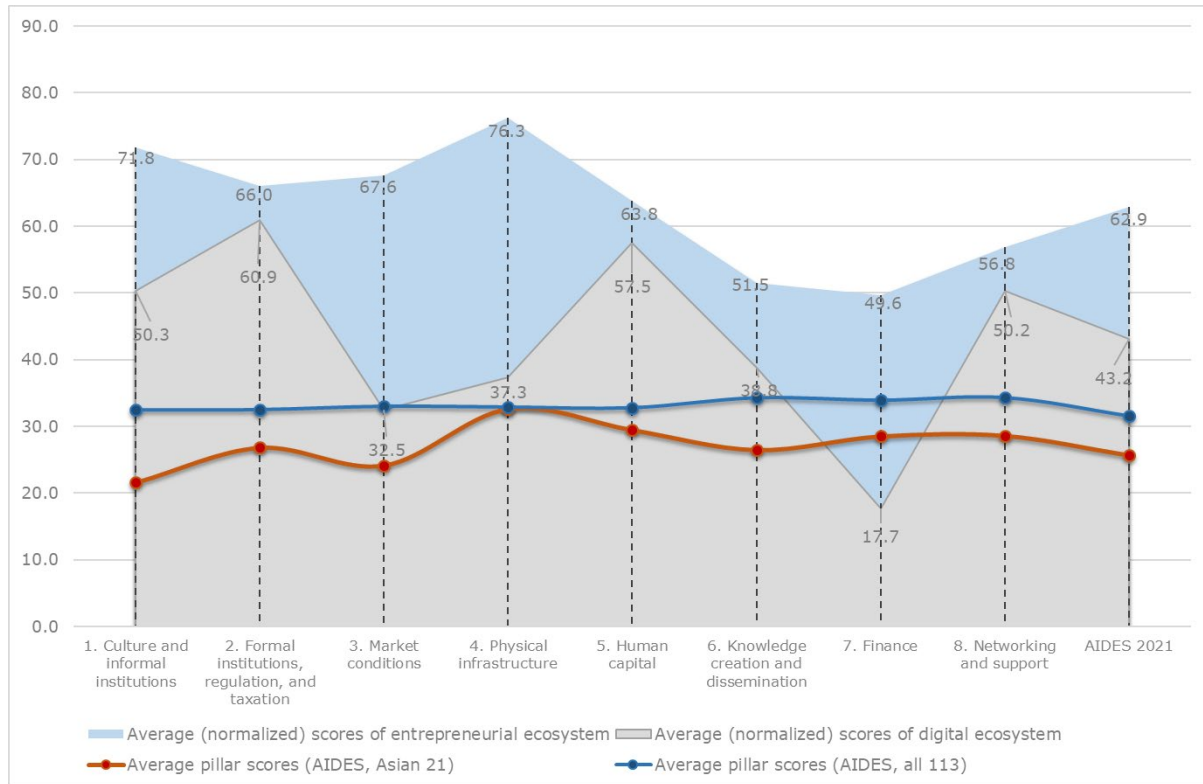


**Figure 4: Asian Index of Digital Entrepreneurship Systems Scores the 21 ADB Member Countries Included in the Index**



Source: Own edition.

**Figure 5: Regional Asian Index of Digital Entrepreneurship Systems, Non-digitalized and Digitalized Component Averages**



Source: Own edition.

On average, the Asia country group scores highest for Physical Infrastructure (Figure 5, red line). This is the only pillar in which the group reaches the average pillar score of the 113 countries (blue line). This indicates that countries in the region generally have high-quality digital and basic physical infrastructure (required for digital infrastructure). The region performs worst on average in Culture and Informal Institutions, where it scores below global average. This suggests that cultural support for digitally enabled entrepreneurship (how people view entrepreneurs in terms of status and career choice, and how the level of corruption in the country affects this view, or how widespread the acceptance of digitalization is) is generally low in the region. However, there is considerable variation across the region in this regard. Overall, the scores of the Asian country group are relatively balanced across all components of the AIDES, suggesting that a broader policy mix is likely to have a greater impact on overall performance than focusing on a single policy area. If we disregard digital weighting and focus only on non-digitalized framework conditions, the group's strongest area is Physical Infrastructure (76.3). This suggests that the availability of basic

infrastructure is generally high in all countries. In contrast, there is significant variation between countries in the quality of Digital Infrastructure (37.3). In contrast, the weakest area of the group is Financing (49.6). The availability of alternative financing opportunities to support high-potential entrepreneurs appears generally low in the region.

Focusing only on the digital components, we can see the same bottleneck: the group shows weakness in Financing. This means that the adoption rate of novel digital financing opportunities is still low in most countries in the region, with the exception of Singapore. At the same time, the region performs well in Formal Institutions, Regulation, and Taxation. The digital part of this pillar refers to the government's strong commitment to digitalization (e.g., e-government, data protection).

## **II. DIGITALIZATION AND THE QUALITY OF THE ENTREPRENEURIAL RESOURCE ALLOCATION DYNAMIC PRODUCTIVE AND UNPRODUCTIVE ENTREPRENEURS**

Entrepreneurship is a potentially potent driver of economic growth and dynamism in countries. Entrepreneurs spot opportunities to make economic profit and start new businesses to pursue these. So doing they contribute to economic dynamism and growth. However, not all entrepreneurs have the same potential to drive economic growth. The annual Global Entrepreneurship Monitor (GEM) survey, for example, consistently reports a *negative* correlation between a country's gross domestic product (GDP) per capita and its rate of self-employment. Most entrepreneurial businesses never employ more than 1–2 people and, in ADB member countries, only less than half a per cent of entrepreneurial businesses ever achieve the employment size of 250 or more employees. These and many other findings highlight that the productivity potential of entrepreneurial businesses can vary tremendously, and only a small minority of all new businesses have the potential to create significant new economic activity.

At the country level, it is useful to think about entrepreneurship as a resource allocation dynamic that allocates resources towards productive uses. Innovative and high-potential entrepreneurs are likely to allocate resources towards highly productive uses, thereby contributing to the country's total factor productivity (TFP). Non-innovative and low-potential entrepreneurs are less likely to make a significant contribution to TFP. Therefore, the quality of the country's entrepreneurial dynamic matters: if a given country is able to nurture high-potential entrepreneurs, it is more likely to see increases in country's TFP and economic growth.

## **A. Country-Level Framework Conditions for Entrepreneurship**

AIDES builds on the premise that a country's framework conditions for entrepreneurship regulate the ability of its entrepreneurial dynamic to allocate resources to productive uses. The index recognizes two types of framework conditions for entrepreneurship: General and Systemic. General Framework Conditions describe the country's general context for business activity and include (i) Culture and Informal Institutions; (ii) Formal Institutions, Regulation, and Taxation; (iii) Market Conditions, and (iv) Physical Infrastructure. All of these have been shown to shape entrepreneurial activity (Autio, Pathak, and Wennberg 2013; de Soto, 2000; Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2002; Djankov, La Porta, Lopez-de-Silanes, and Shleifer 2003; Djankov, McLiesh, and Ramalho 2006; Seung-Hyun, Peng, and Barney, 2007; and Wennberg, Pathak and Autio 2013). General framework conditions shape the quality of entrepreneurial entries by shaping the trade-offs associated with the allocation of resources to alternative economic uses. Culture and informal institutions regulate social norms regarding entrepreneurial careers and related social trade-offs and opportunity costs. Cultures that value entrepreneurial action are more likely to see high-quality entrepreneurs. Formal institutions regulate, for example, compliance costs that entrepreneurs face when starting and operating a new business. Market conditions regulate the ease of market entry by entrepreneurial businesses. Physical infrastructure regulate the ease and cost of running day-to-day operations.

Systemic Framework Conditions describe the quality and quantity of resources available for entrepreneurial opportunity pursuit in the country. These framework conditions describe the resource munificence of the operating environment that a given country offers to entrepreneurial businesses. The systemic framework conditions include (i) Human Capital, (ii) Knowledge Creation and Dissemination, (iii) Finance, and (iv) Networking and Support. These framework conditions regulate the access to external resources by entrepreneurial businesses and, therefore, influence the feasibility of entrepreneurial opportunity pursuit. Countries with an abundant supply of high human capital are able to nurture more productive entrepreneurial businesses. Countries with more sophisticated knowledge creation and dissemination structures are able to support high-potential entrepreneurial businesses with spillovers of advanced knowledge. Countries with more abundant and accessible financial resources are able to better support entrepreneurial start-up and scale-up. Countries with sophisticated networking and support structures are better able to nurture high-potential entrepreneurial businesses.

Summarizing, in the AIDES framework, the country-level framework conditions regulate the quality of its entrepreneurial dynamic in two ways: (i) by shaping the trade-offs associated with resource allocation towards entrepreneurial opportunity pursuit versus alternative occupational pursuits

(general framework conditions); and (ii) by regulating the availability of external resources available to this pursuit (systemic framework conditions). These conditions influence the quality of the country's entrepreneurial resource allocation dynamic by shaping the trade-offs individuals face when considering whether or not to pursue entrepreneurial opportunities.

## **B. Entrepreneurial Resource Allocation Dynamic**

AIDES considers entrepreneurial opportunity pursuit as a fundamentally individual- or team-level activity: individuals and teams perceive entrepreneurial opportunities, and they ultimately decide to pursue them. This pursuit typically requires the allocation of resources, the most important of which are the individual's human capital (e.g., their education, skills, work experience, and cognitive capacities); social capital (e.g., their networks of contacts and their personal and professional reputation); financial capital; and other resources required to produce products and services for sale to others. These resources can normally be allocated towards one primary occupational pursuit only, such as entrepreneurship or salaried employment, for example. When considering alternative occupational pursuits, individuals need to consider which one promises to offer the highest return, be it in the form of wages from salaried employment or in the form of profit generated through an entrepreneurial business. The more valuable the individual's human and social capital are, the higher the required returns will be for their allocation. Individuals with highly valuable human and social capital will require high expected returns from prospective entrepreneurial opportunities. High-quality entrepreneurial opportunities are also the ones that offer the greatest productivity potential.

Because the returns to entrepreneurial opportunity pursuit are seldom guaranteed, and because those returns typically only materialize with a considerable time lag, entrepreneurial opportunity pursuit is inherently risky. The country's framework conditions for entrepreneurship are particularly consequential for high-potential individuals because these individuals face the highest opportunity costs to their allocation of their human and social capital to alternative occupations. Yet, these individuals are the ones whose entrepreneurial businesses are the most likely to make a positive contribution to TFP in the economy. The negative correlation between a country's rate of self-employment activity and its GDP per capita is largely because of this sensitivity. As low-potential entrepreneurs face low trade-offs to their allocation of their human and social capital, they experience low barriers to starting a new business. However, those new businesses are not likely to be very productive. In contrast, individuals with valuable human and social capital have many alternative occupations available to them, and they are able to find well-paid jobs. High-quality framework conditions for entrepreneurship can lower the barrier to entrepreneurship for high-potential

individuals by mitigating downside risks and enhancing the upside returns of entrepreneurial endeavors.

### **C. Digital Framework Conditions and Entrepreneurial Dynamism**

In recent decades, rapid advances in digitalization have been transforming societies and economies. Digitalization is re-shaping both the opportunity landscape for entrepreneurship and the effective ways of pursuing entrepreneurial opportunities. This transformation is generally lowering the barriers for high-potential entrepreneurial entry (Autio and Rannikko 2017; and Yoo, Henfridsson, and Lyytinen 2010).

We distinguish between two core processes through which digital advances transform economies: digitalization and digital transformation. Digitalization is a multifaceted process by which business firms, economies, and societies integrate digital technologies into their processes and functions (Liu et al. 2011 and Organisation for Economic Co-operation and Development [OECD] 2021). In business firms, digitalization promotes productivity and efficiency and leads to cost savings by enabling the introduction of new functions and processes and enabling the organization of existing ones in more effective ways (Autio et al. 2018).

Digitalization acts as a precondition of digital transformation, the game-changing way with which business firms and economies and societies at large perform different functions (Van Alstyne, Parker, and Choudary 2016; and Yoo, Boland Jr, Lyytinen, and Majchrzak 2012) (Vial 2019). Digital artifacts, digital platforms, and digital infrastructures have blurred functional, organizational, and geographic boundaries and disrupted established ways of doing business, as business firms and other societal operators discover how to best adapt to the emerging digital reality (Hausberg et al. 2019). As a result, digital transformation is reshaping entire industries and enabling new concepts such as "Industry 4.0" and "smart factories" (Vaska et al. 2021, Kagermann et al. 2013, and Schwab 2016). The Industry 4.0 trend is transforming entire productive systems and blurring the boundaries between producers and customers and products and markets, as conventional industry sectors are being transformed into multifaceted business ecosystems (Legenvre, Autio, and Hameri 2021; Li, Badr, and Biennier 2012; Li 2009; Pidun, Reeves, and Schüssler 2020; Thomas and Autio 2020; and Van Alstyne et al. 2016).

Because of its transformative impact on economic and societal processes, digitalization inevitably shapes economic development. Researchers agree that digitalization is an important driver of economic growth, as it lowers the cost of transactions (World Bank 2016), increases productivity and efficiency (Cardona et al. 2013, Brynjolfsson and McAfee 2014, OECD 2019, and Hawash et al. 2020), and improves the quality of life (Nevado-Peña et al. 2019). For developing countries,

digitalization offers promise of speeding up economic development (Dahlman et al. 2016, Niebel 2018, Lwoga and Sangeda 2019, and Solomon and van Klyton 2020), while in advanced countries it offers promise to advance sustainable development (Uçar et al. 2020 and Mishakov et al. 2021) and promotes high business agility (Škare and Soriano 2021).

Digital technologies impact entrepreneurship by transforming opportunity landscapes for entrepreneurial entry and by transforming the ways entrepreneurs can pursue entrepreneurial opportunities in practice. The transformative impact on entrepreneurial opportunity landscapes is because of, to a large extent, the nature of digital technologies as general-purpose technologies that can be applied to a wide range of different tasks and purposes in virtually any sector (Carlsson 2004). The most potent current trends include the widespread adoption of cyber-physical systems, internet of things, cloud computing, edge computing, big data, and artificial intelligence and machine-learning technologies and applications. These developments open opportunities to both perform entirely new functions and activities, as well as to radically re-think how existing functions are organized. Because established incumbents and industry leaders are often hampered by their legacy investment in optimizing old ways of doing things, these developments open attractive opportunities for entrepreneurs who are not similarly hampered by legacy investments.

Second, communication and coordination technologies, digital technologies, and infrastructures open new ways to implement structural changes in businesses and industries and dream up radically new ways to organize for the creation, delivery, and capture of economic value. Therefore, the rapid advances in digital technologies and infrastructures act as a powerful driver of business model innovation (Autio et al. 2018 and Horváth and Szabó 2019). With advances in digitalization, entrepreneurs around the world have adopted new, innovative business models to challenge established industry incumbents. Entrepreneurial activities have also witnessed a reorganization at the level of regional agglomerations, as manifested in the widespread emergence of a new type of regional agglomerations of entrepreneurial activity: the entrepreneurial ecosystem (Acs et al. 2014, Spigel 2017, and Autio et al. 2018).<sup>3</sup> Entrepreneurial ecosystems are regional constellations of prospective entrepreneurs, entrepreneurial start-ups and scale-ups, and characteristic organizational innovations such as new venture accelerators, co-working spaces, and makerspaces. Such ecosystems have emerged as important hubs for business model innovation, where new

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<sup>3</sup> We treat the phenomenon of entrepreneurial ecosystems primarily as a regional dynamic that cultivates a shared knowledge base of what works in terms of harnessing digital advances for business model innovation (Autio et al. 2018). Because this knowledge accumulates through entrepreneurial experimentation, it tends to be regionally sticky and accumulate within regional communities of entrepreneurs. In contrast, national systems of entrepreneurship are country-level phenomena defined by a country's framework conditions for entrepreneurship and the country-level dynamic that allocates resources to productive uses.

entrepreneurial businesses experiment with different ways to harness advances in digital technologies by incorporating these into innovative business models (Autio et al. 2018). A growing literature suggests that the more effectively the entrepreneurial ecosystem facilitates the sharing of experiences from business model experimentation, the more productive business models entrepreneurs within the ecosystem will invent, and the more effectively they will harness advances in digital and non-digital technologies for economic growth (Content et al. 2020, Leendertse et al. 2020, Szerb et al. 2020, and Autio et al. 2018).

Policymakers need metrics to monitor the digital entrepreneurial transformation and ensure that the productivity potential of digital advances can be effectively harnessed to enhance economic and societal development. AIDES simulates digitalization, by which digital technologies are embedded in societal, economic, and business functions. Consistent with this embedding process, AIDES does not create specific index pillars to measure digitalization. Instead, it “digitalizes” the current eight framework conditions for entrepreneurship (i.e., four general ones plus four systemic ones) by creating a specifically designed digital weight for each framework condition (refer to the method section). We refer to the digitalized versions of the index pillars as “digital (generic and systemic) framework conditions” or DFCs. We next describe AIDES methodology.



### III. ASIAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS METHODOLOGY

#### A. Index Structure

The European Index of Digital Entrepreneurship Systems (EIDES) was the first attempt to measure both the physical and digital conditions for entrepreneurial stand-up (i.e., the self-selection of individuals into entrepreneurship); start-up (i.e., the creation of new entrepreneurial businesses); and scale-up (i.e., the scaling of new entrepreneurial businesses) in the 27 European Union countries and the United Kingdom. AIDES 2021 builds on the methodological advances introduced in EIDES and extends its geographical scope to cover the digital entrepreneurship systems of 113 countries, with a specific focus on ADB's 21 regional member countries. At the top level, AIDES has the same index structure as EIDES, but its data content has been modified according to data availability. Here, we provide a brief overview of the basic AIDES structure. A detailed description of the index structure, supported by an extensive literature review, can be found in EIDES reports<sup>4</sup>. The AIDES structure is shown in Figure 6. The AIDES distinguishes between general framework conditions and systemic framework conditions:

- General framework conditions capture country-level conditions that regulate entrepreneurial activity in the country through their effect on social and economic trade-offs associated with the allocation of human, social, and financial capital to alternative occupational pursuits, as experienced by individuals and entrepreneurial teams. The index distinguishes between four general framework conditions:
  - Culture and informal institutions regulate individual-level attitudes towards entrepreneurship as a career choice.
  - Formal institutions, regulations, and taxation shape the context within which firms do business and affect entrepreneurial choices (including entry into entrepreneurship as well as post-entry growth aspirations) through their effect on the cost of doing business and the uncertainty regarding, e.g., property ownership and enforceability of contracts.
  - Market conditions regulate the size and accessibility of market opportunities.
  - Physical infrastructure regulates the cost and ease of doing business.
- Systemic framework conditions represent various types of resources available to entrepreneurial firms at three stages of their life cycle: the stand-up stage, which captures

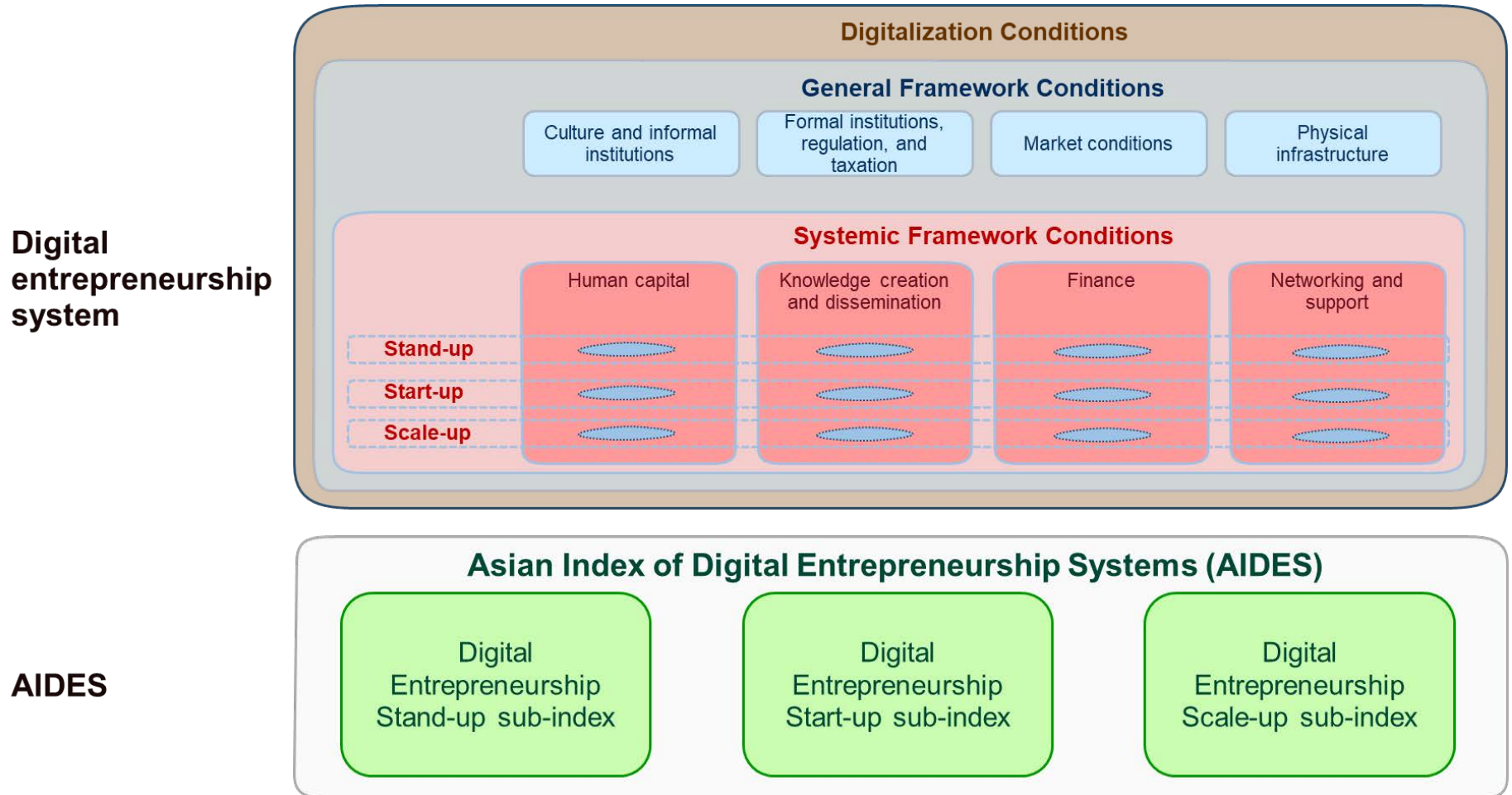
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<sup>4</sup> E. Autio, L. Szerb, É. Komlósi, and M. Tiszberger. 2020. *EIDES 2020 - The European Index of Digital Entrepreneurship Systems*. Luxembourg: Publications Office of the European Union. ISBN 978-92-76-19444-6, doi:10.2760/150797, JRC120727, [https://ec.europa.eu/jrc/sites/default/files/eides\\_2020.pdf](https://ec.europa.eu/jrc/sites/default/files/eides_2020.pdf) (accessed 23 November 2021).

idea formation and the self-selection of individuals to entrepreneurship; the start-up stage, which captures the actual launch and start-up of the new venture including early business model experiments; and the scale-up stage, which captures the scale-up of those new ventures that have discovered a robust and scalable business model. The AIDES also distinguishes between four Systemic Framework Conditions:

- Human capital and talent capture the quality of human capital available for entrepreneurial ventures.
  - Knowledge creation and dissemination captures the availability of knowledge inputs into new ventures in the form of, e.g., technology and professional skills.
  - Finance captures the availability of various forms of finance for new ventures.
  - Networking and support captures various forms of support services, both public and private, that are available for new ventures.
- 
- The AIDES also captures the level of digitalization, labelled as digitalization conditions. Each of the 16 pillars of the AIDES (4 operationalizing general framework conditions and 12 operationalizing the four systemic framework conditions along the three stages of the entrepreneurial life cycle, i.e., stand-up, start-up, and scale-up) is “digitalized” by using an appropriate digital condition as a pillar weight.

Figure 6: Structure of the Asian Index of Digital Entrepreneurship Systems



Source: Authors.

## **B. Index Operationalization**

The operationalization of AIDES includes the following steps:

1. Determination of the variable composition of AIDES pillars (selecting indicators)
2. Calculation of individual pillar values
3. Digital weighting of individual pillar values for a digitalized form of the pillar
4. Calculation of sub-index values
  - a. General Framework Conditions (digitalized or non-digitalized)
  - b. Systemic Framework Conditions (digitalized or non-digitalized), including
    - i. Stand-up (digitalized or non-digitalized)
    - ii. Start-up (digitalized or non-digitalized)
    - iii. Scale-up (digitalized or non-digitalized)
5. Calculation of the overall AIDES value

Appendix 1 provides a detailed explanation of these steps.

In AIDES, both general framework conditions and systemic framework conditions are operationalized as index pillars that are composed of sets of individual variables. The variables included in each index pillar are listed in Table 1 and Table 2.

Individual pillar values are calculated as arithmetic averages of the values of individual pillar variables after normalization. Each framework condition is, thus, represented by a single pillar value. Because AIDES calculates different pillar values for systemic framework conditions for each of the three life cycle stages of entrepreneurial firms (i.e., stand-up, start-up, and scale-up), the index is composed of a total of 16 pillars (four pillars for general framework conditions plus four pillars each for the systemic framework conditions for entrepreneurial stand-up, start-up, and scale-up, respectively).

The AIDES also calculates a measure of the digital context for each index pillar. These measures are listed in Table 2. Each index pillar is matched with a corresponding digital weight. The measures of the different digital conditions (one for each pillar) are calculated as the arithmetic average of their constituent variables after normalization. Thus, the index offers two pillar values for each general and systemic framework condition: a digitalized value and a non-digitalized value. To capture system dynamics, two important methodological steps are followed when aggregating individual pillar values into sub-indices: the equalization of pillar averages and the Penalty for Bottleneck algorithm (Acs, Autio, and Szerb 2014). Most indices make the strong assumption that individual pillar values are fully substitutable among one another. In the context of AIDES, full

substitutability would assume that the lack of financial capital could be fully compensated by increasing knowledge capital, for example. Using a baking analogy, the assumption of full substitutability would mean that lack of sugar could be fully compensated by adding more flour and eggs to the cake, which obviously would not make much sense. Methodologically, the full substitutability assumption is reflected in the way most indices calculate sub-index values as the simple arithmetic mean of the pillar values that compose that sub-index. In such calculation, reductions in one pillar value are fully compensated by increases in another. However, the assumption of full substitutability among index pillars does not reflect the reality of most economic systems. In complex systems, the different constituent elements tend to complement, rather than substitute one another, and they need to come together to co-produce system-level outcomes. If one spoke of a bicycle wheel is broken, this cannot be made up for by making another spoke longer.

AIDES avoids making the unrealistic assumption of full substitutability among system components. To achieve this, AIDES equalizes pillar averages and applies the Penalty for Bottleneck algorithm when aggregating individual pillar values into sub-indices. The full details of these steps are explained in Appendix 1. When individual pillars can only partly substitute each other, any one of the General and Systemic Framework Conditions may act as a bottleneck that holds back the performance of the entire system. To capture this partial non-substitutability, the Penalty for Bottleneck algorithm “penalizes” for gaps in the pillar composition of any given sub-index. In practice, this is done by reducing the value of individual pillars proportionally to the size of the bottleneck penalty. The size of the bottleneck penalty is calculated such that greater differences among individual pillar values will inflict greater bottleneck penalty. This procedure emulates the notion that, in the presence of bottleneck pillars in the index system, other pillars of the system cannot be used to their full effect. In other words, a poorly performing framework condition can hold back the performance of the entire system.

After these steps, the values of each sub-index (one for general framework conditions, three for systemic framework conditions, all framework conditions in digital and non-digital versions) are calculated as arithmetic means of equalized, bottleneck-penalized pillar values. The overall sub-index value for systemic framework conditions is calculated as the arithmetic mean of the sub-index value for stand-up, start-up, and scale-up sub-indices.

Finally, the value of the overall AIDES is the arithmetic mean of the bottleneck-penalized values for general and systemic framework conditions.

This approach, we believe, provides a good and true-to-phenomenon portrayal of national entrepreneurship systems, where general framework conditions regulate the degree to which the systemic conditions can realize their full potential, and where the systemic conditions are directly

involved in the co-production of the national-level entrepreneurial dynamic. The approach also distinguishes between digital and non-digital versions of the dynamic, making it possible to estimate the effect of digitalization on the system's ability to support a high-quality entrepreneurial dynamic. The distinction between systemic conditions and the three sub-dynamics of the overall entrepreneurial dynamic also makes it possible to support more nuanced policy insights (i) for general framework conditions for entrepreneurship, (ii) for digitalization, and (iii) for the three sub-dynamics of the overall entrepreneurial dynamic.

The variable composition of each of the AIDES pillars is shown in Table 1 and Table 2.

**Table 1: Structure of the Asian Index of Digital Entrepreneurship Systems - Entrepreneurship**

| Pillar   | General Framework Conditions (GFC)  |   |  |
|--|---|---|--|
| Culture and Informal Institutions (P1)             | Social desirability and acceptance of entrepreneurship, efficiency of legal framework, corruption | Population attitude toward start-up risk  | Corporate governance, reliance on professional management, willingness to delegate authority                         |
| Formal Institutions, Regulation, and Taxation (P2) | Rule of law, private property protection  | Ease of start-up (regulation)   | Government effectiveness in terms of services and taxation,  |
| Market Conditions (P3)                             | Local, domestic market conditions, urbanization   | Ease of entry to local market (market dominance, complexity)  | Internationalizations  |
| Physical Infrastructure (P4)                       | Electricity infrastructure (access and quality)   | Transport infrastructure (quality and efficiency of service)  |  |
| Pillars  | Systemic Framework Conditions (SFC)   |   |  |
|  | Stand-up Stage (S1)   | Start-up Stage (S2)   | Scale-up Stage (S3)  |
| Human Capital (P1)                                 | Quality of education system, education level of population, future workforce                      | Advanced education, quality of university education, STEM education, entrepreneurial skills                     | Life-long learning, labor market conditions, serial entrepreneurs  |
| Knowledge Creation and Dissemination (P2)          | Skillset of graduates, efficient use of talent, professionals, and researchers                    | Quality of research institutions, technology and knowledge transfer (science in schools)                        | Research and innovation capacity (research and development), knowledge absorption, university-industry collaboration |
| Finance (P3)                                       | Availability of credit, SME finance   | Venture capital availability, venture capital investments and investors (early phase entrepreneurial financing) | Market capitalization, private equity financing (later phase financing)  |
| Networking and Support (P4)                        | Networking, social capital availability   | External support for start-ups, business networking (international co-invention, strategic alliances)           | Clusters and value chain development   |

Source: Based on Autio et al 2020, and modified according to data availability.

**Table 2: Structure of the Asian Index of Digital Entrepreneurship Systems - Digitalization**

| <b>Pillar</b>   | <b>General Digital Framework Conditions (DFC)</b>  |   |  |
|---|--|---|--|
| <b>Culture and Informal Institutions (P1)</b>             | Household with computer and internet   | Individuals using the Internet  | Enterprises having website   |
| <b>Formal Institutions, Regulation, and Taxation (P2)</b> | Government future orientation  | Network attracts, web treats, software piracy                         | Competition in network services, e-government                                    |
| <b>Market Conditions (P3)</b>                             | Individuals using the internet for shopping (buy something online), and pay bills online | B2C E-commerce  | Enterprise online communication (using email to interact with clients/suppliers) |
| <b>Physical Infrastructure (P4)</b>                       | Mobile and internet tariffs  | Upload and download speed   | Mobile coverage, secured internet servers  |
|   | <b>Systemic Digital Conditions (SDC)</b>   |   |  |
| <b>Pillars</b>  | <b>Stand-up Stage (S1)</b>   | <b>Start-up Stage (S2)</b>  | <b>Scale-up Stage (S3)</b>   |
| <b>Human Capital (P1)</b>                                 | Individuals with a daily access and digital skills                                       | Employed ICT specialists (information and communications technicians) | Technology availability, utilization, digital readiness                          |
| <b>Knowledge Creation and Dissemination (P2)</b>          | Open access sources, Wikipedia and YouTube video uploads, mobile app development         | Employment in high tech and KIBS, software developers                 | Computer software spending, ICT impact on businesses, ICT-related patents        |
| <b>Finance (P3)</b>                                       | Digital payment and internet banking   | Alternative finances  | Fintech  |
| <b>Networking and Support (P4)</b>                        | Participating in social and professional networks  | Availability of local online content, startup community               | Professional software use of the enterprises to connect clients                  |

ICT = information and communication technology, KIBS = knowledge-intensive business services.

Source: Based on Autio et al. 2020, and modified according to data availability.



## C. Changes in Variable Content

EIDES was originally designed specifically for developed European countries. As the geographical scope of AIDES is much broader than that of EIDES and includes both developed and developing economies, the index content has been adjusted according to data availability (refer to Appendix 2 for a full description of the data sources used in AIDES).

In selecting individual indicators for inclusion in the index, we applied the following criteria:

- (i) relevance of the indicator for the construct we sought to measure;
- (ii) straightforward interpretability of the indicator;
- (iii) explanatory power of the indicator;
- (iv) distinctiveness of the indicator relative to other indicators included in the index variable;
- (v) comprehensiveness of the combined set of indicators in the pillar relative to the aspect of the digital entrepreneurship system that we sought to measure;
- (vi) positive correlation between each pillar, when fully composed, and the overall AIDES value; and
- (vii) specificity of the indicator to the phenomenon it represents.

### 1. Indicators Included in AIDES

AIDES comprises 103 indicators, of which 50 are used to compute the non-digitalized versions of the index pillars, and 53 indicators are used for the calculation of the pillar-specific digitalization weights.

The main objective of AIDES was to include as many countries as possible in the analysis. This objective introduced the challenge of locating indicators that covered the geographical scope of the index. As some indicators used in EIDES were only available for 27 European Union countries plus the United Kingdom, we replaced these with corresponding proxies. All variables in AIDES are covered by at least one indicator, allowing us to measure all eight framework conditions. Appendix 4 provides detailed information—dataset, type of data, unit of measure, description, date, sources—for all indicators included in the AIDES calculation (sections A–D of Appendix 4). The rightmost columns of the tables show the correspondence between the indicators from AIDES and the original EIDES indicators (categories are same, proxy, or new). Most of the data used to calculate AIDES 2021 are the latest and best data available at the time they were collected (June–August 2021). For most indicators, the data were available for years 2019, 2020, and 2021. However, some indicators were available only for earlier years or for more limited time periods. In such

cases, we pooled the data and calculated the average value for the period and, for each country, we used the most recent data available for that period.

## **2. Availability of Data (by country)**

Our main goal was to include as many countries as possible in the analysis while still covering all framework conditions. We specifically prioritized the inclusion of as many of the ADB 46 regional member countries as possible. Once we had examined the substantive relationship between the original and possible proxy indicators, the next step was to examine their availability. We found that there was wide variation across countries in the availability of indicators. Finally, based on data availability, we decided not to include countries where data were missing for more than 10% of the indicators. As a result, 113 countries were included in the analysis to preserve the original index structure and complexity and richness of the indicator set.

Table A2.5 in Appendix 2 shows the number of missing data by indicator and by country. For the 113 countries involved, the number of missing data is below the 10% threshold mentioned above.

## **IV. ASIAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS RESULTS**

### **A. Country Rankings 2021**

The AIDES 2021 for 113 countries is shown in Table 3. Table 3 also shows the digitalized versions of the index for the three sub-systems, i.e., the stand-up, the start-up, and the scale-up stages of the entrepreneurial dynamic. These sub-indices represent a combination of the General Framework Conditions and the sub-index score for each of the three sub-systems, as composed of Systemic Framework Conditions. The rightmost column shows the overall AIDES score, which represents the arithmetic average of the three sub-index scores. The range for all scales is from a low of 0 to a high of 100.

We have grouped the countries into five: leaders (AIDES score above 60), followers (AIDES score above 45 and up to 60), catchers-up (AIDES score above 35 and up to 45), laggards (AIDES scores above 20 and up to 35), and tailenders (AIDES score below 20).<sup>5</sup> The five groups are highlighted using different colors.

In the AIDES 2021 ranking, 15 countries emerge as leaders in terms of their digitalized General and Systemic Framework Conditions for entrepreneurship. These are Singapore, United States, Sweden, Denmark, Switzerland, Netherlands, Finland, Norway, Luxembourg, United Kingdom, New Zealand, Germany, Canada, Australia, and Austria. Of these, Singapore's score is ahead of the others, which are clustered closer together in terms of their overall AIDES scores. Singapore ranks first for the start-up and scale-up sub-indices and second for the stand-up index. The United States scores first for the stand-up sub-index and second for the scale-up sub-index, but fourth for the start-up sub-index. Sweden scores second for the start-up system, third for scale-up, and fourth for the start-up sub-index. According to the Global Competitiveness Report 2017–2018,<sup>6</sup> these countries in the category of leaders are innovation-driven countries. In addition, according to the ranking of the Global Innovation Index (GII) 2021,<sup>7</sup> each country is among the 25 most innovative countries. All the leading countries are high-income economies (Table 4).

After the group of the leaders, there is a notable gap of nearly 10 index score points to the second group, followers. This group comprises 10 countries: Israel, Ireland, Belgium, Estonia, Japan, United Arab Emirates, the ROK, France, Malta, and Spain. The AIDES scores for this group range

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<sup>5</sup> The thresholds (cut-off points) for leaders, followers, catchers-up, and laggards are the same as the thresholds that were used in the EIDES 2020 report. However, based on this classification, the laggards group would include 73 countries. Consequently, within the laggards, we have identified the “tailenders” category, which includes countries with AIDES scores below 20. This new cut-off point emerges naturally from the data.

<sup>6</sup> Global Competitiveness Report 2017–2018, World Economic Forum, p. 320. <https://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf> (accessed 12 October 2021).

<sup>7</sup> Global Innovation Index. 2021. *Tracking Innovation through the COVID-19 Crisis*, 14th edition, World Intellectual Property Organization. [https://www.wipo.int/edocs/pubdocs/en/wipo\\_pub\\_gii\\_2021.pdf](https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf) (accessed 12 October 2021).

from 45.7 (Spain) to 58.1 (Israel). Of these, the top seven countries are ahead of the bottom three countries in the group. The 10 followers are innovation-driven countries among the top 35 high-income economies based on the GII 2021 results.

The catchers-up group comprises 15 countries: Czech Republic, Malaysia, Slovenia, Bahrain, Saudi Arabia, Lithuania, Italy, Cyprus, Latvia, Portugal, Qatar, Slovak Republic, Poland, the PRC, and Chile. The AIDES scores for this group range from 35.3 (Chile) to 44.8 (Czech Republic). The followers are well behind the leader group, whose index scores average well above 70. This is a mixed group: 6 countries belong to innovation-driven economies (Czech Republic, Slovenia, Italy, Cyprus, Portugal, Qatar), while 7 countries are among the transition economies (Malaysia, Saudi Arabia, Lithuania, Latvia, Slovak Republic, and Chile), and the PRC belong to the efficiency-driven economies. Except the PRC and Malaysia (belonging to upper middle-income group), the catchers-up comprise mainly high-income economies.

The group of laggards comprises 32 countries: the Russian Federation, Hungary, Kuwait, Costa Rica, Croatia, Bulgaria, Mauritius, Uruguay, Romania, Georgia, Oman, Kazakhstan, Greece, Turkey, Ukraine, Montenegro, Serbia, Armenia, Thailand, Azerbaijan, South Africa, North Macedonia, Viet Nam, Brazil, Jordan, Argentina, Colombia, Moldova, Mexico, Panama, Indonesia, and Namibia. The AIDES scores for this group range from 20.1 (Namibia) to 33.4 (Russian Federation). The laggard group includes mainly upper middle-income countries.

Finally, the group of tailenders comprises 41 countries: only Lebanon belongs to the transition economies (from stage 2 to 3), while the other 12 belong to efficiency-driven countries (Egypt, Morocco, Tunisia, Bosnia and Herzegovina, Peru, Dominican Republic, Sri Lanka, Albania, Ecuador, Paraguay, Guatemala, and El Salvador), and 5 are transition economies (from stage 1 to 2: Philippines, Mongolia, Botswana, Algeria, and Nigeria). The rest of tailenders belong to factor-driven economies (India, Kenya, Kyrgyz Republic, Rwanda, Ghana, Tajikistan, Bangladesh, Pakistan, Senegal, Cambodia, Zimbabwe, Nepal, Benin, Tanzania, Uganda, Zambia, Cameroon, Mali, Madagascar, and Mozambique). With the exception of 9 countries (Lebanon, Bosnia and Herzegovina, Peru, Dominican Republic, Botswana, Albania, Ecuador, Paraguay, and Guatemala), the tailenders include only low-income or lower middle-income economies.

Several patterns are notable in this grouping:

- Based on gross national income (GNI) per capita data, the leaders and followers comprise only high-income countries. The catchers-up also include mainly high-income economies. The laggards consist mainly upper middle-income countries, while the majority of the tailenders are low-income or lower middle-income economies (Table 4).

- However, there are also countries whose performance is above expectations for the level of development. For example, although the PRC and Malaysia are upper middle-income countries and would therefore be expected to rank among the laggards, they are among the catchers-up countries based on their AIDES score. Ukraine, Viet Nam, and Indonesia are among the lower middle-income countries, and therefore would be expected to rank in the tailenders group, but are laggards.
- On the other hand, there are countries whose performance is below expectations for the level of development. Hungary, Kuwait, Croatia, Uruguay, Oman and Greece are high-income countries, which would be expected to at least belong to the catchers-up or followers group, but they belong to the laggards based on their AIDES score. In addition, Lebanon, Bosnia and Herzegovina, Peru, Dominican Republic, Botswana, Albania, Ecuador, Paraguay and Guatemala are upper middle-income countries, so they should normally rank among laggards, but they are actually ranked among the tailenders.

## Key Takeaways for Asia's Developing Countries

Table 3 shows the relative ranking of the 21 developing Asian countries based on their overall AIDES score and their three digital sub-indices compared to the 92 other countries. Asian countries differ greatly in their rankings, ranging from Singapore at the top (ranked 1st, 81.3) to Nepal at the bottom (ranked 104th, 11.5). The AIDES ranks developing Asian countries roughly according to their economic development levels.

According to the AIDES ranking, Singapore far outperforms the rest of the Asian region, as it ranks first both regionally and globally. Among developing Asian countries, only ROK belongs to the group of followers. It ranks second in the Asian region and 22nd globally. The performance of the ROK on AIDES is similar (54.1) to that of the United Arab Emirates (54.3) and close to Japan (55.7). The country performs close to the group average in all three sub-indices.

Malaysia and the PRC are the only catchers-up countries in the developing Asian region. Despite being in the same group, the two countries are very different: in the global ranking, Malaysia ranks 27th, while the PRC ranks 39th. Malaysia ranks 10 places ahead of the PRC in all three sub-indices. For all three sub-indices, Malaysia performs above average, whereas the PRC performs below average.

The following seven developing Asian countries belong to the group of laggards: Georgia, Kazakhstan, Armenia, Thailand, Azerbaijan, Viet Nam, and Indonesia. In the global ranking, Georgia is 20 places ahead of Indonesia. Armenia, Thailand, and Azerbaijan perform very similarly: there is no significant difference between the three countries in the stand-up sub-index, Armenia outperforms the other two countries on the start-up sub-index, while Thailand and Azerbaijan score better on the scale-up sub-index. The performance of these countries in the sub-indices is quite balanced, except for Indonesia, where the start-up sub-index lags far behind the performance of the other two sub-indices.

The following 10 Asian countries belong to the group of tailenders: India, Philippines, Sri Lanka, Mongolia, Kyrgyz Republic, Tajikistan, Bangladesh, Pakistan, Cambodia, and Nepal. The performance of India (25.6, 75th) is 1.7 times better than the performance of Nepal's digital ecosystem (11.6, 104<sup>th</sup>). Tajikistan, Bangladesh, Pakistan, Cambodia, and Nepal, each of these countries perform below the average of the group. In sum, in these Asian countries, the digital ecosystem performs at a similar level as in some African and South American countries.

**Table 3: The Asian Index of Digital Entrepreneurship Systems 2021 Rankings (1/3)**

| Country                        | Stand-up System |           | Start-up System |           | Scale-up System |           | AIDES       |           |
|--------------------------------|-----------------|-----------|-----------------|-----------|-----------------|-----------|-------------|-----------|
|                                | Score           | Rank      | Score           | Rank      | Score           | Rank      | Score       | Rank      |
| <b>Singapore</b>               | <b>79.8</b>     | <b>2</b>  | <b>83.6</b>     | <b>1</b>  | <b>80.4</b>     | <b>1</b>  | <b>81.3</b> | <b>1</b>  |
| United States                  | 79.9            | 1         | 79.3            | 4         | 79.7            | 2         | 79.7        | 2         |
| Sweden                         | 78.3            | 4         | 82.3            | 2         | 78.2            | 3         | 79.6        | 3         |
| Denmark                        | 79.4            | 3         | 79.6            | 3         | 77.5            | 4         | 78.8        | 4         |
| Switzerland                    | 77.1            | 5         | 77.0            | 6         | 76.7            | 5         | 76.9        | 5         |
| Netherlands                    | 76.3            | 6         | 75.0            | 7         | 75.3            | 6         | 75.6        | 6         |
| Finland                        | 72.1            | 7         | 77.2            | 5         | 70.6            | 7         | 73.3        | 7         |
| Norway                         | 71.7            | 8         | 70.8            | 9         | 67.1            | 10        | 69.9        | 8         |
| Luxembourg                     | 69.1            | 10        | 71.8            | 8         | 67.8            | 9         | 69.6        | 9         |
| United Kingdom                 | 70.0            | 9         | 68.8            | 10        | 68.1            | 8         | 69.0        | 10        |
| New Zealand                    | 67.9            | 11        | 65.1            | 12        | 63.1            | 12        | 65.3        | 11        |
| Germany                        | 63.1            | 13        | 67.3            | 11        | 63.6            | 11        | 64.7        | 12        |
| Canada                         | 63.4            | 12        | 63.6            | 13        | 61.2            | 13        | 62.7        | 13        |
| Australia                      | 63.0            | 14        | 61.7            | 15        | 59.3            | 15        | 61.3        | 14        |
| Austria                        | 59.2            | 15        | 62.6            | 14        | 59.8            | 14        | 60.5        | 15        |
| Leaders                        | 71.4            |           | 72.4            |           | 69.9            |           | 71.2        |           |
| Israel                         | 55.4            | 19        | 60.6            | 16        | 58.3            | 17        | 58.1        | 16        |
| Ireland                        | 57.7            | 16        | 59.5            | 18        | 56.1            | 19        | 57.8        | 17        |
| Belgium                        | 55.8            | 18        | 57.8            | 19        | 56.2            | 18        | 56.6        | 18        |
| Estonia                        | 56.2            | 17        | 59.6            | 17        | 52.4            | 22        | 56.1        | 19        |
| Japan                          | 53.2            | 21        | 54.8            | 21        | 59.0            | 16        | 55.7        | 20        |
| United Arab Emirates           | 54.9            | 20        | 52.3            | 23        | 55.7            | 21        | 54.3        | 21        |
| <b>Korea, Rep. of</b>          | <b>51.6</b>     | <b>22</b> | <b>54.9</b>     | <b>20</b> | <b>55.9</b>     | <b>20</b> | <b>54.1</b> | <b>22</b> |
| France                         | 48.3            | 24        | 53.2            | 22        | 49.4            | 23        | 50.3        | 23        |
| Malta                          | 50.0            | 23        | 51.4            | 24        | 45.3            | 24        | 48.9        | 24        |
| Spain                          | 46.0            | 25        | 47.2            | 25        | 44.0            | 27        | 45.7        | 25        |
| Followers                      | 52.9            |           | 55.1            |           | 53.2            |           | 53.8        |           |
| Czech Republic                 | 44.0            | 27        | 46.1            | 26        | 44.4            | 25        | 44.8        | 26        |
| <b>Malaysia</b>                | <b>43.1</b>     | <b>28</b> | <b>41.7</b>     | <b>29</b> | <b>44.3</b>     | <b>26</b> | <b>43.1</b> | <b>27</b> |
| Slovenia                       | 41.1            | 29        | 44.1            | 27        | 39.8            | 30        | 41.7        | 28        |
| Bahrain                        | 44.2            | 26        | 39.1            | 34        | 41.1            | 29        | 41.5        | 29        |
| Saudi Arabia                   | 41.0            | 30        | 39.7            | 32        | 41.3            | 28        | 40.7        | 30        |
| Lithuania                      | 39.6            | 32        | 42.0            | 28        | 39.6            | 31        | 40.4        | 31        |
| Italy                          | 39.0            | 33        | 41.5            | 30        | 38.6            | 32        | 39.7        | 32        |
| Cyprus                         | 39.6            | 31        | 41.3            | 31        | 36.5            | 36        | 39.2        | 33        |
| Latvia                         | 37.9            | 35        | 39.7            | 33        | 37.7            | 33        | 38.4        | 34        |
| Portugal                       | 38.0            | 34        | 38.3            | 35        | 35.8            | 38        | 37.4        | 35        |
| Qatar                          | 37.9            | 36        | 34.1            | 41        | 37.6            | 34        | 36.5        | 36        |
| Slovak Republic                | 36.5            | 37        | 37.4            | 37        | 35.6            | 40        | 36.5        | 37        |
| Poland                         | 35.4            | 39        | 37.6            | 36        | 35.8            | 39        | 36.2        | 38        |
| <b>China, People's Rep. of</b> | <b>34.8</b>     | <b>40</b> | <b>34.1</b>     | <b>40</b> | <b>37.1</b>     | <b>35</b> | <b>35.3</b> | <b>39</b> |
| Chile                          | 36.5            | 38        | 33.4            | 42        | 36.0            | 37        | 35.3        | 40        |
| Catchers-up                    | 39.2            |           | 39.4            |           | 38.7            |           | 39.1        |           |

**Table 3: The Asian Index of Digital Entrepreneurship Systems 2021 Rankings**

(continued, 2/3)

| Country            | Stand-up System |           | Start-up System |           | Scale-up System |           | AIDES       |           |
|--------------------|-----------------|-----------|-----------------|-----------|-----------------|-----------|-------------|-----------|
|                    | Score           | Rank      | Score           | Rank      | Score           | Rank      | Score       | Rank      |
| Russian Federation | 32.3            | 43        | 34.5            | 39        | 33.3            | 42        | 33.4        | 41        |
| Hungary            | 31.9            | 44        | 35.5            | 38        | 32.6            | 43        | 33.3        | 42        |
| Kuwait             | 34.3            | 41        | 30.4            | 44        | 34.1            | 41        | 33.0        | 43        |
| Costa Rica         | 32.8            | 42        | 27.8            | 50        | 30.7            | 44        | 30.4        | 44        |
| Croatia            | 29.1            | 47        | 32.6            | 43        | 28.4            | 48        | 30.0        | 45        |
| Bulgaria           | 28.6            | 49        | 29.8            | 45        | 29.3            | 45        | 29.2        | 46        |
| Mauritius          | 30.1            | 45        | 27.5            | 52        | 28.8            | 46        | 28.8        | 47        |
| Uruguay            | 29.6            | 46        | 27.7            | 51        | 28.1            | 50        | 28.5        | 48        |
| Romania            | 27.4            | 52        | 29.4            | 47        | 28.2            | 49        | 28.3        | 49        |
| <b>Georgia</b>     | <b>28.7</b>     | <b>48</b> | <b>28.8</b>     | <b>48</b> | <b>27.6</b>     | <b>52</b> | <b>28.3</b> | <b>50</b> |
| Oman               | 28.0            | 50        | 27.4            | 53        | 28.5            | 47        | 28.0        | 51        |
| <b>Kazakhstan</b>  | <b>27.6</b>     | <b>51</b> | <b>26.6</b>     | <b>58</b> | <b>28.0</b>     | <b>51</b> | <b>27.4</b> | <b>52</b> |
| Greece             | 26.6            | 54        | 29.8            | 46        | 25.6            | 60        | 27.3        | 53        |
| Turkey             | 26.8            | 53        | 26.6            | 56        | 27.4            | 53        | 26.9        | 54        |
| Ukraine            | 25.9            | 57        | 27.3            | 54        | 25.8            | 58        | 26.3        | 55        |
| Montenegro         | 25.7            | 58        | 26.9            | 55        | 26.2            | 57        | 26.3        | 56        |
| Serbia             | 24.9            | 60        | 28.1            | 49        | 25.2            | 61        | 26.1        | 57        |
| <b>Armenia</b>     | <b>25.6</b>     | <b>59</b> | <b>26.6</b>     | <b>57</b> | <b>25.8</b>     | <b>59</b> | <b>26.0</b> | <b>58</b> |
| <b>Thailand</b>    | <b>25.9</b>     | <b>55</b> | <b>24.4</b>     | <b>59</b> | <b>27.3</b>     | <b>54</b> | <b>25.9</b> | <b>59</b> |
| <b>Azerbaijan</b>  | <b>25.9</b>     | <b>56</b> | <b>23.5</b>     | <b>60</b> | <b>27.0</b>     | <b>55</b> | <b>25.5</b> | <b>60</b> |
| South Africa       | 24.3            | 62        | 22.4            | 62        | 26.8            | 56        | 24.5        | 61        |
| North Macedonia    | 24.8            | 61        | 23.3            | 61        | 24.6            | 62        | 24.2        | 62        |
| <b>Viet Nam</b>    | <b>22.9</b>     | <b>63</b> | <b>21.8</b>     | <b>65</b> | <b>24.5</b>     | <b>63</b> | <b>23.1</b> | <b>63</b> |
| Brazil             | 22.6            | 64        | 21.7            | 66        | 23.6            | 64        | 22.7        | 64        |
| Jordan             | 22.2            | 67        | 22.1            | 63        | 22.9            | 65        | 22.4        | 65        |
| Argentina          | 22.3            | 66        | 22.0            | 64        | 22.1            | 67        | 22.2        | 66        |
| Colombia           | 22.2            | 68        | 20.9            | 68        | 22.8            | 66        | 21.9        | 67        |
| Moldova            | 21.5            | 70        | 21.5            | 67        | 20.5            | 72        | 21.2        | 68        |
| Mexico             | 20.2            | 72        | 20.4            | 69        | 21.8            | 70        | 20.8        | 69        |
| Panama             | 21.5            | 69        | 19.5            | 73        | 20.2            | 74        | 20.4        | 70        |
| <b>Indonesia</b>   | <b>22.4</b>     | <b>65</b> | <b>16.8</b>     | <b>82</b> | <b>22.0</b>     | <b>69</b> | <b>20.4</b> | <b>71</b> |
| Namibia            | 20.4            | 71        | 18.5            | 76        | 21.3            | 71        | 20.1        | 72        |
| Laggards           | 26.1            |           | 25.7            |           | 26.3            |           | 26.0        |           |



**Table 3: The Asian Index of Digital Entrepreneurship Systems 2021 Rankings**

(continued. 3/3)

| Country                | Stand-up System |            | Start-up System |            | Scale-up System |            | AIDES       |            |
|------------------------|-----------------|------------|-----------------|------------|-----------------|------------|-------------|------------|
|                        | Score           | Rank       | Score           | Rank       | Score           | Rank       | Score       | Rank       |
| Egypt, Arab Rep. of    | 19.4            | 76         | 18.0            | 78         | 22.1            | 68         | 19.8        | 73         |
| Morocco                | 19.7            | 73         | 19.0            | 75         | 20.3            | 73         | 19.7        | 74         |
| <b>India</b>           | <b>19.0</b>     | <b>78</b>  | <b>19.7</b>     | <b>71</b>  | <b>20.2</b>     | <b>75</b>  | <b>19.6</b> | <b>75</b>  |
| Lebanon                | 19.4            | 75         | 19.9            | 70         | 19.3            | 78         | 19.5        | 76         |
| Tunisia                | 19.2            | 77         | 19.6            | 72         | 19.5            | 77         | 19.4        | 77         |
| Bosnia and Herzegovina | 19.5            | 74         | 19.3            | 74         | 19.0            | 79         | 19.3        | 78         |
| <b>Philippines</b>     | <b>18.5</b>     | <b>79</b>  | <b>16.9</b>     | <b>81</b>  | <b>20.1</b>     | <b>76</b>  | <b>18.5</b> | <b>79</b>  |
| Peru                   | 17.9            | 83         | 17.7            | 79         | 17.8            | 83         | 17.8        | 80         |
| Dominican Republic     | 17.9            | 81         | 16.2            | 85         | 18.7            | 81         | 17.6        | 81         |
| <b>Sri Lanka</b>       | <b>17.9</b>     | <b>80</b>  | <b>16.7</b>     | <b>83</b>  | <b>17.9</b>     | <b>82</b>  | <b>17.5</b> | <b>82</b>  |
| Kenya                  | 17.9            | 82         | 15.5            | 86         | 18.8            | 80         | 17.4        | 83         |
| <b>Mongolia</b>        | <b>17.1</b>     | <b>85</b>  | <b>18.2</b>     | <b>77</b>  | <b>16.4</b>     | <b>86</b>  | <b>17.2</b> | <b>84</b>  |
| Botswana               | 17.0            | 87         | 16.4            | 84         | 17.5            | 84         | 17.0        | 85         |
| Albania                | 17.1            | 84         | 17.0            | 80         | 16.0            | 88         | 16.7        | 86         |
| Ecuador                | 17.0            | 86         | 14.8            | 90         | 16.7            | 85         | 16.2        | 87         |
| <b>Kyrgyz Republic</b> | <b>15.1</b>     | <b>90</b>  | <b>15.0</b>     | <b>87</b>  | <b>15.5</b>     | <b>90</b>  | <b>15.2</b> | <b>88</b>  |
| Rwanda                 | 14.8            | 91         | 14.9            | 88         | 15.9            | 89         | 15.2        | 89         |
| Paraguay               | 15.5            | 88         | 13.9            | 91         | 15.2            | 91         | 14.9        | 90         |
| Ghana                  | 15.2            | 89         | 13.4            | 92         | 16.0            | 87         | 14.9        | 91         |
| Algeria                | 14.2            | 93         | 14.8            | 89         | 15.1            | 92         | 14.7        | 92         |
| Honduras               | 14.5            | 92         | 13.2            | 93         | 13.9            | 94         | 13.8        | 93         |
| Guatemala              | 13.8            | 94         | 10.9            | 100        | 13.9            | 93         | 12.9        | 94         |
| <b>Tajikistan</b>      | <b>13.2</b>     | <b>95</b>  | <b>12.4</b>     | <b>95</b>  | <b>12.8</b>     | <b>99</b>  | <b>12.8</b> | <b>95</b>  |
| <b>Bangladesh</b>      | <b>12.4</b>     | <b>98</b>  | <b>11.9</b>     | <b>96</b>  | <b>13.3</b>     | <b>95</b>  | <b>12.5</b> | <b>96</b>  |
| <b>Pakistan</b>        | <b>12.0</b>     | <b>100</b> | <b>11.7</b>     | <b>97</b>  | <b>13.3</b>     | <b>96</b>  | <b>12.3</b> | <b>97</b>  |
| Senegal                | 12.9            | 96         | 10.4            | 105        | 13.1            | 97         | 12.2        | 98         |
| Bolivia                | 12.6            | 97         | 11.5            | 99         | 12.1            | 105        | 12.1        | 99         |
| El Salvador            | 12.4            | 99         | 10.7            | 102        | 13.0            | 98         | 12.1        | 100        |
| <b>Cambodia</b>        | <b>11.9</b>     | <b>101</b> | <b>11.7</b>     | <b>98</b>  | <b>12.3</b>     | <b>103</b> | <b>12.0</b> | <b>101</b> |
| Nigeria                | 11.3            | 103        | 10.9            | 101        | 12.5            | 101        | 11.6        | 102        |
| Zimbabwe               | 10.7            | 108        | 12.6            | 94         | 11.5            | 109        | 11.6        | 103        |
| <b>Nepal</b>           | <b>11.8</b>     | <b>102</b> | <b>10.4</b>     | <b>104</b> | <b>12.2</b>     | <b>104</b> | <b>11.5</b> | <b>104</b> |
| Benin                  | 10.7            | 107        | 10.6            | 103        | 12.3            | 102        | 11.2        | 105        |
| Tanzania               | 10.7            | 106        | 9.4             | 107        | 12.6            | 100        | 10.9        | 106        |
| Uganda                 | 11.0            | 105        | 9.7             | 106        | 11.8            | 106        | 10.8        | 107        |
| Zambia                 | 11.3            | 104        | 9.2             | 108        | 11.6            | 107        | 10.7        | 108        |
| Cameroon               | 10.3            | 109        | 8.8             | 109        | 11.4            | 110        | 10.2        | 109        |
| Mali                   | 10.0            | 110        | 7.9             | 112        | 11.5            | 108        | 9.8         | 110        |
| Madagascar             | 8.3             | 112        | 7.8             | 113        | 9.5             | 111        | 8.5         | 111        |
| Burkina Faso           | 8.8             | 111        | 8.7             | 110        | 7.6             | 113        | 8.4         | 112        |
| Mozambique             | 7.8             | 113        | 8.1             | 111        | 8.1             | 112        | 8.0         | 113        |
| Tailenders             | 14.3            |            | 13.6            |            | 14.8            |            | 14.2        |            |
| Average                | 32.0            |            | 31.9            |            | 32.0            |            | 31.9        |            |

Note: The countries in bold are the 21 developing Asian countries.

Source: Own calculation.

**Table 4: Asian Index of Digital Entrepreneurship System 2021 Country Groupings Based on Performance at Different Income Levels**

| High-Income Group     |        | Upper-Middle-Income Group      |         | Lower-Middle-Income Group  |         | Low-Income Group    |      |
|-----------------------|--------|--------------------------------|---------|----------------------------|---------|---------------------|------|
| Country               | Rank   | Country                        | Rank    | Country                    | Rank    | Country             | Rank |
| <b>Singapore</b>      | 10     | <b>Malaysia</b>                | 61 (+)  | <b>Ukraine</b>             | 120 (+) | <b>Rwanda</b>       | 174  |
| United States         | 6      | <b>China, People's Rep. of</b> | 60 (+)  | <b>Viet Nam</b>            | 132 (+) | <b>Uganda</b>       | 172  |
| Sweden                | 11     | Russian Federation             | 59      | <b>Indonesia</b>           | 113 (+) | <b>Mali</b>         | 171  |
| Denmark               | 8      | Costa Rica                     | 58      | <b>Egypt, Arab Rep. of</b> | 118     | <b>Madagascar</b>   | 187  |
| Switzerland           | 2      | Bulgaria                       | 63      | <b>Morocco</b>             | 124     | <b>Burkina Faso</b> | 173  |
| Netherlands           | 13     | Mauritius                      | 62      | <b>India</b>               | 143     | <b>Mozambique</b>   | 188  |
| Finland               | 15     | Romania                        | 56      | Tunisia                    | 128     |                     |      |
| Norway                | 3      | <b>Georgia</b>                 | 108     | <b>Philippines</b>         | 121     |                     |      |
| Luxembourg            | 5      | <b>Kazakhstan</b>              | 68      | <b>Sri Lanka</b>           | 114     |                     |      |
| United Kingdom        | 23     | Turkey                         | 64      | Kenya                      | 147     |                     |      |
| New Zealand           | 21     | Montenegro                     | 70      | <b>Mongolia</b>            | 116     |                     |      |
| Germany               | 17     | Serbia                         | 73      | <b>Kyrgyz Republic</b>     | 160     |                     |      |
| Canada                | 19     | <b>Armenia</b>                 | 109     | Ghana                      | 137     |                     |      |
| Australia             | 12     | <b>Thailand</b>                | 77      | Algeria                    | 119     |                     |      |
| Austria               | 14     | <b>Azerbaijan</b>              | 105     | Honduras                   | 139     |                     |      |
| Israel                | 20     | South Africa                   | 93      | <b>Tajikistan</b>          | 164     |                     |      |
| Ireland               | 7      | North Macedonia                | 89      | <b>Bangladesh</b>          | 141     |                     |      |
| Belgium               | 16     | Brazil                         | 71      | <b>Pakistan</b>            | 154     |                     |      |
| Estonia               | 34     | Jordan                         | 107     | Senegal                    | 153     |                     |      |
| Japan                 | 24     | Argentina                      | 65      | Bolivia                    | 123     |                     |      |
| United Arab Emirates  | 18     | Colombia                       | 88      | El Salvador                | 117     |                     |      |
| <b>Korea, Rep. of</b> | 27     | Moldova                        | 102     | <b>Cambodia</b>            | 151     |                     |      |
| France                | 22     | Mexico                         | 69      | Nigeria                    | 142     |                     |      |
| Malta                 | 33     | Panama                         | 57      | Zimbabwe                   | 162     |                     |      |
| Spain                 | 29     | Namibia                        | 103     | <b>Nepal</b>               | 158     |                     |      |
| Czech Republic        | 38     | Lebanon                        | 91 (-)  | Benin                      | 154     |                     |      |
| Slovenia              | 32     | Bosnia and Herzegovina         | 84 (-)  | Tanzania                   | 163     |                     |      |
| Bahrain               | 35     | Peru                           | 85 (-)  | Zambia                     | 158     |                     |      |
| Saudi Arabia          | 37     | Dominican Republic             | 75 (-)  | Cameroon                   | 150     |                     |      |
| Lithuania             | 40     | Botswana                       | 81 (-)  |                            |         |                     |      |
| Italy                 | 26     | Albania                        | 94 (-)  |                            |         |                     |      |
| Cyprus                | 31     | Ecuador                        | 90 (-)  |                            |         |                     |      |
| Latvia                | 42     | Paraguay                       | 95 (-)  |                            |         |                     |      |
| Portugal              | 36     | Guatemala                      | 104 (-) |                            |         |                     |      |
| Qatar                 | 9      |                                |         |                            |         |                     |      |
| Slovak Republic       | 41     |                                |         |                            |         |                     |      |
| Poland                | 49     |                                |         |                            |         |                     |      |
| Chile                 | 54     |                                |         |                            |         |                     |      |
| Hungary               | 45 (-) |                                |         |                            |         |                     |      |
| Kuwait                | 25 (-) |                                |         |                            |         |                     |      |
| Croatia               | 52 (-) |                                |         |                            |         |                     |      |
| Uruguay               | 47 (-) |                                |         |                            |         |                     |      |
| Oman                  | 53 (-) |                                |         |                            |         |                     |      |
| Greece                | 39 (-) |                                |         |                            |         |                     |      |

Notes:

The countries in bold are the 21 developing Asian countries.

(+) Country performance above expectations for level of development.

(-) Country performance below expectations for level of development.

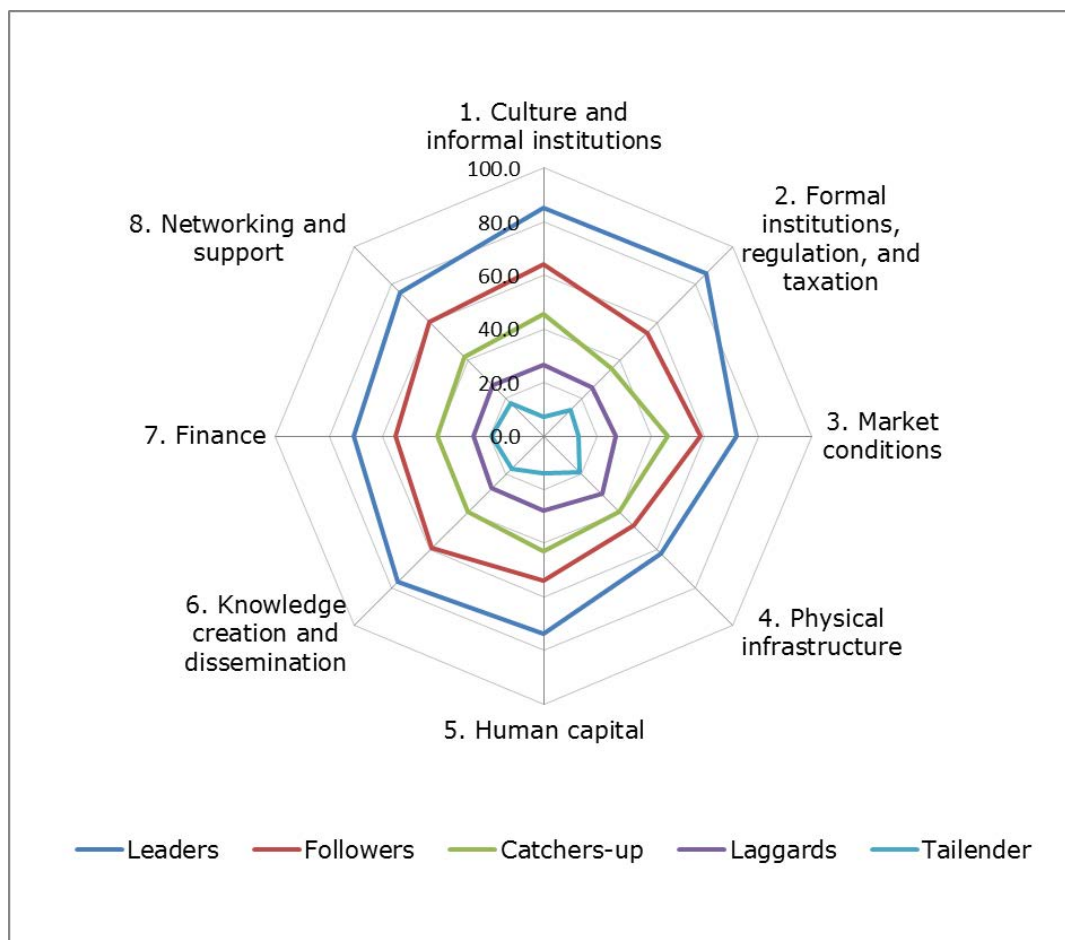
No operator means that country performance is in line with the level of development.

Rankings shown are those given by the World Bank (based on the gross national income per capita (US\$) in 2020 at nominal values, according to the Atlas method. [https://data.worldbank.org/indicator/ny.gnp.pcap.cd?year\\_high\\_desc=true](https://data.worldbank.org/indicator/ny.gnp.pcap.cd?year_high_desc=true) [accessed 12 October 2021]).

Source: Own calculation.

Figure 7 shows the AIDES profiles of the five country groups in terms of their average performance for the eight index pillars that represent General and Systemic Framework Conditions. For the systemic conditions, the combined score of the three sub-systems is shown.

**Figure 7: Asian Index of Digital Entrepreneurship Systems Profiles of the Four Country Groups 2021**



Source: Own edition.

Table 5 and Table 6 show individual pillar values for the 113 countries, grouped by leaders, followers, catchers-up, laggards and tailenders. This table allows a more close-up inspection and comparison of the profiles of different countries.<sup>8</sup> Several interesting observations can be made:

- For the Culture and informal institutions pillar, Sweden, Singapore, Norway, Denmark, and the Netherlands are the only countries with pillar scores above 95.0 (Sweden with a perfect

<sup>8</sup> Two-page close-ups of each country are provided in the country pages (section V).

score of 100.0) by having the most positive culture for digital entrepreneurship among the 113 countries.

- For the Formal institutions, regulation, and taxation pillar, Luxembourg stands out in its category as the country with the friendliest regulation and taxation system, followed by other innovative European economies: the Netherlands, Switzerland, Denmark, Austria and Finland. Singapore is ranked eighth.
- For Market conditions, large developed countries tend to have higher scores because of their larger domestic markets. However, the United Kingdom, the Netherlands, Denmark, and Sweden stand out despite their relative smaller domestic market, ranking alongside the United States and Germany. Singapore has a moderate performance in terms of market conditions.
- For the Physical infrastructure pillar, within-group variations are the most significant. While Denmark scores a perfect 100.0, Australia (43.0) and Canada (39.9) both have low scores. At the same time, the ROK, as a follower country, posts a score that is ahead of the AIDES overall (average) score of the leaders. Singapore ranks third behind Sweden.
- For the Human capital pillar, Singapore ranks on top, followed by Denmark and Sweden. Canada, Finland, New Zealand, and Australia rank well above the AIDES overall score of their group, while the United States (67.7), for example, ranks significantly below the group average (73.8).
- For the Knowledge creation and dissemination pillar, Switzerland is ahead of the other leader countries, followed by Sweden and the United States. Singapore ranks at fifth.
- For the Finance pillar, Singapore ranks first among the leader countries, followed by the United States. Sweden, Luxembourg, and the United Kingdom rank significantly ahead of the group's AIDES overall score. So does Estonia from the follower group, while the leader Germany lags far behind of its group's AIDES overall score.
- For the Networking and support pillar, the United States leads the pack. Singapore, Sweden, Canada, the Netherlands, and Luxembourg are well ahead of the group's overall AIDES score, while Austria ranks far behind from the group average score.

**Table 5: Pillar Values of the Asian Index of Digital Entrepreneurship Systems 2021  
(Leader, Follower, Catchers-up)**

| Country                        | 1. Culture and informal institutions | 2. Formal institutions, regulation, and taxation | 3. Market conditions | 4. Physical infrastructure | 5. Human capital | 6. Knowledge creation and dissemination | 7. Finance   | 8. Networking and support | AIDES 2021 scores |
|--------------------------------|--------------------------------------|--|----------------------|----------------------------|------------------|---|--------------|---------------------------|-------------------|
| <b>Singapore</b>               | <b>97.2</b>                          | <b>85.7</b>                                      | <b>61.6</b>          | <b>74.8</b>                | <b>100.0</b>     | <b>82.0</b>                             | <b>100.0</b> | <b>83.8</b>               | <b>81.3</b>       |
| United States                  | 75.1                                 | 78.7   | 100.0                | 62.9                       | 67.7             | 87.8                                    | 95.7         | 100.0                     | 79.7              |
| Sweden                         | 100.0                                | 79.1   | 74.9                 | 76.0                       | 88.6             | 89.1                                    | 74.1         | 81.6                      | 79.6              |
| Denmark                        | 95.6                                 | 93.3   | 77.3                 | 100.0                      | 89.5             | 76.5                                    | 64.5         | 75.5                      | 78.8              |
| Switzerland                    | 87.0                                 | 99.0   | 65.8                 | 73.3                       | 72.6             | 100.0                                   | 70.2         | 75.9                      | 76.9              |
| Netherlands                    | 95.1                                 | 99.3   | 80.6                 | 69.4                       | 62.1             | 85.8                                    | 67.9         | 80.8                      | 75.6              |
| Finland                        | 85.6                                 | 88.0   | 67.6                 | 61.6                       | 76.8             | 87.2                                    | 69.3         | 73.2                      | 73.3              |
| Norway                         | 96.4                                 | 76.1   | 69.8                 | 56.7                       | 71.9             | 74.9                                    | 63.2         | 71.0                      | 69.9              |
| Luxembourg                     | 83.3                                 | 100.0  | 56.8                 | 62.4                       | 55.8             | 69.5                                    | 76.7         | 80.6                      | 69.6              |
| United Kingdom                 | 81.0                                 | 81.8   | 95.8                 | 44.1                       | 62.5             | 73.5                                    | 82.9         | 77.9                      | 69.0              |
| New Zealand                    | 90.5                                 | 93.7   | 64.2                 | 44.9                       | 76.8             | 59.6                                    | 67.1         | 63.0                      | 65.3              |
| Germany                        | 73.9                                 | 83.9   | 79.1                 | 59.0                       | 57.7             | 75.1                                    | 54.4         | 62.4                      | 64.7              |
| Canada                         | 77.4                                 | 59.9   | 69.3                 | 39.9                       | 83.2             | 69.4                                    | 62.9         | 81.0                      | 62.7              |
| Australia                      | 68.7                                 | 74.7   | 64.6                 | 43.0                       | 76.2             | 57.5                                    | 64.9         | 68.8                      | 61.3              |
| Austria                        | 71.4                                 | 90.3   | 50.7                 | 61.0                       | 66.3             | 66.1                                    | 47.0         | 57.8                      | 60.5              |
| <b>Leaders</b>                 | <b>85.2</b>                          | <b>85.6</b>                                      | <b>71.9</b>          | <b>61.9</b>                | <b>73.8</b>      | <b>76.9</b>                             | <b>70.7</b>  | <b>75.6</b>               | <b>71.2</b>       |
| Israel                         | 60.0                                 | 54.6   | 51.8                 | 46.2                       | 53.3             | 77.0                                    | 69.9         | 72.0                      | 58.1              |
| Ireland                        | 73.2                                 | 56.1   | 61.7                 | 41.0                       | 61.7             | 70.6                                    | 56.0         | 66.2                      | 57.8              |
| Belgium                        | 74.0                                 | 55.0   | 62.7                 | 51.1                       | 49.3             | 62.9                                    | 52.0         | 63.9                      | 56.6              |
| Estonia                        | 64.2                                 | 46.7   | 54.3                 | 46.3                       | 56.6             | 64.2                                    | 78.2         | 55.1                      | 56.1              |
| Japan                          | 68.7                                 | 93.9   | 63.1                 | 53.3                       | 57.9             | 53.0                                    | 43.1         | 48.7                      | 55.7              |
| United Arab Emirates           | 94.5                                 | 68.7   | 51.8                 | 46.0                       | 47.7             | 41.9                                    | 49.2         | 65.1                      | 54.3              |
| <b>Korea, Rep. of</b>          | <b>55.6</b>                          | <b>40.7</b>                                      | <b>70.3</b>          | <b>61.3</b>                | <b>66.4</b>      | <b>50.4</b>                             | <b>50.7</b>  | <b>61.6</b>               | <b>54.1</b>       |
| France                         | 54.7                                 | 47.5   | 63.1                 | 41.7                       | 42.9             | 63.3                                    | 51.6         | 57.2                      | 50.3              |
| Malta                          | 50.1                                 | 45.5   | 44.5                 | 33.2                       | 54.9             | 59.5                                    | 59.8         | 66.9                      | 48.9              |
| Spain                          | 43.8                                 | 36.6   | 59.6                 | 53.5                       | 46.8             | 45.8                                    | 43.8         | 46.8                      | 45.7              |
| <b>Followers</b>               | <b>63.9</b>                          | <b>54.5</b>                                      | <b>58.3</b>          | <b>47.4</b>                | <b>53.8</b>      | <b>58.9</b>                             | <b>55.4</b>  | <b>60.4</b>               | <b>53.8</b>       |
| Czech Republic                 | 47.3                                 | 26.4   | 73.8                 | 49.8                       | 52.6             | 51.1                                    | 40.9         | 43.5                      | 44.8              |
| <b>Malaysia</b>                | <b>46.7</b>                          | <b>45.6</b>                                      | <b>43.4</b>          | <b>32.2</b>                | <b>58.5</b>      | <b>40.5</b>                             | <b>40.9</b>  | <b>48.9</b>               | <b>43.1</b>       |
| Slovenia                       | 48.0                                 | 30.2   | 50.2                 | 34.4                       | 43.6             | 53.4                                    | 42.4         | 44.6                      | 41.7              |
| Bahrain                        | 72.3                                 | 47.0   | 29.0                 | 37.2                       | 55.3             | 28.1                                    | 51.2         | 46.8                      | 41.5              |
| Saudi Arabia                   | 72.9                                 | 48.1   | 42.6                 | 28.1                       | 49.5             | 31.7                                    | 32.2         | 38.5                      | 40.7              |
| Lithuania                      | 34.6                                 | 33.2   | 46.5                 | 42.9                       | 39.1             | 43.7                                    | 50.7         | 41.2                      | 40.4              |
| Italy                          | 30.2                                 | 29.4   | 60.3                 | 41.2                       | 42.1             | 45.1                                    | 38.6         | 43.7                      | 39.7              |
| Cyprus                         | 40.5                                 | 47.3   | 31.6                 | 37.7                       | 31.7             | 40.4                                    | 44.7         | 53.0                      | 39.2              |
| Latvia                         | 42.2                                 | 28.2   | 43.6                 | 38.0                       | 37.2             | 43.6                                    | 48.3         | 37.0                      | 38.4              |
| Portugal                       | 31.6                                 | 36.0   | 33.7                 | 38.7                       | 40.4             | 48.3                                    | 35.5         | 43.1                      | 37.4              |
| Qatar                          | 68.7                                 | 46.6   | 33.6                 | 40.7                       | 58.3             | 35.3                                    | 12.4         | 46.7                      | 36.5              |
| Slovak Republic                | 37.7                                 | 20.1   | 57.7                 | 45.1                       | 31.0             | 37.8                                    | 37.0         | 47.2                      | 36.5              |
| Poland                         | 36.9                                 | 22.8   | 54.3                 | 52.7                       | 29.8             | 40.3                                    | 38.5         | 31.0                      | 36.2              |
| <b>China, People's Rep. of</b> | <b>25.6</b>                          | <b>33.4</b>                                      | <b>61.1</b>          | <b>51.4</b>                | <b>32.0</b>      | <b>27.6</b>                             | <b>39.2</b>  | <b>30.3</b>               | <b>35.3</b>       |
| Chile                          | 47.1                                 | 38.0   | 34.9                 | 28.1                       | 42.5             | 32.0                                    | 42.6         | 32.1                      | 35.3              |
| <b>Catchers-up</b>             | <b>45.5</b>                          | <b>35.5</b>                                      | <b>46.4</b>          | <b>39.9</b>                | <b>42.9</b>      | <b>39.9</b>                             | <b>39.7</b>  | <b>41.8</b>               | <b>39.1</b>       |

Note: The countries in bold are the developing Asian countries.

Source: Own calculation.

**Table 6: Pillar Values of the Asian Index of Digital Entrepreneurship Systems 2021  
(Laggards, Tailenders)**

| Country                | 1. Culture and informal institutions | 2. Formal institutions, regulation, and taxation | 3. Market conditions | 4. Physical infrastructure | 5. Human capital | 6. Knowledge creation and dissemination | 7. Finance  | 8. Networking and support | AIDES 2021 scores |
|------------------------|--------------------------------------|--|----------------------|----------------------------|------------------|---|-------------|---------------------------|-------------------|
| Russian Federation     | 28.0                                 | 19.9   | 47.8                 | 52.2                       | 33.0             | 36.1                                    | 31.1        | 35.0                      | 33.4              |
| Hungary                | 33.0                                 | 24.5   | 40.2                 | 46.3                       | 27.2             | 39.8                                    | 31.7        | 35.2                      | 33.3              |
| Kuwait                 | 52.0                                 | 33.6   | 26.8                 | 40.4                       | 35.7             | 21.8                                    | 36.7        | 31.3                      | 33.0              |
| Costa Rica             | 31.0                                 | 27.1   | 30.1                 | 31.1                       | 43.8             | 34.2                                    | 24.6        | 29.9                      | 30.4              |
| Croatia                | 25.0                                 | 24.6   | 39.3                 | 37.2                       | 27.5             | 37.3                                    | 32.3        | 27.1                      | 30.0              |
| Bulgaria               | 23.3                                 | 24.8   | 32.1                 | 32.2                       | 32.4             | 33.5                                    | 28.5        | 32.8                      | 29.2              |
| Mauritius              | 28.6                                 | 46.7   | 18.8                 | 29.1                       | 30.1             | 26.0                                    | 32.9        | 28.3                      | 28.8              |
| Uruguay                | 33.6                                 | 29.6   | 32.1                 | 24.9                       | 30.6             | 26.9                                    | 26.1        | 28.8                      | 28.5              |
| Romania                | 28.6                                 | 30.6   | 29.1                 | 42.6                       | 23.2             | 29.9                                    | 21.5        | 29.6                      | 28.3              |
| <b>Georgia</b>         | <b>28.5</b>                          | <b>59.3</b>                                      | <b>18.8</b>          | <b>32.0</b>                | <b>20.1</b>      | <b>22.0</b>                             | <b>37.3</b> | <b>22.6</b>               | <b>28.3</b>       |
| Oman                   | 65.9                                 | 38.0   | 29.6                 | 27.3                       | 41.0             | 19.9                                    | 8.4         | 27.1                      | 28.0              |
| <b>Kazakhstan</b>      | <b>37.9</b>                          | <b>27.8</b>                                      | <b>25.8</b>          | <b>36.0</b>                | <b>41.1</b>      | <b>25.0</b>                             | <b>25.4</b> | <b>18.9</b>               | <b>27.4</b>       |
| Greece                 | 30.2                                 | 19.3   | 30.0                 | 33.2                       | 29.3             | 33.4                                    | 25.1        | 25.3                      | 27.3              |
| Turkey                 | 30.9                                 | 22.7   | 36.3                 | 36.7                       | 19.1             | 24.5                                    | 29.8        | 26.3                      | 26.9              |
| Ukraine                | 22.6                                 | 15.5   | 31.1                 | 33.8                       | 36.8             | 32.8                                    | 26.0        | 21.9                      | 26.3              |
| Montenegro             | 23.8                                 | 32.6   | 20.6                 | 24.7                       | 28.2             | 32.0                                    | 26.0        | 27.6                      | 26.3              |
| Serbia                 | 29.8                                 | 19.5   | 29.5                 | 28.8                       | 24.5             | 31.2                                    | 25.0        | 25.8                      | 26.1              |
| <b>Armenia</b>         | <b>27.6</b>                          | <b>28.5</b>                                      | <b>19.4</b>          | <b>25.0</b>                | <b>32.1</b>      | <b>28.9</b>                             | <b>27.6</b> | <b>24.1</b>               | <b>26.0</b>       |
| <b>Thailand</b>        | <b>18.3</b>                          | <b>22.4</b>                                      | <b>27.5</b>          | <b>33.4</b>                | <b>25.0</b>      | <b>23.8</b>                             | <b>32.2</b> | <b>31.5</b>               | <b>25.9</b>       |
| <b>Azerbaijan</b>      | <b>39.9</b>                          | <b>31.2</b>                                      | <b>17.1</b>          | <b>28.2</b>                | <b>40.7</b>      | <b>26.1</b>                             | <b>15.4</b> | <b>23.5</b>               | <b>25.5</b>       |
| South Africa           | 16.2                                 | 29.8   | 21.5                 | 23.9                       | 23.0             | 23.2                                    | 36.0        | 29.9                      | 24.5              |
| North Macedonia        | 23.2                                 | 23.2   | 23.0                 | 23.4                       | 20.6             | 33.4                                    | 30.2        | 24.3                      | 24.2              |
| <b>Viet Nam</b>        | <b>11.6</b>                          | <b>19.5</b>                                      | <b>31.2</b>          | <b>40.8</b>                | <b>24.4</b>      | <b>22.7</b>                             | <b>20.7</b> | <b>24.9</b>               | <b>23.1</b>       |
| Brazil                 | 20.0                                 | 12.4   | 31.5                 | 24.4                       | 20.1             | 25.0                                    | 29.3        | 27.5                      | 22.7              |
| Jordan                 | 21.5                                 | 26.1   | 18.6                 | 26.1                       | 19.2             | 20.9                                    | 21.3        | 29.6                      | 22.4              |
| Argentina              | 28.1                                 | 12.2   | 28.8                 | 20.1                       | 27.8             | 25.0                                    | 18.4        | 25.2                      | 22.2              |
| Colombia               | 21.2                                 | 14.9   | 24.5                 | 21.2                       | 29.9             | 23.0                                    | 22.4        | 24.0                      | 21.9              |
| Moldova                | 19.1                                 | 13.1   | 23.0                 | 30.6                       | 21.3             | 24.4                                    | 21.9        | 22.3                      | 21.2              |
| Mexico                 | 17.7                                 | 17.9   | 22.3                 | 28.5                       | 18.9             | 21.8                                    | 19.6        | 24.2                      | 20.8              |
| Panama                 | 15.2                                 | 14.7   | 18.4                 | 24.4                       | 19.7             | 24.9                                    | 21.6        | 29.6                      | 20.4              |
| <b>Indonesia</b>       | <b>10.4</b>                          | <b>22.1</b>                                      | <b>14.7</b>          | <b>24.0</b>                | <b>29.0</b>      | <b>22.3</b>                             | <b>22.0</b> | <b>30.4</b>               | <b>20.4</b>       |
| Namibia                | 10.9                                 | 34.5   | 16.7                 | 16.9                       | 17.2             | 19.7                                    | 33.7        | 20.2                      | 20.1              |
| <b>Laggards</b>        | <b>26.7</b>                          | <b>25.6</b>                                      | <b>26.8</b>          | <b>30.6</b>                | <b>27.9</b>      | <b>27.2</b>                             | <b>26.3</b> | <b>27.0</b>               | <b>26.0</b>       |
| Egypt, Arab Rep. of    | 18.1                                 | 19.8   | 14.0                 | 32.1                       | 18.1             | 20.4                                    | 14.7        | 28.4                      | 19.8              |
| Morocco                | 28.9                                 | 24.5   | 17.6                 | 27.8                       | 20.3             | 15.5                                    | 13.7        | 16.6                      | 19.7              |
| <b>India</b>           | <b>5.3</b>                           | <b>26.4</b>                                      | <b>19.8</b>          | <b>32.4</b>                | <b>23.1</b>      | <b>20.8</b>                             | <b>20.1</b> | <b>23.0</b>               | <b>19.6</b>       |
| Lebanon                | 23.5                                 | 10.3   | 25.5                 | 21.3                       | 17.8             | 21.0                                    | 19.8        | 24.1                      | 19.5              |
| Tunisia                | 18.0                                 | 15.4   | 20.4                 | 28.8                       | 27.1             | 20.2                                    | 17.3        | 15.1                      | 19.4              |
| Bosnia and Herzegovina | 18.4                                 | 10.3   | 26.7                 | 24.4                       | 15.7             | 19.1                                    | 24.1        | 22.6                      | 19.3              |
| <b>Philippines</b>     | <b>8.0</b>                           | <b>16.2</b>                                      | <b>19.3</b>          | <b>19.2</b>                | <b>21.5</b>      | <b>24.4</b>                             | <b>18.0</b> | <b>30.9</b>               | <b>18.5</b>       |
| Peru                   | 13.0                                 | 13.7   | 20.0                 | 20.9                       | 26.8             | 19.7                                    | 19.0        | 17.2                      | 17.8              |
| Dominican Republic     | 11.2                                 | 15.6   | 21.5                 | 22.5                       | 15.2             | 19.0                                    | 21.3        | 21.3                      | 17.6              |
| <b>Sri Lanka</b>       | <b>3.0</b>                           | <b>14.4</b>                                      | <b>8.7</b>           | <b>50.3</b>                | <b>13.4</b>      | <b>23.8</b>                             | <b>21.7</b> | <b>24.1</b>               | <b>17.5</b>       |
| Kenya                  | 4.4                                  | 18.0   | 15.8                 | 18.7                       | 18.4             | 15.4                                    | 36.9        | 24.9                      | 17.4              |
| <b>Mongolia</b>        | <b>8.4</b>                           | <b>12.4</b>                                      | <b>16.1</b>          | <b>22.4</b>                | <b>16.1</b>      | <b>18.2</b>                             | <b>30.2</b> | <b>21.4</b>               | <b>17.2</b>       |
| Botswana               | 11.5                                 | 22.9   | 12.9                 | 17.1                       | 13.5             | 21.9                                    | 25.5        | 16.5                      | 17.0              |
| Albania                | 11.4                                 | 11.0   | 14.5                 | 23.9                       | 24.2             | 19.6                                    | 18.1        | 15.2                      | 16.7              |
| Ecuador                | 13.8                                 | 8.1  | 16.7                 | 21.7                       | 21.6             | 18.6                                    | 17.0        | 17.5                      | 16.2              |
| <b>Kyrgyz Republic</b> | <b>11.8</b>                          | <b>12.1</b>                                      | <b>10.9</b>          | <b>18.8</b>                | <b>21.4</b>      | <b>16.9</b>                             | <b>17.0</b> | <b>17.0</b>               | <b>15.2</b>       |
| Rwanda                 | 3.5                                  | 35.0   | 8.2                  | 14.8                       | 8.7              | 18.8                                    | 23.3        | 21.1                      | 15.2              |
| Paraguay               | 9.8                                  | 11.4   | 15.4                 | 18.8                       | 12.7             | 15.8                                    | 22.9        | 15.9                      | 14.9              |
| Ghana                  | 5.0                                  | 20.8   | 12.6                 | 16.3                       | 12.6             | 16.2                                    | 27.3        | 16.0                      | 14.9              |
| Algeria                | 13.3                                 | 9.8  | 15.1                 | 22.1                       | 23.9             | 12.6                                    | 13.8        | 13.6                      | 14.7              |
| Honduras               | 5.4                                  | 12.6   | 13.4                 | 15.5                       | 9.4              | 21.3                                    | 17.2        | 22.4                      | 13.8              |
| Guatemala              | 5.6                                  | 12.5   | 15.0                 | 17.6                       | 10.2             | 15.2                                    | 16.5        | 16.4                      | 12.9              |
| <b>Tajikistan</b>      | <b>3.7</b>                           | <b>15.6</b>                                      | <b>8.5</b>           | <b>2.9</b>                 | <b>22.7</b>      | <b>19.7</b>                             | <b>18.6</b> | <b>19.4</b>               | <b>12.8</b>       |
| <b>Bangladesh</b>      | <b>2.1</b>                           | <b>10.0</b>                                      | <b>7.8</b>           | <b>32.1</b>                | <b>8.5</b>       | <b>14.5</b>                             | <b>20.1</b> | <b>14.6</b>               | <b>12.5</b>       |
| <b>Pakistan</b>        | <b>4.9</b>                           | <b>13.9</b>                                      | <b>9.1</b>           | <b>26.5</b>                | <b>6.0</b>       | <b>15.9</b>                             | <b>14.2</b> | <b>16.0</b>               | <b>12.3</b>       |
| Senegal                | 2.8                                  | 15.1   | 11.9                 | 14.0                       | 8.5              | 15.1                                    | 21.2        | 15.6                      | 12.2              |
| Bolivia                | 4.6                                  | 2.7  | 15.7                 | 18.1                       | 12.6             | 18.6                                    | 19.3        | 11.9                      | 12.1              |
| El Salvador            | 3.6                                  | 12.1   | 14.6                 | 18.1                       | 10.3             | 14.7                                    | 15.3        | 13.4                      | 12.1              |
| <b>Cambodia</b>        | <b>4.0</b>                           | <b>14.4</b>                                      | <b>8.8</b>           | <b>18.5</b>                | <b>9.4</b>       | <b>13.1</b>                             | <b>13.1</b> | <b>20.0</b>               | <b>12.0</b>       |
| Nigeria                | 0.9                                  | 10.4   | 10.4                 | 16.1                       | 10.4             | 21.3                                    | 16.4        | 15.4                      | 11.6              |
| Zimbabwe               | 4.8                                  | 7.3  | 11.9                 | 11.1                       | 9.6              | 13.4                                    | 23.6        | 15.9                      | 11.6              |
| <b>Nepal</b>           | <b>3.1</b>                           | <b>11.6</b>                                      | <b>7.6</b>           | <b>22.7</b>                | <b>7.4</b>       | <b>17.5</b>                             | <b>14.5</b> | <b>13.6</b>               | <b>11.5</b>       |
| Benin                  | 1.4                                  | 17.5   | 9.6                  | 11.7                       | 11.6             | 14.3                                    | 17.5        | 12.5                      | 11.2              |
| Tanzania               | 1.3                                  | 13.9   | 9.6                  | 12.1                       | 8.5              | 11.3                                    | 23.8        | 14.5                      | 10.9              |
| Uganda                 | 1.5                                  | 15.3   | 7.9                  | 12.8                       | 5.2              | 12.9                                    | 26.0        | 13.1                      | 10.8              |
| Zambia                 | 3.6                                  | 11.5   | 10.8                 | 10.1                       | 5.4              | 16.1                                    | 22.6        | 12.9                      | 10.7              |
| Cameroon               | 2.2                                  | 9.5  | 10.7                 | 9.1                        | 12.2             | 14.6                                    | 16.8        | 11.4                      | 10.2              |
| Mali                   | 1.6                                  | 9.8  | 7.3                  | 4.3                        | 17.0             | 14.5                                    | 18.1        | 11.7                      | 9.8               |
| Madagascar             | 0.8                                  | 5.6  | 7.8                  | 10.8                       | 7.9              | 12.9                                    | 15.8        | 11.2                      | 8.5               |
| Burkina Faso           | 0.9                                  | 18.7   | 6.2                  | 6.8                        | 5.1              | 12.7                                    | 13.7        | 7.9                       | 8.4               |
| Mozambique             | 2.0                                  | 6.1  | 4.6                  | 9.1                        | 3.3              | 10.8                                    | 18.1        | 14.5                      | 8.0               |
| <b>Tailenders</b>      | <b>7.3</b>                           | <b>14.0</b>                                      | <b>13.2</b>          | <b>18.9</b>                | <b>14.0</b>      | <b>17.0</b>                             | <b>19.6</b> | <b>17.2</b>               | <b>14.2</b>       |

Note: The countries in bold are the developing Asian countries.

Source: Own calculation.

## **Key Takeaways for Developing Asian Countries**

In what follows, we focus on the pillar-level analysis. Table 7 shows all eight pillar scores for the developing Asian countries and includes two additional useful benchmarks: the average pillar scores for the countries with the most advanced digital entrepreneurial ecosystem (leaders) and the average pillar scores for the 21 developing Asian countries. We also identify the most and least favorable pillar scores for each country (the last two columns in Table 7).

The smallest overall pillar variance (16.1) was found in the pillar capturing Physical infrastructure. At the other end, the Culture and informal institution pillar, representing acceptance and recognition of the important role of entrepreneurs by the population, shows the largest pillar differences in variance (23.6), since it ranges from 97.2 (Singapore) to 3.1 (Nepal).

Examining the least favorable pillars, we can see that most developing Asian economies have serious problems in recognizing the important role of entrepreneurs, as illustrated by the Culture and informal institutions pillar. This pillar is the weakest in 14 of the 21 countries: in all tailenders, three laggards (Indonesia, Viet Nam, and Thailand) and one catcher-up (the PRC). The most favorable pillar is Physical infrastructure in 7 of the 21 countries, Human capital in six countries, and Networking and support in three countries.

In general, it can be said that the weakest pillar for Asian countries is the Culture and informal institutions pillar, while the most favorable pillar is the Physical infrastructure pillar. In contrast, for the leaders with the most advanced digital ecosystem, the most favorable pillar is typically the Culture and informal institutions pillar and the Formal institutions, regulation, and taxation pillar, while the Physical infrastructure pillar is the least favorable.

**Table 7: The Pillar Level Values of the 21 Developing Asian Countries**

| Country                     | 1    | 2    | 3    | 4    | 5     | 6    | 7     | 8    | Less Favorable                            | Most Favorable   |
|-----------------------------|------|------|------|------|-------|------|-------|------|---|--|
| Singapore                   | 97.2 | 85.7 | 61.6 | 74.8 | 100.0 | 82.0 | 100.0 | 83.8 | Market conditions                         | Human capital, Finance   |
| Korea, Rep. of              | 55.6 | 40.7 | 70.3 | 61.3 | 66.4  | 50.4 | 50.7  | 61.6 | Formal institutions, regulation, taxation | Market conditions  |
| Malaysia                    | 46.7 | 45.6 | 43.4 | 32.2 | 58.5  | 40.5 | 40.9  | 48.9 | Physical infrastructure                   | Human capital  |
| China, People's Rep. of     | 25.6 | 33.4 | 61.1 | 51.4 | 32.0  | 27.6 | 39.2  | 30.3 | Cultural and informal institutions        | Market conditions  |
| Georgia                     | 28.5 | 59.3 | 18.8 | 32.0 | 20.1  | 22.0 | 37.3  | 22.6 | Market conditions                         | Formal institutions, regulation, taxation                                    |
| Kazakhstan                  | 37.9 | 27.8 | 25.8 | 36.0 | 41.1  | 25.0 | 25.4  | 18.9 | Networking and support                    | Human capital  |
| Armenia                     | 27.6 | 28.5 | 19.4 | 25.0 | 32.1  | 28.9 | 27.6  | 24.1 | Market conditions                         | Human capital  |
| Thailand                    | 18.3 | 22.4 | 27.5 | 33.4 | 25.0  | 23.8 | 32.2  | 31.5 | Cultural and informal institutions        | Physical infrastructure  |
| Azerbaijan                  | 39.9 | 31.2 | 17.1 | 28.2 | 40.7  | 26.1 | 15.4  | 23.5 | Finance                                   | Human capital  |
| Viet Nam                    | 11.6 | 19.5 | 31.2 | 40.8 | 24.4  | 22.7 | 20.7  | 24.9 | Physical infrastructure                   | Culture and informal institutions  |
| Indonesia                   | 10.4 | 22.1 | 14.7 | 24.0 | 29.0  | 22.3 | 22.0  | 30.4 | Cultural and informal institutions        | Networking and support   |
| India                       | 5.3  | 26.4 | 19.8 | 32.4 | 23.1  | 20.8 | 20.1  | 23.0 | Cultural and informal institutions        | Physical infrastructure  |
| Philippines                 | 8.0  | 16.2 | 19.3 | 19.2 | 21.5  | 24.4 | 18.0  | 30.9 | Cultural and informal institutions        | Networking and support   |
| Sri Lanka                   | 3.0  | 14.4 | 8.7  | 50.3 | 13.4  | 23.8 | 21.7  | 24.1 | Cultural and informal institutions        | Physical infrastructure  |
| Mongolia                    | 8.4  | 12.4 | 16.1 | 22.4 | 16.1  | 18.2 | 30.2  | 21.4 | Cultural and informal institutions        | Finance  |
| Kyrgyz Republic             | 11.8 | 12.1 | 10.9 | 18.8 | 21.4  | 16.9 | 17.0  | 17.0 | Market conditions                         | Human capital  |
| Tajikistan                  | 3.7  | 15.6 | 8.5  | 2.9  | 22.7  | 19.7 | 18.6  | 19.4 | Physical infrastructure                   | Human capital  |
| Bangladesh                  | 2.1  | 10.0 | 7.8  | 32.1 | 8.5   | 14.5 | 20.1  | 14.6 | Cultural and informal institutions        | Physical infrastructure  |
| Pakistan                    | 4.9  | 13.9 | 9.1  | 26.5 | 6.0   | 15.9 | 14.2  | 16.0 | Cultural and informal institutions        | Physical infrastructure  |
| Cambodia                    | 4.0  | 14.4 | 8.8  | 18.5 | 9.4   | 13.1 | 13.1  | 20.0 | Cultural and informal institutions        | Networking and support   |
| Nepal                       | 3.1  | 11.6 | 7.6  | 22.7 | 7.4   | 17.5 | 14.5  | 13.6 | Cultural and informal institutions        | Physical infrastructure  |
| Average of the Asian region | 21.6 | 26.8 | 24.2 | 32.6 | 29.5  | 26.5 | 28.5  | 28.6 | Cultural and informal institutions        | Physical infrastructure  |
| Average of the leaders      | 85.2 | 85.6 | 71.9 | 61.9 | 73.8  | 76.9 | 70.7  | 75.6 | Physical infrastructure                   | Culture and informal institutions, Formal institutions, taxation, regulation |

Note: The colors reflect the value of the score from the best (green) toward the medium (amber) to the worst (red). First row: 1 = culture, informal institutions; 2 = formal institutions, regulation, taxation; 3 = market condition; 4 = physical infrastructure; 5 = human capital; 6 = knowledge creation and dissemination; 7 = finance; 8 = networking and support.

Source: Own calculation



## **B. Entrepreneurship System Index 2021 (non-digitalized version of Asian Index of Digital Entrepreneurship Systems)**

The AIDES 2021 can be used to measure and optimize the performance of digitally enabled, national-level systems of entrepreneurship. AIDES provides consistent quantifiable measures that capture both the strengths and weaknesses of the digital entrepreneurship system. The index uses measures of digitalization as weights to adjust the magnitude of general institutional and contextual factors in regulating the quality of the entrepreneurial dynamics.

Our index-building methodology provides the opportunity to examine the performance of each country's national-level entrepreneurship systems in isolation of the impact of digitalization. Consequently, a separate sub-index, the Entrepreneurship System Index (ESI) 2021 can be formed to measure the performance of entrepreneurial ecosystem in a national context. The ESI score refers to the arithmetic average of the country's non-digitalized pillar scores. The calculation of the non-digitalized pillar scores of the AIDES is described in Appendix 1 (sections 1–2). The scale ranges from 0 to 100 (high).

As can be seen from Table 8, the differences between ESI of the 113 countries are considerable: the difference between the first Singapore (ESI = 98.5) and the last Mozambique (ESI = 40.6) is large, almost 2.5-fold. There is a strong relationship between the ESI and the development of the country, as measured by its per-capita GDP: the Spearman correlation coefficient for the two variables is 0.90. Rich and especially highly agglomerated, innovative, and high-income Western European countries top the ranking along with Singapore, the United States, Canada, Japan, United Arab Emirates, New Zealand, Australia, and Malaysia. The less-developed African, Asian, South and Central American, and some Balkan countries are at the bottom of the ranking.

Based on cut-off points derived from the data, we classified countries into four groups according to the performance of their entrepreneurship system, highlighted by different colors in the table:

- Leaders (ESI score over 80)
- Followers (65 < ESI score ≤ 80)
- Catchers-up (55 < ESI score ≤ 65)
- Laggards (ESI score below 55)

We first tested a 5-cluster model, but some clusters were difficult to interpret. The final four cut-off points were determined by using a 4-cluster model that classified the countries based on the eight pillars.<sup>9</sup>

Twenty-three countries emerged as leaders in terms of their entrepreneurship systems: Singapore, Switzerland, the United States, the Netherlands, Finland, Sweden, Denmark, Germany, the United Kingdom, Luxembourg, Canada, Japan, Israel, United Arab Emirates, Austria, Norway, New Zealand, Belgium, Australia, France, Ireland, Malaysia, and the ROK. The entrepreneurial ecosystems scores for this group range from 98.5 (Singapore) to 79.9 (ROK). The average score of this group is 86.2. Twenty-one countries are among the high-income countries, while alone Malaysia belongs to the upper middle-income group. With the exception of Malaysia, all countries in leader group are innovation-driven countries.

The follower group comprises the following 25 countries: Qatar, Saudi Arabia, Spain, Estonia, Bahrain, Malta, the PRC, Czech Republic, Oman, Italy, Chile, Portugal, Slovenia, Cyprus, Lithuania, Thailand, Azerbaijan, South Africa, Poland, Latvia, Mauritius, India, Kuwait, Indonesia, and Jordan. The ESI scores for this group range from 78.1 (Qatar) to 64.7 (Jordan). The group average is 69.4. Based on the results of the GII 2021, 10 followers are innovation-driven countries, seven countries are transition countries (from stage 2 to 3), while five countries belong to efficiency-driven and two to transition countries (from stage 1 to 2), and one to factor-driven countries. Eighteen out of the 25 follower countries are among the high-income countries. the PRC, Thailand, Azerbaijan, South Africa, Jordan, and Mauritius belong to the upper middle-income group, while India and Indonesia are in the lower middle-income group category.

We identified 36 countries in the catchers-up group. The average score of this group is 59.6. The ESI scores for catchers-up range from 63.8 (Hungary) to 55.8 (North Macedonia). Based on the range of the data, this group has the lowest variability compared to the other three groups. This suggests that the ESI performance of these countries is relatively similar.

The group of laggards comprises 29 countries. The most of them are lower-income or low-income countries, while only six laggards are among the upper middle-income countries. The average score of this group is 49.7. The ESI scores for this group range from 54.3 (Ghana) to 40.6 (Mozambique). With the exception of two Balkan countries, the laggards are African, South or Central American, and Asian countries.

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<sup>9</sup> According to the result of this 4-cluster model, the ROK, despite having an AIDES overall score of 79.9, belongs to leaders. On the other hand, Algeria would fall into the laggard group based on its AIDES overall score (53.7), but is in the catchers-up group according to the results of the cluster analysis. Similarly, although India (64.9), Kuwait (64.7), Indonesia (64.7), and Jordan (64.7) have AIDES scores below 65, they belong to the followers.

There are 111 countries where the non-digital (entrepreneurial) elements of the AIDES, i.e. the components of the general ESI are better than the digital ones. For two countries, Estonia and Slovak Republic, digitalization compensates for the shortcomings of the entrepreneurial ecosystem.

Going down the ranking, we can see that the average difference between non-digital and digital score increases (refer to last column in Table 8): the smallest difference is among the leader countries (10.9), while the largest is among the laggards (19.3). There are 10 leader countries where the digital ecosystem represented by digital conditions lags significantly (i.e., above the average difference) behind the non-digital factors of ESI: Singapore, Switzerland, Finland, Germany, Japan, Israel, United Arab Emirates, Belgium, France, and Malaysia. Malaysia exhibits the most pronounced differences in the group. For followers, there are also 12 countries where digital parts are significantly weaker than non-digital parts that make up the entrepreneurial ecosystem: Qatar, Saudi Arabia, the PRC, Oman, Chile, Thailand, Azerbaijan, South Africa, Mauritius, India, Indonesia, and Jordan. The impact of the digitalization process is even more moderated for both catchers-up and laggards, as countries in these groups perform significantly better on non-digital (ESI) elements of the AIDES.

### **Key Takeaways for Asia's Developing Countries**

ESI 2021 is able to measure the level of the entrepreneurial ecosystem on a 0–100-point scale. Table 8 shows the relative ranking of the 21 developing Asian countries based on their overall ESI scores and their three digital sub-indices compared to 92 other countries. Clearly, there are significant differences in ESI scores among developing Asian countries: the difference between the first Singapore (ESI = 98.5) and the last Cambodia (ESI = 49.0) is considerable, about twofold. Besides Singapore, Malaysia (80.4) and the ROK (79.9) belong to the leader category as well, but they perform at the bottom of the group ranking. Their performance is close to Ireland (80.7) and France (81.3). For these three countries, digital factors severely hamper general ESI performance, particularly in Malaysia. The PRC, Thailand, Azerbaijan, India, and Indonesia are among the followers. In the case of the followers as well, the digital factors hamper general ESI performance the most, especially in India. There are five developing Asian countries which belong to the catchers-up. Their digital entrepreneurship system performance lags on average 18.4 points behind the performance of their general entrepreneurship system based on their ESI scores.

**Table 8: Entrepreneurial Ecosystem Index 2021 Rankings**

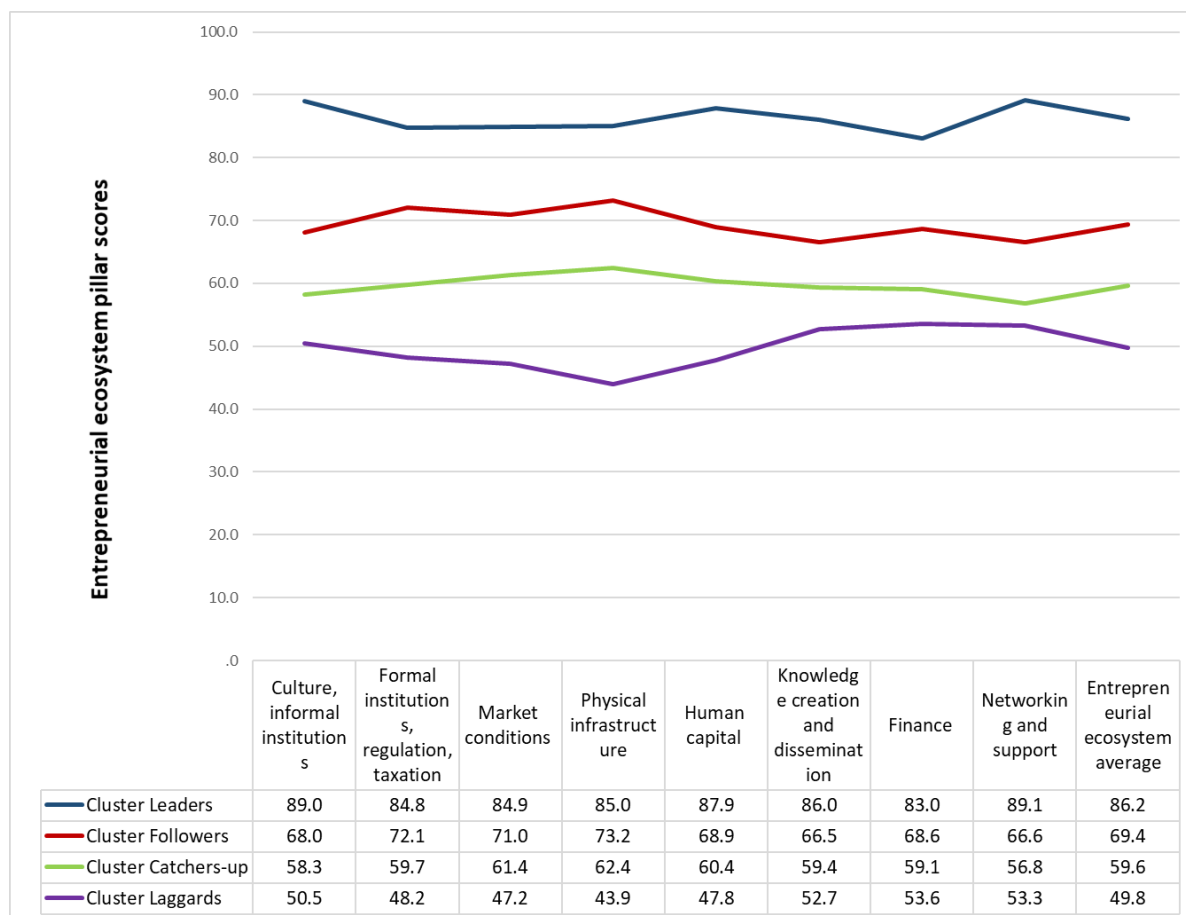
| Country                        | Entrepreneurial Ecosystem (EE) |           | Digital Ecosystem (DE) |      | Diff (EE-DE) |
|--------------------------------|--------------------------------|-----------|------------------------|------|--------------|
|                                | Score                          | Rank      | Score                  | Rank |              |
| <b>Singapore</b>               | <b>98.5</b>                    | <b>1</b>  | 82.7                   | 5    | 15.7         |
| Switzerland                    | 93.7                           | 2         | 81.3                   | 8    | 12.3         |
| United States                  | 92.5                           | 3         | 85.3                   | 3    | 7.2          |
| Netherlands                    | 90.6                           | 4         | 83.6                   | 4    | 7.0          |
| Finland                        | 90.5                           | 5         | 78.8                   | 10   | 11.7         |
| Sweden                         | 89.9                           | 6         | 88.0                   | 1    | 1.9          |
| Denmark                        | 89.6                           | 7         | 86.4                   | 2    | 3.2          |
| Germany                        | 87.8                           | 8         | 74.8                   | 15   | 12.9         |
| United Kingdom                 | 87.5                           | 9         | 81.9                   | 6    | 5.6          |
| Luxembourg                     | 86.7                           | 10        | 80.1                   | 9    | 6.6          |
| Canada                         | 85.5                           | 11        | 76.5                   | 12   | 9.0          |
| Japan                          | 85.4                           | 12        | 69.8                   | 21   | 15.6         |
| Israel                         | 84.7                           | 13        | 69.8                   | 22   | 14.9         |
| United Arab Emirates           | 84.0                           | 14        | 66.3                   | 24   | 17.7         |
| Austria                        | 83.4                           | 15        | 73.6                   | 16   | 9.9          |
| Norway                         | 83.3                           | 16        | 81.5                   | 7    | 1.8          |
| New Zealand                    | 82.9                           | 17        | 78.3                   | 11   | 4.6          |
| Belgium                        | 82.3                           | 18        | 70.2                   | 20   | 12.2         |
| Australia                      | 81.7                           | 19        | 75.8                   | 14   | 5.9          |
| France                         | 81.3                           | 20        | 64.5                   | 26   | 16.8         |
| Ireland                        | 80.7                           | 21        | 72.4                   | 17   | 8.3          |
| <b>Malaysia</b>                | <b>80.4</b>                    | <b>22</b> | 55.5                   | 41   | 24.8         |
| <b>Korea, Rep. of</b>          | <b>79.9</b>                    | <b>23</b> | 71.8                   | 18   | 8.1          |
| <b>Leaders</b>                 | <b>86.2</b>                    |           | <b>76.0</b>            |      | <b>10.2</b>  |
| Qatar                          | 78.1                           | 24        | 55.5                   | 42   | 22.5         |
| Saudi Arabia                   | 75.8                           | 25        | 56.6                   | 38   | 19.2         |
| Spain                          | 74.7                           | 26        | 63.9                   | 27   | 10.9         |
| Estonia                        | 74.2                           | 27        | 76.4                   | 13   | -2.2         |
| Bahrain                        | 73.1                           | 28        | 62.9                   | 28   | 10.3         |
| Malta                          | 73.1                           | 29        | 71.2                   | 19   | 1.9          |
| <b>China, People's Rep. of</b> | <b>72.2</b>                    | <b>30</b> | 52.4                   | 45   | 19.8         |
| Czech Republic                 | 71.1                           | 31        | 67.5                   | 23   | 3.6          |
| Oman                           | 70.3                           | 32        | 47.6                   | 54   | 22.7         |
| Italy                          | 70.2                           | 33        | 60.5                   | 32   | 9.7          |
| Chile                          | 70.1                           | 34        | 54.9                   | 43   | 15.2         |
| Portugal                       | 69.9                           | 35        | 57.1                   | 35   | 12.8         |
| Slovenia                       | 69.8                           | 36        | 62.7                   | 29   | 7.1          |
| Cyprus                         | 69.2                           | 37        | 59.1                   | 33   | 10.1         |
| Lithuania                      | 67.4                           | 38        | 62.2                   | 30   | 5.2          |
| <b>Thailand</b>                | <b>67.0</b>                    | <b>39</b> | 42.5                   | 66   | 24.5         |
| <b>Azerbaijan</b>              | <b>66.5</b>                    | <b>40</b> | 44.9                   | 61   | 21.6         |
| South Africa                   | 66.2                           | 41        | 41.5                   | 68   | 24.7         |
| Poland                         | 66.1                           | 42        | 58.8                   | 34   | 7.3          |
| Latvia                         | 65.6                           | 43        | 61.7                   | 31   | 3.9          |
| Mauritius                      | 65.2                           | 44        | 46.5                   | 57   | 18.8         |
| <b>India</b>                   | <b>64.9</b>                    | <b>49</b> | 35.5                   | 83   | 29.4         |
| Kuwait                         | 64.7                           | 50        | 56.4                   | 39   | 8.3          |
| <b>Indonesia</b>               | <b>64.7</b>                    | <b>51</b> | 37.6                   | 78   | 27.2         |
| Jordan                         | 64.7                           | 52        | 38.1                   | 76   | 26.6         |
| <b>Followers</b>               | <b>69.4</b>                    |           | <b>55.0</b>            |      | <b>14.4</b>  |

| Country                | Entrepreneurial Ecosystem (EE) |            | Digital Ecosystem (DE) |      | Diff (EE-DE) |
|------------------------|--------------------------------|------------|------------------------|------|--------------|
|                        | Score                          | Rank       | Score                  | Rank |              |
| Hungary                | 63.8                           | 53         | 56.7                   | 36   | 7.1          |
| Russian Federation     | 63.4                           | 54         | 56.6                   | 37   | 6.8          |
| Turkey                 | 63.4                           | 55         | 47.5                   | 55   | 15.8         |
| Costa Rica             | 62.4                           | 56         | 52.6                   | 44   | 9.8          |
| Bulgaria               | 62.2                           | 57         | 50.7                   | 46   | 11.5         |
| Slovak Republic        | 61.9                           | 58         | 64.5                   | 25   | -2.6         |
| Montenegro             | 61.7                           | 59         | 45.3                   | 60   | 16.4         |
| <b>Kazakhstan</b>      | <b>61.6</b>                    | <b>60</b>  | 50.4                   | 47   | 11.2         |
| <b>Georgia</b>         | <b>61.6</b>                    | <b>61</b>  | 47.9                   | 53   | 13.7         |
| Greece                 | 61.5                           | 62         | 49.6                   | 50   | 11.9         |
| <b>Philippines</b>     | <b>61.2</b>                    | <b>63</b>  | 34.9                   | 87   | 26.3         |
| Uruguay                | 61.2                           | 64         | 49.9                   | 48   | 11.3         |
| Romania                | 61.0                           | 65         | 49.8                   | 49   | 11.1         |
| <b>Armenia</b>         | <b>60.9</b>                    | <b>66</b>  | 46.2                   | 58   | 14.7         |
| Mexico                 | 60.7                           | 67         | 39.9                   | 71   | 20.8         |
| Serbia                 | 60.5                           | 68         | 47.3                   | 56   | 13.2         |
| Morocco                | 60.1                           | 69         | 38.5                   | 73   | 21.5         |
| Ukraine                | 60.0                           | 70         | 48.5                   | 52   | 11.5         |
| <b>Viet Nam</b>        | <b>59.8</b>                    | <b>71</b>  | 42.8                   | 65   | 17.0         |
| Lebanon                | 59.3                           | 72         | 38.3                   | 74   | 21.1         |
| Colombia               | 59.1                           | 73         | 42.3                   | 67   | 16.8         |
| Croatia                | 58.9                           | 74         | 56.1                   | 40   | 2.8          |
| Panama                 | 58.6                           | 75         | 40.4                   | 69   | 18.2         |
| Egypt, Arab Rep. of    | 58.3                           | 76         | 40.2                   | 70   | 18.1         |
| <b>Sri Lanka</b>       | <b>58.2</b>                    | <b>77</b>  | 34.5                   | 88   | 23.7         |
| Brazil                 | 58.2                           | 78         | 44.2                   | 62   | 14.0         |
| Dominican Republic     | 57.9                           | 79         | 36.7                   | 81   | 21.2         |
| Namibia                | 57.8                           | 80         | 38.2                   | 75   | 19.6         |
| Argentina              | 57.7                           | 81         | 44.2                   | 63   | 13.5         |
| Kenya                  | 57.6                           | 82         | 35.3                   | 84   | 22.3         |
| Rwanda                 | 57.6                           | 83         | 29.6                   | 96   | 28.0         |
| Tunisia                | 57.0                           | 84         | 38.9                   | 72   | 18.1         |
| Botswana               | 56.2                           | 85         | 33.9                   | 89   | 22.3         |
| Peru                   | 56.1                           | 86         | 37.7                   | 77   | 18.3         |
| North Macedonia        | 55.8                           | 87         | 48.9                   | 51   | 7.0          |
| Albania                | 52.6                           | 89         | 36.3                   | 82   | 16.3         |
| <b>Catchers-up</b>     | <b>59.6</b>                    |            | <b>44.3</b>            |      | <b>15.3</b>  |
| Ghana                  | 54.3                           | 84         | 32.5                   | 91   | 21.8         |
| <b>Tajikistan</b>      | <b>54.1</b>                    | <b>85</b>  | 28.8                   | 99   | 25.3         |
| <b>Pakistan</b>        | <b>53.9</b>                    | <b>86</b>  | 27.1                   | 108  | 26.8         |
| Algeria                | 53.7                           | 87         | 32.9                   | 90   | 20.8         |
| Ecuador                | 52.6                           | 88         | 36.7                   | 80   | 15.9         |
| <b>Mongolia</b>        | <b>52.1</b>                    | <b>90</b>  | 36.8                   | 79   | 15.3         |
| Guatemala              | 52.0                           | 91         | 30.5                   | 94   | 21.6         |
| Moldova                | 52.0                           | 92         | 45.6                   | 59   | 6.3          |
| Honduras               | 51.8                           | 93         | 31.7                   | 92   | 20.1         |
| <b>Nepal</b>           | <b>51.4</b>                    | <b>94</b>  | 26.9                   | 109  | 24.5         |
| Bosnia and Herzegovina | 51.4                           | 95         | 43.2                   | 64   | 8.2          |
| Senegal                | 51.2                           | 96         | 29.0                   | 97   | 22.1         |
| Nigeria                | 51.2                           | 97         | 28.6                   | 100  | 22.6         |
| El Salvador            | 51.1                           | 98         | 29.7                   | 95   | 21.4         |
| <b>Bangladesh</b>      | <b>50.7</b>                    | <b>99</b>  | 28.6                   | 101  | 22.2         |
| <b>Kyrgyz Republic</b> | <b>50.6</b>                    | <b>100</b> | 34.9                   | 86   | 15.7         |
| Paraguay               | 50.2                           | 101        | 35.0                   | 85   | 15.2         |
| Tanzania               | 49.7                           | 102        | 27.2                   | 106  | 22.5         |
| <b>Cambodia</b>        | <b>49.0</b>                    | <b>103</b> | 28.9                   | 98   | 20.2         |
| Benin                  | 48.1                           | 104        | 28.0                   | 102  | 20.1         |
| Zimbabwe               | 48.1                           | 105        | 27.2                   | 107  | 20.9         |
| Cameroon               | 47.9                           | 106        | 26.2                   | 110  | 21.8         |
| Uganda                 | 47.9                           | 107        | 27.6                   | 104  | 20.3         |
| Zambia                 | 47.6                           | 108        | 27.6                   | 105  | 20.0         |
| Bolivia                | 46.6                           | 109        | 31.4                   | 93   | 15.2         |
| Mali                   | 45.6                           | 110        | 27.9                   | 103  | 17.7         |
| Burkina Faso           | 43.2                           | 111        | 23.6                   | 112  | 19.6         |
| Madagascar             | 43.1                           | 112        | 24.2                   | 111  | 18.9         |
| Mozambique             | 40.6                           | 113        | 22.5                   | 113  | 18.1         |
| <b>Laggards</b>        | <b>49.7</b>                    |            | <b>30.4</b>            |      | <b>19.3</b>  |
| <b>Average</b>         | <b>64.9</b>                    |            | <b>49.5</b>            |      |              |

Note: The colors reflect the value of the score from the best (green) toward the medium (amber) to the worst (red).  
Source: Own calculation.

The AIDES methodology is based on the harmonization of its eight pillars. Therefore, it is particularly suitable for identifying potential conflict trap domains. Differences in digital entrepreneurship systems are clear when we classify the countries according to the eight framework conditions for entrepreneurship (Figure 8).

**Figure 8: Grouping of the 113 Regions Based on the Eight Asian Index of Digital Entrepreneurial Systems Pillars (K-means cluster, final cluster centers)**



Source: Own calculation.

The countries in the leader group perform well above the other three clusters in all eight pillars. The leaders are strong in Culture and informal institutions, Networking and support, and Human capital pillars. Countries in the follower group perform above the group average for the Physical Infrastructure, Formal institutions, regulation, taxation and Market condition pillars, while they per-

form poorly for both the Knowledge creation and dissemination and Networking and support pillars. Catchers-up countries are relatively strong in Physical infrastructure and Market condition pillars but lag behind in the Knowledge creation and dissemination pillar. The countries in the laggards group lag significantly behind the other three clusters in all eight pillars. They are relatively strong in Financing and weak in Physical infrastructure.

Table 9 and Table 10 show average equated pillar values comprising the digital entrepreneurship systems of the 113 countries, grouped by leaders, followers, catchers-up, and laggards. An analysis on the eight pillars provides a more detailed and a more precise picture about the entrepreneurial profile of each country. The colors help to identify the position of a country's particular pillar. For example, the United States has a maximum value in Knowledge creation and dissemination (100.0, green color) but weaker in Physical infrastructure (89.0, amber color) and low in Formal institution, regulation, and taxation (82.0, reddish color). Greener colors mean higher and better scores while reddish color imply poor performance that may call for policy intervention. The colors reflect to the value of the score from the best (green) toward the medium (amber) to the worst (red). In addition, several interesting observations can be noted:

- For the Culture and informal institutions pillar, Singapore stands out as the only country with a perfect 100.0 pillar value. New Zealand (98.0), Sweden (97.0), the Netherlands (96.0), Finland (96.0), and Denmark (96.0) also attract attention as the only countries in the leaders group with pillar values above 95.0.
- Singapore (with a perfect 100.0) has the most friendly Formal institution, regulation, and taxation system, followed by other innovative, high-income economies such as United Arab Emirates (98.0), Luxemburg (94.0), Finland (93.0), Denmark (90.0), and Switzerland (90.0). In addition, the pillar values of three follower countries—Qatar (93.0), Saudi Arabia (89.0), and Bahrain (88.0)—exceeds the average pillar value of the leader group.
- For the Market conditions pillar, Japan ranks first among the 113 countries. Singapore (98.0), the United States (96.0), and Germany (93.0) rank significantly ahead of their overall ESI ranking, whereas Austria (79.0), Israel (77.0), Ireland (76.0), Australia (76.0), and Norway (76.0) rank far behind. In this pillar, Italy (86.0) as a follower country outperforms these leading countries.
- For the Physical infrastructure pillar, Singapore (with a perfect 100.0) leads the pack closely followed by the Netherlands (97.6) and Japan (96.4). Overall, most Western European countries are strong in this pillar. At the same time, the sparsely populated northern European countries (Finland, Sweden, and Norway) are weaker, as are Australia, New Zealand, and

Malaysia. In this pillar, the performance of the ROK (96.4) and Spain (90.7) as countries belonging to the followers group exceed the overall pillar value of the leader group.

- For the Human capital pillar, Finland (with a perfect 100.0) and Singapore (99.8) rank ahead of the other countries, with a significant gap to the other countries that belong to the leader group. Although France (77.9), Japan (77.5), United Arab Emirates (76.6), and Luxembourg (74.1) are among the leader countries, their outstanding performance is primarily not because of this pillar, as their performance is below the overall pillar value. The ROK (82.5), although one of the follower countries, performs better than the above-mentioned leader countries in the Human capital pillar.
- For the Knowledge creation and dissemination pillar, the United States (with a perfect 100.0) ranks first, followed by Switzerland (96.5), Singapore (93.9), and Germany (93.4). Although New Zealand (77.5), Australia (77.0), and Malaysia (76.7) are leaders, this pillar is among their weakest points, as their performance is below the average pillar value for the group. Although the ROK (85.6) is one of the follower countries, it stands out by far from the other countries in its cluster.
- For the Finance pillar, Singapore (with a perfect 100.0) ranks first among the leader countries, followed by the United States (98.3). In addition, Switzerland (93.3), Sweden (92.8), and Luxembourg (92.6) rank significantly ahead of their respective overall AIDES rankings. On the other hand, this is Ireland's weakest pillar (67.3). Its pillar value does not even reach the average pillar value of the Followers group.
- For the Networking and support pillar, Sweden (with a perfect 100.0) leads the pack, closely followed by Canada (99.6). In addition to Singapore (96.4), innovative European countries such as Finland (97.6), Denmark (96.9), Switzerland (97.1), and Luxembourg (96.3) are strong in this pillar. However, for both Japan (73.0) and Malaysia (75.0), this pillar is the weakest, as both countries perform significantly below the leader group pillar average.

**Table 9: Pillar Values of the Entrepreneurial Ecosystem Index 2021 (Leader, Follower)**

| Country                        | Culture, informal institutions (GFC_P1) | Formal institutions, regulation, taxation (GFC_P2) | Market conditions (GFC_P3) | Physical infrastructure (GFC_P4) | Human capital (SEC_P1) | Knowledge creation and dissemination (SEC_P2) | Finance (SEC_P3) | Networking and support (SEC_P4) |
|--------------------------------|---|--|----------------------------|----------------------------------|------------------------|---|------------------|---------------------------------|
| <b>Singapore</b>               | 100.0                                   | 100.0  | 97.5                       | 100.0                            | 99.8                   | 93.9  | 100.0            | 96.4                            |
| Switzerland                    | 93.1                                    | 90.0   | 88.4                       | 95.2                             | 95.8                   | 96.5  | 93.3             | 97.1                            |
| United States                  | 91.6                                    | 81.9   | 96.1                       | 89.0                             | 92.3                   | 100.0   | 98.3             | 91.0                            |
| Netherlands                    | 96.2                                    | 86.2   | 90.9                       | 97.6                             | 88.4                   | 91.0  | 83.5             | 90.9                            |
| Finland                        | 96.0                                    | 92.8   | 83.6                       | 79.2                             | 100.0                  | 91.0  | 84.0             | 97.6                            |
| Sweden                         | 96.5                                    | 81.0   | 87.7                       | 80.2                             | 91.7                   | 89.0  | 92.8             | 100.0                           |
| Denmark                        | 95.8                                    | 90.3   | 84.3                       | 85.6                             | 96.0                   | 87.2  | 81.0             | 96.9                            |
| Germany                        | 85.7                                    | 79.6   | 93.3                       | 93.4                             | 89.1                   | 93.4  | 77.8             | 90.0                            |
| United Kingdom                 | 88.9                                    | 84.7   | 87.8                       | 89.3                             | 89.1                   | 82.4  | 87.5             | 90.0                            |
| Luxembourg                     | 86.3                                    | 94.4   | 83.7                       | 82.6                             | 74.1                   | 83.6  | 92.6             | 96.3                            |
| Canada                         | 89.3                                    | 82.8   | 80.8                       | 75.3                             | 86.6                   | 84.0  | 85.4             | 99.6                            |
| Japan                          | 83.6                                    | 82.2   | 100.0                      | 96.4                             | 77.5                   | 87.5  | 83.0             | 73.0                            |
| Israel                         | 87.5                                    | 83.6   | 76.7                       | 79.5                             | 83.0                   | 87.5  | 85.6             | 93.9                            |
| United Arab Emirates           | 89.5                                    | 97.9   | 81.5                       | 92.0                             | 76.6                   | 78.7  | 77.1             | 78.8                            |
| Austria                        | 85.4                                    | 81.6   | 79.0                       | 88.6                             | 89.8                   | 84.7  | 71.4             | 87.0                            |
| Norway                         | 92.3                                    | 84.1   | 75.5                       | 67.6                             | 92.2                   | 81.3  | 82.6             | 90.5                            |
| New Zealand                    | 97.9                                    | 89.4   | 75.1                       | 69.0                             | 89.5                   | 77.5  | 79.7             | 85.1                            |
| Belgium                        | 81.7                                    | 75.1   | 86.5                       | 86.0                             | 85.3                   | 82.3  | 74.4             | 87.2                            |
| Australia                      | 86.6                                    | 81.3   | 75.7                       | 73.6                             | 91.4                   | 77.0  | 80.4             | 87.8                            |
| France                         | 77.7                                    | 76.4   | 84.6                       | 90.7                             | 77.9                   | 84.9  | 77.2             | 81.2                            |
| Ireland                        | 86.9                                    | 82.0   | 76.2                       | 72.5                             | 90.9                   | 80.7  | 67.3             | 89.1                            |
| <b>Malaysia</b>                | 86.1                                    | 82.9   | 84.2                       | 76.7                             | 81.2                   | 76.7  | 80.4             | 74.8                            |
| <b>Korea, Rep. of</b>          | 69.5                                    | 71.3   | 81.3                       | 96.4                             | 82.5                   | 85.6  | 76.0             | 76.4                            |
| <b>Leaders</b>                 | <b>88.9</b>                             | <b>84.8</b>  | <b>84.8</b>                | <b>85.1</b>                      | <b>87.9</b>            | <b>85.9</b>                                   | <b>83.1</b>      | <b>89.2</b>                     |
| Qatar                          | 75.8                                    | 93.0   | 78.1                       | 81.8                             | 72.3                   | 73.0  | 78.3             | 72.1                            |
| Saudi Arabia                   | 79.0                                    | 89.4   | 82.5                       | 75.1                             | 76.2                   | 68.0  | 70.1             | 65.8                            |
| Spain                          | 69.8                                    | 66.6   | 81.2                       | 90.7                             | 79.4                   | 68.3  | 70.2             | 71.8                            |
| Estonia                        | 78.7                                    | 78.4   | 69.0                       | 68.9                             | 77.3                   | 73.4  | 76.4             | 71.8                            |
| Bahrain                        | 73.6                                    | 87.6   | 71.6                       | 75.1                             | 68.2                   | 61.1  | 74.7             | 73.2                            |
| Malta                          | 67.4                                    | 67.0   | 75.5                       | 68.3                             | 77.4                   | 74.8  | 67.5             | 87.0                            |
| <b>China, People's Rep. of</b> | 64.7                                    | 69.4   | 81.3                       | 80.2                             | 64.0                   | 79.0  | 77.8             | 61.3                            |
| Czech Republic                 | 67.1                                    | 61.4   | 79.9                       | 81.2                             | 70.5                   | 75.7  | 64.1             | 69.1                            |
| Oman                           | 72.3                                    | 79.6   | 68.5                       | 81.3                             | 67.4                   | 62.2  | 69.2             | 62.1                            |
| Italy                          | 54.4                                    | 61.0   | 85.8                       | 83.4                             | 71.7                   | 72.0  | 59.3             | 74.3                            |
| Chile                          | 73.3                                    | 75.3   | 69.3                       | 70.8                             | 71.3                   | 66.3  | 75.0             | 59.2                            |
| Portugal                       | 60.6                                    | 67.9   | 70.7                       | 80.6                             | 77.9                   | 69.8  | 63.8             | 67.8                            |
| Slovenia                       | 65.2                                    | 66.5   | 71.1                       | 71.4                             | 78.5                   | 72.3  | 58.7             | 74.4                            |
| Cyprus                         | 61.9                                    | 77.7   | 63.7                       | 69.1                             | 70.9                   | 67.2  | 64.7             | 78.5                            |
| Lithuania                      | 74.0                                    | 68.5   | 66.4                       | 71.6                             | 74.0                   | 63.1  | 60.1             | 61.7                            |
| <b>Thailand</b>                | 66.7                                    | 62.4   | 67.4                       | 70.2                             | 65.2                   | 63.1  | 78.1             | 62.8                            |
| <b>Azerbaijan</b>              | 71.6                                    | 76.2   | 62.2                       | 75.8                             | 67.4                   | 63.5  | 61.4             | 53.8                            |
| South Africa                   | 70.6                                    | 66.7   | 65.3                       | 65.1                             | 54.8                   | 59.4  | 82.3             | 65.5                            |
| Poland                         | 59.3                                    | 56.7   | 75.2                       | 79.0                             | 70.0                   | 66.2  | 60.2             | 62.2                            |
| Latvia                         | 65.1                                    | 66.5   | 67.5                       | 70.4                             | 71.4                   | 65.4  | 58.6             | 60.3                            |
| Mauritius                      | 70.1                                    | 84.5   | 48.5                       | 64.4                             | 62.2                   | 61.8  | 67.7             | 62.5                            |
| <b>India</b>                   | 67.5                                    | 64.5   | 68.3                       | 68.9                             | 57.6                   | 62.9  | 69.6             | 60.1                            |
| Kuwait                         | 60.8                                    | 79.0   | 70.8                       | 61.1                             | 58.0                   | 54.9  | 71.7             | 61.6                            |
| <b>Indonesia</b>               | 66.1                                    | 66.7   | 66.1                       | 66.6                             | 59.1                   | 60.7  | 66.3             | 66.1                            |
| Jordan                         | 64.0                                    | 70.4   | 68.7                       | 61.4                             | 62.7                   | 60.2  | 70.3             | 59.7                            |
| <b>Followers</b>               | <b>68.0</b>                             | <b>72.1</b>  | <b>71.0</b>                | <b>73.3</b>                      | <b>69.0</b>            | <b>66.6</b>                                   | <b>68.6</b>      | <b>66.6</b>                     |

Note: The colors reflect the value of the score from the best (green) toward the medium (amber) to the worst (red).  
Source: Own calculation.



**Table 10: Pillar Values of the Entrepreneurial Ecosystem Index 2021**  
(Catchers-up, Laggards)

| Country                | Culture, informal institutions (GFC_P1) | Formal institutions, regulation, taxation (GFC_P2) | Market conditions (GFC_P3) | Physical infrastructure (GFC_P4) | Human capital (SEC_P1) | Knowledge creation and dissemination (SEC_P2) | Finance (SEC_P3) | Networking and support (SEC_P4) |
|------------------------|---|--|----------------------------|----------------------------------|------------------------|---|------------------|---------------------------------|
| Hungary                | 53.2                                    | 55.4   | 70.6                       | 76.7                             | 62.9                   | 67.3  | 58.7             | 65.4                            |
| Russian Federation     | 55.5                                    | 55.3   | 72.3                       | 69.4                             | 72.5                   | 68.8  | 57.0             | 56.3                            |
| Turkey                 | 61.3                                    | 60.1   | 72.6                       | 74.0                             | 63.4                   | 57.6  | 62.2             | 55.9                            |
| Costa Rica             | 66.2                                    | 61.7   | 63.9                       | 59.1                             | 65.0                   | 67.8  | 54.9             | 60.3                            |
| Bulgaria               | 58.7                                    | 61.9   | 66.4                       | 65.1                             | 64.5                   | 59.9  | 60.8             | 60.4                            |
| Slovak Republic        | 57.1                                    | 51.3   | 67.0                       | 72.8                             | 57.6                   | 63.3  | 61.7             | 64.4                            |
| Montenegro             | 60.4                                    | 71.3   | 56.7                       | 54.6                             | 64.5                   | 61.8  | 64.6             | 59.7                            |
| Kazakhstan             | 64.7                                    | 69.2   | 60.4                       | 64.3                             | 65.9                   | 60.9  | 54.6             | 52.9                            |
| Georgia                | 64.5                                    | 87.2   | 57.3                       | 61.7                             | 61.9                   | 53.9  | 54.1             | 52.2                            |
| Greece                 | 53.6                                    | 53.9   | 68.4                       | 73.1                             | 75.4                   | 59.7  | 53.1             | 54.6                            |
| Philippines            | 61.5                                    | 55.6   | 61.9                       | 53.8                             | 62.7                   | 64.0  | 66.2             | 63.8                            |
| Uruguay                | 64.5                                    | 67.7   | 66.6                       | 58.2                             | 62.8                   | 56.4  | 54.6             | 58.7                            |
| Romania                | 57.9                                    | 68.8   | 68.5                       | 66.2                             | 57.8                   | 58.4  | 52.4             | 57.8                            |
| Armenia                | 64.7                                    | 70.4   | 57.3                       | 62.1                             | 61.6                   | 58.6  | 57.7             | 54.9                            |
| Mexico                 | 55.7                                    | 50.3   | 79.0                       | 68.2                             | 58.8                   | 58.1  | 59.7             | 56.0                            |
| Serbia                 | 52.0                                    | 58.7   | 59.4                       | 69.1                             | 68.4                   | 61.0  | 56.6             | 59.1                            |
| Morocco                | 61.8                                    | 69.9   | 61.8                       | 68.9                             | 49.7                   | 52.9  | 66.3             | 49.4                            |
| Ukraine                | 57.3                                    | 51.8   | 65.7                       | 67.5                             | 67.9                   | 62.8  | 52.7             | 54.5                            |
| Viet Nam               | 52.3                                    | 62.6   | 57.1                       | 64.7                             | 57.7                   | 58.7  | 67.9             | 57.9                            |
| Lebanon                | 48.8                                    | 48.4   | 64.7                       | 63.0                             | 64.2                   | 65.7  | 62.9             | 57.1                            |
| Colombia               | 59.9                                    | 49.7   | 65.0                       | 58.3                             | 62.8                   | 59.5  | 60.5             | 56.8                            |
| Croatia                | 46.0                                    | 58.6   | 61.3                       | 72.8                             | 58.5                   | 60.4  | 57.5             | 56.1                            |
| Panama                 | 54.8                                    | 51.0   | 61.4                       | 65.1                             | 53.8                   | 57.0  | 66.6             | 59.3                            |
| Egypt, Arab Rep. of    | 55.7                                    | 62.7   | 61.6                       | 69.7                             | 48.6                   | 54.1  | 60.4             | 53.1                            |
| Sri Lanka              | 60.1                                    | 54.4   | 44.4                       | 70.5                             | 51.8                   | 60.6  | 62.7             | 61.3                            |
| Brazil                 | 57.7                                    | 47.8   | 71.8                       | 58.0                             | 53.9                   | 58.5  | 60.7             | 57.1                            |
| Dominican Republic     | 55.4                                    | 47.8   | 61.6                       | 70.0                             | 58.1                   | 54.7  | 58.5             | 56.8                            |
| Namibia                | 66.1                                    | 74.9   | 47.8                       | 47.5                             | 53.4                   | 54.7  | 60.4             | 57.9                            |
| Argentina              | 56.4                                    | 45.2   | 69.6                       | 60.4                             | 65.4                   | 60.6  | 47.9             | 55.8                            |
| Kenya                  | 65.0                                    | 59.4   | 46.5                       | 49.6                             | 56.5                   | 59.6  | 61.1             | 63.2                            |
| Rwanda                 | 75.2                                    | 77.8   | 41.2                       | 41.8                             | 49.6                   | 57.6  | 59.2             | 58.3                            |
| Tunisia                | 55.7                                    | 58.3   | 60.2                       | 55.6                             | 60.8                   | 55.7  | 61.0             | 48.8                            |
| Botswana               | 66.5                                    | 67.8   | 51.0                       | 42.9                             | 51.8                   | 56.6  | 57.6             | 55.1                            |
| Peru                   | 53.1                                    | 49.3   | 60.2                       | 56.1                             | 64.5                   | 53.3  | 59.5             | 52.6                            |
| North Macedonia        | 48.6                                    | 64.8   | 50.3                       | 59.2                             | 55.5                   | 61.5  | 56.6             | 50.1                            |
| Albania                | 54.0                                    | 43.9   | 53.3                       | 50.3                             | 65.1                   | 54.5  | 49.2             | 50.8                            |
| Catchers-up            | 58.4                                    | 59.6   | 61.2                       | 62.2                             | 60.4                   | 59.4  | 58.8             | 56.8                            |
| Ghana                  | 60.8                                    | 55.5   | 51.9                       | 42.0                             | 54.6                   | 55.1  | 56.0             | 58.4                            |
| Tajikistan             | 56.3                                    | 57.6   | 42.6                       | 53.5                             | 57.7                   | 56.9  | 54.1             | 53.8                            |
| Pakistan               | 57.0                                    | 57.4   | 52.6                       | 53.6                             | 41.1                   | 55.4  | 59.7             | 54.5                            |
| Algeria                | 47.9                                    | 48.9   | 59.0                       | 56.6                             | 61.0                   | 50.8  | 54.3             | 51.5                            |
| Ecuador                | 50.5                                    | 42.1   | 48.4                       | 63.6                             | 54.3                   | 53.6  | 54.9             | 53.7                            |
| Mongolia               | 51.4                                    | 50.8   | 44.5                       | 49.7                             | 60.5                   | 51.2  | 51.8             | 57.2                            |
| Guatemala              | 50.5                                    | 49.4   | 53.8                       | 51.0                             | 48.5                   | 52.4  | 55.9             | 54.7                            |
| Moldova                | 52.7                                    | 52.3   | 48.4                       | 62.0                             | 45.8                   | 53.0  | 49.8             | 51.6                            |
| Honduras               | 52.7                                    | 49.7   | 51.0                       | 48.3                             | 46.0                   | 54.1  | 55.2             | 57.2                            |
| Nepal                  | 50.7                                    | 48.7   | 39.7                       | 52.0                             | 46.3                   | 54.4  | 65.8             | 53.7                            |
| Bosnia and Herzegovina | 43.2                                    | 47.1   | 55.7                       | 56.2                             | 52.2                   | 49.5  | 54.6             | 52.6                            |
| Senegal                | 54.3                                    | 55.4   | 49.4                       | 43.7                             | 44.4                   | 55.8  | 54.4             | 52.2                            |
| Nigeria                | 61.3                                    | 46.7   | 54.4                       | 37.0                             | 44.1                   | 59.4  | 50.7             | 55.8                            |
| El Salvador            | 47.7                                    | 46.8   | 55.7                       | 57.8                             | 46.0                   | 49.7  | 57.0             | 48.4                            |
| Bangladesh             | 48.0                                    | 50.4   | 48.0                       | 51.0                             | 49.0                   | 49.4  | 57.9             | 52.2                            |
| Kyrgyz Republic        | 51.3                                    | 49.1   | 45.2                       | 47.6                             | 56.9                   | 50.7  | 51.5             | 52.4                            |
| Paraguay               | 43.8                                    | 48.3   | 53.4                       | 52.4                             | 40.0                   | 51.0  | 58.0             | 54.7                            |
| Tanzania               | 57.4                                    | 52.3   | 46.6                       | 34.2                             | 40.5                   | 56.3  | 55.7             | 54.7                            |
| Cambodia               | 46.4                                    | 49.9   | 42.7                       | 44.6                             | 46.5                   | 49.3  | 58.9             | 54.1                            |
| Benin                  | 51.1                                    | 53.7   | 48.9                       | 28.7                             | 50.3                   | 53.5  | 50.5             | 48.1                            |
| Zimbabwe               | 57.5                                    | 45.3   | 40.0                       | 31.7                             | 54.3                   | 53.4  | 48.3             | 54.2                            |
| Cameroon               | 47.2                                    | 47.0   | 49.7                       | 34.6                             | 45.4                   | 56.9  | 51.0             | 51.7                            |
| Uganda                 | 55.2                                    | 50.5   | 40.5                       | 34.1                             | 45.5                   | 48.4  | 52.9             | 55.8                            |
| Zambia                 | 52.7                                    | 52.1   | 44.7                       | 32.7                             | 42.2                   | 51.6  | 49.7             | 55.2                            |
| Bolivia                | 42.2                                    | 23.1   | 51.2                       | 47.8                             | 50.0                   | 50.2  | 59.2             | 49.4                            |
| Mali                   | 43.1                                    | 41.9   | 43.0                       | 37.4                             | 39.1                   | 54.8  | 52.1             | 53.2                            |
| Burkina Faso           | 45.1                                    | 52.3   | 38.4                       | 24.5                             | 44.5                   | 54.8  | 36.3             | 50.1                            |
| Madagascar             | 42.7                                    | 40.8   | 39.6                       | 22.1                             | 43.2                   | 49.1  | 56.5             | 50.7                            |
| Mozambique             | 38.9                                    | 41.0   | 36.4                       | 26.4                             | 33.8                   | 47.4  | 47.3             | 53.8                            |
| Laggards               | 50.3                                    | 48.5   | 47.4                       | 44.0                             | 47.7                   | 52.7  | 53.8             | 53.3                            |
| Average                | 64.9                                    | 64.9   | 64.9                       | 64.9                             | 64.9                   | 64.8  | 64.8             | 64.8                            |

Note: The colors reflect the value of the score from the best (green) toward the medium (amber) to the worst (red).  
Source: Own calculation.

## **Key Takeaways for Asian Countries**

In this part of the report, we continue to focus on the pillar level analysis of the general ESI. Table 11 shows the pillar scores of the ESI for the developing Asian countries and includes two additional useful benchmarks: the average pillar scores for the countries with the most advanced digital ESI (leaders) and the average pillar scores for the 21 developing Asian countries. We also identify the most and least favorable pillar scores for each country (the last two columns in Table 11).

Networking and supporting pillar exhibits the smallest overall pillar variance (10.8). At the other end, the Market condition pillar shows the largest differences in variance (16.2), since it ranges from 97.5 (Singapore) to 42.7 (Cambodia).

Examining the least favorable pillars, we can see that most developing Asian economies have problems with Market conditions pillar. This pillar is weakest in 8 of the 21 countries, mainly for those countries belong to the laggards. While the most favorable pillar are the Finance and Formal institutions, regulation, and taxation pillars. In contrast, for the leaders with the most advanced entrepreneurship system, the most favorable pillar is typically the Networking and support pillar.

**Table 11: Pillar Level Analysis of the 21 Developing Asian Countries**

| Country                     | 1     | 2     | 3    | 4     | 5    | 6    | 7     | 8    | Less Favorable                            | Most Favorable  |
|-----------------------------|-------|-------|------|-------|------|------|-------|------|---|---|
| Singapore                   | 100.0 | 100.0 | 97.5 | 100.0 | 99.8 | 93.9 | 100.0 | 96.4 | Knowledge creation and dissemination      | Culture and informal institutions, Formal institutions, Finance |
| Malaysia                    | 86.1  | 82.9  | 84.2 | 76.7  | 81.2 | 76.7 | 80.4  | 74.8 | Networking and support                    | Culture and informal institutions                               |
| Korea, Rep. of              | 69.5  | 71.3  | 81.3 | 96.4  | 82.5 | 85.6 | 76.0  | 76.4 | Cultural and informal institutions        | Physical infrastructure   |
| China, People's Rep. of     | 64.7  | 69.4  | 81.3 | 80.2  | 64.0 | 79.0 | 77.8  | 61.3 | Networking and support                    | Market conditions   |
| Thailand                    | 66.7  | 62.4  | 67.4 | 70.2  | 65.2 | 63.1 | 78.1  | 62.8 | Formal institutions, regulation, taxation | Finance   |
| Azerbaijan                  | 71.6  | 76.2  | 62.2 | 75.8  | 67.4 | 63.5 | 61.4  | 53.8 | Networking and support                    | Formal institutions, regulation, taxation                       |
| India                       | 67.5  | 64.5  | 68.3 | 68.9  | 57.6 | 62.9 | 69.6  | 60.1 | Human capital                             | Finance   |
| Indonesia                   | 64.7  | 69.2  | 60.4 | 64.3  | 65.9 | 60.9 | 54.6  | 52.9 | Networking and support                    | Formal institutions, regulation, taxation                       |
| Kazastan                    | 64.5  | 87.2  | 57.3 | 61.7  | 61.9 | 53.9 | 54.1  | 52.2 | Networking and support                    | Formal institutions, regulation, taxation                       |
| Georgia                     | 61.5  | 55.6  | 61.9 | 53.8  | 62.7 | 64.0 | 66.2  | 63.8 | Physical infrastructure                   | Finance   |
| Philippines                 | 64.7  | 70.4  | 57.3 | 62.1  | 61.6 | 58.6 | 57.7  | 54.9 | Networking and support                    | Formal institutions, regulation, taxation                       |
| Armenia                     | 52.3  | 62.6  | 57.1 | 64.7  | 57.7 | 58.7 | 67.9  | 57.9 | Cultural and informal institutions        | Finance   |
| Viet Nam                    | 60.1  | 54.4  | 44.4 | 70.5  | 51.8 | 60.6 | 62.7  | 61.3 | Market conditions                         | Physical infrastructure   |
| Sri Lanka                   | 56.3  | 57.6  | 42.6 | 53.5  | 57.7 | 56.9 | 54.1  | 53.8 | Market conditions                         | Human capital, Formal institutions, regulation, taxation        |
| Tajikistan                  | 57.0  | 57.4  | 52.6 | 53.6  | 41.1 | 55.4 | 59.7  | 54.5 | Human capital                             | Finance   |
| Pakistan                    | 51.4  | 50.8  | 44.5 | 49.7  | 60.5 | 51.2 | 51.8  | 57.2 | Market conditions                         | Human capital   |
| Mongolia                    | 50.7  | 48.7  | 39.7 | 52.0  | 46.3 | 54.4 | 65.8  | 53.7 | Market conditions                         | Finance   |
| Nepal                       | 48.0  | 50.4  | 48.0 | 51.0  | 49.0 | 49.4 | 57.9  | 52.2 | Market conditions                         | Finance   |
| Bangladesh                  | 51.3  | 49.1  | 45.2 | 47.6  | 56.9 | 50.7 | 51.5  | 52.4 | Market conditions                         | Human capital   |
| Kyrgyz Republic             | 46.4  | 49.9  | 42.7 | 44.6  | 46.5 | 49.3 | 58.9  | 54.1 | Market conditions                         | Finance   |
| Cambodia                    | 46.4  | 49.9  | 42.7 | 44.6  | 46.5 | 49.3 | 58.9  | 54.1 | Market conditions                         | Finance   |
| Average of the Asian region | 62.0  | 63.8  | 59.0 | 63.9  | 61.1 | 61.8 | 65.0  | 60.0 | Market conditions                         | Finance, Formal institutions, regulation and taxation           |
| Averag of the leaders       | 88.9  | 84.8  | 84.8 | 85.1  | 87.9 | 85.9 | 83.1  | 89.2 | Networking and support                    | Finance   |

Note: The colors reflect the value of the score from the best (green) toward the medium (amber) to the worst (red). First row: 1 = culture, informal institutions; 2 = formal institutions, regulation, taxation; 3 = market condition; 4 = physical infrastructure; 5 = human capital; 6 = knowledge creation and dissemination; 7 = finance; 8 = networking and support.

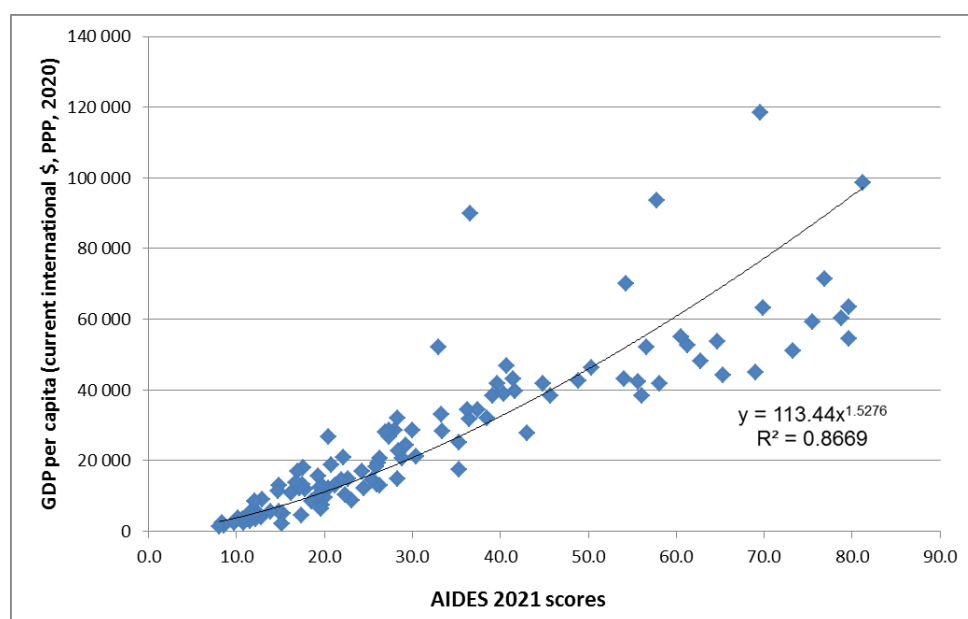
Source: Own calculation.

### C. Comparison between Asian Index of Digital Entrepreneurship Systems and Other Measures of Country-Level Entrepreneurship

How does the AIDES compare with a country's GDP per capita and country-level measures of entrepreneurial activity? We compare AIDES against GDP per capita to check if there is any top-level association between the two. We also explore top-level associations between AIDES and the Digital Platform Economy Index (DPE) 2020 (Acs et al. 2020).<sup>10</sup> For entrepreneurial attitude and activity measures, we explore associations between measures of preferences for self-employment in general, as well as measures of the importance of “modern” start-ups.

The AIDES scores exhibit a positive association with a country's GDP per capita (Figure 9). The coefficient for the bivariate correlation, without the outlier Luxembourg and Qatar, is 0.92. Based on the exponential adjusted trend adjustment, the “variance explained” in this bivariate association (i.e., the  $R^2$  score) is 0.87. This association is not surprising and should not be interpreted as indicating a causal effect. This is because wealthy economies will have more resources and will be able to better invest in the kinds of infrastructures and institutions that are captured in the AIDES. In this association, the outliers are Luxembourg and Qatar because of their high per capita GDP.

**Figure 9: Correlation between Asian Index of Digital Entrepreneurship Systems 2021 Scores and Gross Domestic Product Per Capita, 2020**



GDP = gross domestic product, PPP = purchasing power parity.

Note: Luxembourg and Qatar are shown although they are not included in the trend line.

Source: Own edition.

<sup>10</sup> <https://thegedi.org/wp-content/uploads/2020/12/DPE-2020-Report-Final.pdf> (13 October, 2021).

Table 12 shows bivariate correlations between the AIDES, its sub-indices, and pillars. The strong correlations between AIDES, its sub-indices and pillars are a direct consequence of the index methodology. Not surprisingly, the AIDES and its sub-indices also correlate strongly with the DPE which is built following a similar methodology.

**Table 12: Correlations between Asian Index of Digital Entrepreneurship Systems 2021 and Digital Platform Economy Index 2020**

|   | 1 | 2       | 3       | 4       | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      | 13      |
|---|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| <b>AIDES 2021</b>                                       | 1 | 0.999** | 0.998** | 0.998** | 0.952** | 0.923** | 0.934** | 0.886** | 0.947** | 0.967** | 0.924** | 0.971** | 0.963** |
| Entrepreneurship Stand-up sub-index                     |   | 1       | 0.995** | 0.997** | 0.955** | 0.926** | 0.930** | 0.879** | 0.950** | 0.963** | 0.924** | 0.971** | 0.961** |
| Entrepreneurship Start-up sub-index                     |   |         | 1       | 0.994** | 0.945** | 0.913** | 0.935** | 0.888** | 0.941** | 0.973** | 0.924** | 0.968** | 0.961** |
| Entrepreneurship Scale-up sub-index                     |   |         |         | 1       | 0.952** | 0.928** | 0.934** | 0.888** | 0.946** | 0.962** | 0.919** | 0.969** | 0.961** |
| Pillar 1: Culture and informal institutions             |   |         |         |         | 1       | 0.902** | 0.866** | 0.820** | 0.935** | 0.882** | 0.824** | 0.909** | 0.914** |
| Pillar 2: Formal institutions, regulation, and taxation |   |         |         |         |         | 1       | 0.793** | 0.784** | 0.860** | 0.869** | 0.838** | 0.881** | 0.884** |
| Pillar 3: Market conditions                             |   |         |         |         |         |         | 1       | 0.846** | 0.864** | 0.907** | 0.853** | 0.905** | 0.908** |
| Pillar 4: Physical infrastructure                       |   |         |         |         |         |         |         | 1       | 0.821** | 0.845** | 0.761** | 0.826** | 0.830** |
| Pillar 5: Human capital                                 |   |         |         |         |         |         |         |         | 1       | 0.894** | 0.836** | 0.907** | 0.890** |
| Pillar 6: Knowledge creation and dissemination          |   |         |         |         |         |         |         |         |         | 1       | 0.904** | 0.949** | 0.940** |
| Pillar 7: Finance                                       |   |         |         |         |         |         |         |         |         |         | 1       | 0.921** | 0.877** |
| Pillar 8: Networking and support                        |   |         |         |         |         |         |         |         |         |         |         | 1       | 0.945** |
| <b>DPE Index 2020</b>                                   |   |         |         |         |         |         |         |         |         |         |         |         | 1       |

Note: \*\*. Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculation

Table 13 shows the correlation coefficients between AIDES and various entrepreneurial outcome measures. We can see that the AIDES scores tend to correlate negatively with measures reflecting general self-employment. This correlation is caused by the fact that the bulk of self-employment activity is true self-employment and does not generate significant scale. There are qualitative differences among forms of self-employment, small business, and entrepreneurship. It is notable that the GEM-based measures of overall entrepreneurial activity (i.e., the GEM “TEA” measure) show no correlation with the AIDES score. This may reflect the high share of self-employment activity in GEM data.

The only positive and strong associations for the AIDES score are shown for the share of start-ups. The start-up number and its scores are maintained by startupranking.com, and it provides a proxy of the start-up’s visibility in the internet and social media. The advantage of this ranking is that it focuses on “modern” start-ups, defined as “An organization with high innovation compe-

tence and strong technological base, which has the faculty of an accelerated growth and maintains independence through time. The max lifespan should be of 10 years.” This definition fits well the population of start-ups that inhabit new venture accelerators and constitute the target group of the AIDES.<sup>11</sup> For calculating the start-up numbers, we used the number of start-ups for each country and standardized it by the population. The positive correlation between the AIDES score and the start-up numbers suggests an association between AIDES and the visibility of the country’s start-ups in the global start-up community.

**Table 13: Bivariate Correlations between Asian Index of Digital Entrepreneurship Systems and Entrepreneurial Outcome Measures**

|   |   | 1 | 2               | 3            | 4              |
|---|---|---|-----------------|--------------|----------------|
| 1 | AIDES 2021  | 1 | <b>-0.707**</b> | <b>0.159</b> | <b>0.714**</b> |
| 2 | Self-employment (2017–2019 average) <sup>a</sup>                |   | 1               | -0.263       | -0.424**       |
| 3 | TEA 2017 <sup>b</sup>   |   |                 | 1            | 0.377**        |
| 4 | Start-up number, standardized by population (2021) <sup>c</sup> |   |                 |              | 1              |

<sup>a</sup> Self-employment data are from the World Bank database. <https://data.worldbank.org/indicator/SL.EMP.SELF.ZS> (accessed 13 October 2021) Self-employment data are from the World Bank database. <https://data.worldbank.org/indicator/SL.EMP.SELF.ZS> (accessed 13 October 2021).

<sup>b</sup> TEA is the Total early-stage Entrepreneurial Activity measure of the Global Entrepreneurship Monitor dataset. <http://gemconsortium.org/data> (accessed 13 October 2021).

<sup>c</sup> Data are calculated from Startupranking website. <https://www.startupranking.com/countries> (accessed 13 October 2021).

Note: \*\* Correlation is significant at the 0,01 level (2-tailed).

Source: Own calculation.

**Table 14: Bivariate Correlations between Asian Index of Digital Entrepreneurship Systems and Framework Indices**

|   |   | 1 | 2              | 3              | 4              | 5              |
|---|---|---|----------------|----------------|----------------|----------------|
| 1 | AIDES 2021  | 1 | <b>0.932**</b> | <b>0.934**</b> | <b>0.960**</b> | <b>0.925**</b> |
| 2 | Global Competitiveness Index 4.0 (2019) <sup>a</sup>  |   | 1              | 0.921**        | 0.970**        | 0.896**        |
| 3 | Global Innovation Index 2020 <sup>b</sup>             |   |                | 1              | 0.944**        | 0.876**        |
| 4 | Network Readiness Index 2020 <sup>c</sup>             |   |                |                | 1              | 0.906**        |
| 5 | Global Entrepreneurship Index (GEI) 2018 <sup>d</sup> |   |                |                |                | 1              |

<sup>a</sup> Global Competitiveness Index score is the World Economic Forum’s flagship product, measuring presents a framework and a corresponding set of indicators in three principal categories (sub-indices) and 12 policy domains (pillars) for the economies. Present data are from the 2019 edition. [https://www3.weforum.org/docs/WEF\\_TheGlobalCompetitivenessReport2019.pdf](https://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf) (accessed 13 October 2021).

<sup>b</sup> Global Innovation Index score is from the Global Innovation Index, INSEAD report measuring various aspect of the innovation system. Data are from the 2018 and the 2020 issues (<https://www.globalinnovationindex.org/>).

<sup>11</sup> The downside of the start-up ranking is that it is not a random sample, but rather based on self-registration by businesses that self-identify as start-ups that fit the ranking’s criteria.

<sup>c</sup> Network Readiness Index scores are from the Portulans Institute. Network Readiness Index is a tool assessing countries' preparedness to reap the benefits of emerging technologies and capitalize on the opportunities presented by the digital transformation and beyond. <https://networkreadinessindex.org/nri-2020-analysis/> (accessed 13 October 2021).

<sup>d</sup> Global Entrepreneurship Index is a measure of countries' entrepreneurship system in 14 categories by combining both the individual and the institutional aspects of potentially high impact start-ups. Data are from the 2018 Global Entrepreneurship Index report and dataset. <http://thegei.org/downloads/> (accessed 13 October 2021).

Note: \*\* Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculation.

We also explored associations between AIDES and other indices that estimate the quality of the framework conditions for innovation, entrepreneurship, and competitiveness in general. These correlations are shown in Table 14. All the indices compared correlate positively with each other and the AIDES. Since all these indices use exclusively or mostly closely correlated institutional variables, this is not surprising. Note that the reason for building different framework indices, even if highly correlated, is not to measure development in general but to highlight different aspects of development potential. Although these are generally positively associated with one another, the differences between different aspects can be informative. Note that the AIDES also correlates strongly with the only index of national systems of entrepreneurship, the Global Entrepreneurship Index.

## V. COUNTRY PAGES

### A. Country Page Guide

General information starts with the official country name, followed by population size (million, 2021) and GDP per capita (purchasing power parity, international \$, 2020). These data were retrieved from the United Nations<sup>12</sup> and the World Bank databases<sup>13</sup> on 6 of October 2021.

Performance overview provides the country's overall performance in AIDES.

Country group indicates the country's performance relative to others, grouped in four categories:

- Tailenders (AIDES score below 20)
- Laggards (20 < AIDES score ≤ 35)
- Catchers-up (35 < AIDES score ≤ 45)
- Followers (45 < AIDES score ≤ 60)
- Leaders (AIDES score over 60)

AIDES rank is the country's AIDES ranking among the 113 countries.

AIDES score is the AIDES overall index score on a scale from 0 (low) to 100 (high).

The three sub-indices show the country's ranking and the country's score (in parentheses) for each of the three sub-indices: the Digital Entrepreneurship Stand-up sub-index, the Digital Entrepreneurship Start-up sub-index, and the Digital Entrepreneurship Scale-up sub-index. Sub-index scores are on a scale from 0 to 100 index points.

AIDES profile is a spider diagram that shows the performance of each country for the eight AIDES pillars. The country performance is compared against the average pillar scores of each country group. For individual countries in the Leaders and the Followers groups, the country's pillar score is compared against the Leaders and Follower group averages. For countries in the Catchers-up group, the country's pillar score is compared against the Followers and Catchers-up group averages. For countries in the Laggards group, the country's pillar score is shown against the group averages for the Catchers-up and the Laggards groups. For countries in the Tailenders group, the country's pillar score is shown against the group averages for the Laggards and the Tailenders groups. All scales are from 0 to 100.

Pillar performance. Below the AIDES profile diagram we show the country's scores for its strongest and weakest index pillar (in parentheses). Pillar scores are from 0 to 100.

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<sup>12</sup> United Nations, Department of Economic and Social Affairs, Population Division. 2019. *World Population Prospects 2019*, Online Edition. Rev. 1. <https://population.un.org/wpp/>.

<sup>13</sup> <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>.



AIDES pillar and component values. On page 2 of the individual country reports, we present the pillar values for each of the eight AIDES pillars. We also list the non-digitalized value of the pillar (non-digital score or entrepreneurship), as well as the value of the digitalization parameter (digital). It is important to recognize that the scores of individual pillar components are NOT the result of a simple multiplication of the non-digital (i.e., non-digital score) and the digital (i.e., digital) components. The AIDES pillar scores are calculated from “raw” values. In columns “non-digital score” and “digital”, we report normalized and average-adjusted values for the respective pillar components. The colors in each cell of the table denote the quartile within which the country is grouped for each component. Dark blue color of the cell indicates the top quartile; light blue the second quartile; light brown the third quartile; and dark brown the bottom quartile.

- I.1 Pillar: In the first column, we list the eight pillar names and the three sub-index names as well as the AIDES score.
- I.2 Pillar score column shows the country’s pillar scores on a 0–100-point scale.
- I.3 Non-digital score (“entrepreneurship”) column shows the country’s non-digitalized pillar scores. The calculation of these scores is described in Appendix 1 (scale from 0 to 100).
- I.4 Digital column shows the digital component scores on a scale from 0 to 100. The calculation of these scores is described in Appendix 1.
- I.5 AIDES score shows the overall index score, as well as the scores for non-digital and digital components on a scale from 0 to 100.
- I.6 Sub-index scores are shown for each of the digital entrepreneurship sub-indices on a scale from 0 to 100. Color codes are as described above.

**Policy optimization simulation.** Finally, we present a policy optimization simulation for each country. This simulation informs on the “optimal” allocation of policy attention and policy resources for improving the country’s AIDES performance. This simulation assumes that the country’s entrepreneurial dynamic is held back most by its “weakest”, or “bottleneck” pillar, i.e., the pillar with the lowest pillar score. Under this assumption, the “optimal” allocation of policy resources should always target the weakest pillar first. Once the individual pillar performance has improved such that the pillar no longer constitutes a bottleneck, policy attention should shift to focus on the second weakest pillar, and so on. Therefore, an “optimal” policy systematically and dynamically addresses “bottleneck” pillars until the desired improvement in the AIDES score has been achieved. This simulation assumes that the marginal cost of performance improvement is the same for each index pillar. Because of this simplifying assumption, the scenario shown in the policy optimization

simulation should NOT be taken as prescriptive. Instead, the simulation simply suggests potential bottlenecks in each country's digital entrepreneurship system, providing material for policy debates.

In the simulation, we have set the target for each country as reaching a 10% increase in the AIDES score. The graph then shows the “optimal” allocation of policy resources across the four General Framework Condition Pillars (GFC) and the 12 Systemic Framework Condition Pillars (SFC; remember that separate SFC pillar values are calculated for the stand-up, start-up, and scale-up stages, creating a total of 12 SFC pillar values).

**Sum of additional resources** (in unit per population): Below the policy simulation table, we report the sum of the addition units that is required to reach a 10-point increase in the AIDES score. While the monetary value of the unit is unknown, its magnitude reflects the amount of additional money required for the 10-point AIDES score increase. This value is expressed in unit per population.

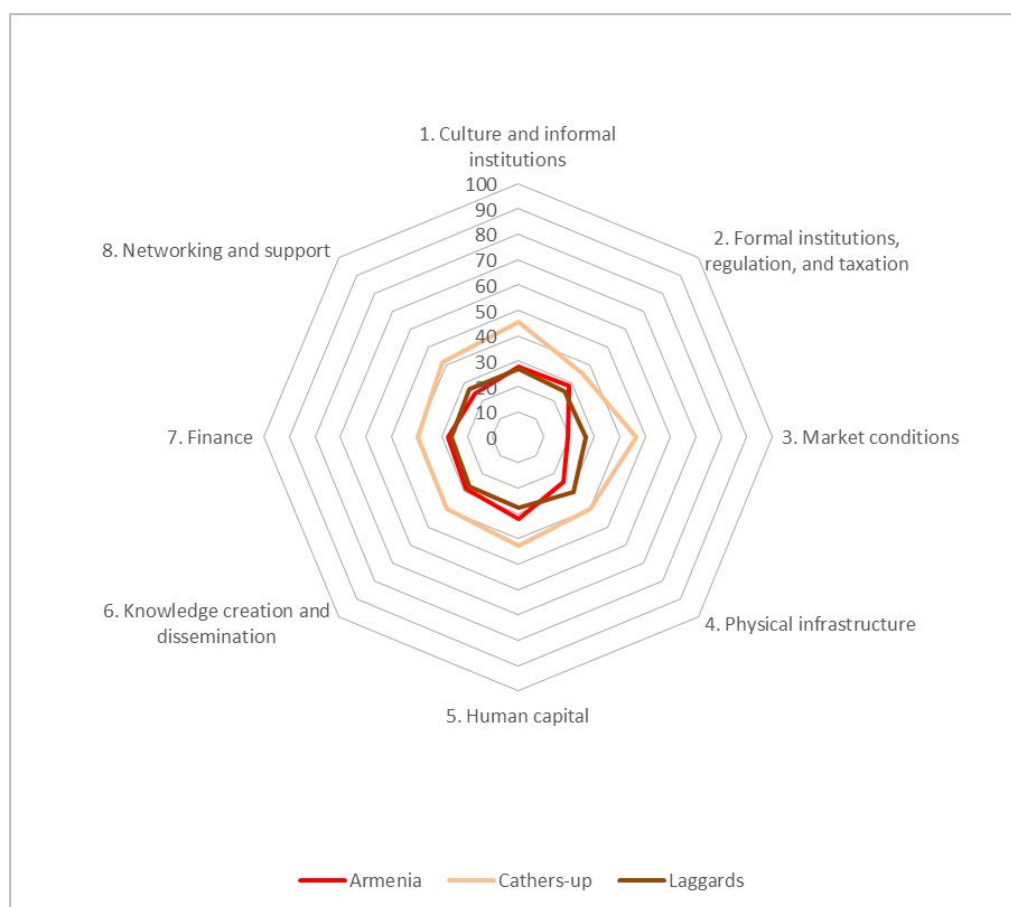
In addition to the 21 developing Asian countries for which data were available (this includes all of Association of Southeast Asian Nations-6), we prepared 2-page country reports for three major advanced economies (United States, Japan, and Germany), three innovative European economies (Finland, Sweden, and Israel), and three major Latin American economies (Mexico, Brazil, and Chile).

## B. Country Profiles

### Armenia

|  |           |
|--|-----------|
| Size of population 2021 (as of 1 July, in million)       | 2.97      |
| GDP per capita, PPP (current international \$) 2020      | 13 284    |
| Country group  | Laggards  |
| AIDES rank (score)                                       | 58 (26.0) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 59 (25.6) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 57 (26.6) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 59 (25.8) |

**Figure 10: Armenia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

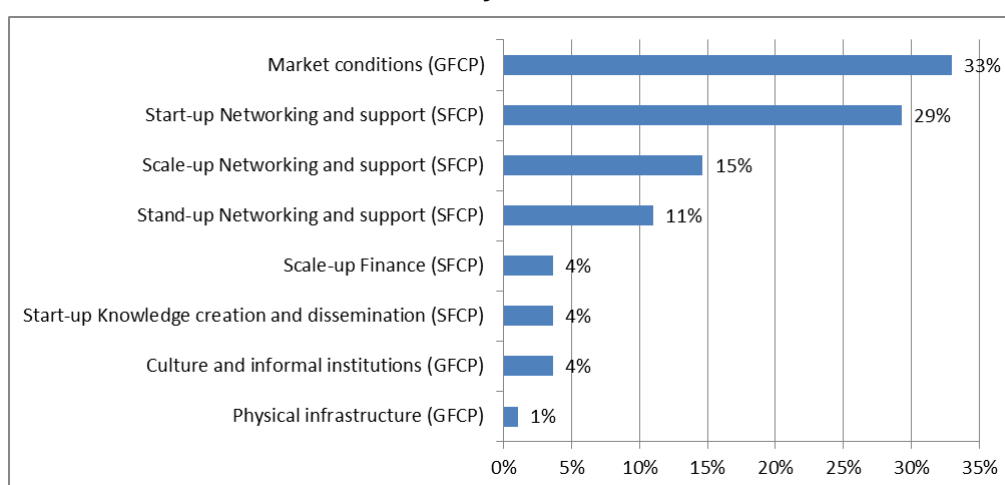
Market conditions (19.4)  
Human capital (32.1)

**Table 15: Armenia's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                      | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|--------------------------------------|---|------------------------|-------------------|---------------|
| <b>General Framework Conditions</b>  | Culture, informal institutions            | 27.6                   | 64.7              | 48.8          |
|                                      | Formal institutions, regulation, taxation | 28.5                   | 70.4              | 43.2          |
|                                      | Market conditions                         | 19.4                   | 57.3              | 38.5          |
|                                      | Physical infrastructure                   | 25.0                   | 62.1              | 43.0          |
| <b>Systemic Framework Conditions</b> | Human capital                             | 32.1                   | 61.6              | 56.4          |
|                                      | Knowledge creation and dissemination      | 28.9                   | 58.6              | 50.3          |
|                                      | Finance                                   | 27.6                   | 57.7              | 46.5          |
|                                      | Networking and support                    | 24.1                   | 54.9              | 43.2          |
| <b>Aides Score</b>                   |   | <b>26.0</b>            | <b>60.9</b>       | <b>46.2</b>   |
| <b>Sub-index</b>                     |   | <b>Sub-index Score</b> |                   |               |
| <b>Sub-indices</b>                   | Digital Entrepreneurship Stand-up         | 25.6                   |                   |               |
|                                      | Digital Entrepreneurship Start-up         | 26.6                   |                   |               |
|                                      | Digital Entrepreneurship Scale-up         | 25.8                   |                   |               |

Source: Own calculations.

**Figure 11: Armenia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurial Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 27.3.

Source: Own calculations.

## Azerbaijan

Size of population 2021 (as of 1 July, in million) 10.2  
GDP per capita, PPP (current international \$) 2020 14 452

Country group Laggards

AIDES rank (score) 60 (25.5)

Digital Entrepreneurship Stand-up sub-index rank (score) 56 (25.9)

Digital Entrepreneurship Start-up sub-index rank (score) 60 (23.5)

Digital Entrepreneurship Scale-up sub-index rank (score) 55 (27.0)

**Figure 12: Azerbaijan's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

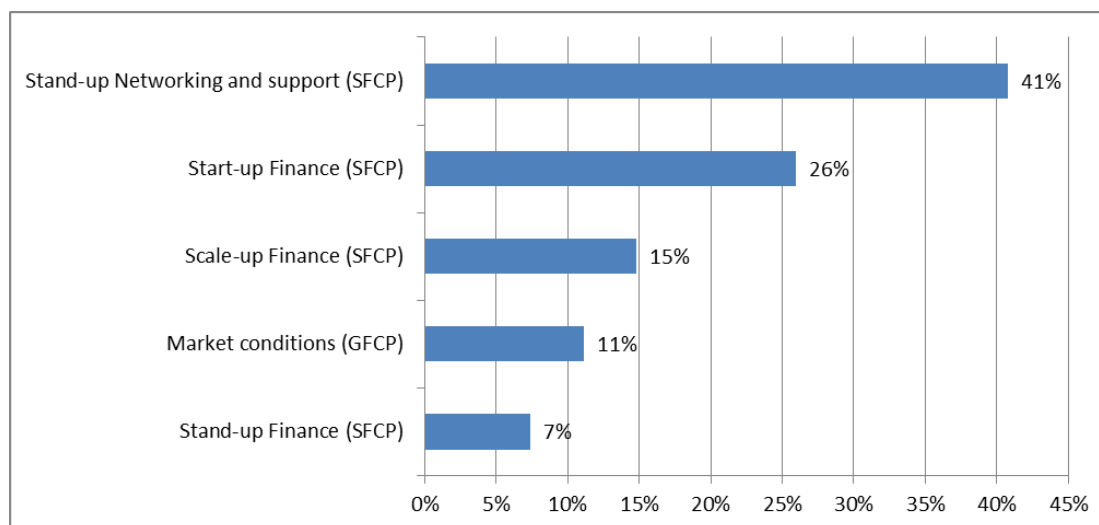
Finance (15.4)  
Human capital (40.7)

**Table 16: Azerbaijan's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                      | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|--------------------------------------|---|------------------------|-------------------|---------------|
| <b>General Framework Conditions</b>  | Culture, informal institutions            | 39.9                   | 71.6              | 60.2          |
|                                      | Formal institutions, regulation, taxation | 31.2                   | 76.2              | 41.1          |
|                                      | Market conditions                         | 17.1                   | 62.2              | 33.3          |
|                                      | Physical infrastructure                   | 28.2                   | 75.8              | 43.1          |
| <b>Systemic Framework Conditions</b> | Human capital                             | 40.7                   | 67.4              | 63.9          |
|                                      | Knowledge creation and dissemination      | 26.1                   | 63.5              | 40.8          |
|                                      | Finance                                   | 15.4                   | 61.4              | 25.6          |
|                                      | Networking and support                    | 23.5                   | 53.8              | 51.2          |
| <b>Aides Score</b>                   |   | <b>25.5</b>            | <b>66.5</b>       | <b>44.9</b>   |
| <b>Sub-index</b>                     |   | <b>Sub-index Score</b> |                   |               |
| <b>Sub-indices</b>                   | Digital Entrepreneurship Stand-up         | 25.9                   |                   |               |
|                                      | Digital Entrepreneurship Start-up         | 23.5                   |                   |               |
|                                      | Digital Entrepreneurship Scale-up         | 27.0                   |                   |               |

Source: Own calculations.

**Figure 13: Azerbaijan's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 27.0

Source: Own calculations.

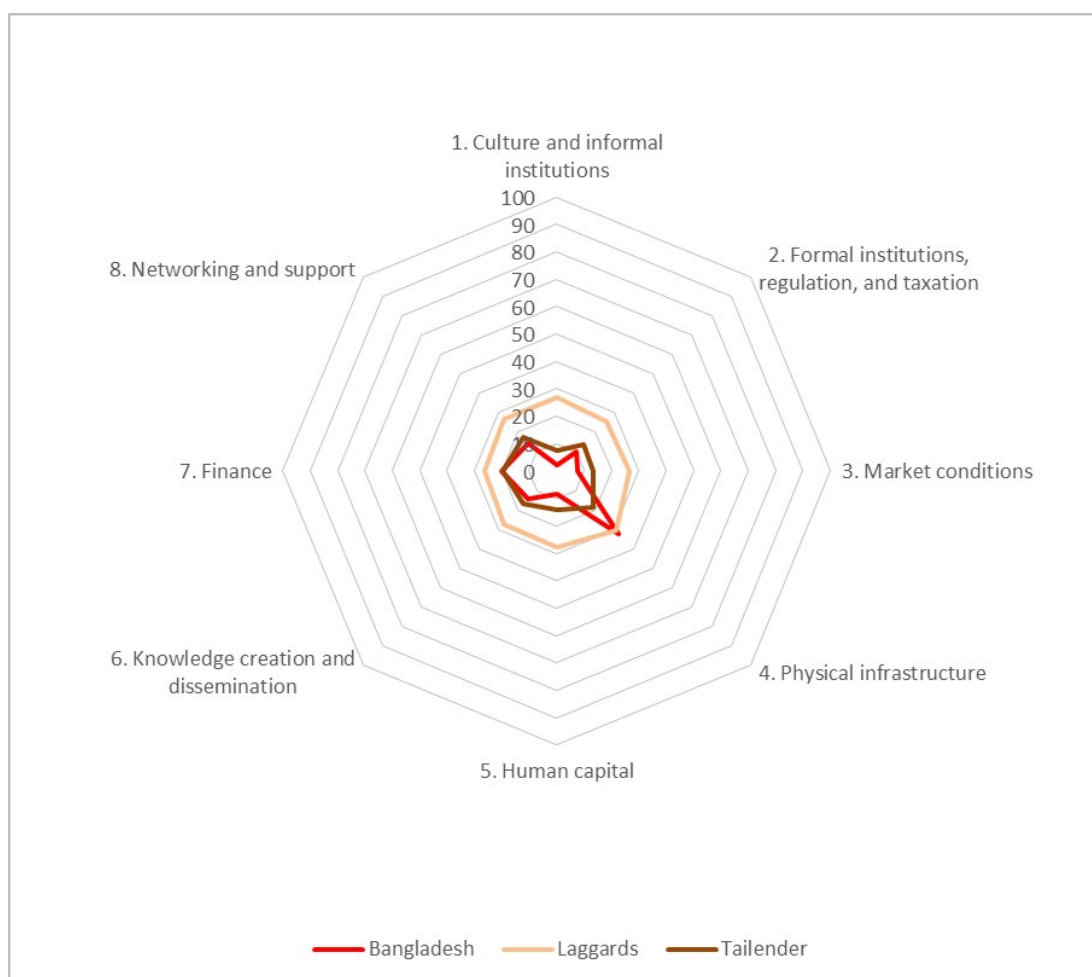
## Bangladesh

|   |       |
|---|-------|
| Size of population 2021 (as of 1 July, in million)  | 166.3 |
| GDP per capita, PPP (current international \$) 2020 | 5 083 |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 96 (12.5) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 98 (12.4) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 96 (11.9) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 95 (13.3) |

**Figure 14: Bangladesh's Position in the Eight Asian Index of Digital Entrepreneurial Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

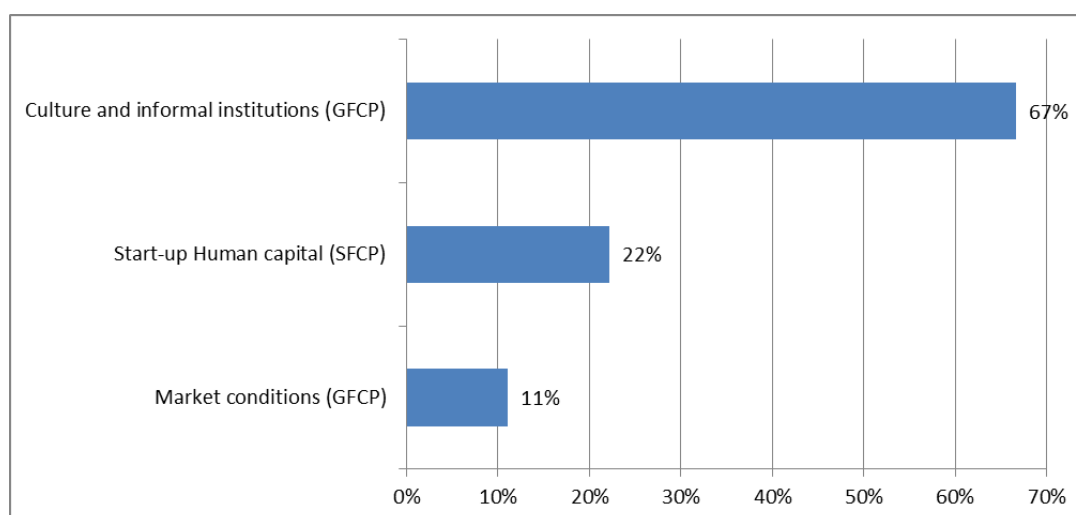
Culture and informal institutions (2.1)  
Physical infrastructure (32.1)

**Table 17: Bangladesh's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score    | Non-digital Score | Digital Score |
|-------------------------------|---|-----------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 2.1             | 48.0              | 6.8           |
|                               | Formal institutions, regulation, taxation | 10.0            | 50.4              | 28.6          |
|                               | Market conditions                         | 7.8             | 48.0              | 21.5          |
|                               | Physical infrastructure                   | 32.1            | 51.0              | 56.0          |
| Systemic Framework Conditions | Human capital                             | 8.5             | 49.0              | 19.4          |
|                               | Knowledge creation and dissemination      | 14.5            | 49.4              | 30.2          |
|                               | Finance                                   | 20.1            | 57.9              | 34.7          |
|                               | Networking and support                    | 14.6            | 52.2              | 31.3          |
| Aides Score                   |   | 12.5            | 50.7              | 28.6          |
| Sub-index                     |   | Sub-index Score |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 12.4            |                   |               |
|                               | Digital Entrepreneurship Start-up         | 11.9            |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 13.3            |                   |               |

Source: Own calculations.

**Figure 15: Bangladesh's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 9.0

Source: Own calculations.



## Brazil

Size of population 2021 (as of 1 July, in million) 214.0  
 GDP per capita, PPP (current international \$) 2020 14 836

Country group Laggards

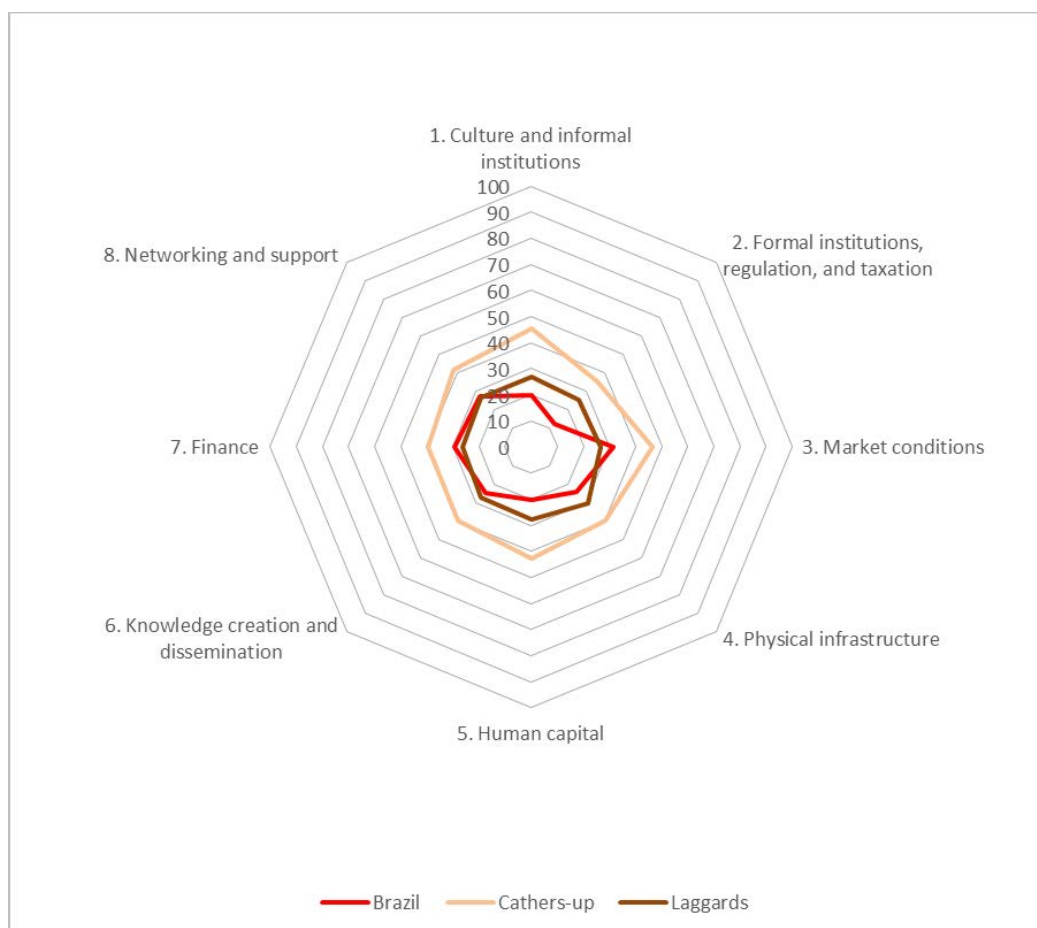
AIDES rank (score) 64 (22.7)

Digital Entrepreneurship Stand-up sub-index rank (score) 64 (22.6)

Digital Entrepreneurship Start-up sub-index rank (score) 66 (21.7)

Digital Entrepreneurship Scale-up sub-index rank (score) 64 (23.6)

**Figure 16: Brazil's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Formal institutions, regulation, taxation (12.4)

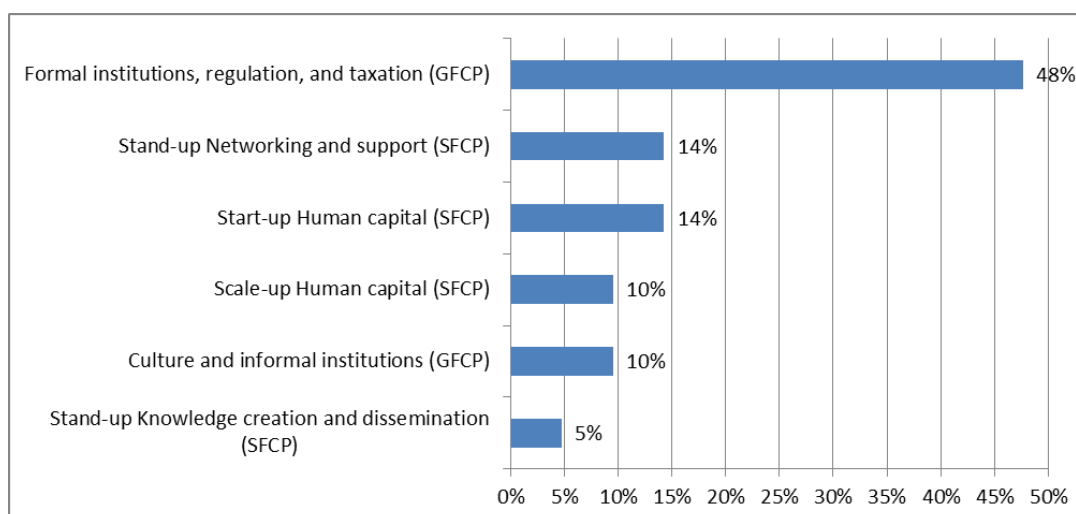
Market conditions (31.5)

**Table 18: Brazil's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|--------------------------------|---|------------------------|-------------------|---------------|
| General Frame-work Conditions  | Culture, informal institutions            | 20.0                   | 57.7              | 41.9          |
|                                | Formal institutions, regulation, taxation | 12.4                   | 47.8              | 38.2          |
|                                | Market conditions                         | 31.5                   | 71.8              | 48.5          |
|                                | Physical infrastructure                   | 24.4                   | 58.0              | 43.5          |
| Systemic Frame-work Conditions | Human capital                             | 20.1                   | 53.9              | 41.1          |
|                                | Knowledge creation and dissemination      | 25.0                   | 58.5              | 42.9          |
|                                | Finance                                   | 29.3                   | 60.7              | 47.0          |
|                                | Networking and support                    | 27.5                   | 57.1              | 50.5          |
| <b>Aides Score</b>             |   | <b>22.7</b>            | <b>58.2</b>       | <b>44.2</b>   |
| <b>Sub-index</b>               |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                    | Digital Entrepreneurship Stand-up         | 22.6                   |                   |               |
|                                | Digital Entrepreneurship Start-up         | 21.7                   |                   |               |
|                                | Digital Entrepreneurship Scale-up         | 23.6                   |                   |               |

Source: Own calculations.

**Figure 17: Brazil's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 21.0

Source: Own calculations.

## Cambodia

Size of population 2021 (as of 1 July, in million) 16.9  
GDP per capita, PPP (current international \$) 2020 4 422

Country group Tailenders

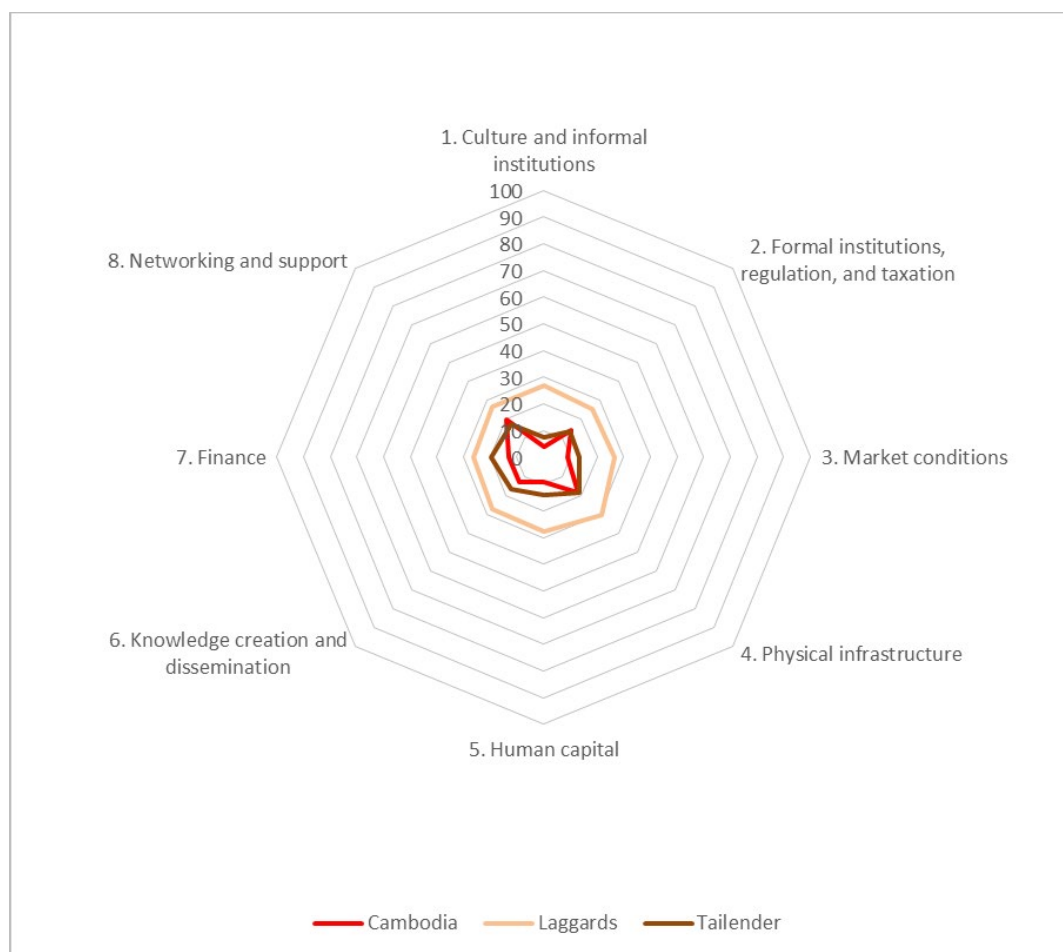
AIDES rank (score) 101 (12.0)

Digital Entrepreneurship Stand-up sub-index rank (score) 101 (11.9)

Digital Entrepreneurship Start-up sub-index rank (score) 98 (11.7)

Digital Entrepreneurship Scale-up sub-index rank (score) 103 (12.3)

**Figure 18: Cambodia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

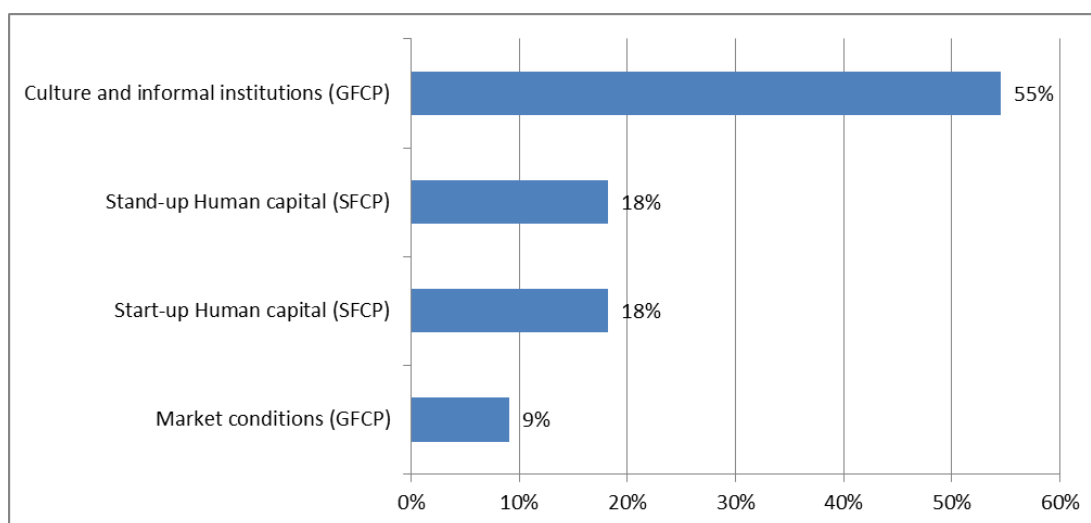
Culture and informal institutions (4.0)  
Networking and support (20.0)

**Table 19: Cambodia's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 4.0                    | 46.4              | 12.8          |
|                               | Formal institutions, regulation, taxation | 14.4                   | 49.9              | 40.8          |
|                               | Market conditions                         | 8.8                    | 42.7              | 25.2          |
|                               | Physical infrastructure                   | 18.5                   | 44.6              | 40.2          |
| Systemic Framework Conditions | Human capital                             | 9.4                    | 46.5              | 23.5          |
|                               | Knowledge creation and dissemination      | 13.1                   | 49.3              | 27.7          |
|                               | Finance                                   | 13.1                   | 58.9              | 23.4          |
|                               | Networking and support                    | 20.0                   | 54.1              | 37.5          |
| <b>Aides Score</b>            |   | <b>12.0</b>            | <b>49.0</b>       | <b>28.9</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 11.9                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 11.7                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 12.3                   |                   |               |

Source: Own calculations.

**Figure 19: Cambodia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 11.0

Source: Own calculations.

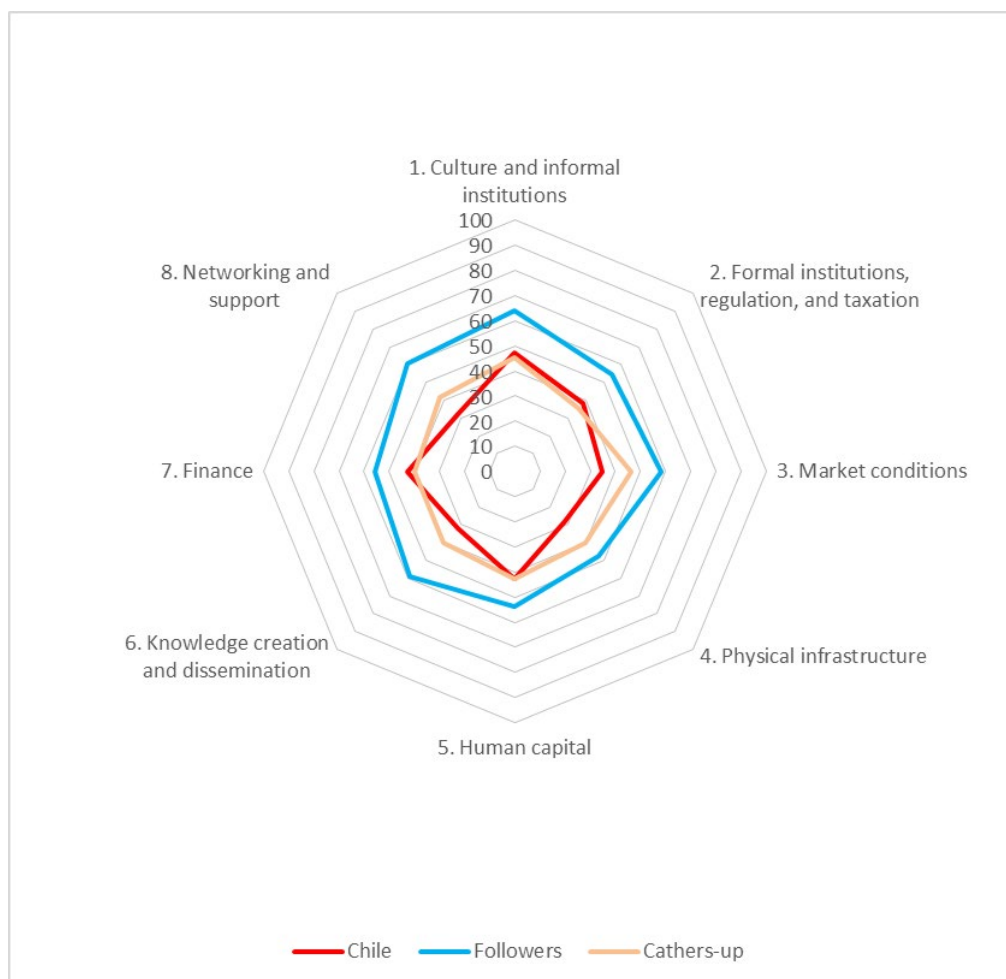
## Chile

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 19.2   |
| GDP per capita, PPP (current international \$) 2020 | 25 068 |

Country group Catchers-up

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 40 (35.3) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 38 (36.5) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 42 (33.4) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 37 (36.0) |

**Figure 20: Chile's Position in the Eight Asian Index of Digital Entrepreneurship System Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

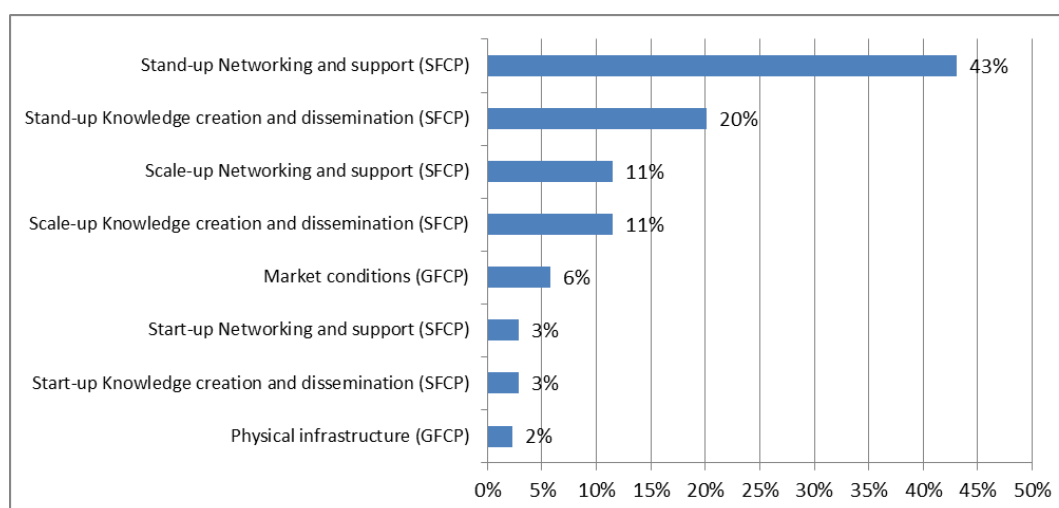
Physical infrastructure (28.1)  
Culture and informal institutions (47.1)

**Table 20: Chile's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Frame-work Conditions | Culture, informal institutions            | 47.1                   | 73.3              | 67.9          |
|                               | Formal institutions, regulation, taxation | 38.0                   | 75.3              | 50.3          |
|                               | Market conditions                         | 34.9                   | 69.3              | 53.6          |
|                               | Physical infrastructure                   | 28.1                   | 70.8              | 44.2          |
| Systemic Framework Conditions | Human capital                             | 42.5                   | 71.3              | 62.2          |
|                               | Knowledge creation and dissemination      | 32.0                   | 66.3              | 48.0          |
|                               | Finance                                   | 42.6                   | 75.0              | 56.9          |
|                               | Networking and support                    | 32.1                   | 59.2              | 56.0          |
| <b>Aides Score</b>            |   | <b>35.3</b>            | <b>70.1</b>       | <b>54.9</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 36.5                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 33.4                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 36.0                   |                   |               |

Source: Own calculations.

**Figure 21: Chile's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 34.8

Source: Own calculations.

## People's Republic of China

Size of population 2021 (as of 1 July, in million) 1 444.2

GDP per capita, PPP (current international \$) 2020 17 312

Country group Catchers-up

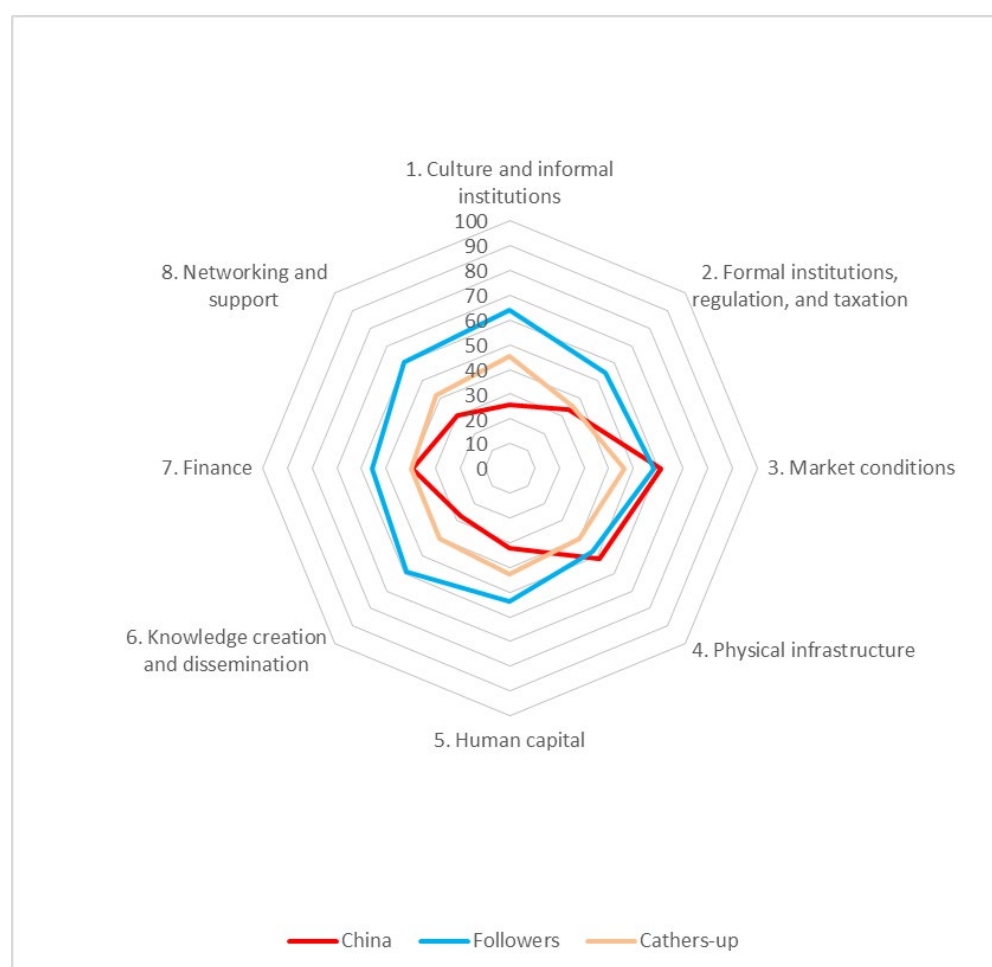
AIDES rank (score) 39 (35.3)

Digital Entrepreneurship Stand-up sub-index rank (score) 40 (34.8)

Digital Entrepreneurship Start-up sub-index rank (score) 40 (34.1)

Digital Entrepreneurship Scale-up sub-index rank (score) 35 (37.1)

**Figure 22: People's Republic of China's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Culture and informal institutions (25.6)

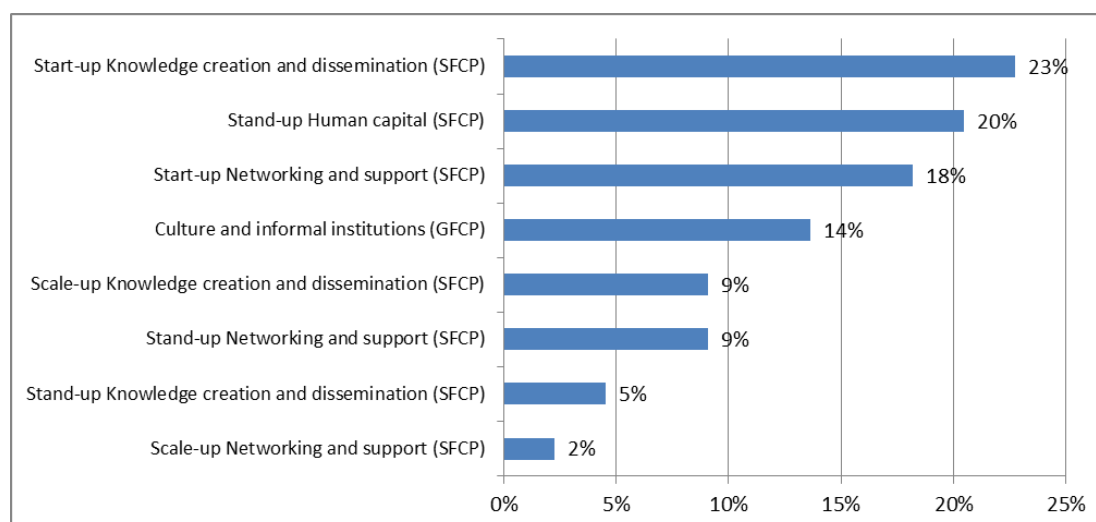
Market conditions (61.1)

**Table 21: People's Republic of China's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Frame-work Conditions | Culture, informal institutions            | 25.6                   | 64.7              | 45.6          |
|                               | Formal institutions, regulation, taxation | 33.4                   | 69.4              | 51.2          |
|                               | Market conditions                         | 61.1                   | 81.3              | 74.5          |
|                               | Physical infrastructure                   | 51.4                   | 80.2              | 64.2          |
| Systemic Framework Conditions | Human capital                             | 32.0                   | 64.0              | 53.4          |
|                               | Knowledge creation and dissemination      | 27.6                   | 79.0              | 31.2          |
|                               | Finance                                   | 39.2                   | 77.8              | 51.3          |
|                               | Networking and support                    | 30.3                   | 61.3              | 48.0          |
| <b>Aides Score</b>            |   | <b>35.3</b>            | <b>72.2</b>       | <b>52.4</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 34.8                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 34.1                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 37.1                   |                   |               |

Source: Own calculations.

**Figure 23: People's Republic of China's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurial Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 44.0

Source: Own calculations.



## Germany

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 83.9   |
| GDP per capita, PPP (current international \$) 2020 | 53 694 |

Country group Leaders

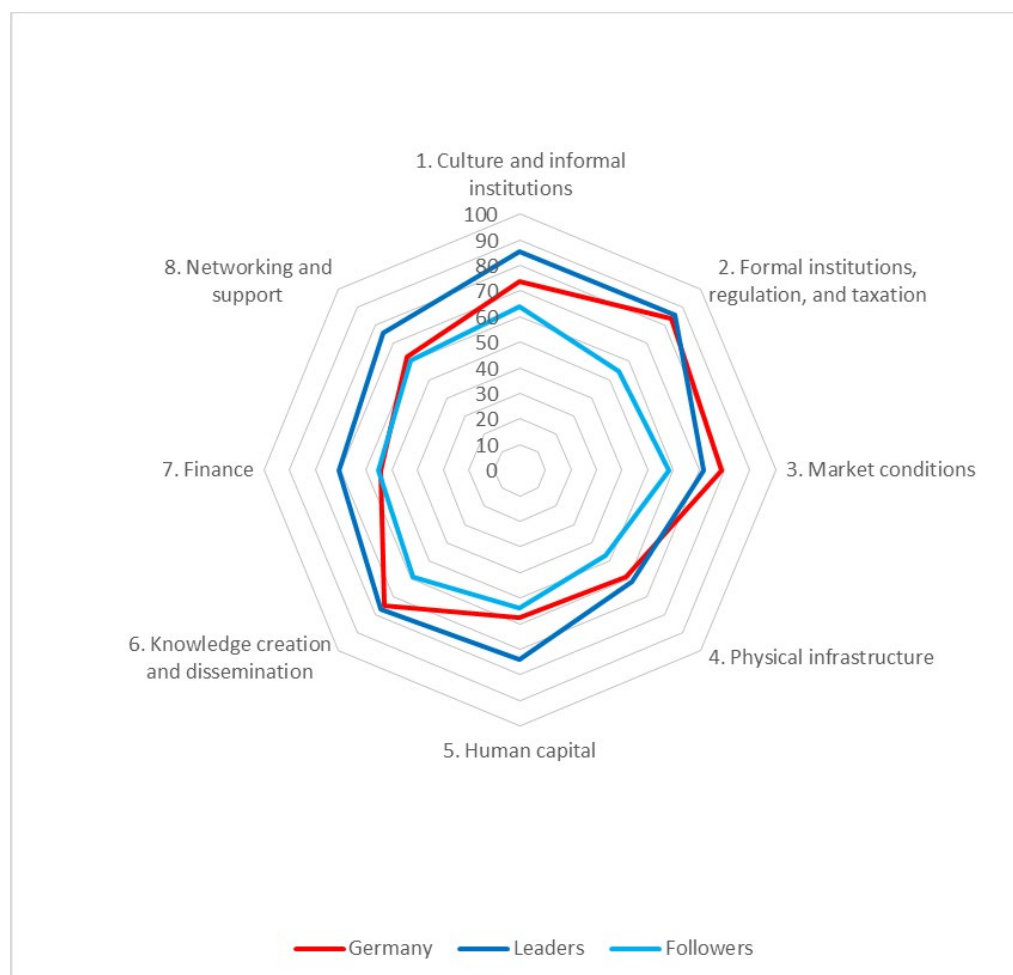
AIDES rank (score) 12 (64.7)

Digital Entrepreneurship Stand-up sub-index rank (score) 13 (63.1)

Digital Entrepreneurship Start-up sub-index rank (score) 11 (67.3)

Digital Entrepreneurship Scale-up sub-index rank (score) 11 (63.6)

**Figure 24: Germany's Position in the Eight Asian Index of Digital Entrepreneurship System Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

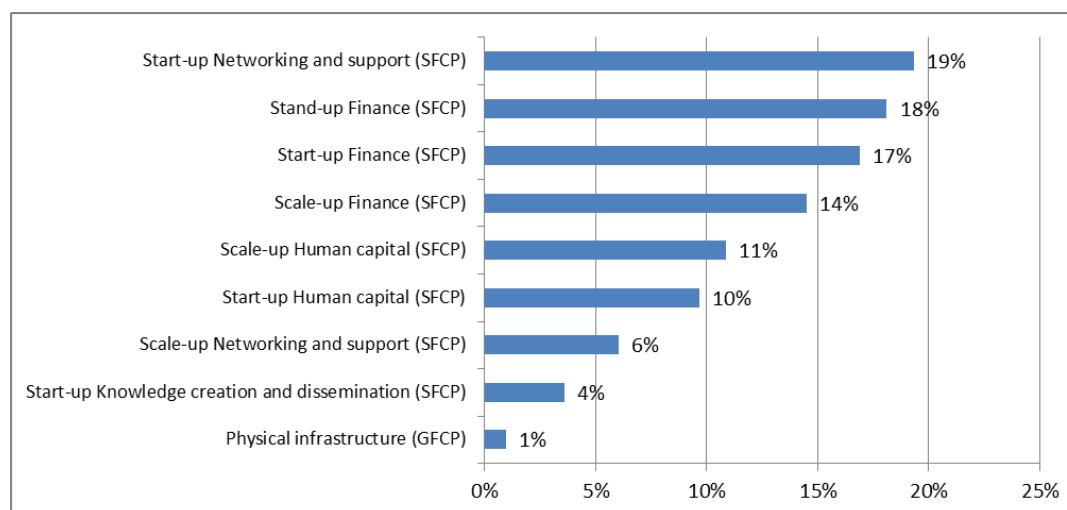
Finance (54.4)  
Formal institutions, regulation, taxation (83.9)

**Table 22: Germany's Asian Index of Digital Entrepreneurship System Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 73.9                   | 85.7              | 84.4          |
|                               | Formal institutions, regulation, taxation | 83.9                   | 79.6              | 95.1          |
|                               | Market conditions                         | 79.1                   | 93.3              | 83.4          |
|                               | Physical infrastructure                   | 59.0                   | 93.4              | 66.3          |
| Systemic Framework Conditions | Human capital                             | 57.7                   | 89.1              | 64.2          |
|                               | Knowledge creation and dissemination      | 75.1                   | 93.4              | 75.3          |
|                               | Finance                                   | 54.4                   | 77.8              | 68.6          |
|                               | Networking and support                    | 62.4                   | 90.0              | 61.3          |
| <b>Aides Score</b>            |   | <b>64.7</b>            | <b>87.8</b>       | <b>74.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 63.1                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 67.3                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 63.6                   |                   |               |

Source: Own calculations.

**Figure 25: Germany's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



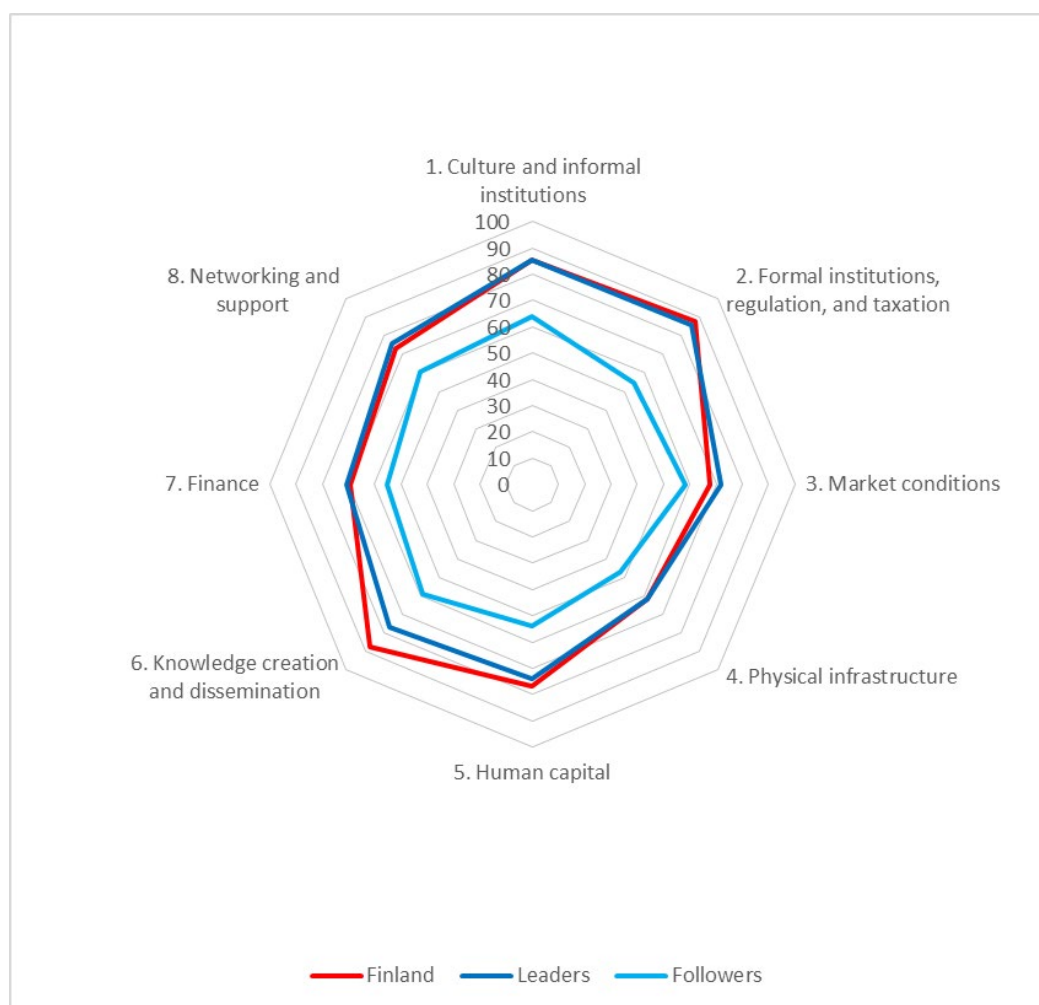
Sum of additional resources for 10% AIDES score increase (in unit per population) 82.8

Source: Own calculations.

## Finland

|  |          |
|--|----------|
| Size of population 2021 (as of 1 July, in million)       | 5.5      |
| GDP per capita, PPP (current international \$) 2020      | 51 090   |
| Country group  | Leaders  |
| AIDES rank (score)                                       | 7 (73.3) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 7 (72.1) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 5 (77.2) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 7 (70.6) |

**Figure 26: Finland's Position in the Eight Asian Index of Digital Entrepreneurial Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Physical infrastructure (61.6)

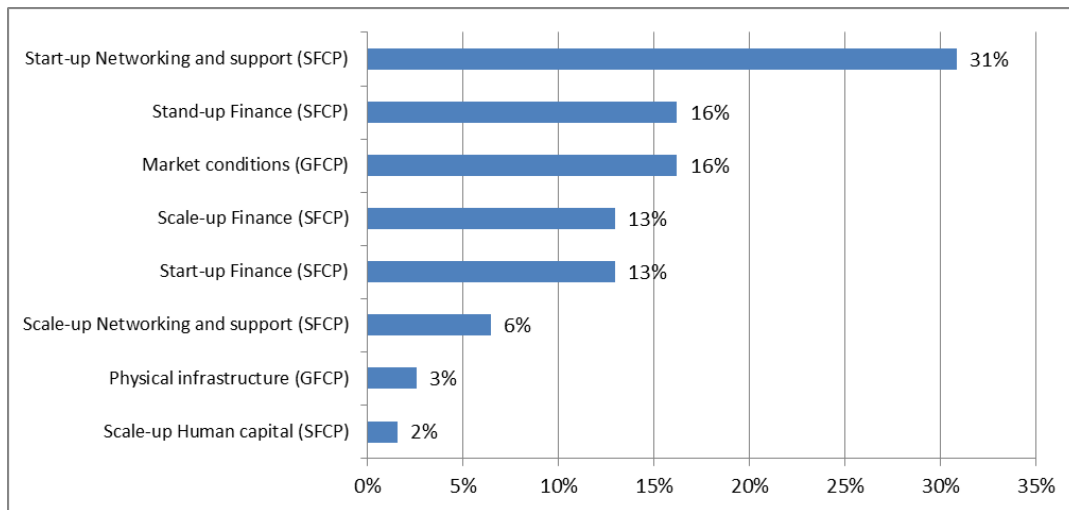
Formal institutions, regulation, taxation (88.0)

**Table 23: Finland's Asian Index of Digital Entrepreneurship System Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 85.6                   | 96.0              | 83.8          |
|                               | Formal institutions, regulation, taxation | 88.0                   | 92.8              | 77.0          |
|                               | Market conditions                         | 67.6                   | 83.6              | 79.1          |
|                               | Physical infrastructure                   | 61.6                   | 79.2              | 73.5          |
| Systemic Framework Conditions | Human capital                             | 76.8                   | 100.0             | 75.6          |
|                               | Knowledge creation and dissemination      | 87.2                   | 91.0              | 92.5          |
|                               | Finance                                   | 69.3                   | 84.0              | 80.8          |
|                               | Networking and support                    | 73.2                   | 97.6              | 68.0          |
| <b>Aides Score</b>            |   | <b>73.3</b>            | <b>90.5</b>       | <b>78.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 72.1                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 77.2                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 70.6                   |                   |               |

Source: Own calculations.

**Figure 27: Finland's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population)

61.6

Source: Own calculations.

## Georgia

Size of population 2021 (as of 1 July, in million) 4.0  
 GDP per capita, PPP (current international \$) 2020 14 863

Country group Laggards

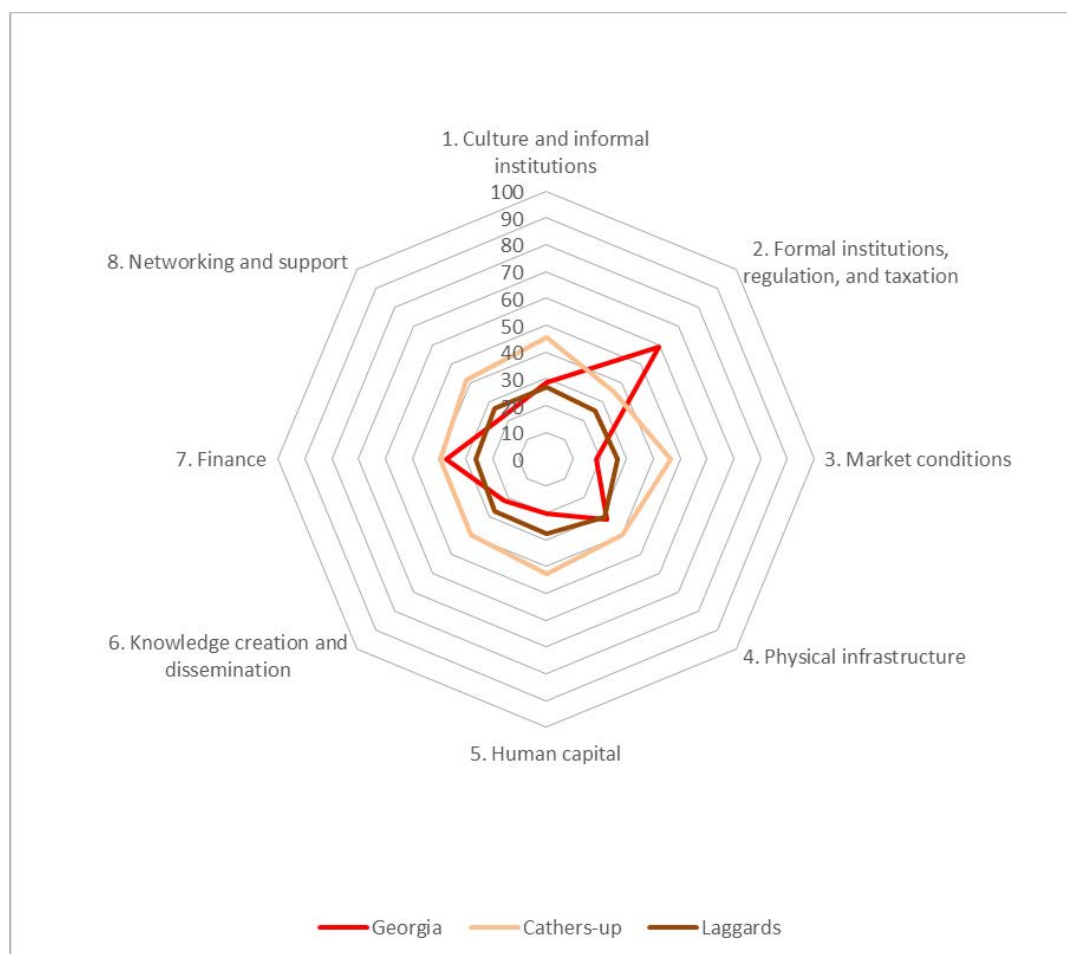
AIDES rank (score) 50 (28.3)

Digital Entrepreneurship Stand-up sub-index rank (score) 48 (28.7)

Digital Entrepreneurship Start-up sub-index rank (score) 48 (28.8)

Digital Entrepreneurship Scale-up sub-index rank (score) 52 (27.6)

**Figure 28: Georgia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
 Strongest pillar  
 Source: Own calculations.

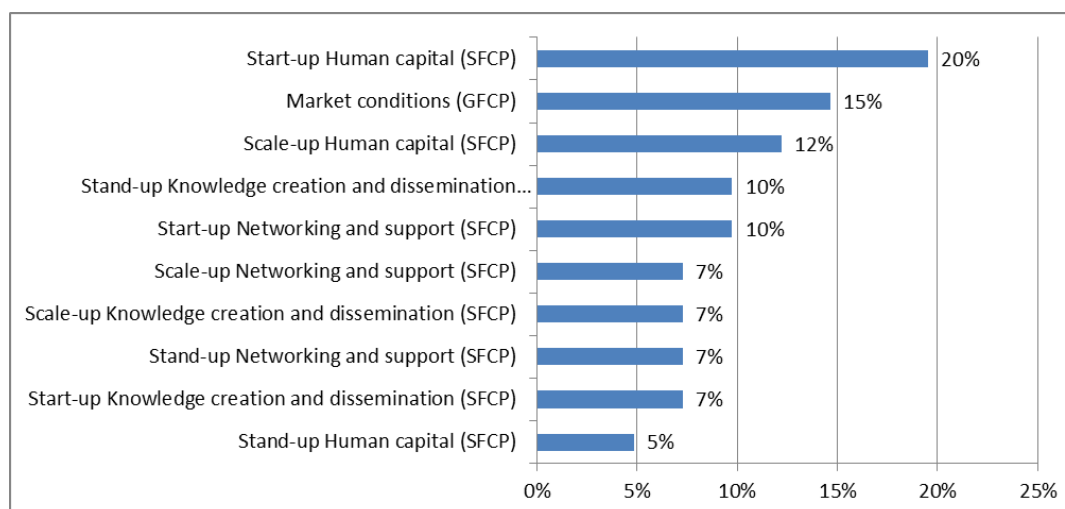
Market conditions (18.8)  
 Formal institutions, regulation, taxation (59.3)

**Table 24: Georgia's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score    | Non-digital Score | Digital Score |
|-------------------------------|---|-----------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 28.5            | 64.5              | 50.5          |
|                               | Formal institutions, regulation, taxation | 59.3            | 87.2              | 59.4          |
|                               | Market conditions                         | 18.8            | 57.3              | 37.5          |
|                               | Physical infrastructure                   | 32.0            | 61.7              | 51.4          |
| Systemic Framework Conditions | Human capital                             | 20.1            | 61.9              | 33.8          |
|                               | Knowledge creation and dissemination      | 22.0            | 53.9              | 42.2          |
|                               | Finance                                   | 37.3            | 54.1              | 64.7          |
|                               | Networking and support                    | 22.6            | 52.2              | 43.6          |
| Aides Score                   |   | 28.3            | 61.6              | 47.9          |
| Sub-index                     |   | Sub-index Score |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 28.7            |                   |               |
|                               | Digital Entrepreneurship Start-up         | 28.8            |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 27.6            |                   |               |

Source: Own calculations.

**Figure 29: Georgia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurial Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 41.0

Source: Own calculations.

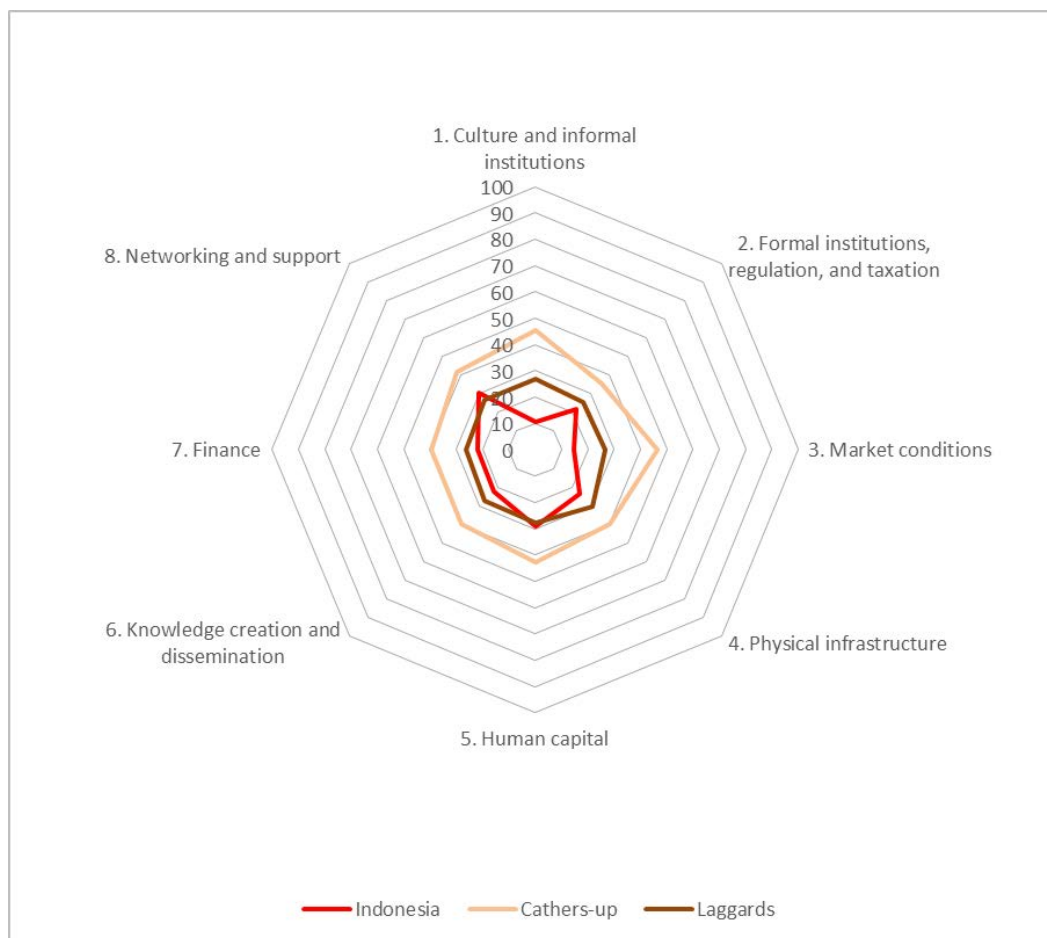
## Indonesia

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 276.4  |
| GDP per capita, PPP (current international \$) 2020 | 12 073 |

Country group Laggards

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 71 (20.4) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 65 (22.4) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 82 (16.8) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 69 (22.0) |

**Figure 30: Indonesia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

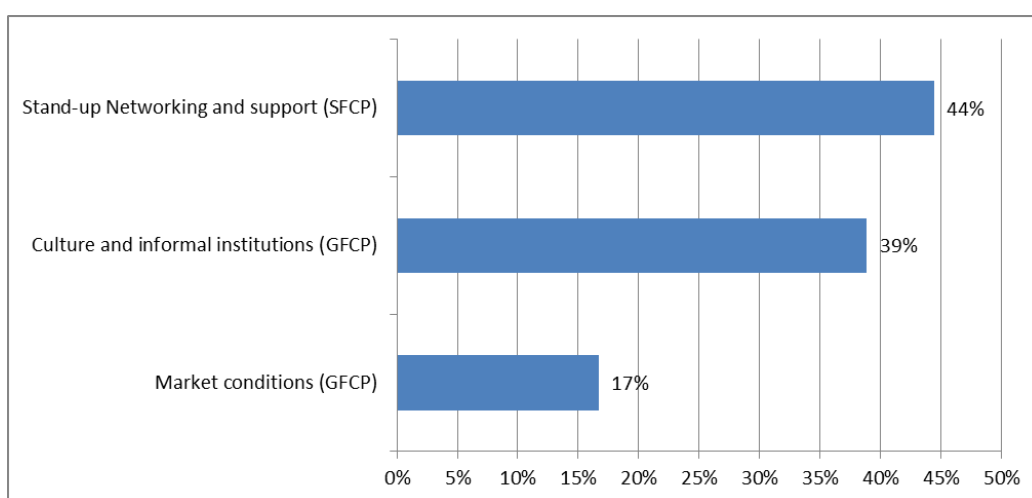
Culture and informal institutions (10.4)  
Networking and support (30.4)

**Table 25: Indonesia's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 10.4                   | 66.1              | 19.6          |
|                               | Formal institutions, regulation, taxation | 22.1                   | 66.7              | 37.3          |
|                               | Market conditions                         | 14.7                   | 66.1              | 28.6          |
|                               | Physical infrastructure                   | 24.0                   | 66.6              | 40.5          |
| Systemic Framework Conditions | Human capital                             | 29.0                   | 59.1              | 53.7          |
|                               | Knowledge creation and dissemination      | 22.3                   | 60.7              | 36.6          |
|                               | Finance                                   | 22.0                   | 66.3              | 33.8          |
|                               | Networking and support                    | 30.4                   | 66.1              | 50.4          |
| <b>Aides Score</b>            |   | <b>20.4</b>            | <b>64.7</b>       | <b>37.6</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 22.4                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 16.8                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 22.0                   |                   |               |

Source: Own calculations.

**Figure 31: Indonesia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 18.0

Source: Own calculations.



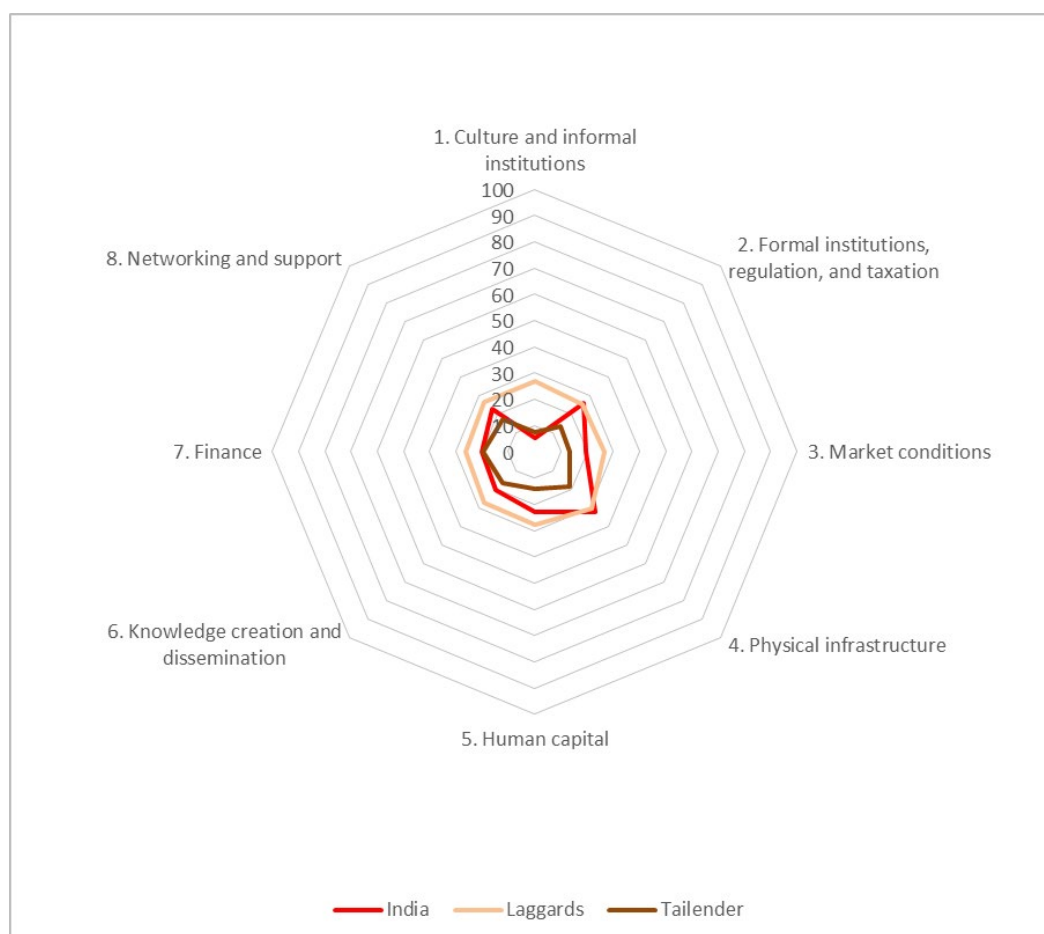
## India

|   |         |
|---|---------|
| Size of population 2021 (as of 1 July, in million)  | 1 393.4 |
| GDP per capita, PPP (current international \$) 2020 | 6 454   |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 75 (19.6) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 78 (19.0) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 71 (19.7) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 75 (20.2) |

**Figure 32: India's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Culture and informal institutions (5.3)

Strongest pillar

Physical infrastructure (32.4)

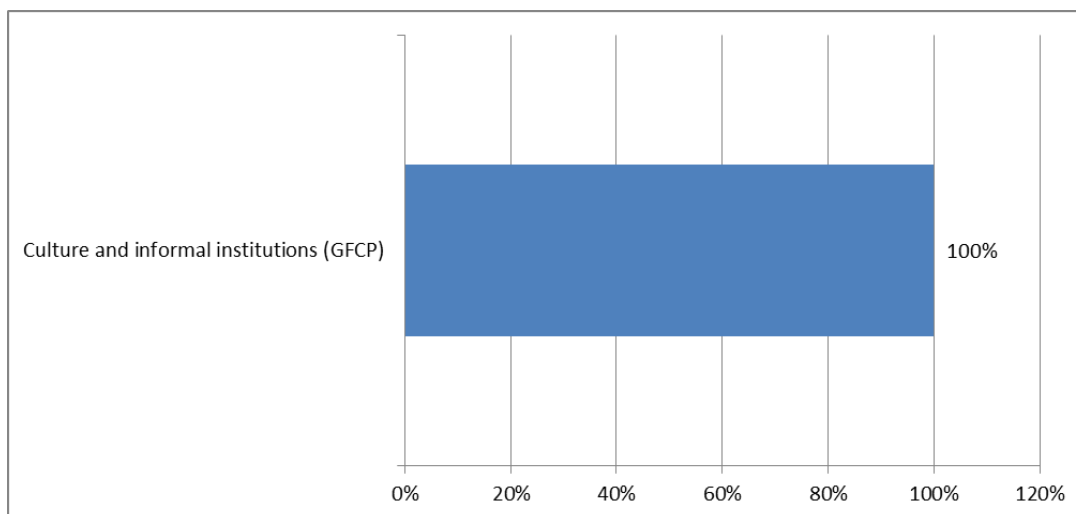
Source: Own calculations.

**Table 26: India's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score    | Non-digital Score | Digital Score |
|-------------------------------|---|-----------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 5.3             | 67.5              | 10.4          |
|                               | Formal institutions, regulation, taxation | 26.4            | 64.5              | 46.6          |
|                               | Market conditions                         | 19.8            | 68.3              | 35.1          |
|                               | Physical infrastructure                   | 32.4            | 68.9              | 49.4          |
| Systemic Framework Conditions | Human capital                             | 23.1            | 57.6              | 43.5          |
|                               | Knowledge creation and dissemination      | 20.8            | 62.9              | 31.8          |
|                               | Finance                                   | 20.1            | 69.6              | 30.0          |
|                               | Networking and support                    | 23.0            | 60.1              | 37.2          |
| Aides Score                   |   | 19.6            | 64.9              | 35.5          |
| Sub-index                     |   | Sub-index Score |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 19.0            |                   |               |
|                               | Digital Entrepreneurship Start-up         | 19.7            |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 20.2            |                   |               |

Source: Own calculations.

**Figure 33: India's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population)

9.0

Source: Own calculations.

## Israel

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 8.8    |
| GDP per capita, PPP (current international \$) 2020 | 41 855 |

Country group Followers

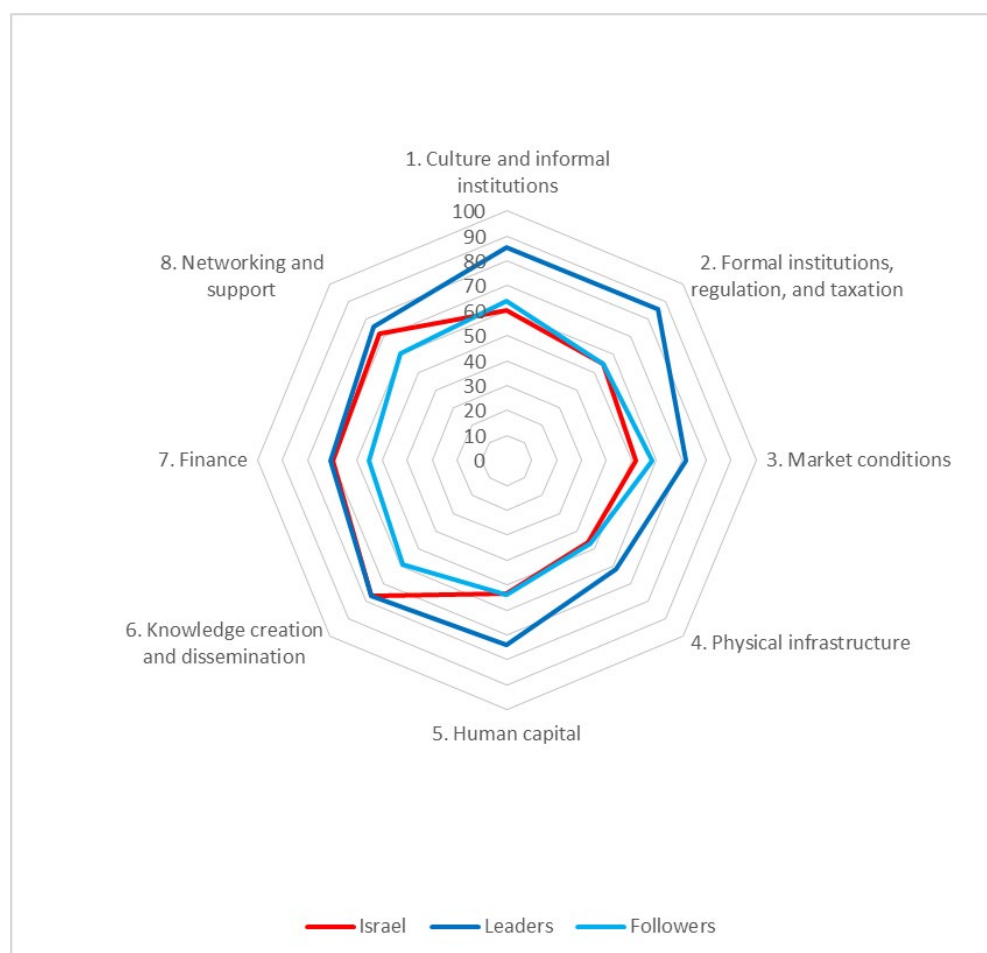
AIDES rank (score) 16 (58.1)

Digital Entrepreneurship Stand-up sub-index rank (score) 19 (55.4)

Digital Entrepreneurship Start-up sub-index rank (score) 16 (60.6)

Digital Entrepreneurship Scale-up sub-index rank (score) 17 (58.3)

**Figure 34: Israel's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Physical infrastructure (46.2)

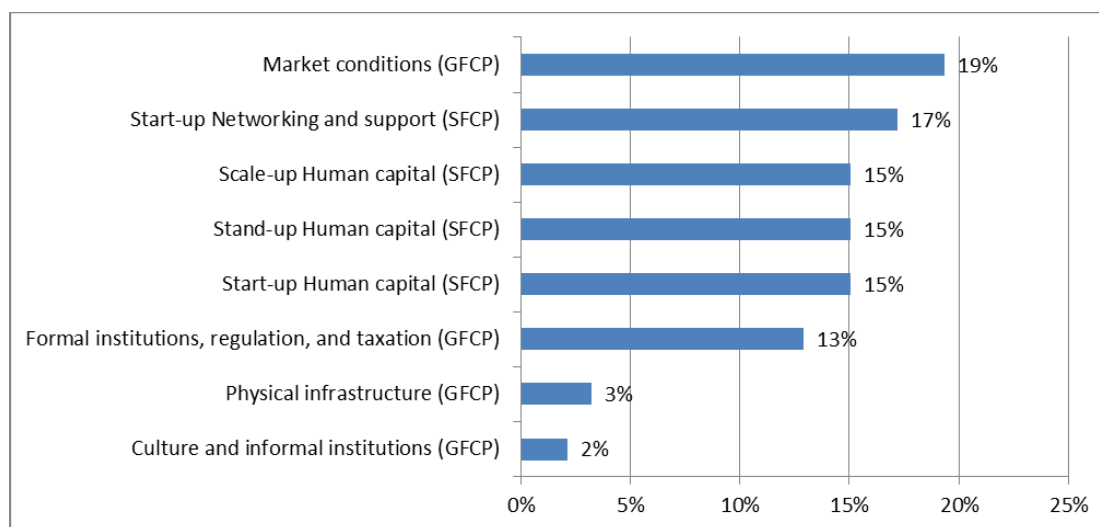
Knowledge creation and dissemination (77.0)

**Table 27: Israel's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score    | Non-digital Score | Digital Score |
|-------------------------------|---|-----------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 60.0            | 87.5              | 68.1          |
|                               | Formal institutions, regulation, taxation | 54.6            | 83.6              | 59.0          |
|                               | Market conditions                         | 51.8            | 76.7              | 68.1          |
|                               | Physical infrastructure                   | 46.2            | 79.5              | 59.8          |
| Systemic Framework Conditions | Human capital                             | 53.3            | 83.0              | 64.6          |
|                               | Knowledge creation and dissemination      | 77.0            | 87.5              | 86.5          |
|                               | Finance                                   | 69.9            | 85.6              | 81.1          |
|                               | Networking and support                    | 72.0            | 93.9              | 71.4          |
| Aides Score                   |   | 58.1            | 84.7              | 69.8          |
| Sub-index                     |   | Sub-index Score |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 55.4            |                   |               |
|                               | Digital Entrepreneurship Start-up         | 60.6            |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 58.3            |                   |               |

Source: Own calculations.

**Figure 35: Israel's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 46.5

Source: Own calculations.

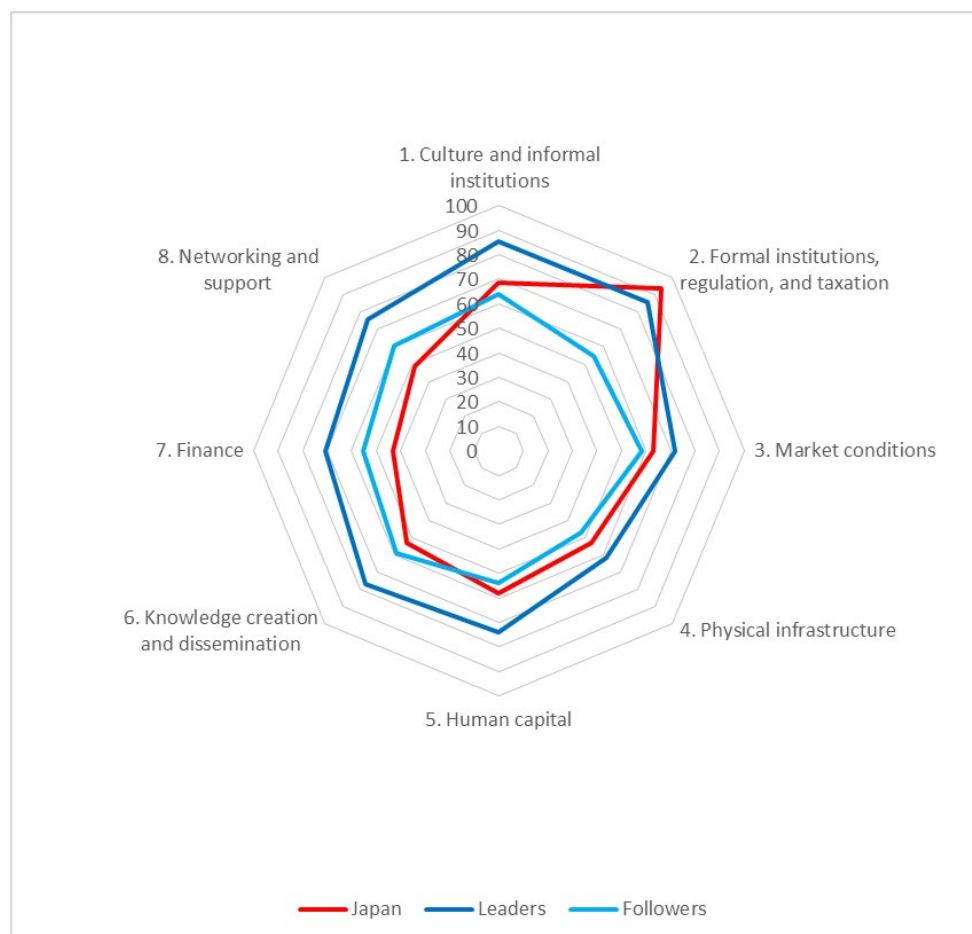
## Japan

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 126.1  |
| GDP per capita, PPP (current international \$) 2020 | 42 197 |

Country group Followers

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 20 (55.7) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 21 (53.2) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 21 (54.8) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 16 (59.0) |

**Figure 36: Japan's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

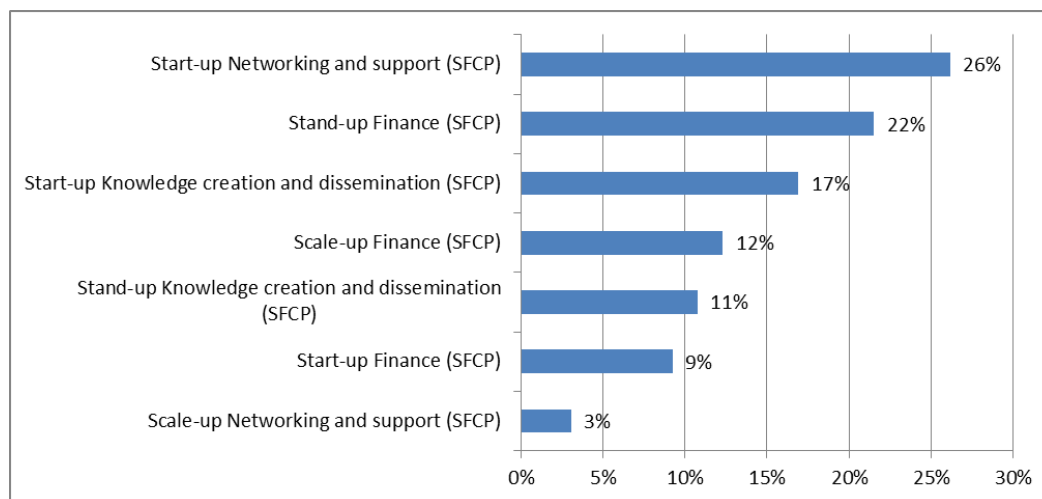
Financing (43.1)  
Formal institutions, regulation, taxation (93.9)

**Table 28: Japan's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 68.7                   | 83.6              | 81.5          |
|                               | Formal institutions, regulation, taxation | 93.9                   | 82.2              | 100.0         |
|                               | Market conditions                         | 63.1                   | 100.0             | 67.4          |
|                               | Physical infrastructure                   | 53.3                   | 96.4              | 60.9          |
| Systemic Framework Conditions | Human capital                             | 57.9                   | 77.5              | 77.6          |
|                               | Knowledge creation and dissemination      | 53.0                   | 87.5              | 57.1          |
|                               | Finance                                   | 43.1                   | 83.0              | 53.4          |
|                               | Networking and support                    | 48.7                   | 73.0              | 60.9          |
| <b>Aides Score</b>            |   | <b>55.7</b>            | <b>85.4</b>       | <b>69.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 53.2                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 54.8                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 59.0                   |                   |               |

Source: Own calculations.

**Figure 37: Japan's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 65.0

Source: Own calculations.

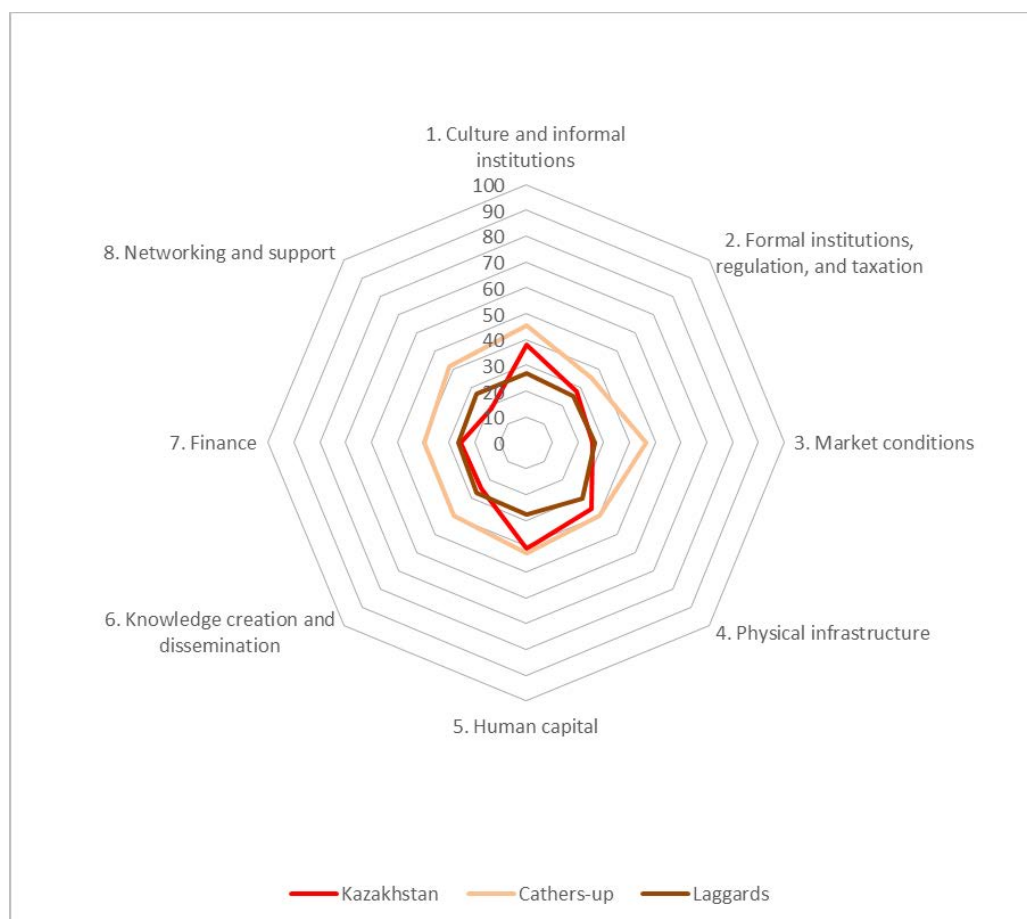
## Kazakhstan

Size of population 2021 (as of 1 July, in million) 19.0  
GDP per capita, PPP (current international \$) 2020 26 729

Country group Laggards

AIDES rank (score) 52 (27.4)  
Digital Entrepreneurship Stand-up sub-index rank (score) 51 (27.6)  
Digital Entrepreneurship Start-up sub-index rank (score) 58 (26.6)  
Digital Entrepreneurship Scale-up sub-index rank (score) 51 (28.0)

**Figure 38: Kazakhstan's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

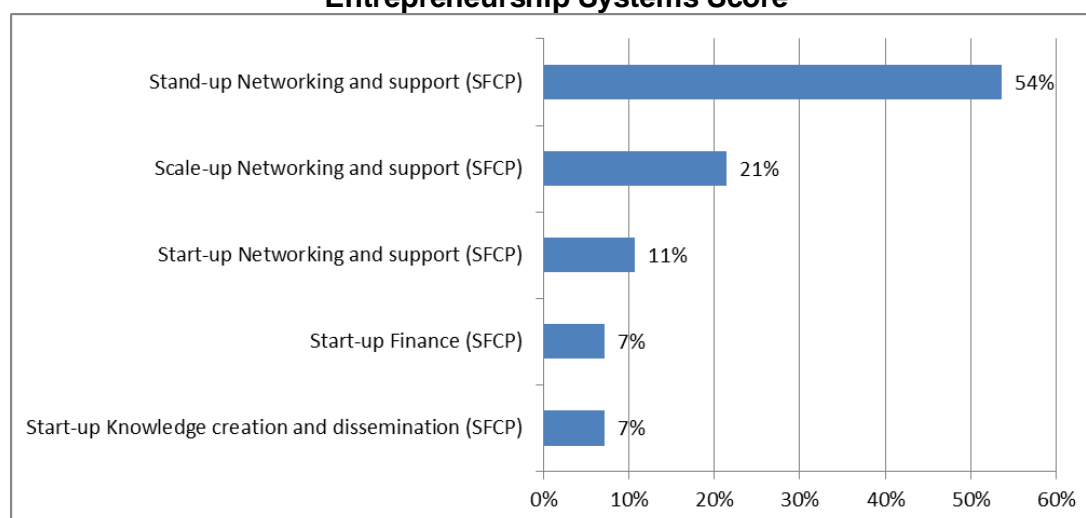
Networking and support (18.9)  
Human capital (41.1)

**Table 29: Kazakhstan's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                      | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|--------------------------------------|---|------------------------|-------------------|---------------|
| <b>General Frame-work Conditions</b> | Culture, informal institutions            | 37.9                   | 64.7              | 65.2          |
|                                      | Formal institutions, regulation, taxation | 27.8                   | 69.2              | 43.4          |
|                                      | Market conditions                         | 25.8                   | 60.4              | 46.2          |
|                                      | Physical infrastructure                   | 36.0                   | 64.3              | 54.9          |
| <b>Systemic Framework Conditions</b> | Human capital                             | 41.1                   | 65.9              | 66.7          |
|                                      | Knowledge creation and dissemination      | 25.0                   | 60.9              | 40.7          |
|                                      | Finance                                   | 25.4                   | 54.6              | 44.5          |
|                                      | Networking and support                    | 18.9                   | 52.9              | 41.6          |
| <b>Aides Score</b>                   |   | <b>27.4</b>            | <b>61.6</b>       | <b>50.4</b>   |
| <b>Sub-index</b>                     |   | <b>Sub-index Score</b> |                   |               |
| <b>Sub-indices</b>                   | Digital Entrepreneurship Stand-up         | 27.6                   |                   |               |
|                                      | Digital Entrepreneurship Start-up         | 26.6                   |                   |               |
|                                      | Digital Entrepreneurship Scale-up         | 28.0                   |                   |               |

Source: Own calculations.

**Figure 39: Kazakhstan's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 28.0

Source: Own calculations.



## Kyrgyz Republic

Size of population 2021 (as of 1 July, in million) 6.6  
GDP per capita, PPP (current international \$) 2020 4 965

Country group Tailenders

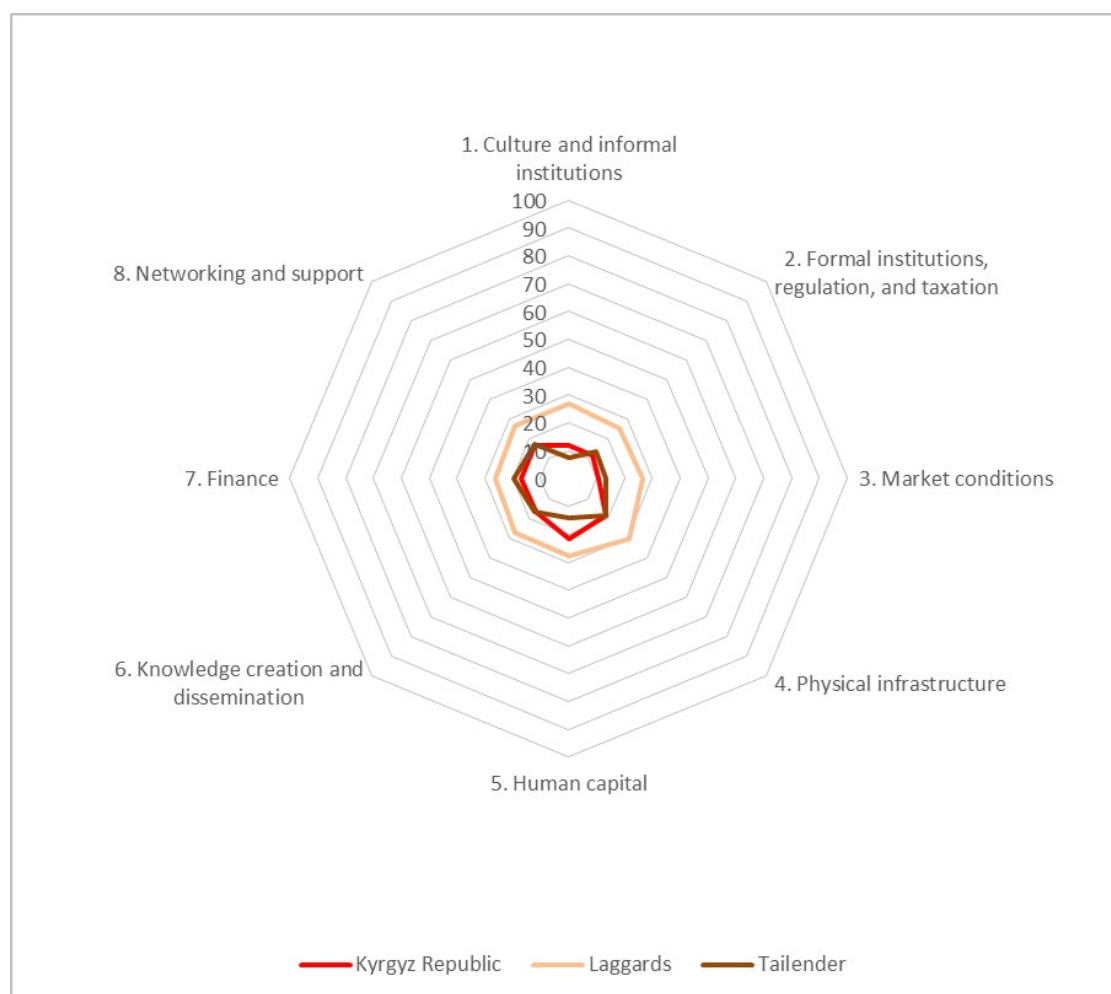
AIDES rank (score) 88 (15.2)

Digital Entrepreneurship Stand-up sub-index rank (score) 90 (15.1)

Digital Entrepreneurship Start-up sub-index rank (score) 87 (15.0)

Digital Entrepreneurship Scale-up sub-index rank (score) 90 (15.5)

**Figure 40: Kyrgyz Republic's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

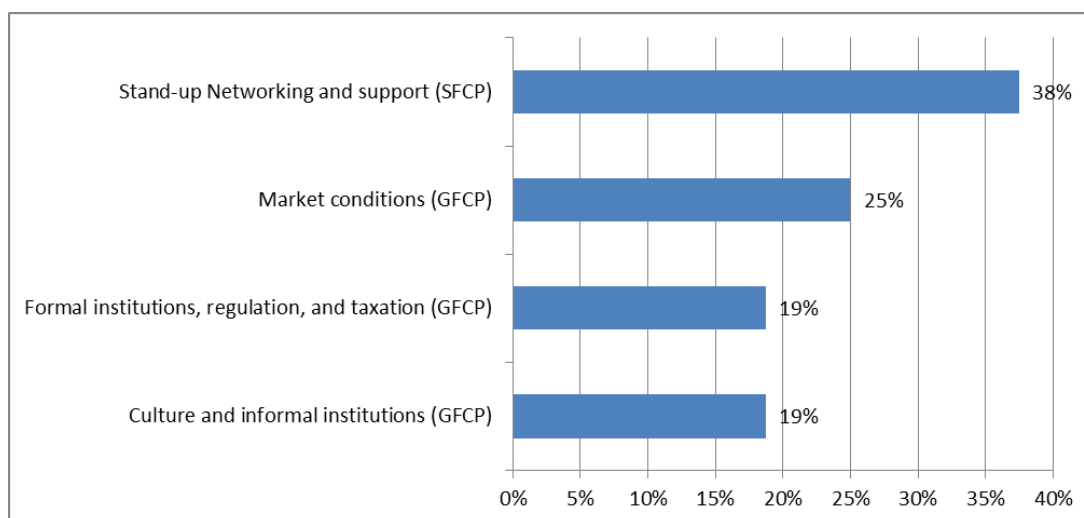
Market conditions (10.9)  
Human capital (21.4)

**Table 30: Kyrgyz Republic's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 11.8                   | 51.3              | 30.0          |
|                               | Formal institutions, regulation, taxation | 12.1                   | 49.1              | 35.7          |
|                               | Market conditions                         | 10.9                   | 45.2              | 28.6          |
|                               | Physical infrastructure                   | 18.8                   | 47.6              | 39.5          |
| Systemic Framework Conditions | Human capital                             | 21.4                   | 56.9              | 40.5          |
|                               | Knowledge creation and dissemination      | 16.9                   | 50.7              | 34.2          |
|                               | Finance                                   | 17.0                   | 51.5              | 32.2          |
|                               | Networking and support                    | 17.0                   | 52.4              | 38.4          |
| <b>Aides Score</b>            |   | <b>15.2</b>            | <b>50.6</b>       | <b>34.9</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 15.1                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 15.0                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 15.5                   |                   |               |

Source: Own calculations.

**Figure 41: Kyrgyz Republic's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 16.0

Source: Own calculations.

## Republic of Korea

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 51.3   |
| GDP per capita, PPP (current international \$) 2020 | 43 124 |

Country group Followers

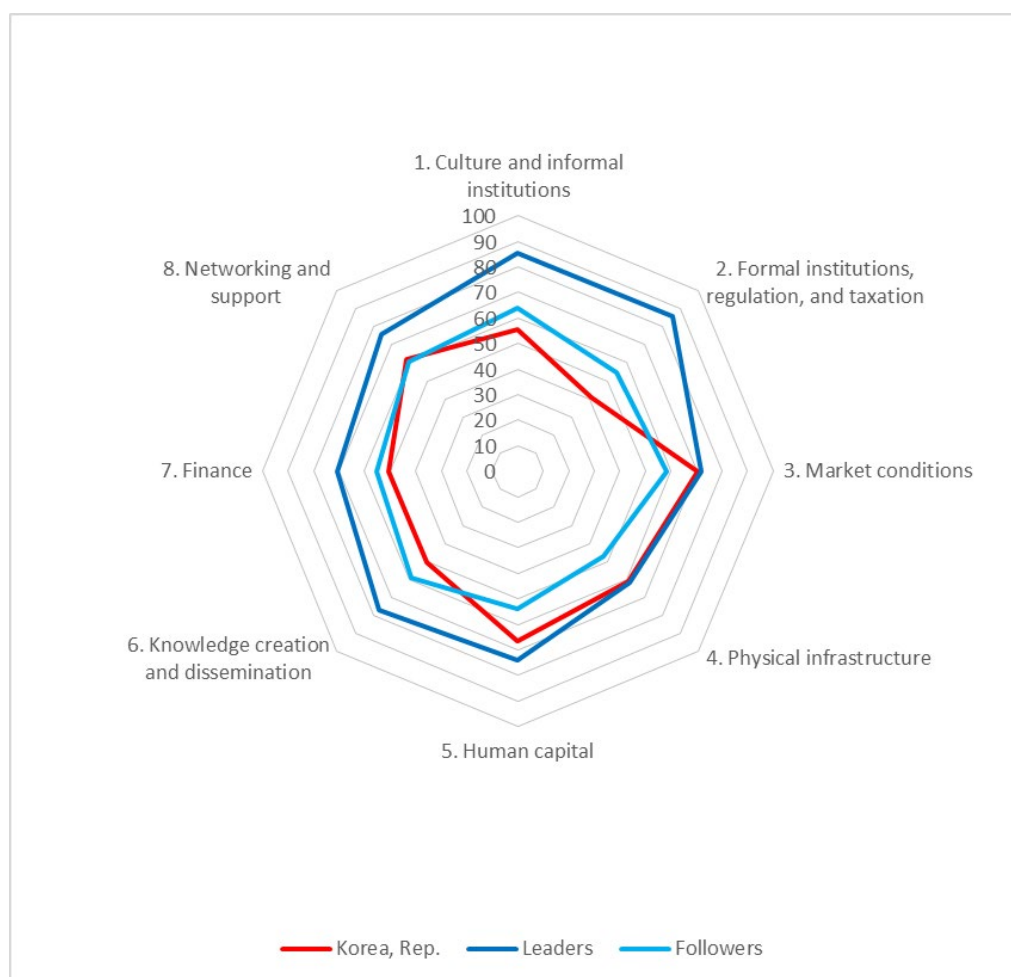
AIDES rank (score) 22 (54.1)

Digital Entrepreneurship Stand-up sub-index rank (score) 22 (51.6)

Digital Entrepreneurship Start-up sub-index rank (score) 20 (54.9)

Digital Entrepreneurship Scale-up sub-index rank (score) 20 (55.9)

**Figure 42: The Republic of Korea's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Formal institutions, regulation, taxation (40.7)

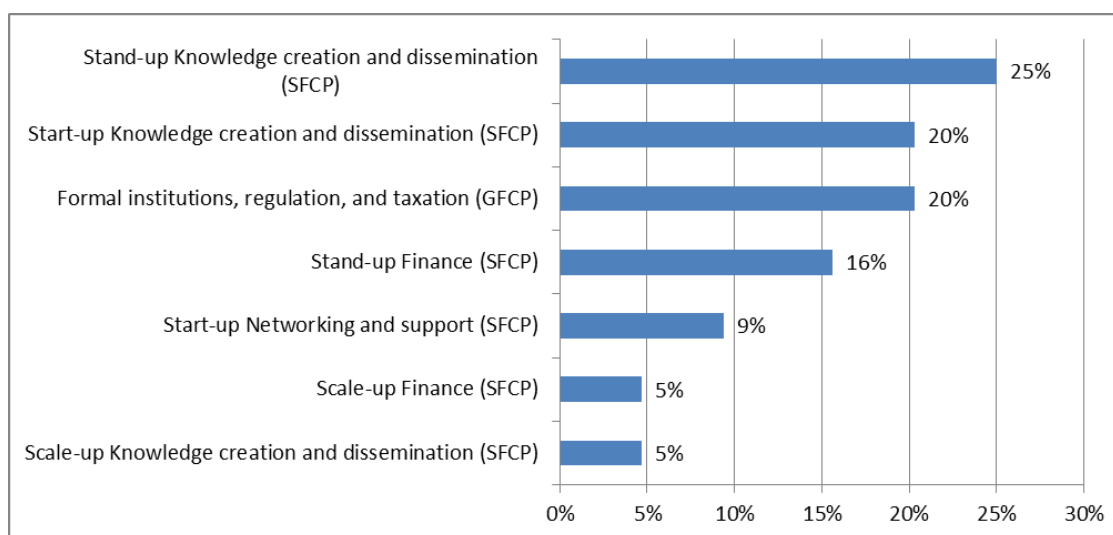
Market conditions (70.3)

**Table 31: The Republic of Korea's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                      | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|--------------------------------------|---|------------------------|-------------------|---------------|
| <b>General Framework Conditions</b>  | Culture, informal institutions            | 55.6                   | 69.5              | 84.4          |
|                                      | Formal institutions, regulation, taxation | 40.7                   | 71.3              | 58.7          |
|                                      | Market conditions                         | 70.3                   | 81.3              | 82.9          |
|                                      | Physical infrastructure                   | 61.3                   | 96.4              | 67.2          |
| <b>Systemic Framework Conditions</b> | Human capital                             | 66.4                   | 82.5              | 84.4          |
|                                      | Knowledge creation and dissemination      | 50.4                   | 85.6              | 56.0          |
|                                      | Finance                                   | 50.7                   | 76.0              | 65.9          |
|                                      | Networking and support                    | 61.6                   | 76.4              | 74.8          |
| <b>Aides Score</b>                   |   | <b>54.1</b>            | <b>79.9</b>       | <b>71.8</b>   |
| <b>Sub-index</b>                     |   | <b>Sub-index Score</b> |                   |               |
| <b>Sub-indices</b>                   | Digital Entrepreneurship Stand-up         | 51.6                   |                   |               |
|                                      | Digital Entrepreneurship Start-up         | 54.9                   |                   |               |
|                                      | Digital Entrepreneurship Scale-up         | 55.9                   |                   |               |

Source: Own calculations.

**Figure 43: The Republic of Korea's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Each a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population)

64.0

Source: Own calculations.

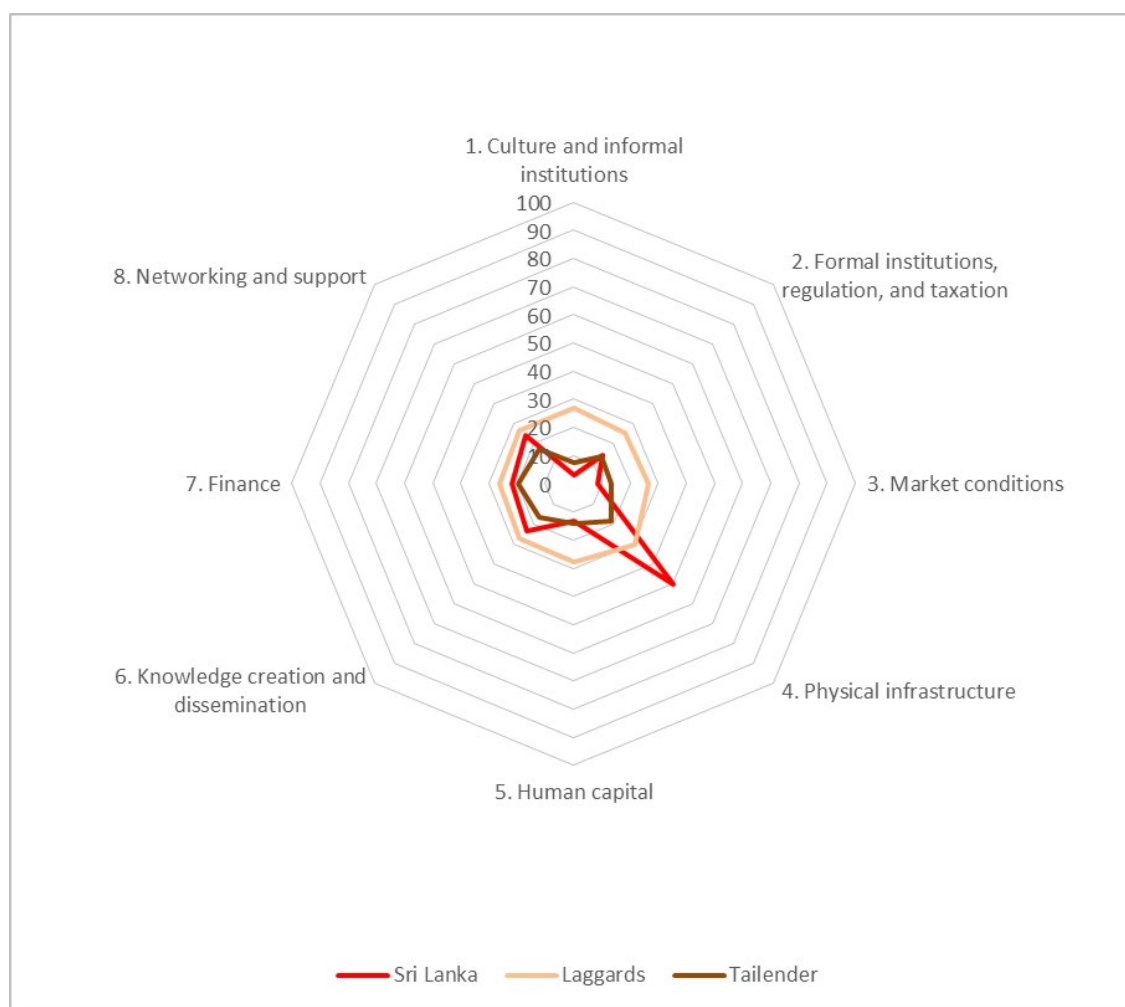
## Sri Lanka

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 21.4   |
| GDP per capita, PPP (current international \$) 2020 | 13 225 |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 82 (17.5) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 80 (17.9) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 83 (16.7) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 82 (17.9) |

**Figure 44: Sri Lanka's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

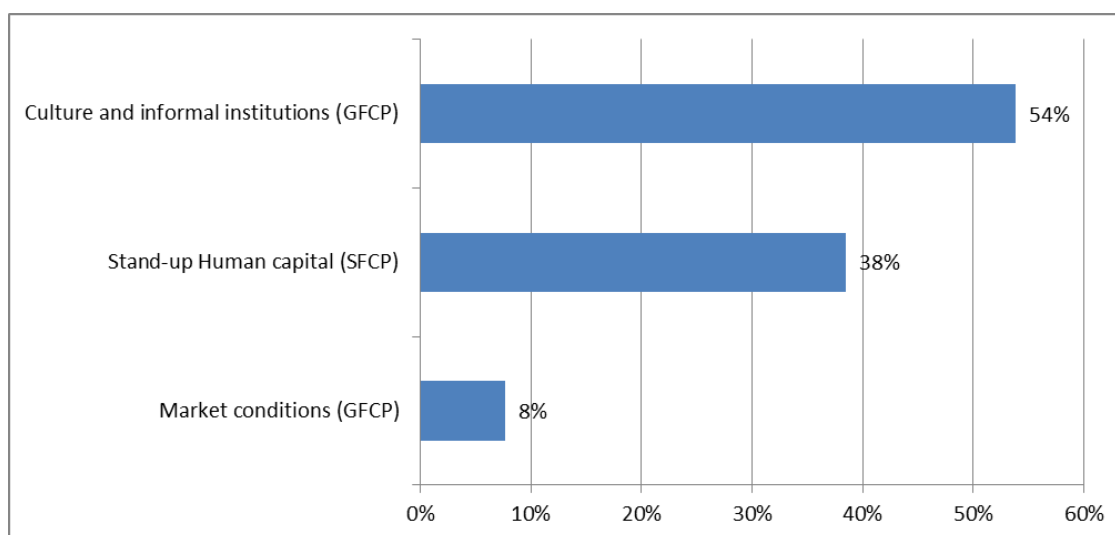
Culture and informal institutions (3.0)  
Physical infrastructure (50.3)

**Table 32: Sri Lanka's Asian Index of Digital Entrepreneurship Systems  
Component Values**

|                                    | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|------------------------------------|---|------------------------|-------------------|---------------|
| General Frame-<br>work Conditions  | Culture, informal institutions            | 3.0                    | 60.1              | 7.1           |
|                                    | Formal institutions, regulation, taxation | 14.4                   | 54.4              | 35.3          |
|                                    | Market conditions                         | 8.7                    | 44.4              | 24.4          |
|                                    | Physical infrastructure                   | 50.3                   | 70.5              | 66.9          |
| Systemic Frame-<br>work Conditions | Human capital                             | 13.4                   | 51.8              | 30.5          |
|                                    | Knowledge creation and dissemination      | 23.8                   | 60.6              | 38.7          |
|                                    | Finance                                   | 21.7                   | 62.7              | 34.9          |
|                                    | Networking and support                    | 24.1                   | 61.3              | 38.5          |
| <b>Aides Score</b>                 |   | <b>17.5</b>            | <b>58.2</b>       | <b>34.5</b>   |
| <b>Sub-index</b>                   |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                        | Digital Entrepreneurship Stand-up         | 17.9                   |                   |               |
|                                    | Digital Entrepreneurship Start-up         | 16.7                   |                   |               |
|                                    | Digital Entrepreneurship Scale-up         | 17.9                   |                   |               |

Source: Own calculations.

**Figure 45: Sri Lanka's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 13.0

Source: Own calculations.

## Mexico

Size of population 2021 (as of 1 July, in million) 130.3  
 GDP per capita, PPP (current international \$) 2020 18 833

Country group Laggards

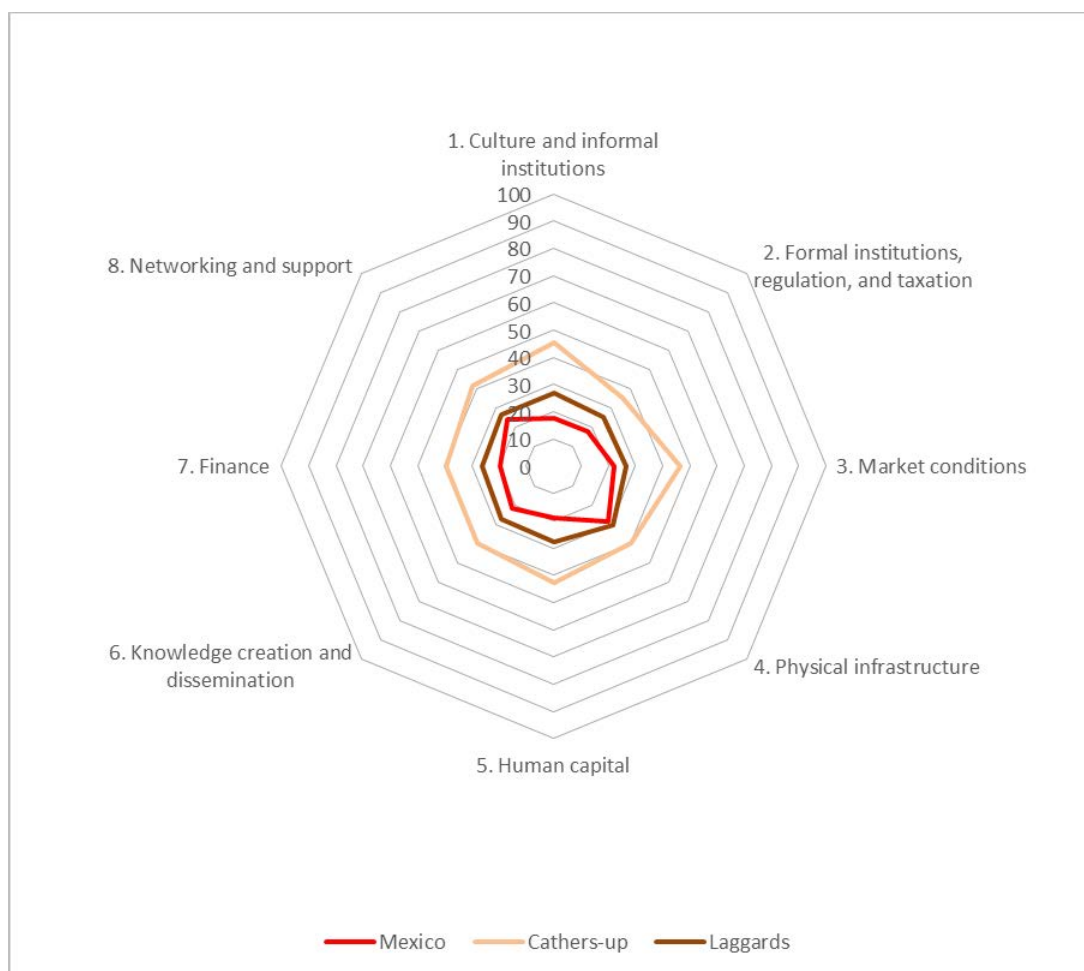
AIDES rank (score) 69 (20.8)

Digital Entrepreneurship Stand-up sub-index rank (score) 72 (20.2)

Digital Entrepreneurship Start-up sub-index rank (score) 69 (20.4)

Digital Entrepreneurship Scale-up sub-index rank (score) 70 (21.8)

**Figure 46: Mexico's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
 Strongest pillar  
 Source: Own calculations.

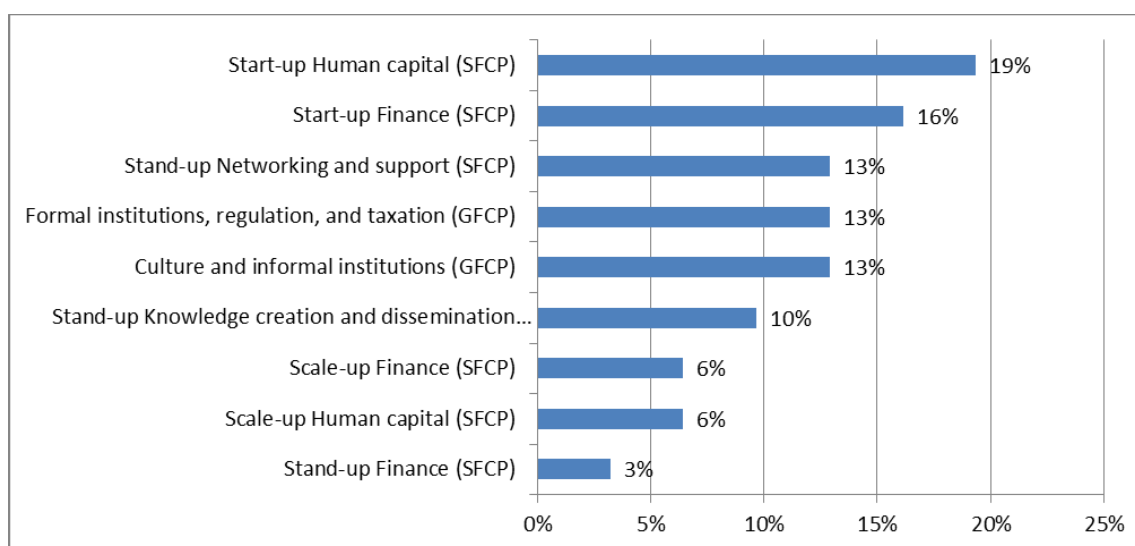
Culture and informal institutions (17.7)  
 Physical infrastructure (28.5)

**Table 33: Mexico's Asian Index of Digital Entrepreneurship Systems Component Values**

|                                    | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|------------------------------------|---|------------------------|-------------------|---------------|
| General Frame-<br>work Conditions  | Culture, informal institutions            | 17.7                   | 55.7              | 39.2          |
|                                    | Formal institutions, regulation, taxation | 17.9                   | 50.3              | 49.1          |
|                                    | Market conditions                         | 22.3                   | 79.0              | 35.3          |
|                                    | Physical infrastructure                   | 28.5                   | 68.2              | 45.3          |
| Systemic Frame-<br>work Conditions | Human capital                             | 18.9                   | 58.8              | 34.0          |
|                                    | Knowledge creation and dissemination      | 21.8                   | 58.1              | 37.7          |
|                                    | Finance                                   | 19.6                   | 59.7              | 32.8          |
|                                    | Networking and support                    | 24.2                   | 56.0              | 45.6          |
| <b>Aides Score</b>                 |   | <b>20.8</b>            | <b>60.7</b>       | <b>39.9</b>   |
| <b>Sub-index</b>                   |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                        | Digital Entrepreneurship Stand-up         | 20.2                   |                   |               |
|                                    | Digital Entrepreneurship Start-up         | 20.4                   |                   |               |
|                                    | Digital Entrepreneurship Scale-up         | 21.8                   |                   |               |

Source: Own calculations.

**Figure 47: Mexico's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 31.0

Source: Own calculations.



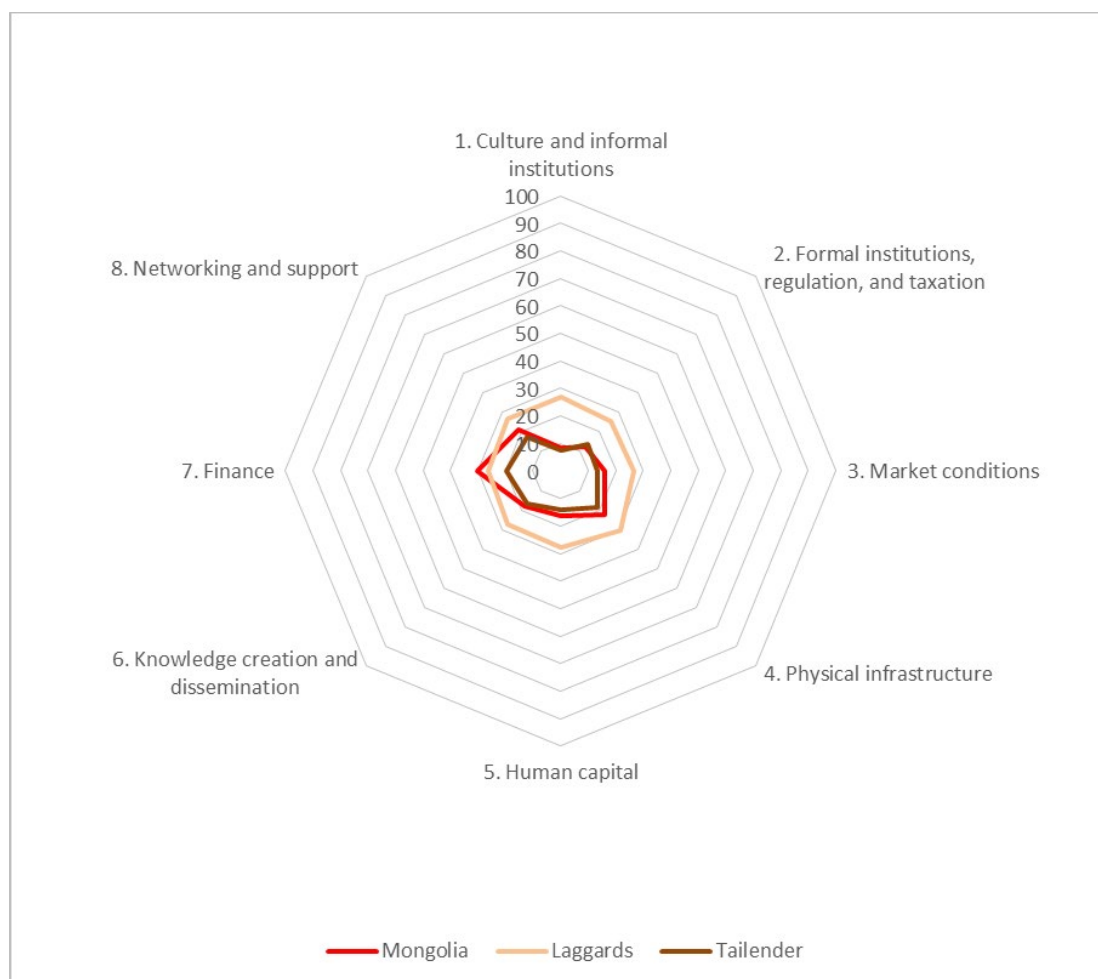
## Mongolia

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 3.3    |
| GDP per capita, PPP (current international \$) 2020 | 12 101 |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 84 (17.2) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 85 (17.1) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 77 (18.2) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 86 (16.4) |

**Figure 48: Mongolia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



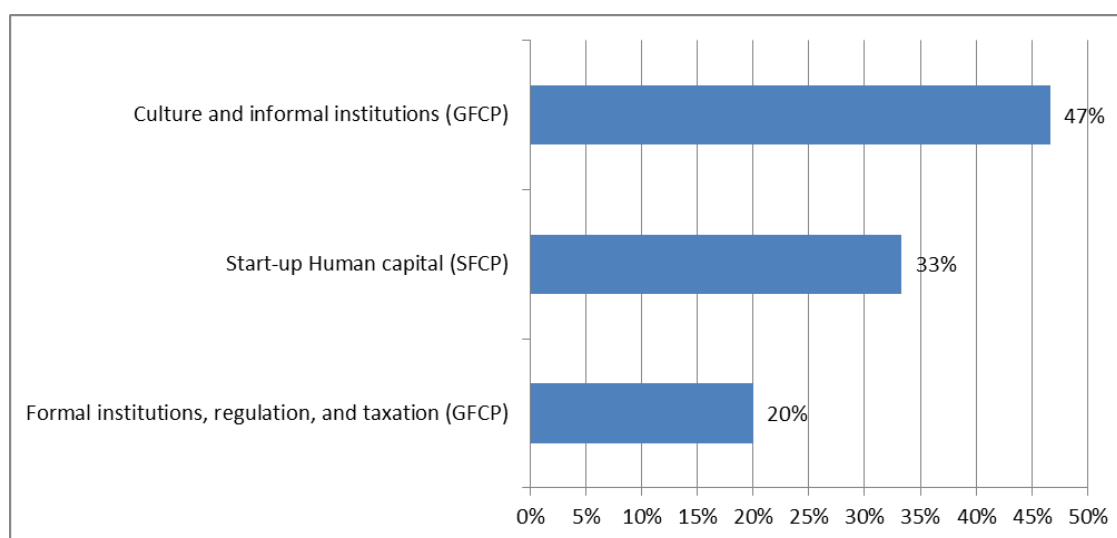
Weakest pillar Culture, informal institutions (8.4)  
 Strongest pillar Finance (30.2)  
 Source: Own calculations.

**Table 34: Mongolia's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Frame-work Conditions | Culture, informal institutions            | 8.4                    | 51.4              | 22.0          |
|                               | Formal institutions, regulation, taxation | 12.4                   | 50.8              | 34.6          |
|                               | Market conditions                         | 16.1                   | 44.5              | 38.8          |
|                               | Physical infrastructure                   | 22.4                   | 49.7              | 43.8          |
| Systemic Framework Conditions | Human capital                             | 16.1                   | 60.5              | 26.2          |
|                               | Knowledge creation and dissemination      | 18.2                   | 51.2              | 36.9          |
|                               | Finance                                   | 30.2                   | 51.8              | 54.7          |
|                               | Networking and support                    | 21.4                   | 57.2              | 37.5          |
| <b>Aides Score</b>            |   | <b>17.2</b>            | <b>52.1</b>       | <b>36.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 17.1                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 18.2                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 16.4                   |                   |               |

Source: Own calculations.

**Figure 49: Mongolia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 15.0

Source: Own calculations.

## Malaysia

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 32.8   |
| GDP per capita, PPP (current international \$) 2020 | 27 887 |

Country group Catchers-up

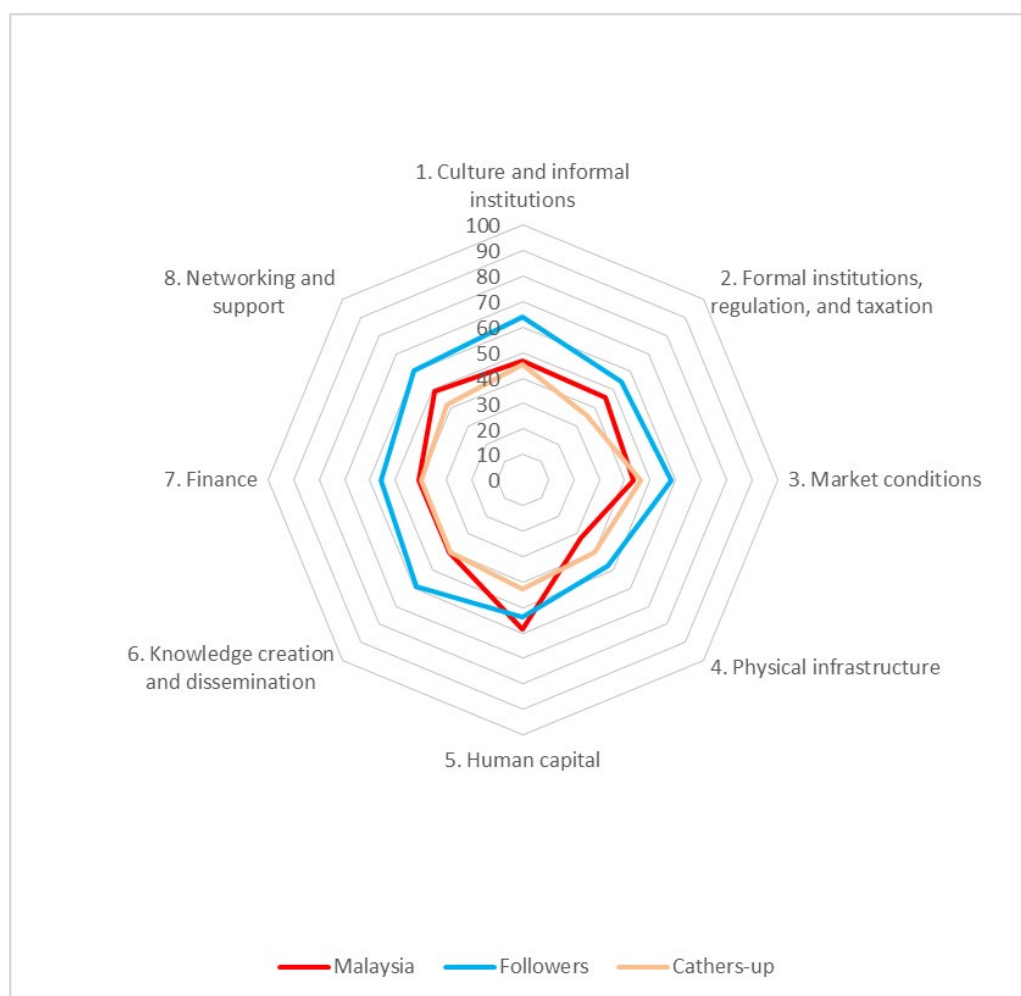
AIDES rank (score) 27 (43.1)

Digital Entrepreneurship Stand-up sub-index rank (score) 28 (43.1)

Digital Entrepreneurship Start-up sub-index rank (score) 29 (41.7)

Digital Entrepreneurship Scale-up sub-index rank (score) 26 (44.3)

**Figure 50: Malaysia's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Physical infrastructure (32.2)

Strongest pillar

Human capital (58.5)

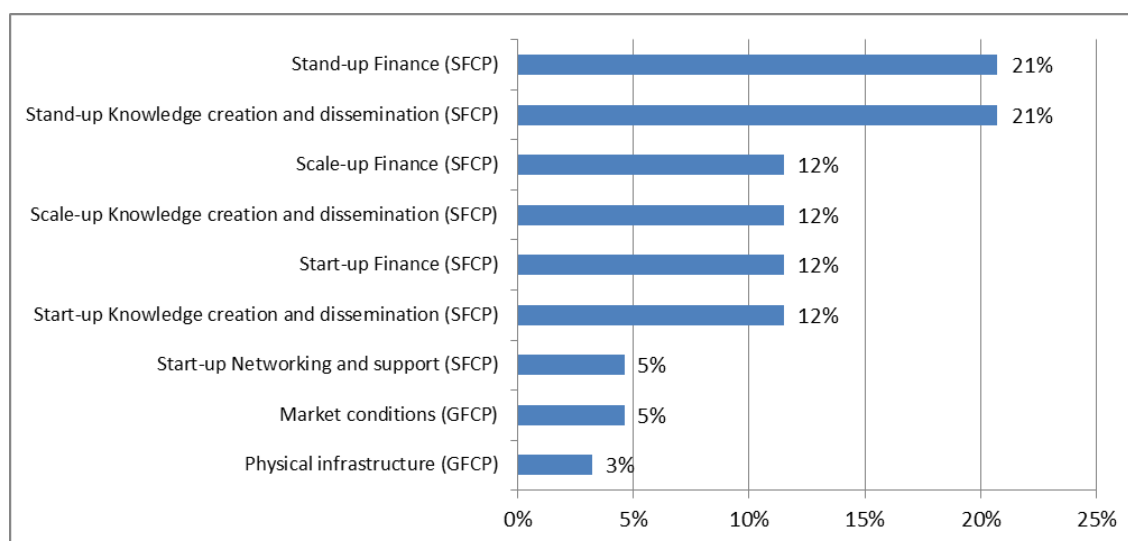
Source: Own calculations.

**Table 35: Malaysia's Asian Index of Digital Entrepreneurship System Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 46.7                   | 86.1              | 55.3          |
|                               | Formal institutions, regulation, taxation | 45.6                   | 82.9              | 50.7          |
|                               | Market conditions                         | 43.4                   | 84.2              | 56.3          |
|                               | Physical infrastructure                   | 32.2                   | 76.7              | 47.0          |
| Systemic Framework Conditions | Human capital                             | 58.5                   | 81.2              | 73.1          |
|                               | Knowledge creation and dissemination      | 40.5                   | 76.7              | 50.5          |
|                               | Finance                                   | 40.9                   | 80.4              | 52.0          |
|                               | Networking and support                    | 48.9                   | 74.8              | 59.5          |
| <b>Aides Score</b>            |   | <b>43.1</b>            | <b>80.4</b>       | <b>55.5</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 43.1                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 41.7                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 44.3                   |                   |               |

Source: Own calculations.

**Figure 51: Malaysia's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 43.4

Source: Own calculations.

## Nepal

|   |       |
|---|-------|
| Size of population 2021 (as of 1 July, in million)  | 29.7  |
| GDP per capita, PPP (current international \$) 2020 | 4 009 |

Country group Tailenders

|  |            |
|--|------------|
| AIDES rank (score)                                       | 104 (11.5) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 102 (11.8) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 104 (10.4) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 104 (12.2) |

**Figure 52: Nepal's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

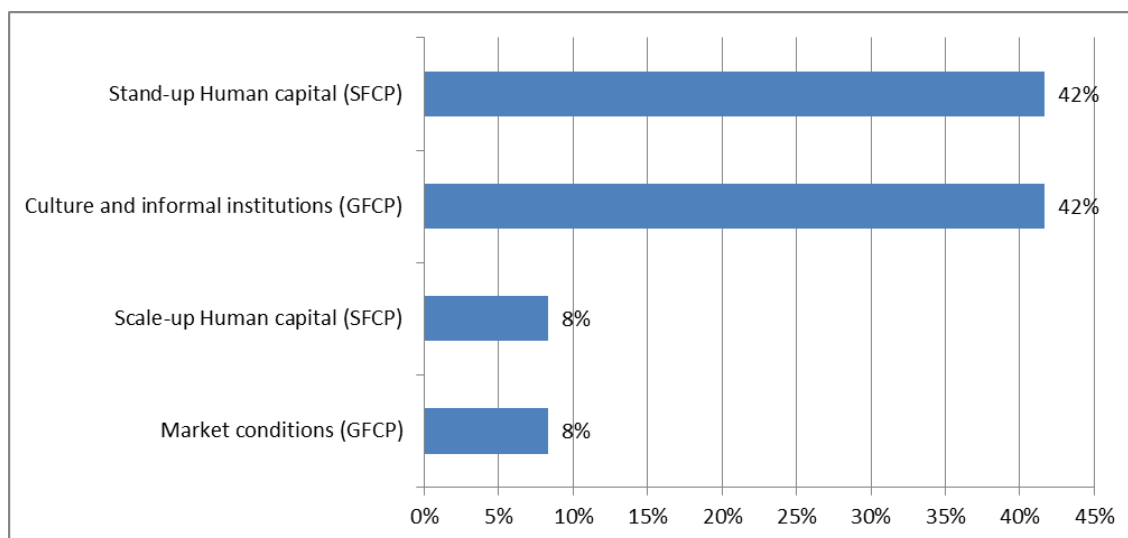
Culture, informal institutions (3.1)  
Physical infrastructure (22.7)

**Table 36: Nepal's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 3.1                    | 50.7              | 9.0           |
|                               | Formal institutions, regulation, taxation | 11.6                   | 48.7              | 34.7          |
|                               | Market conditions                         | 7.6                    | 39.7              | 23.5          |
|                               | Physical infrastructure                   | 22.7                   | 52.0              | 43.5          |
| Systemic Framework Conditions | Human capital                             | 7.4                    | 46.3              | 20.0          |
|                               | Knowledge creation and dissemination      | 17.5                   | 54.4              | 32.3          |
|                               | Finance                                   | 14.5                   | 65.8              | 23.5          |
|                               | Networking and support                    | 13.6                   | 53.7              | 28.7          |
| <b>Aides Score</b>            |   | <b>11.5</b>            | <b>51.4</b>       | <b>26.9</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 11.8                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 10.4                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 12.2                   |                   |               |

Source: Own calculations.

**Figure 53: Nepal's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population)

12.0

Source: Own calculations.

## Pakistan

Size of population 2021 (as of 1 July, in million) 225.2

GDP per capita, PPP (current international \$) 2020 4 877

Country group Tailenders

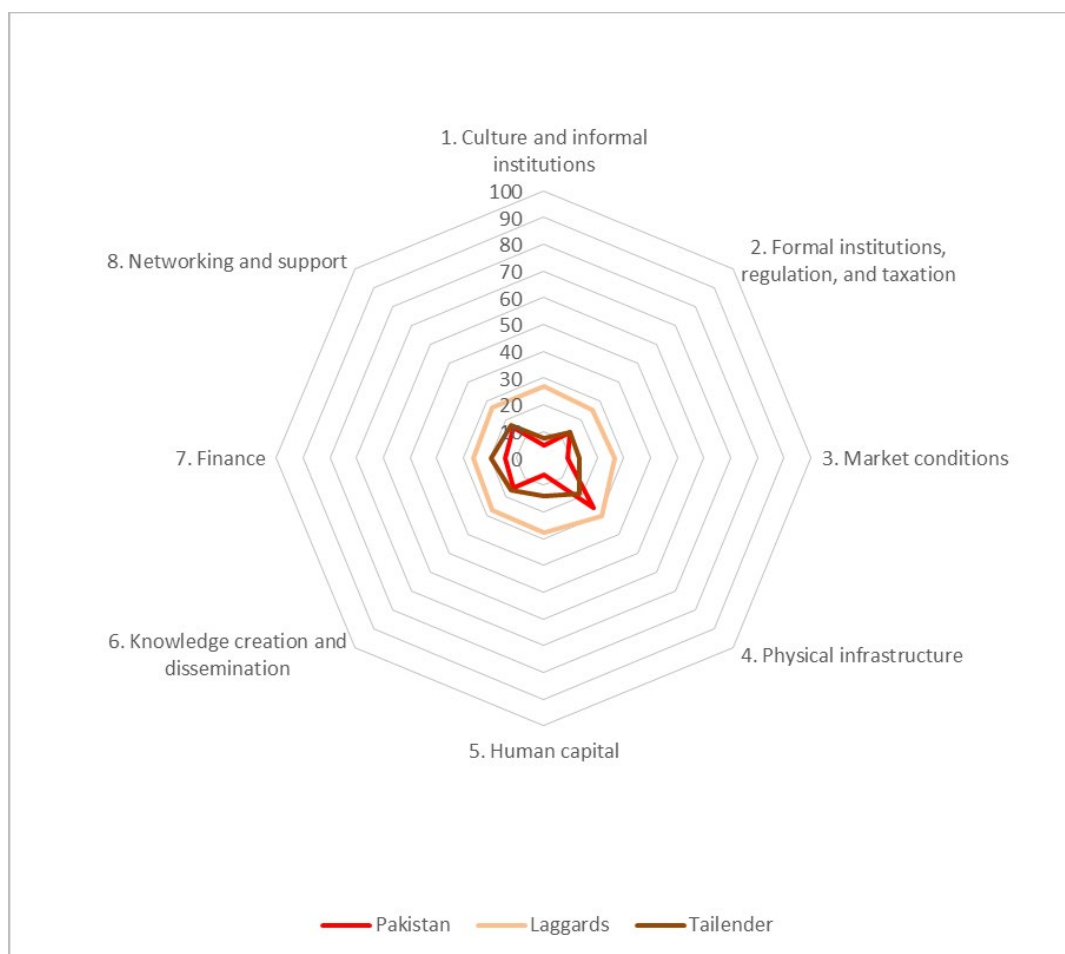
AIDES rank (score) 97 (12.3)

Digital Entrepreneurship Stand-up sub-index rank (score) 100 (12.0)

Digital Entrepreneurship Start-up sub-index rank (score) 97 (11.7)

Digital Entrepreneurship Scale-up sub-index rank (score) 96 (13.3)

**Figure 54: Pakistan's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

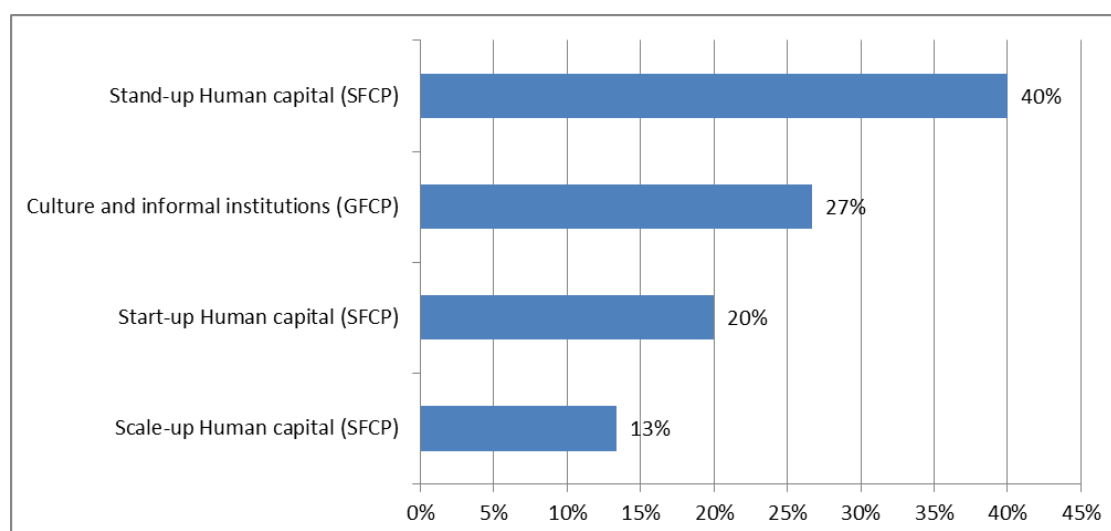
Culture, informal institutions (4.9)  
Physical infrastructure (26.5)

**Table 37: Pakistan's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 4.9                    | 57.0              | 11.9          |
|                               | Formal institutions, regulation, taxation | 13.9                   | 57.4              | 31.2          |
|                               | Market conditions                         | 9.1                    | 52.6              | 22.7          |
|                               | Physical infrastructure                   | 26.5                   | 53.6              | 47.8          |
| Systemic Framework Conditions | Human capital                             | 6.0                    | 41.1              | 19.2          |
|                               | Knowledge creation and dissemination      | 15.9                   | 55.4              | 28.4          |
|                               | Finance                                   | 14.2                   | 59.7              | 24.2          |
|                               | Networking and support                    | 16.0                   | 54.5              | 31.4          |
| <b>Aides Score</b>            |   | <b>12.3</b>            | <b>53.9</b>       | <b>27.1</b>   |
| <b>Sub-Index</b>              |   | <b>Sub-Index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 12.0                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 11.7                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 13.3                   |                   |               |

Source: Own calculations.

**Figure 55: Pakistan's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 15.0

Source: Own calculations.



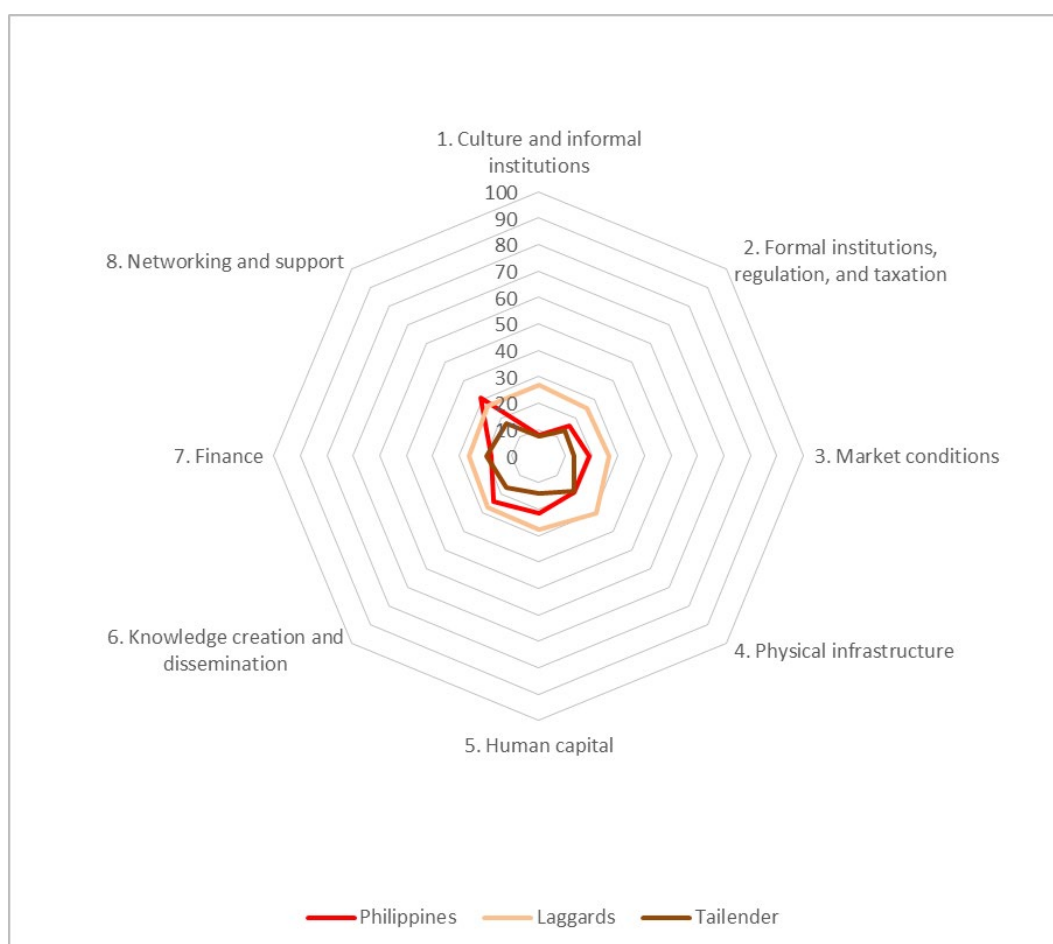
## Philippines

|   |       |
|---|-------|
| Size of population 2021 (as of 1 July, in million)  | 111.0 |
| GDP per capita, PPP (current international \$) 2020 | 8 390 |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 79 (18.5) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 79 (18.5) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 81 (16.9) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 76 (20.1) |

**Figure 56: Philippines's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar

Strongest pillar

Source: Own calculations.

Culture and informal institutions (8.0)

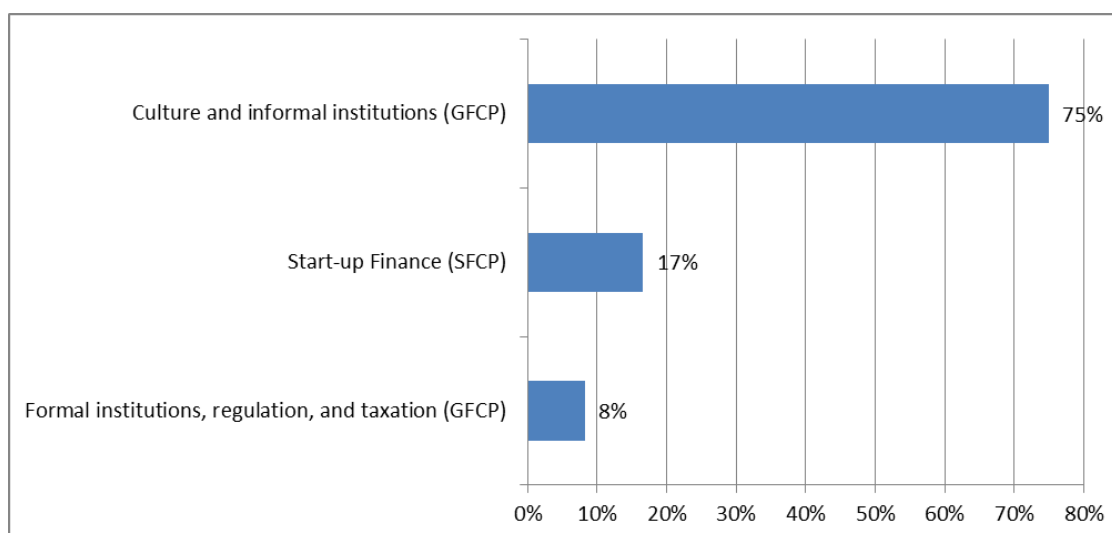
Networking and support (30.9)

**Table 38: Philippines's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score    | Non-digital Score | Digital Score |
|-------------------------------|---|-----------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 8.0             | 61.5              | 16.8          |
|                               | Formal institutions, regulation, taxation | 16.2            | 55.6              | 37.9          |
|                               | Market conditions                         | 19.3            | 61.9              | 36.6          |
|                               | Physical infrastructure                   | 19.2            | 53.8              | 38.0          |
| Systemic Framework Conditions | Human capital                             | 21.5            | 62.7              | 36.6          |
|                               | Knowledge creation and dissemination      | 24.4            | 64.0              | 37.3          |
|                               | Finance                                   | 18.0            | 66.2              | 28.2          |
|                               | Networking and support                    | 30.9            | 63.8              | 47.8          |
| Aides Score                   |   | 18.5            | 61.2              | 34.9          |
| Sub-index                     |   | Sub-index Score |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 18.5            |                   |               |
|                               | Digital Entrepreneurship Start-up         | 16.9            |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 20.1            |                   |               |

Source: Own calculations.

**Figure 57: Philippines's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



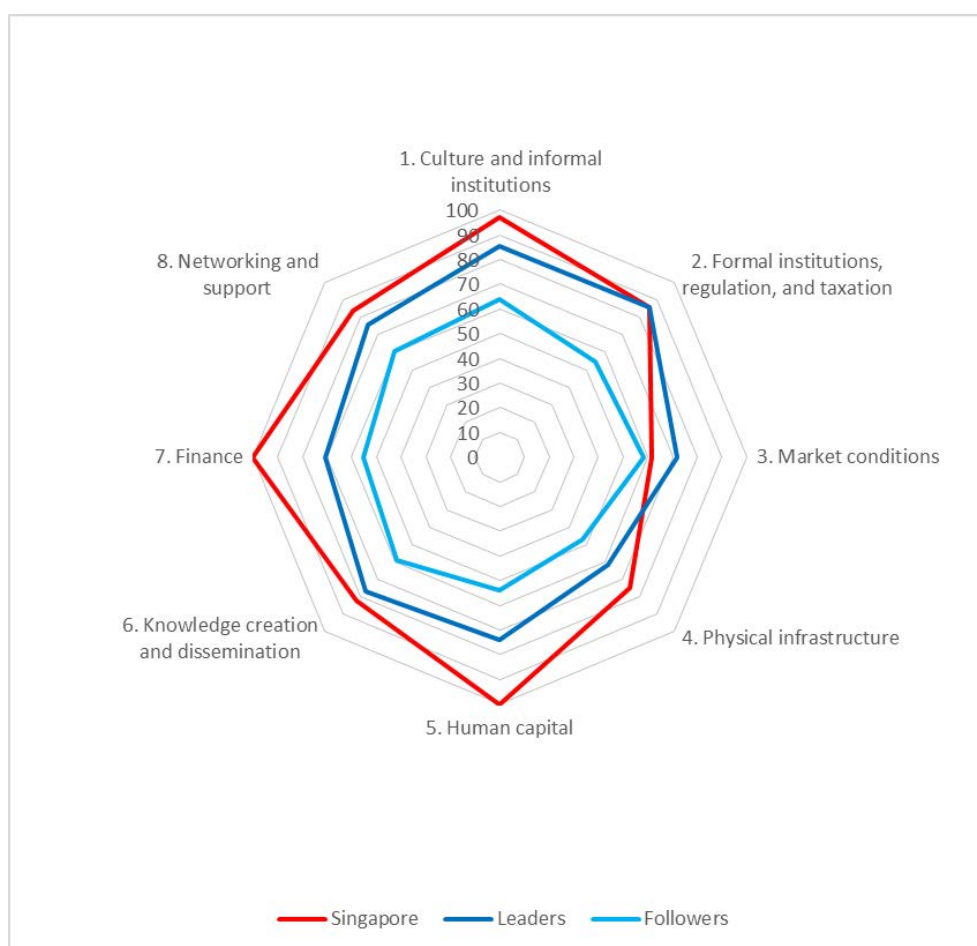
Sum of additional resources for 10% AIDES score increase (in unit per population) 12.0

Source: Own calculations.

## Singapore

|  |          |
|--|----------|
| Size of population 2021 (as of 1 July, in million)       | 5.9      |
| GDP per capita, PPP (current international \$) 2020      | 98 526   |
| Country group  | Leaders  |
| AIDES rank (score)                                       | 1 (81.3) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 2 (79.8) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 1 (83.6) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 1 (80.4) |

**Figure 58: Singapore's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

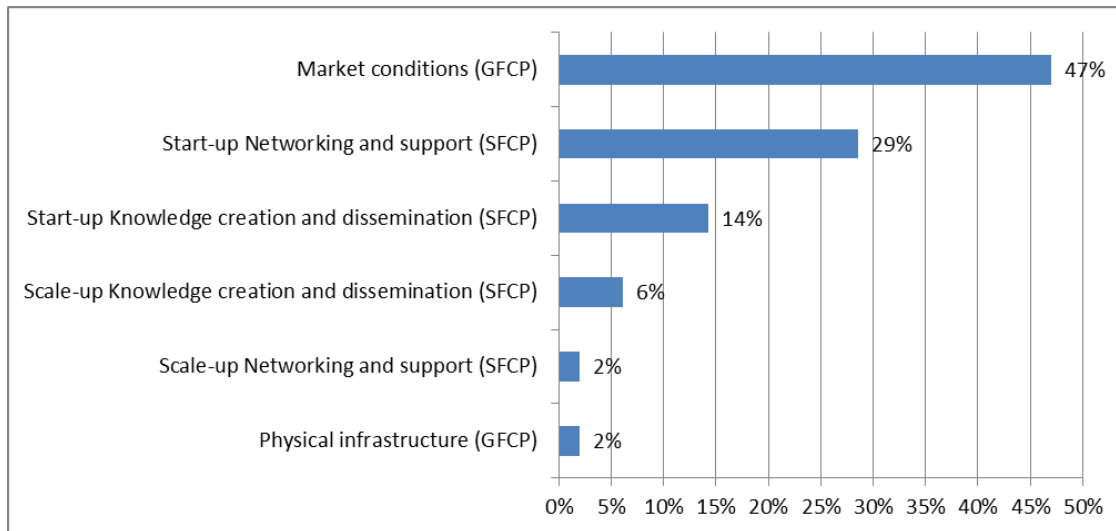
Market conditions (61.6)  
Human capital / Finance (100.0)

**Table 39: Singapore's Asian Index of Digital Entrepreneurship Systems component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 97.2                   | 100.0             | 89.5          |
|                               | Formal institutions, regulation, taxation | 85.7                   | 100.0             | 66.3          |
|                               | Market conditions                         | 61.6                   | 97.5              | 67.2          |
|                               | Physical infrastructure                   | 74.8                   | 100.0             | 76.2          |
| Systemic Framework Conditions | Human capital                             | 100.0                  | 99.8              | 100.0         |
|                               | Knowledge creation and dissemination      | 82.0                   | 93.9              | 82.3          |
|                               | Finance                                   | 100.0                  | 100.0             | 100.0         |
|                               | Networking and support                    | 83.8                   | 96.4              | 80.3          |
| <b>Aides Score</b>            |   | <b>81.3</b>            | <b>98.5</b>       | <b>82.7</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 79.8                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 83.6                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 80.4                   |                   |               |

Source: Own calculations.

**Figure 59: Singapore's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 49.0

Source: Own calculations.

## Sweden

|  |          |
|--|----------|
| Size of population 2021 (as of 1 July, in million)       | 10.2     |
| GDP per capita, PPP (current international \$) 2020      | 54 563   |
| Country group  | Leaders  |
| AIDES rank (score)                                       | 3 (79.6) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 4 (78.3) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 2 (82.3) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 3 (78.2) |

**Figure 60: Sweden's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

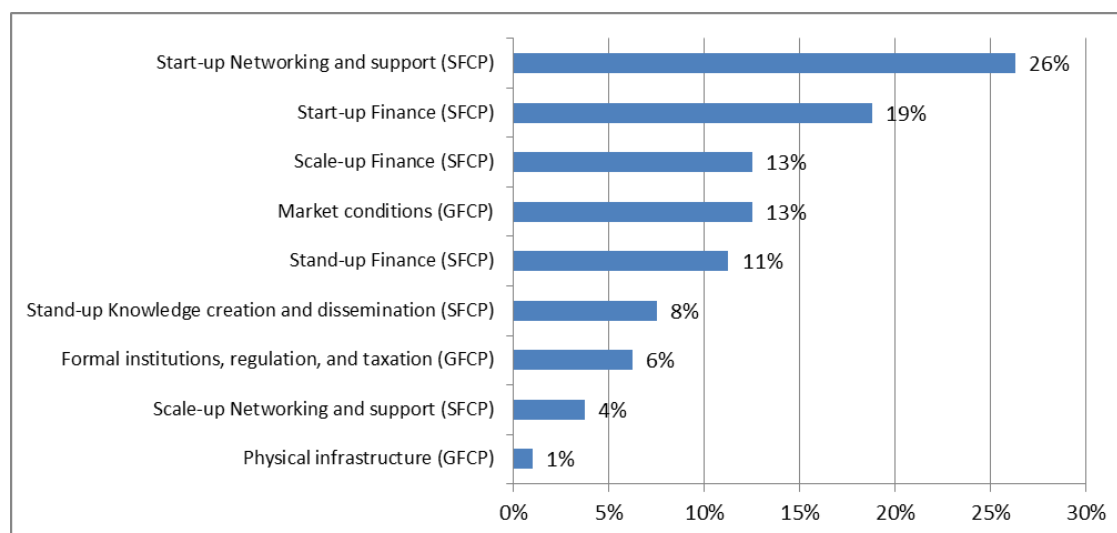
Finance (74.1)  
Culture and informal infrastructure (100.0)

**Table 40: Sweden's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 100.0                  | 96.5              | 95.9          |
|                               | Formal institutions, regulation, taxation | 79.1                   | 81.0              | 87.5          |
|                               | Market conditions                         | 74.9                   | 87.7              | 83.1          |
|                               | Physical infrastructure                   | 76.0                   | 80.2              | 84.7          |
| Systemic Framework Conditions | Human capital                             | 88.6                   | 91.7              | 98.3          |
|                               | Knowledge creation and dissemination      | 89.1                   | 89.0              | 98.6          |
|                               | Finance                                   | 74.1                   | 92.8              | 80.0          |
|                               | Networking and support                    | 81.6                   | 100.0             | 75.8          |
| <b>Aides Score</b>            |   | <b>79.6</b>            | <b>89.9</b>       | <b>88.0</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 78.3                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 82.3                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 78.2                   |                   |               |

Source: Own calculations.

**Figure 61: Sweden's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



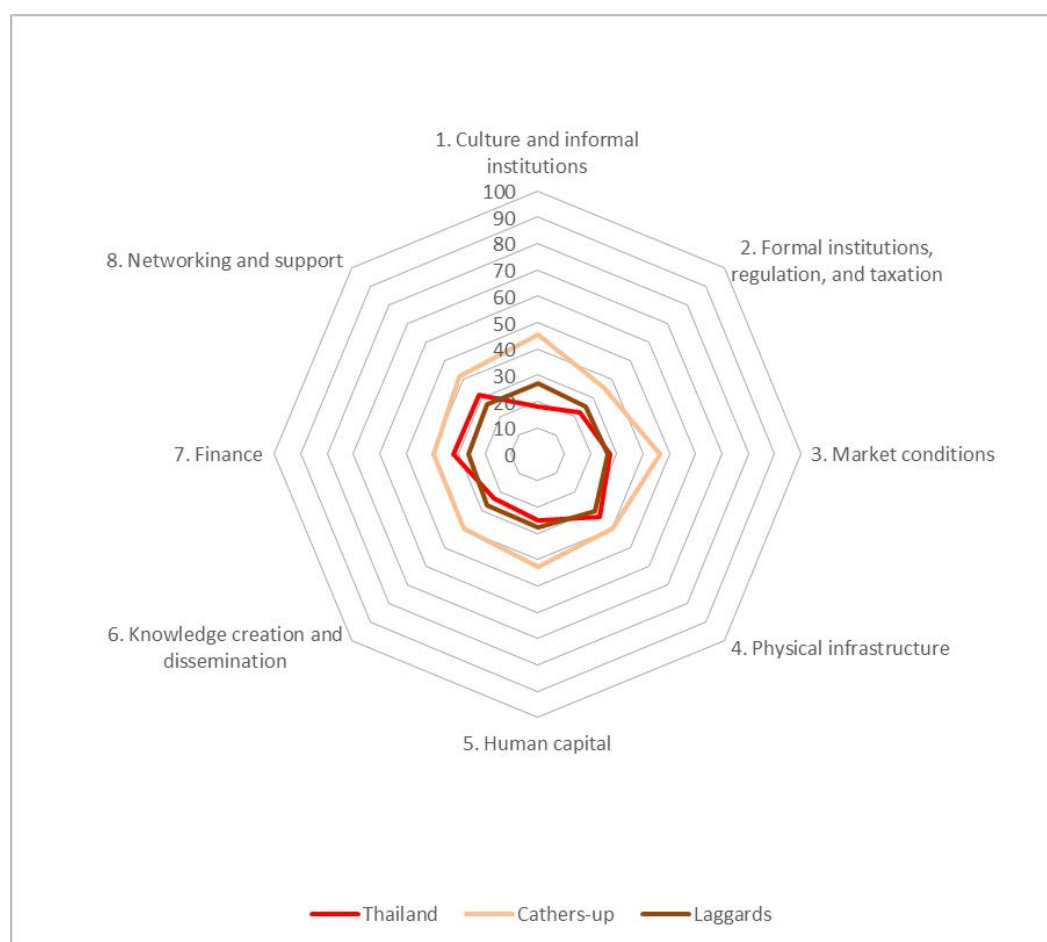
Sum of additional resources for 10% AIDES score increase (in unit per population) 79.8

Source: Own calculations.

## Thailand

|  |           |
|--|-----------|
| Size of population 2021 (as of 1 July, in million)       | 70.0      |
| GDP per capita, PPP (current international \$) 2020      | 18 236    |
| Country group  | Laggards  |
| AIDES rank (score)                                       | 59 (25.9) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 55 (25.9) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 59 (24.4) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 54 (27.3) |

**Figure 62: Thailand's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

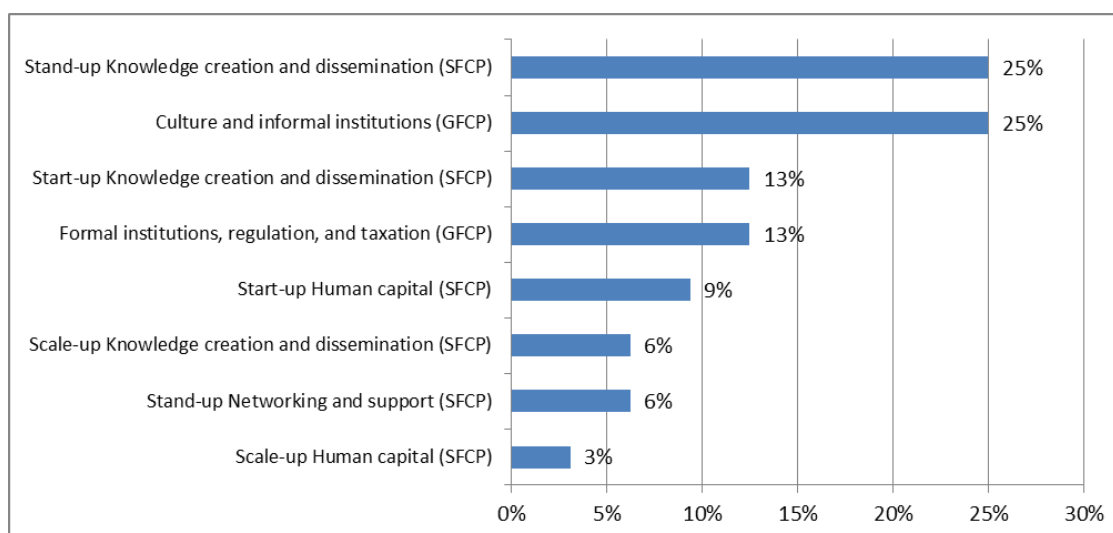
Culture and informal infrastructure (18.3)  
Physical infrastructure (33.4)

**Table 41: Thailand's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 18.3                   | 66.7              | 32.3          |
|                               | Formal institutions, regulation, taxation | 22.4                   | 62.4              | 42.2          |
|                               | Market conditions                         | 27.5                   | 67.4              | 45.5          |
|                               | Physical infrastructure                   | 33.4                   | 70.2              | 50.1          |
| Systemic Framework Conditions | Human capital                             | 25.0                   | 65.2              | 40.0          |
|                               | Knowledge creation and dissemination      | 23.8                   | 63.1              | 36.8          |
|                               | Finance                                   | 32.2                   | 78.1              | 42.9          |
|                               | Networking and support                    | 31.5                   | 62.8              | 50.0          |
| <b>Aides Score</b>            |   | <b>25.9</b>            | <b>67.0</b>       | <b>42.5</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 25.9                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 24.4                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 27.3                   |                   |               |

Source: Own calculations.

**Figure 63: Thailand's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 32.0

Source: Own calculations.



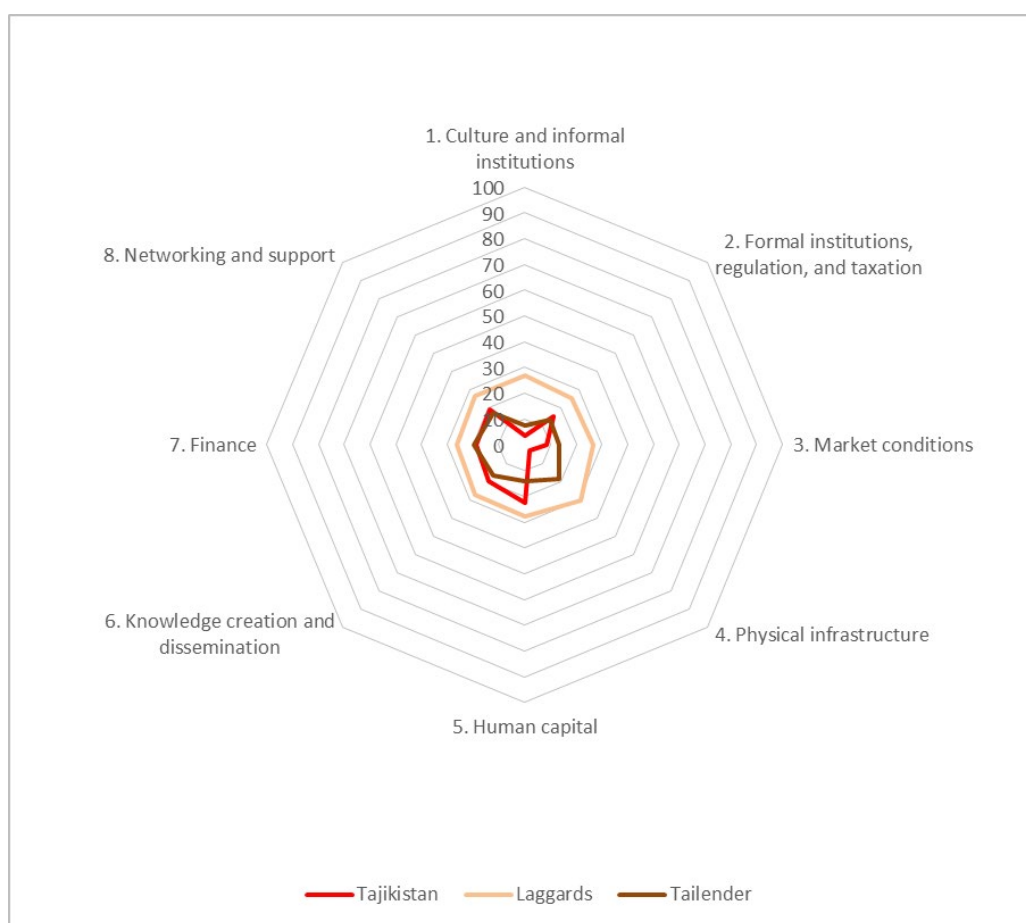
## Tajikistan

|   |       |
|---|-------|
| Size of population 2021 (as of 1 July, in million)  | 9.7   |
| GDP per capita, PPP (current international \$) 2020 | 3 858 |

Country group Tailenders

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 95 (12.8) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 95 (13.2) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 95 (12.4) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 99 (12.8) |

**Figure 64: Tajikistan's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

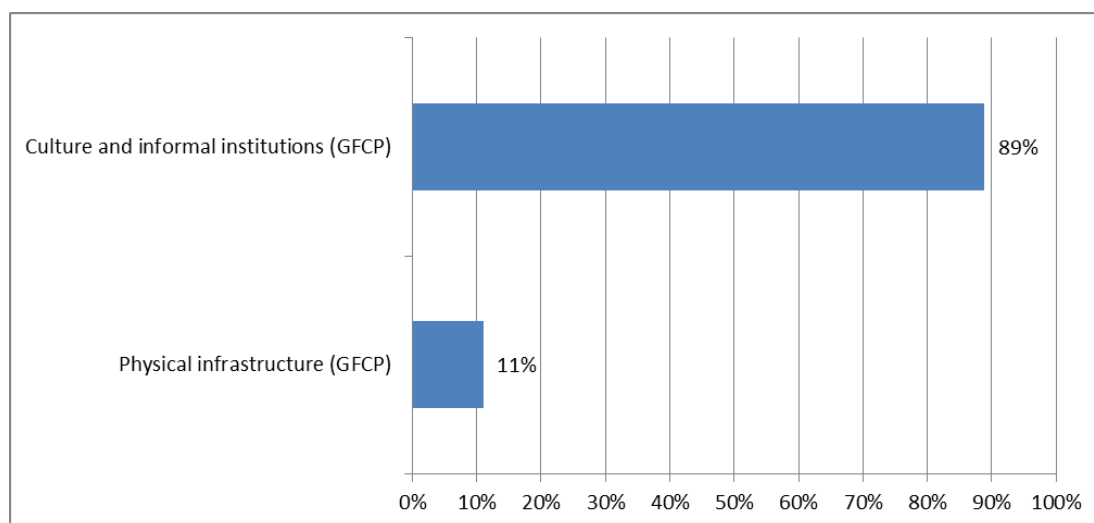
Physical infrastructure (2.9)  
Human capital (22.7)

**Table 42: Tajikistan's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 3.7                    | 56.3              | 9.3           |
|                               | Formal institutions, regulation, taxation | 15.6                   | 57.6              | 34.5          |
|                               | Market conditions                         | 8.5                    | 42.6              | 24.6          |
|                               | Physical infrastructure                   | 2.9                    | 53.5              | 10.0          |
| Systemic Framework Conditions | Human capital                             | 22.7                   | 57.7              | 42.5          |
|                               | Knowledge creation and dissemination      | 19.7                   | 56.9              | 34.9          |
|                               | Finance                                   | 18.6                   | 54.1              | 33.6          |
|                               | Networking and support                    | 19.4                   | 53.8              | 40.8          |
| <b>Aides Score</b>            |   | <b>12.8</b>            | <b>54.1</b>       | <b>28.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 13.2                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 12.4                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 12.8                   |                   |               |

Source: Own calculations.

**Figure 65: Tajikistan's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population)

4.5

Source: Own calculations.

## United States

|   |        |
|---|--------|
| Size of population 2021 (as of 1 July, in million)  | 332.9  |
| GDP per capita, PPP (current international \$) 2020 | 63 544 |

Country group Leaders

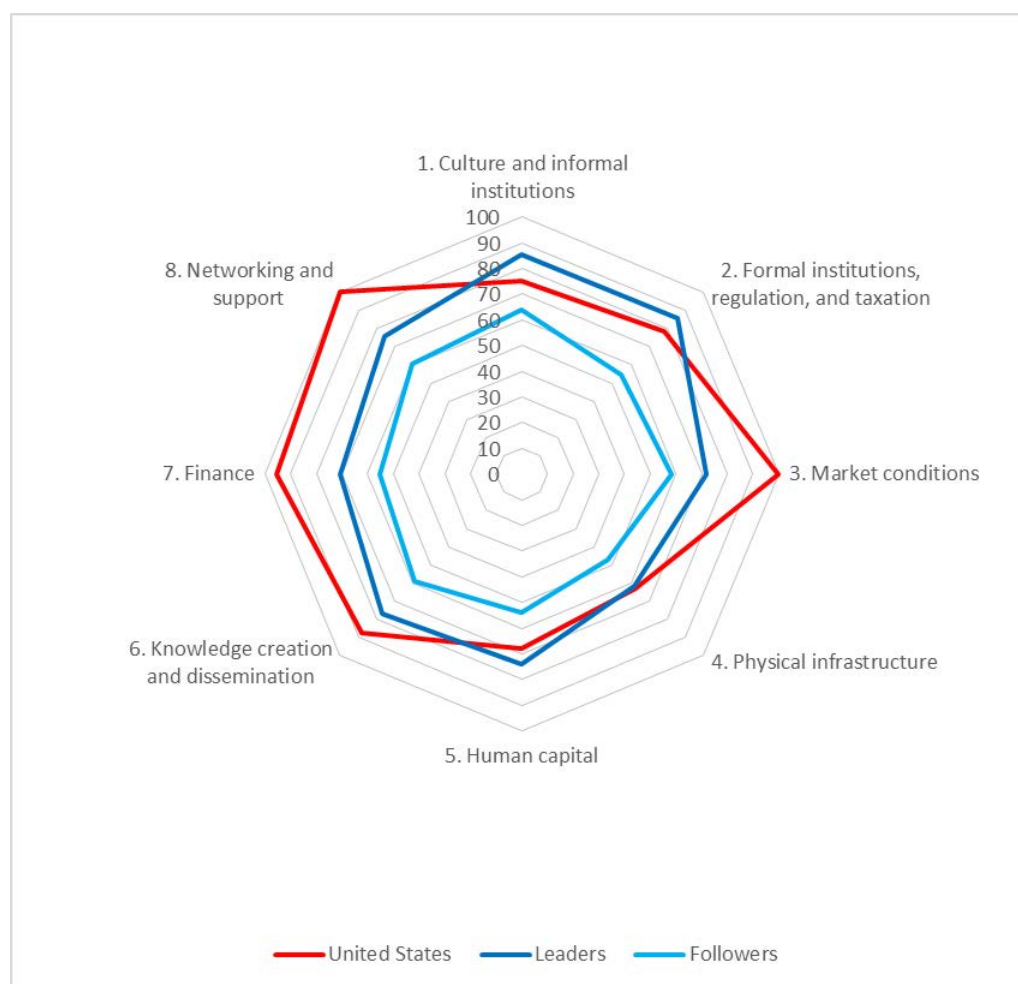
AIDES rank (score) 2 (79.7)

Digital Entrepreneurship Stand-up sub-index rank (score) 1 (79.9)

Digital Entrepreneurship Start-up sub-index rank (score) 4 (79.3)

Digital Entrepreneurship Scale-up sub-index rank (score) 2 (79.7)

**Figure 66: United States' Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

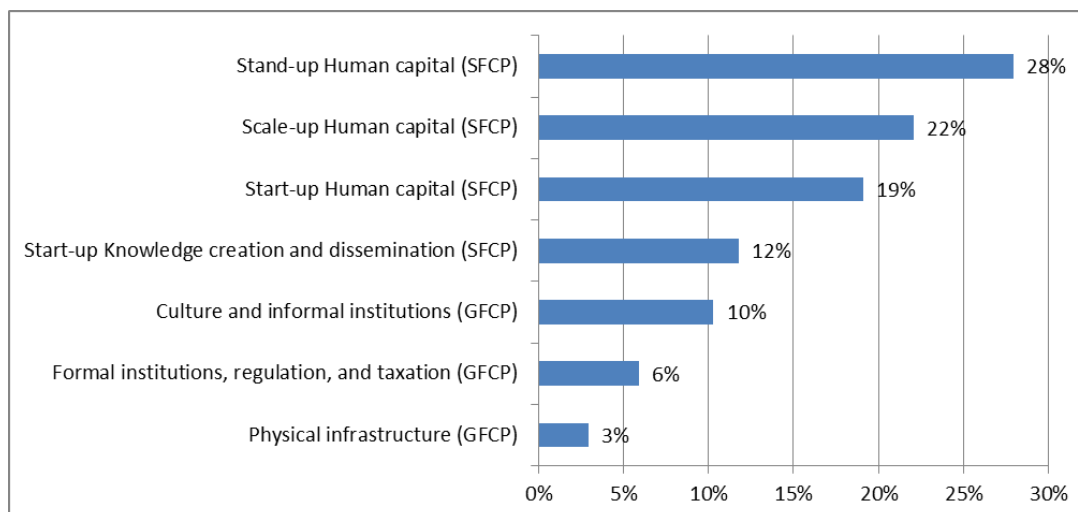
Physical infrastructure (62.9)  
Market conditions / Networking and support (100.0)

**Table 43: United States' Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Frame-work Conditions | Culture, informal institutions            | 75.1                   | 91.6              | 78.9          |
|                               | Formal institutions, regulation, taxation | 78.7                   | 81.9              | 85.4          |
|                               | Market conditions                         | 100.0                  | 96.1              | 97.9          |
|                               | Physical infrastructure                   | 62.9                   | 89.0              | 70.8          |
| Systemic Framework Conditions | Human capital                             | 67.7                   | 92.3              | 72.1          |
|                               | Knowledge creation and dissemination      | 87.8                   | 100.0             | 81.0          |
|                               | Finance                                   | 95.7                   | 98.3              | 96.4          |
|                               | Networking and support                    | 100.0                  | 91.0              | 100.0         |
| <b>Aides Score</b>            |   | <b>79.7</b>            | <b>92.5</b>       | <b>85.3</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 79.9                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 79.3                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 79.7                   |                   |               |

Source: Own calculations.

**Figure 67: United States' Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 68.0

Source: Own calculations.

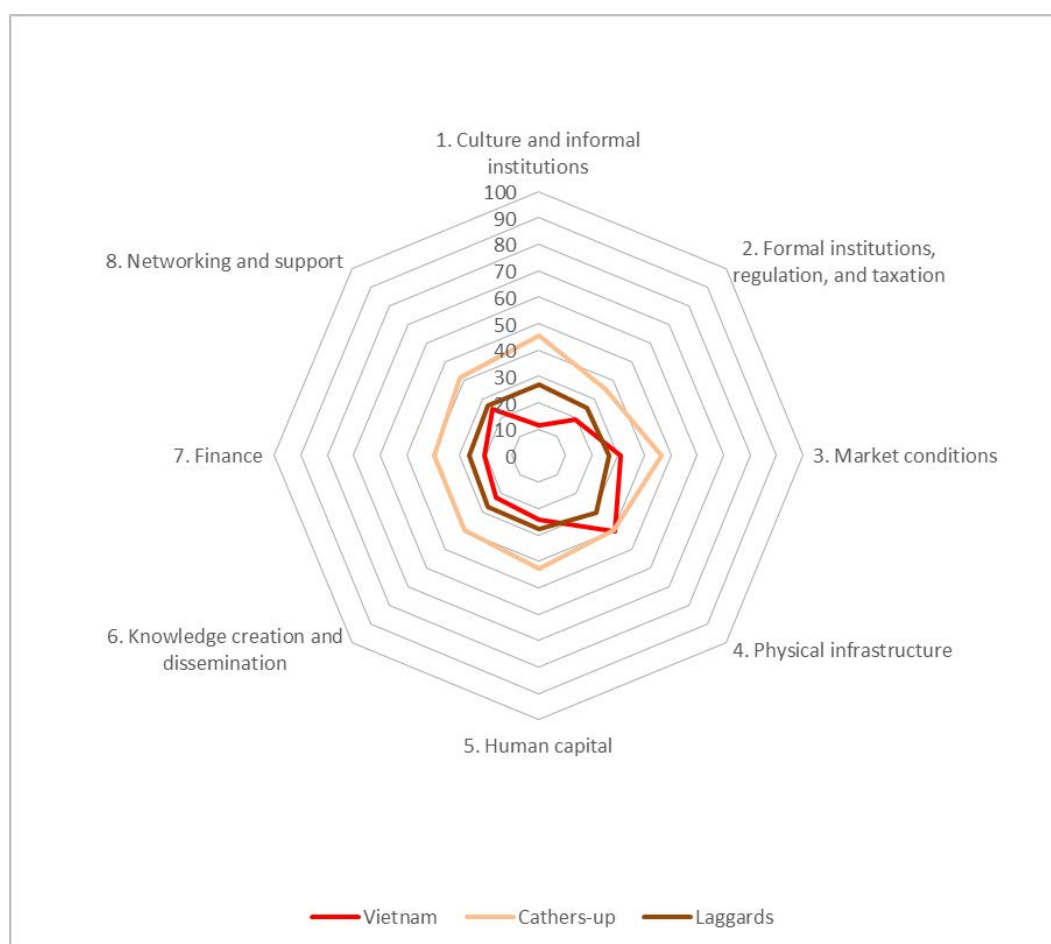
## Viet Nam

|   |       |
|---|-------|
| Size of population 2021 (as of 1 July, in million)  | 98.2  |
| GDP per capita, PPP (current international \$) 2020 | 8 651 |

Country group Laggards

|  |           |
|--|-----------|
| AIDES rank (score)                                       | 63 (23.1) |
| Digital Entrepreneurship Stand-up sub-index rank (score) | 63 (22.9) |
| Digital Entrepreneurship Start-up sub-index rank (score) | 65 (21.8) |
| Digital Entrepreneurship Scale-up sub-index rank (score) | 63 (24.5) |

**Figure 68: Viet Nam's Position in the Eight Asian Index of Digital Entrepreneurship Systems Pillars**



Weakest pillar  
Strongest pillar  
Source: Own calculations.

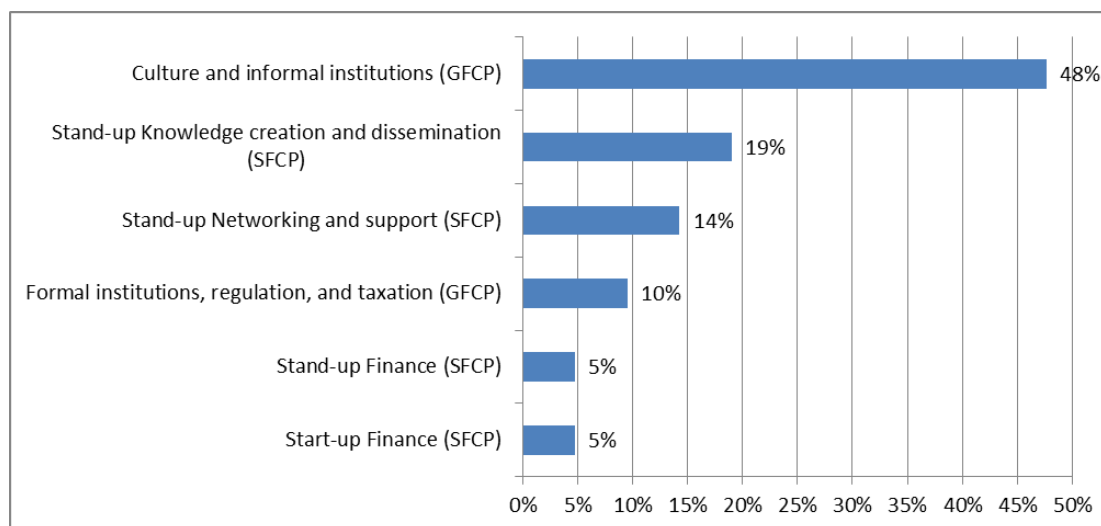
Culture and informal infrastructure (11.6)  
Physical infrastructure (40.8)

**Table 44: Viet Nam's Asian Index of Digital Entrepreneurship Systems Component Values**

|                               | Category                                  | Pillar Score           | Non-digital Score | Digital Score |
|-------------------------------|---|------------------------|-------------------|---------------|
| General Framework Conditions  | Culture, informal institutions            | 11.6                   | 52.3              | 28.9          |
|                               | Formal institutions, regulation, taxation | 19.5                   | 62.6              | 36.9          |
|                               | Market conditions                         | 31.2                   | 57.1              | 55.2          |
|                               | Physical infrastructure                   | 40.8                   | 64.7              | 59.8          |
| Systemic Framework Conditions | Human capital                             | 24.4                   | 57.7              | 46.2          |
|                               | Knowledge creation and dissemination      | 22.7                   | 58.7              | 38.7          |
|                               | Finance                                   | 20.7                   | 67.9              | 31.8          |
|                               | Networking and support                    | 24.9                   | 57.9              | 45.1          |
| <b>Aides Score</b>            |   | <b>23.1</b>            | <b>59.8</b>       | <b>42.8</b>   |
| <b>Sub-index</b>              |   | <b>Sub-index Score</b> |                   |               |
| Sub-indices                   | Digital Entrepreneurship Stand-up         | 22.9                   |                   |               |
|                               | Digital Entrepreneurship Start-up         | 21.8                   |                   |               |
|                               | Digital Entrepreneurship Scale-up         | 24.5                   |                   |               |

Source: Own calculations.

**Figure 69: Viet Nam's Policy Optimization Simulation: The Allocation of Additional Resources among the Pillars to Reach a 10% Increase in Asian Index of Digital Entrepreneurship Systems Score**



Sum of additional resources for 10% AIDES score increase (in unit per population) 21.0

Source: Own calculations.

## APPENDIXES

### APPENDIX 1: CALCULATION OF THE ASIAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS SCORES

In constructing the Asian Index of Digital Entrepreneurship Systems (AIDES), we followed 11 steps:

(i) **Normalization of indicators**, Altogether we have selected 103 indicators. Out of these, there are 18 general framework entrepreneurship, 32 systemic framework entrepreneurship, 24 general framework digital indicators, and 29 systemic framework digital indicators. First, we normalized all the indicators using the distance methodology:

$$x_{i,k} = \frac{z_{i,j}}{\max z_{i,j}} \quad (1)$$

for all  $i = 1 \dots 113$ , the number of countries

$j = 1 \dots 103$ , the number of indicators

where  $x_{i,j}$  is the normalized indicator score value for country  $i$  and indicator  $j$

$z_{i,j}$  is the original indicator value for country  $i$  and indicator  $j$

(ii) **Construction of the variables**, We calculate all variables from the indicators by calculating the simple arithmetic averages. Altogether we have 24 variables, 16 entrepreneurship and eight digital variables.

The four general framework entrepreneurship variables are calculated as follows:

$$GFC\_P1_i = \frac{\sum_1^6 x_{i,j}}{6} \quad (2a)$$

$$GFC\_P2_i = \frac{\sum_7^{11} x_{i,j}}{7} \quad (2b)$$

$$GFC\_P3_i = \frac{\sum_{12}^{16} x_{i,j}}{7} \quad (2c)$$

$$GFC\_P4_i = \frac{\sum_{17}^{18} x_{i,j}}{3} \quad (2d)$$

for all countries  $i$

GFC\_P1= Culture and Informal Institution entrepreneurship

GFC\_P2= Formal Institutions and Regulatory Framework entrepreneurship

GFC\_P3= Market Conditions entrepreneurship

GFC\_P4= Physical Infrastructure entrepreneurship

The systemic entrepreneurship variables are calculated independently for the three stages.

$$S1\_SEC\_P1_i = \frac{\sum_{19}^{20} x_{ij}}{2} \quad (2e)$$

$$S2\_SEC\_P1_i = \frac{\sum_{21}^{24} x_{ij}}{4} \quad (2f)$$

$$S3\_SEC\_P1_i = \frac{\sum_{25}^{27} x_{ij}}{4} \quad (2g)$$

S1\_SEC\_P1= Human Capital entrepreneurship Stand-up

S2\_SEC\_P1= Human Capital entrepreneurship Start-up

S3\_SEC\_P1= Human Capital entrepreneurship Scale-up

$$S1\_SEC\_P2_i = \frac{\sum_{28}^{30} x_{ij}}{2} \quad (2h)$$

$$S2\_SEC\_P2_i = \frac{\sum_{31}^{33} x_{ij}}{2} \quad (2i)$$

$$S3\_SEC\_P2_i = \frac{\sum_{34}^{37} x_{ij}}{7} \quad (2j)$$

S1\_SEC\_P2= Knowledge creation, transfer and absorption entrepreneurship Stand-up

S2\_SEC\_P2= Knowledge creation, transfer and absorption entrepreneurship Start-up

S3\_SEC\_P2= Knowledge creation, transfer and absorption entrepreneurship Scale-up

$$S1\_SEC\_P3_i = \frac{\sum_{38}^{39} x_{ij}}{2} \quad (2k)$$

$$S2\_SEC\_P3_i = \frac{\sum_{40}^{42} x_{ij}}{6} \quad (2l)$$

$$S3\_SEC\_P3_i = \frac{\sum_{43}^{44} x_{ij}}{4} \quad (2m)$$

S1\_SEC\_P3= Finance entrepreneurship Stand-up

S2\_SEC\_P3= Finance entrepreneurship Start-up

S3\_SEC\_P3= Finance entrepreneurship Scale-up

$$S1\_SEC\_P4_i = \frac{\sum_{45}^{45} x_{ij}}{1} \quad (2n)$$

$$S2\_SEC\_P4_i = \frac{\sum_{46}^{47} x_{ij}}{2} \quad (2o)$$

$$S3\_SEC\_P4_i = \frac{\sum_{48}^{50} x_{ij}}{3} \quad (2p)$$

S1\_SEC\_P4= Networking and support entrepreneurship Stand-up



S2\_SEC\_P4= Networking and support entrepreneurship Start-up

S3\_SEC\_P4= Networking and support entrepreneurship Scale-up

The calculation of the digital variables follows exactly the same logic.

The four general framework digital variables are calculated as follows:

$$DFC\_P1_i = \frac{\sum_{51}^{54} x_{i,j}}{4} \quad (2a)$$

$$DFC\_P2_i = \frac{\sum_{55}^{60} x_{i,j}}{6} \quad (2b)$$

$$DFC\_P3_i = \frac{\sum_{61}^{66} x_{i,j}}{7} \quad (2c)$$

$$DFC\_P4_i = \frac{\sum_{67}^{74} x_{i,j}}{9} \quad (2d)$$

for all countries

DFC\_P1= Culture and Informal Institution digital

DFC\_P2= Formal Institutions and Regulatory Framework digital

DFC\_P3= Market Conditions digital

DFC\_P4= Physical Infrastructure digital

The systemic digital variables are also calculated independently for the three stages.

$$S1\_SDC\_P1_i = \frac{\sum_{75}^{76} x_{i,j}}{3} \quad (2e)$$

$$S2\_SDC\_P1_i = \frac{\sum_{77}^{77} x_{i,j}}{1} \quad (2f)$$

$$S3\_SDC\_P1_i = \frac{\sum_{78}^{78} x_{i,j}}{2} \quad (2g)$$

S1\_SDC\_P1= Human Capital digital Stand-up

S2\_SDC\_P1= Human Capital digital Start-up

S3\_SDC\_P1= Human Capital digital Scale-up

$$S1\_SDC\_P2_i = \frac{\sum_{79}^{83} x_{i,j}}{3} \quad (2h)$$

$$S2\_SDC\_P2_i = \frac{\sum_{84}^{85} x_{i,j}}{2} \quad (2i)$$

$$S3\_SDC\_P2_i = \frac{\sum_{86}^{89} x_{i,j}}{2} \quad (2j)$$

S1\_SDC\_P2= Knowledge creation, transfer and absorption digital Stand-up

S2\_SDC\_P2= Knowledge creation, transfer and absorption digital Start-up

S3\_SDC\_P2= Knowledge creation, transfer and absorption digital Scale-up

$$S1\_SDC\_P3_i = \frac{\sum_{90}^{92} x_{i,j}}{3} \quad (2k)$$

$$S2\_SDC\_P3_i = \frac{\sum_{93}^{93} x_{i,j}}{1} \quad (2l)$$

$$S3\_SDC\_P3_i = \frac{\sum_{94}^{94} x_{i,j}}{1} \quad (2m)$$

S1\_SDC\_P3= Finance digital Stand-up

S2\_SDC\_P3= Finance digital Start-up

S3\_SDC\_P3= Finance digital Scale-up

$$S1\_SDC\_P4_i = \frac{\sum_{95}^{98} x_{i,j}}{2} \quad (2n)$$

$$S2\_SDC\_P4_i = \frac{\sum_{99}^{100} x_{i,j}}{4} \quad (2o)$$

$$S3\_SDC\_P4_i = \frac{\sum_{101}^{103} x_{i,j}}{3} \quad (2p)$$

S1\_SDC\_P4= Networking and support digital Stand-up

S2\_SDC\_P4= Networking and support digital Start-up

S3\_SDC\_P4= Networking and support digital Scale-up

(iii) **Normalization of the variables.** Variables are normalized again to a range from 0 to 1:

$$m(norm)_{i,l} = \frac{m_{i,l}}{\max m_{i,l}} \quad (3)$$

for all  $l = 1 \dots 24$ , the number of variables

where  $m(norm)_{i,j}$  is the normalized score value for country  $i$  and variable  $j$

$m_{i,l}$  is the original pillar value for country  $i$  and variable  $l$

$\max m_{i,l}$  is the maximum value for variable  $l$

(iv) **Digital systemic variable calculation.** Our original idea was to match the entrepreneurship and the digital variables one by one. Unfortunately, some of the digital systemic variables contain, on a few or in three cases, only one indicator. Therefore, their reliability is not as high as

the systemic entrepreneurship component values. So we decided to calculate only one digital component for all four systemic digital variables.

$$SDC\_P1_i = \frac{\sum_{s=1}^3 S(s)\_SDC\_P1_{i,s}}{3} \quad (4a)$$

$$SDC\_P2_i = \frac{\sum_{s=1}^3 S(s)\_SDC\_P2_{i,s}}{3} \quad (4a)$$

$$SDC\_P3_i = \frac{\sum_{s=1}^3 S(s)\_SDC\_P3_{i,s}}{3} \quad (4a)$$

$$SDC\_P4_i = \frac{\sum_{s=1}^3 S(s)\_SDC\_P4_{i,s}}{3} \quad (4a)$$

where SDC\_P1, SDC\_P2, SDC\_P3, SDC\_P4 are the systemic digital variable for all country i and the S(s)\_SDC\_P1; S(s)\_SDC\_P2; S(s)\_SDC\_P3; S(s)\_SDC\_P4 are the systemic digital variables for stages s=1,2,3

(v) **Normalization of the digital systemic variables.** Similar to the previous cases, we calculate the normalized scores for the four digital systemic variables

$$m(norm)_{i,l} = \frac{m_{i,l}}{\max m_{i,l}} \quad (5)$$

for all l= 20 ... 24, the number of variables

where  $m(norm)_{i,l}$  is the normalized variable score value for country i and variable l

$m_{i,l}$  is the original digital variable value for country i and variable l

$\max m_{i,l}$  is the maximum value for variable l

(vi) **Pillar calculation.** There are altogether 16 pillars in the digital entrepreneurial ecosystem index. All 16 pillars are the result of the multiplication of the digital ecosystem variable and the associated digital variable.

For the general framework condition the digital entrepreneurship pillars are the followings:

$$GDFC\_P1_i = GFC\_P1_i * DFC\_P1_i \quad (6a)$$

$$GDFC\_P2_i = GFC\_P2_i * DFC\_P2_i \quad (6b)$$

$$GDFC\_P3_i = GFC\_P3_i * DFC\_P3_i \quad (6c)$$

$$GDFC\_P4_i = GFC\_P4_i * DFC\_P4_i \quad (6d)$$

where:

GDFC\_P1= Culture and Informal Institution digital entrepreneurship pillar

GDFC\_P2= Formal Institutions and Regulatory Framework digital entrepreneurship pillar

GDFC\_P3= Market Conditions digital entrepreneurship pillar

GDFC\_P4= Physical Infrastructure digital entrepreneurship pillar

For the systemic framework conditions the digital entrepreneurship pillars are calculated separately for all three stages.

For the Stand-up stage:

$$S1\_SDEC\_P1_i = S1\_SEC\_P1_i * SDC\_P1_i \quad (6e)$$

$$S1\_SDEC\_P2_i = S1\_SEC\_P2_i * SDC\_P2_i \quad (6f)$$

$$S1\_SDEC\_P3_i = S1\_SEC\_P3_i * SDC\_P3_i \quad (6g)$$

$$S1\_SDEC\_P4_i = S1\_SEC\_P4_i * SDC\_P4_i \quad (6h)$$

where:

S1\_SDEC\_P1= Human capital Stand-up digital entrepreneurship pillar

S1\_SDEC\_P2= Knowledge creation, transfer and absorption Stand-up digital entrepreneurship pillar

S1\_SDEC\_P3= Finance Stand-up digital entrepreneurship pillar

S1\_SDEC\_P4= Networking and support Stand-up digital entrepreneurship pillar

For the Start-up stage:

$$S2\_SDEC\_P1_i = S2\_SEC\_P1_i * SDC\_P1_i \quad (6i)$$

$$S2\_SDEC\_P2_i = S2\_SEC\_P2_i * SDC\_P2_i \quad (6j)$$

$$S2\_SDEC\_P3_i = S2\_SEC\_P3_i * SDC\_P3_i \quad (6k)$$

$$S2\_SDEC\_P4_i = S2\_SEC\_P4_i * SDC\_P4_i \quad (6l)$$

where:

S2\_SDEC\_P1= Human capital Start-up digital entrepreneurship pillar

S2\_SDEC\_P2= Knowledge creation, transfer and absorption Start-up digital entrepreneurship pillar

S2\_SDEC\_P3= Finance Start-up digital entrepreneurship pillar

S2\_SDEC\_P4= Networking and support Start-up digital entrepreneurship pillar

For the Scale-up stage:

$$S3\_SDEC\_P1_i = S3\_SEC\_P1_i * SDC\_P1_i \quad (6m)$$

$$S3\_SDEC\_P2_i = S3\_SEC\_P2_i * SDC\_P2_i \quad (6n)$$

$$S3\_SDEC\_P3_i = S3\_SEC\_P3_i * SDC\_P3_i \quad (6o)$$

$$S3\_SDEC\_P4_i = S3\_SEC\_P4_i * SDC\_P4_i \quad (6p)$$

where:

S3\_SDEC\_P1= Human capital Scale-up digital entrepreneurship pillar

S3\_SDEC\_P2= Knowledge creation, transfer and absorption Scale-up digital entrepreneurship pillar

S3\_SDEC\_P3= Finance Scale-up digital entrepreneurship pillar

S3\_SDEC\_P4= Networking and support Scale-up digital entrepreneurship pillar

(vii) **Normalization of the pillars.** Similar to the previous cases we calculate the normalized scores for all the 16 pillars

$$p(norm)_{i,k} = \frac{p_{i,k}}{\max p_{i,k}} \quad (7)$$

for all  $k = 1 \dots 16$ , the number of pillars

where  $p(norm)_{i,k}$  is the normalized score value for country  $i$  and pillar  $k$

$p_{i,k}$  is the original digital pillar value for country  $i$  and pillar  $k$

$\max p_{i,k}$  is the maximum value for pillar  $k$

(viii) **Average pillar adjustment.** The different averages of the normalized values of the pillars imply that reaching the same indicator values requires different effort and resources. Since we want to apply the European Index of Digital Entrepreneurial Systems (EIDES) for public policy purposes, the additional resources for the same marginal improvement of the pillar values should be the same for all pillars. Therefore, we need a transformation to equalize the average values of the pillar components. Equation 8 shows the calculation of the average value of the  $k$  pillar:

$$\overline{p(norm)}_k = \frac{\sum_{i=1}^n p(norm)_{i,k}}{n} \quad \text{for all } k \quad (8a)$$

where  $\overline{p(norm)}_k$  is the average value of all  $k=16$  normalized pillars

We want to transform the  $p(norm)_{i,k}$  values such that the potential values to be in the  $[0, 1]$  range.

$$y_{i,k} = p(norm)_{i,k}^t \quad (8b)$$

where  $t$  is the “strength of adjustment”, the  $t$ -th moment of  $p(norm)_k$  is exactly the needed average,  $\bar{y}_j$

We have to find the root of the following equation for  $k$ :

$$\sum_{i=1}^n p(norm)_{i,k}^t - n\bar{y}_j = 0 \quad (8c)$$

Based on previous conditions and derivatives, it is easy to see that the function is decreasing and convex, which means it can be quickly solved using the well-known Newton-Raphson method with an initial guess of 0. After obtaining  $k$ , the computations are straightforward.

(ix) **Penalizing.** After these transformations, the Penalty for Bottleneck (PFB) methodology was used to create pillar-adjusted PFB values. We define our penalty function following as:

$$h_{(i),k} = \min y_{(i),k} + (1 - e^{-(y_{(i),k} - \min y_{(i),k})}) \quad (9)$$

where  $h_{i,k}$  is the modified, post-penalty value of pillar  $k$  in country  $i$

$y_{i,j}$  is the normalized value of index component  $k$  in country  $i$

$y_{\min}$  is the lowest value of  $y_{i,k}$  for country  $i$ .

$i = 1, 2, \dots, 28$  = the number of countries

$k = 1, 2, \dots, 16$  = the number of pillars

(x) **Sub-index calculation.** The value of a sub-index for any country was then calculated as the arithmetic average of its PFB-adjusted pillars for that sub-index multiplied by 100 to get a 100-point scale. Note that the general framework conditions pillars are the same for all stages

$$DE\_Stand\_up_i = \frac{100}{8} \left( \sum_{k=1}^4 GDFC_{P_{i,k}} + \sum_{k=5}^8 S1\_SDEC_{P_{i,k}} \right) \quad (10a)$$

$$DE\_Start\_up_i = \frac{100}{8} \left( \sum_{k=1}^4 GDFC_{P_{i,k}} + \sum_{k=5}^8 S2\_SDEC_{P_{i,k}} \right) \quad (10b)$$

$$DE\_Scale\_up_i = \frac{100}{8} \left( \sum_{k=1}^4 GDFC_{P_{i,k}} + \sum_{k=5}^8 S3\_SDEC_{P_{i,k}} \right) \quad (10c)$$

where

DE\_Stand\_up= Digital Entrepreneurship Stand-up sub-index

DE\_Start\_up= Digital Entrepreneurship Start-up sub-index

DE\_Scale\_up= Digital Entrepreneurship Scale-up sub-index

(xi) **EIDES point calculation.** Finally, the scores are calculated as simple arithmetic averages of the three sub-indices.

$$AIDES_i = \frac{1}{3} (DE\_Stand\_up_i + DE\_Start\_up_i + DE\_Scale\_up_i) \quad (11)$$

## APPENDIX 2: REVISION OF THE EUROPEAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS 2020 INDICATORS

### A. Availability of the Indicators

#### 1. Entrepreneurial (Non-digital) Part of the Index

The original 56 indicators of the European Index of Digital Entrepreneurship Systems (EIDES) 2020 can be covered by 50 indicators (89.3%):

- (i) 36 indicators fully match the original EIDES indicators (64.3%), and another 8 indicators are available from other databases (*proxy indicators*);<sup>1</sup>
- (ii) 10 indicators are missing, of which 5 can be covered by *new indicators*,<sup>2</sup> but 5 of the missing indicators cannot be replaced by either a proxy indicator or a new indicator, and
- (iii) 1 additional *new indicator* is found.

**Table A2.1: Summary of Availability of the European Index of Digital Entrepreneurial Systems 2020/Asian Index of Digital Entrepreneurship Systems 2021 Components (Entrepreneurial – Non-Digital Part)**

| Name   | EIDES<br>2020<br>Indi-<br>cators | AIDES<br>2021<br>Indi-<br>cators | Same      | Proxy    | Miss-<br>ing | New      |
|--|----------------------------------|----------------------------------|-----------|----------|--------------|----------|
| <b>ENTREPRENEURIAL (non-digital) part</b>                    | <b>56</b>                        | <b>50</b>                        | <b>36</b> | <b>8</b> | <b>10</b>    | <b>6</b> |
| <b>A. GENERAL FRAMEWORK CONDI-<br/>TIONS (GFC) (1+2+3+4)</b> | <b>20</b>                        | <b>18</b>                        | <b>18</b> | <b>0</b> | <b>2</b>     | <b>0</b> |
| 1. Culture, informal institutions (GFC_P1)                   | 6                                | 6                                | 6         | 0        | 0            | 0        |
| 2. Formal institutions, regulation, taxation (GFC_P2)        | 5                                | 5                                | 5         | 0        | 0            | 0        |
| 3. Market conditions (GFC_P3)                                | 7                                | 5                                | 5         | 0        | 2            | 0        |
| 4. Physical infrastructure (GFC_P4)                          | 2                                | 2                                | 2         | 0        | 0            | 0        |
| <b>B. SYSTEMIC FRAMEWORK CONDI-<br/>TIONS (SFC, a+b+c)</b>   | <b>36</b>                        | <b>32</b>                        | <b>18</b> | <b>8</b> | <b>10</b>    | <b>6</b> |
| a. STAND-UP (S1)   | 9                                | 8                                | 5         | 2        | 2            | 1        |
| 1a. Human capital (S1_SFC_P1)                                | 3                                | 2                                | 1         | 1        | 1            | 0        |
| 2a. Knowledge creation and dissemination (S1_SFC_P2)         | 3                                | 3                                | 2         | 1        | 0            | 0        |
| 3a. Finance (S1_SFC_P3)                                      | 2                                | 2                                | 2         | 0        | 0            | 0        |

<sup>1</sup> *Proxy indicator* refers to an indicator with similar content to the original EIDES indicator, but it is from a different database.

<sup>2</sup> The content of a *new indicator* is related to the given pillar, but its content is not (necessarily) related to the original indicator measuring the pillar.

|  |    |    |   |   |   |                |
|--|----|----|---|---|---|----------------|
| 4a. Networking and support (S1_SFC_P4)               | 1  | 1  | 0 | 0 | 1 | 1              |
| b. START-UP (S2)                                     | 12 | 12 | 4 | 3 | 5 | 5              |
| 1b. Human capital (S2_SFC_P1)                        | 4  | 4  | 1 | 3 | 0 | 0              |
| 2b. Knowledge creation and dissemination (S2_SFC_P2) | 3  | 3  | 2 | 0 | 1 | 1              |
| 3b. Finance (S2_SFC_P3)                              | 3  | 3  | 1 | 0 | 2 | 2 <sup>a</sup> |
| 4b. Networking and support (S2_SFC_P4)               | 2  | 2  | 0 | 0 | 2 | 2              |
| c. SCALE-UP (S3)                                     | 15 | 12 | 9 | 3 | 3 | 0              |
| 1c. Human capital (S3_SFC_P1)                        | 4  | 3  | 2 | 1 | 1 | 0              |
| 2c. Knowledge creation and dissemination (S3_SFC_P2) | 4  | 4  | 3 | 1 | 0 | 0              |
| 3c. Finance (S3_SFC_P3)                              | 4  | 2  | 1 | 1 | 2 | 0              |
| 4d. Networking and support (S3_SFC_P4)               | 3  | 3  | 3 | 0 | 0 | 0              |

<sup>a</sup> These two (new) indicators were included in the EIDES 2018 calculation.

Source: Own edition.

## B. Digital Part of the Index

The original 56 indicators of the EIDES 2020 can be covered by 53 variables (94.6%):

- (i) 19 indicators fully match the original indicators (34.0%), and another 19 indicators are available from other databases (*proxy indicators*) (footnote 1);
- (ii) 23 indicators are missing, of which 15 indicators can be covered by *new indicators* (footnote 2), but 5 of the missing indicators cannot be replaced by either a proxy indicator or a new variable, and
- (iii) 2 additional *new indicators* are found.

**Table A2.2: Summary of Availability of the European Index of Digital Entrepreneurial Systems 2020/Asian Index of Digital Entrepreneurial Systems 2021 Components (Digital Part)**

| Name   | EIDES indicators | AIDES indicators | Same      | Proxy     | Missing  | New      |
|--|------------------|------------------|-----------|-----------|----------|----------|
| <b>I. DIGITAL FRAMEWORK CONDITIONS (DFC) (1+2+3+4)</b> | <b>23</b>        | <b>24</b>        | <b>11</b> | <b>11</b> | <b>5</b> | <b>2</b> |
| 1. Culture, informal institutions (DFC_P1)             | 4                | 4                | 0         | 4         | 0        | 0        |
| 2. Formal institutions, regulation, taxation (DFC_P2)  | 6                | 6                | 6         | 0         | 0        | 0        |
| 3. Market conditions (DFC_P3)                          | 6                | 6                | 1         | 3         | 4        | 2        |
| 4. Physical infrastructure (DFC_P4)                    | 7                | 8                | 4         | 4         | 1        | 0        |



|  |           |           |          |          |           |                |
|--|-----------|-----------|----------|----------|-----------|----------------|
| <b>II. SYSTEMIC DIGITAL CONDITIONS (SDC, a+b+c)</b>  | <b>33</b> | <b>29</b> | <b>8</b> | <b>8</b> | <b>18</b> | <b>13</b>      |
| <b>a. STAND-UP (S1) (1a+2a+3a+4a)</b>                | 12        | 14        | 5        | 5        | 3         | 4              |
| 1a. Human capital (S1_SDC_P1)                        | 3         | 2         | 1        | 1        | 1         | 0              |
| 2a. Knowledge creation and dissemination (S1_SDC_P2) | 3         | 5         | 2        | 1        | 0         | 2              |
| 3a. Finance (S1_SDC_P3)                              | 3         | 3         | 0        | 1        | 2         | 2              |
| 4a. Networking and support (S1_SDC_P4)               | 3         | 4         | 2        | 2        | 0         | 0              |
| <b>b. START-UP (S2) (1b+2b+3b+4b)</b>                | 13        | 6         | 2        | 2        | 9         | 2              |
| 1b. Human capital (S2_SDC_P1)                        | 1         | 1         | 0        | 1        | 0         | 0              |
| 2b. Knowledge creation and dissemination (S2_SDC_P2) | 2         | 2         | 1        | 1        | 0         | 0              |
| 3b. Finance (S2_SDC_P3)                              | 4         | 1         | 1        | 0        | 3         | 0              |
| 4b. Networking and support (S2_SDC_P4)               | 6         | 2         | 0        | 0        | 6         | 2              |
| <b>c. SCALE-UP (S3) (1c+2c+3c+4c)</b>                | 8         | 9         | 1        | 1        | 6         | 7              |
| 1c. Human capital (S3_SDC_P1)                        | 2         | 1         | 0        | 0        | 2         | 1              |
| 2c. Knowledge creation and dissemination (S3_SDC_P2) | 2         | 4         | 0        | 1        | 1         | 3              |
| 3c. Finance (S3_SDC_P3)                              | 1         | 1         | 1        | 0        | 0         | 0              |
| 4c. Networking and support (S3_SDC_P4)               | 3         | 3         | 0        | 0        | 3         | 3 <sup>a</sup> |

<sup>a</sup> Two (new) indicators were included in the EIDES 2018 calculation.

Source: Own edition.

### C. Correlation Analysis

**Table A2.3: Correlation Analysis between Asian Index of Digital Entrepreneurial Systems Proxy/New Indicators (Non-digital Part) and European Index of Digital Entrepreneurial Systems 2020 Original Indicators**

| <b>AIDES 2021 Proxy/New Indicator</b>   |       | <b>EIDES 2020 Original Indicator</b>  | <b>Correlation</b>                     |
|---|-------|---|--|
| Quality of education system<br>Quality of management schools<br>WEF, Global Information Technology Report, Likert scale (1–7, best), 2018 | proxy | Quality of education<br>IMD World Talent Ranking<br>Likert scale (1–10, best), 2019             | <b>0.9149</b> (strong)                 |
| Attracting and retraining talents<br>WEF GCI, Likert scale (1–7, best), 2018  | prox  | Attracting and retaining talents<br>IMD World Talent Ranking<br>Likert scale (1–10, best), 2019 | <b>0.8402</b> (strong)                 |
| Social capital<br>WEF GCI, %, 2019  | new   | Opinion about entrepreneurs<br>Flash Eurobarometer, %, 2012                                     | <b>0.5189</b> (stronger than moderate) |
|   |       | Networking and support pillar<br>S1_SEC_P4  | <b>0.5189</b> (stronger than moderate) |

|   |       |   |  |
|---|-------|---|--|
| Tertiary education enrollment<br>UIS Statistics, %, 2017  | proxy | Tertiary education enrollment<br>Eurostat, %, 2017                    | <b>0.9899</b> (strong)                 |
| % of graduates from tertiary education graduating from natural sciences, mathematics, and statistics programs, (%), UIS. Statistics, average 2012–2019<br>% of graduates from tertiary education graduating from engineering, manufacturing, and construction programs, (%), UIS. Statistics, average 2012–2019 | proxy | STEM education<br>Eurostat, %, 2017                                   | <b>0.4138</b> (weaker than moderate)   |
| Total research and development personnel per million inhabitants,<br>UIS. Statistics, average 2016  | proxy | Human resources in science and technology<br>Eurostat, 2018           | <b>0.6882</b> (stronger than moderate) |
| Quality of math and science education<br>WEF GCI, 2018  | new   | Science in schools<br>IMD World Talent Ranking, 2018                  | <b>0.7488</b> (stronger than moderate) |
| International co-inventions<br>WEF GCI, 2019  | new   | EU Network places / members, 2019                                     | 0.0336 (weak)                          |
| Joint venture/strategic alliance deals, GII, 2018   | new   | EU Network places / members, 2019                                     | <b>0.5311</b> (stronger than moderate) |
| Skilled labor<br>WEF GCI, 2019  | proxy | Skilled labor,<br>IMD World Talent Ranking, 2019                      | <b>0.7242</b> (stronger than moderate) |
| GERD, GII, 2018   | proxy | GERD, Eurostat 2018   | <b>0.9928</b> (strong)                 |
| Financing through local equity market, 1–7 (best), WEF GCI, 2018  | proxy | Private equity, European Private Equity Activity, Invest Europe, 2018 | <b>0.5311</b> (stronger than moderate) |

Note:  $r=0.00$  no correlation;  $0.01 \leq r \leq 0.30$  weak;  $0.31 \leq r \leq 0.49$  weaker than moderate;  $r \approx 0.50$  moderate;  $0.51 \leq r \leq 0.80$  stronger than moderate;  $0.81 \leq r \leq 0.99$  strong;  $r=1.00$  deterministic (or functional) relationship.

Source: Own calculation.

**Table A2.4: Correlation Analysis between Asian Index of Digital Entrepreneurial Systems Proxy/New Indicators (Digital Part) and European Index of Digital Entrepreneurial Systems 2020 Original Indicators**

| <b>AIDES 2021 Proxy/New Indicator</b>   |       | <b>EIDES 2020 Original Indicator</b>  | <b>Correlation</b>   |
|---|-------|---|--|
| Households with a computer at home<br>ITU, 2017   | proxy | Households with a computer at home<br>Eurostat, 2017  | <b>0.9409</b> (strong)   |
| Households with internet access<br>ITU, 2017  | proxy | Households with internet access<br>Eurostat, 2019   | <b>0.8899</b> (strong)   |
| Individuals using internet<br>ITU, 2017   | proxy | Individuals using internet, Eurostat,<br>2019   | <b>0.9370</b> (strong)   |
| Households with a computer at home<br>WBG Enterprise survey, average<br>2005–2020   | proxy | Households with a computer at home<br>Eurostat, 2019  | <b>0.7353</b> (stronger than moderate)   |
| Used the internet to pay bills or to buy something online in the past year (% age 15+)<br>WB Global Findex, 2014, 2017<br>Used the internet to buy something online in the past, WB Global Findex, 2017<br>Internet shopping<br>Network Readiness Index, Global Findex Index, WBG, 2020 edition | proxy | Individuals using the internet for ordering goods or services<br>Eurostat, 2019                   | <b>0.9061</b> (strong)   |
| % of firms using email to interact with clients/suppliers<br>WBG enterprise survey, 2005–2020   | new   | Enterprises having received orders via computer mediated networks, % of enterprises Eurostat 2019 | <b>0.3988</b> (weaker than moderate)   |
| B2B e-commerce<br>UNCTAD, 2019  | new   | Enterprises' total turnover from ecommerce<br>Eurostat, 2019                                      | <b>0.4861</b> (weaker than moderate)   |
| Median download / uploads<br>Fastmetrix 2020  | proxy | Average download / upload<br>Testmy.net, 2019   | <b>0.3523</b> (weaker than moderate)<br><b>0.5283</b> (stronger than moderate) |

|   |       |  |  |
|---|-------|--|--|
| Internet access in schools<br>WEF GCI, 2017   | proxy | Individuals with a daily access<br>Eurostat, 2019        | <b>0.6995</b> (stronger than moderate) |
| Number of OA journals by country DOAJ<br>Morrison et al, 2019   | proxy | Open access of scientific documents<br>OECD, 2017        | <b>0.6390</b> (stronger than moderate) |
| Scientific and technical journal articles<br>National Science Foundation, Science and Engineering Indicator,                  | new   | Open access of scientific documents<br>OECD, 2017        | <b>0.4335</b> (weaker than moderate)   |
| Mobile app creation<br>Network Readiness Index, GSM Association, The GSMA Mobile Connectivity Index, 2018                     | new   | Video uploads on YouTube<br>Global Innovation Index 2019 | <b>0.7377</b> (stronger than moderate) |
| Made or received digital payments in the past year<br>Global Findex Database, WGB   | proxy | Digital payment transactions<br>Statista 2020            | <b>0.4797</b> (weaker than moderate)   |
| Used a mobile phone or the internet to access a financial institution account in the past year<br>Global Findex Database, WGB | new   | Internet banking<br>Eurostat 2019                        | <b>0.9199</b> (strong)                 |
| Used a mobile phone or the internet to check account balance in the past year<br>Global Findex Database, WGB                  | new   | Internet banking<br>Eurostat 2019                        | <b>0.8979</b> (strong)                 |
| Use of virtual social networks<br>We Are Social and Hootsuite (2020) Global Digital Report 2020                               | proxy | Participating in social networks<br>Eurostat, 2019       | <b>0.5940</b> (stronger than moderate) |
| Employees by occupations Information and communications technicians<br>ILO statistics, 2012–2020                              | proxy | Employed ICT specialists<br>Eurostat, 2018               | <b>0.5791</b> (stronger than moderate) |
| Employment in knowledge intensive<br>The Global Innovation Index, 2018  | proxy | Software developer<br>Developer survey, 2019             | <b>0.2396</b> (weaker than moderate)   |

|  |       |  |  |
|--|-------|--|--|
| Market Volumes of Alternative Finance Transactions<br>The Global Alternative Finance Market Benchmarking Report 2020 (Cambridge) | proxy | Financing pillar (S2_SDF_P3)   | <b>0.5711</b> (stronger than moderate) |
| Availability of local content<br>The Network Readiness Index average of 2018–2019  | new   | Meetup Tech Group Indicator (MTGI, MTMI)<br>meetup.com, 2018-2019  | <b>0.3930</b> (weaker than moderate)   |
| SR score<br>Startupranking, com, 2021  | new   | Meetup Tech Group Indicator (MTGI, MTMI)<br>meetup.com, 2018-2019  | <b>0.5223</b> (stronger than moderate) |
| Technology Adaptation<br>Cisco Readiness Index, 2017–2018  | new   | Internet use: looking for information<br>Eurostat, 2019  | <b>0.5454</b> (stronger than moderate) |
| Total computer software spending<br>The Global Innovation Index, 2018  | proxy | Enterprises who have ERP software<br>Eurostat, 2019  | <b>0.3614</b> (weaker than moderate)   |
| Impact of ICTs on business models<br>WEF GCI   | new   | Knowledge dissemination pillar (S3_SDF_P2)   | <b>0.5892</b> (stronger than moderate) |
| Impact of ICTs on new organizational models<br>WEF GCI   | new   | Knowledge dissemination pillar (S3_SDF_P2)   | <b>0.5485</b> (stronger than moderate) |
| ICT PCT patents, applications/million population<br>Global Information Technology Report, 2012–2016 average                      | new   | Knowledge dissemination pillar (S3_SDF_P2)   | <b>0.5033</b> (moderate)               |
| Business use of digital tools<br>Network Readiness Index, 2020   | new   | Enterprises whose business processes are automatically linked to those of their suppliers and/or customers<br>Eurostat, 2017<br>Enterprises using software solutions, like CRM to analyze information about clients for marketing purposes<br>Eurostat, 2019 | <b>0.4010</b> (weaker than moderate)   |

Note:  $r=0.00$  no correlation;  $0.01 \leq r \leq 0.30$  weak;  $0.31 \leq r \leq 0.49$  weaker than moderate;  $r \approx 0.50$  moderate;  $0.51 \leq r \leq 0.80$  stronger than moderate;  $0.81 \leq r \leq 0.99$  strong;  $r=1.00$  deterministic (or functional) relationship.  
Source: Own calculation.

## D. Availability of Data (by Country)

**Table A2.5: Percentage of Missing Data by Countries**

| Country                     | ISO Code | Number of Missing Data | % of Missing Data | Country            | ISO Code | Number of Missing Data | % of Missing Data |
|-----------------------------|----------|------------------------|-------------------|--------------------|----------|------------------------|-------------------|
| Albania                     | ALB      | 2                      | 2%                | Lebanon            | LBN      | 7                      | 7%                |
| United Arab Emirates        | ARE      | 2                      | 2%                | Sri Lanka          | LKA      | 2                      | 2%                |
| Argentina                   | ARG      | 0                      | 0%                | Lithuania          | LTU      | 0                      | 0%                |
| Armenia                     | ARM      | 3                      | 3%                | Luxembourg         | LUX      | 4                      | 4%                |
| Australia                   | AUS      | 4                      | 4%                | Latvia             | LVA      | 0                      | 0%                |
| Austria                     | AUT      | 2                      | 2%                | Morocco            | MAR      | 1                      | 1%                |
| Azerbaijan                  | AZE      | 3                      | 3%                | Moldova            | MDA      | 7                      | 7%                |
| Belgium                     | BEL      | 2                      | 2%                | Madagascar         | MDG      | 9                      | 9%                |
| Benin                       | BEN      | 10                     | 10%               | Mexico             | MEX      | 0                      | 0%                |
| Burkina Faso                | BFA      | 10                     | 10%               | North Macedonia    | MKD      | 9                      | 9%                |
| Bangladesh                  | BGD      | 4                      | 4%                | Mali               | MLI      | 7                      | 7%                |
| Bulgaria                    | BGR      | 0                      | 0%                | Malta              | MLT      | 3                      | 3%                |
| Bahrain                     | BHR      | 7                      | 7%                | Montenegro         | MNE      | 1                      | 1%                |
| Bosnia and Herzegovina      | BIH      | 3                      | 3%                | Mongolia           | MNG      | 3                      | 3%                |
| Bolivia                     | BOL      | 6                      | 6%                | Mozambique         | MOZ      | 8                      | 8%                |
| Brazil                      | BRA      | 0                      | 0%                | Mauritius          | MUS      | 2                      | 2%                |
| Botswana                    | BWA      | 5                      | 5%                | Malaysia           | MYS      | 1                      | 1%                |
| Canada                      | CAN      | 4                      | 4%                | Namibia            | NAM      | 6                      | 6%                |
| Switzerland                 | CHE      | 3                      | 3%                | Nigeria            | NGA      | 5                      | 5%                |
| Chile                       | CHL      | 1                      | 1%                | Netherlands        | NLD      | 3                      | 3%                |
| China, People's Republic of | CHN      | 7                      | 7%                | Norway             | NOR      | 3                      | 3%                |
| Cameroon                    | CMR      | 6                      | 6%                | Nepal              | NPL      | 8                      | 8%                |
| Colombia                    | COL      | 1                      | 1%                | New Zealand        | NZL      | 5                      | 5%                |
| Costa Rica                  | CRI      | 2                      | 2%                | Oman               | OMN      | 10                     | 10%               |
| Cyprus                      | CYP      | 2                      | 2%                | Pakistan           | PAK      | 2                      | 2%                |
| Czech Republic              | CZE      | 2                      | 2%                | Panama             | PAN      | 3                      | 3%                |
| Germany                     | DEU      | 1                      | 1%                | Peru               | PER      | 2                      | 2%                |
| Denmark                     | DNK      | 2                      | 2%                | Philippines        | PHL      | 0                      | 0%                |
| Dominican Republic          | DOM      | 4                      | 4%                | Poland             | POL      | 0                      | 0%                |
| Algeria                     | DZA      | 2                      | 2%                | Portugal           | PRT      | 0                      | 0%                |
| Ecuador                     | ECU      | 2                      | 2%                | Paraguay           | PRY      | 3                      | 3%                |
| Egypt, Arab Rep. of         | EGY      | 5                      | 5%                | Qatar              | QAT      | 9                      | 9%                |
| Spain                       | ESP      | 0                      | 0%                | Romania            | ROU      | 0                      | 0%                |
| Estonia                     | EST      | 0                      | 0%                | Russian Federation | RUS      | 2                      | 2%                |
| Finland                     | FIN      | 2                      | 2%                | Rwanda             | RWA      | 4                      | 4%                |
| France                      | FRA      | 2                      | 2%                | Saudi Arabia       | SAU      | 5                      | 5%                |
| United Kingdom              | GBR      | 3                      | 3%                | Senegal            | SEN      | 3                      | 3%                |
| Georgia                     | GEO      | 2                      | 2%                | Singapore          | SGP      | 5                      | 5%                |
| Ghana                       | GHA      | 2                      | 2%                | El Salvador        | SLV      | 1                      | 1%                |
| Greece                      | GRC      | 0                      | 0%                | Serbia             | SRB      | 0                      | 0%                |
| Guatemala                   | GTM      | 1                      | 1%                | Slovak Republic    | SVK      | 3                      | 3%                |
| Honduras                    | HND      | 5                      | 5%                | Slovenia           | SVN      | 0                      | 0%                |
| Croatia                     | HRV      | 0                      | 0%                | Sweden             | SWE      | 2                      | 2%                |
| Hungary                     | HUN      | 1                      | 1%                | Thailand           | THA      | 0                      | 0%                |
| Indonesia                   | IDN      | 1                      | 1%                | Tajikistan         | TJK      | 9                      | 9%                |
| India                       | IND      | 1                      | 1%                | Tunisia            | TUN      | 1                      | 1%                |
| Ireland                     | IRL      | 0                      | 0%                | Turkey             | TUR      | 0                      | 0%                |
| Israel                      | ISR      | 2                      | 2%                | Tanzania           | TZA      | 10                     | 10%               |
| Italy                       | ITA      | 1                      | 1%                | Uganda             | UGA      | 4                      | 4%                |
| Jordan                      | JOR      | 1                      | 1%                | Ukraine            | UKR      | 1                      | 1%                |
| Japan                       | JPN      | 4                      | 4%                | Uruguay            | URY      | 1                      | 1%                |
| Kazakhstan                  | KAZ      | 2                      | 2%                | United States      | USA      | 2                      | 2%                |
| Kenya                       | KEN      | 3                      | 3%                | Viet Nam           | VNM      | 5                      | 5%                |
| Kyrgyz Republic             | KGZ      | 6                      | 6%                | South Africa       | ZAF      | 2                      | 2%                |
| Cambodia                    | KHM      | 3                      | 3%                | Zambia             | ZMB      | 5                      | 5%                |
| Korea, Rep. of              | KOR      | 5                      | 5%                | Zimbabwe           | ZWE      | 6                      | 6%                |
| Kuwait                      | KWT      | 4                      | 4%                |                    |          |                        |                   |

Source: Own calculation.

### **APPENDIX 3: ROBUSTNESS ANALYSES OF THE ASIAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS AND ITS COMPONENTS**

In composite indicator analysis, the setting up of the final index is based upon a series of choices. The aim of the robustness (or uncertainty) analysis is to examine the extent to which the final ranking depends on the set of choices made during the selection and transformation of the variables (Van Roy-Nepelski 2016 and Saisana et al. 2005).

The indicators, which populate the pillars in the framework, are generally chosen by integrating experts' judgment, data availability, and checks on statistical consistency.

Robustness analysis in our case involves (i) compensability effect analysis, (ii) the role of the pillars and the sub-indices in the development stages, and (iii) dropout effect of the pillars.

#### **A. Compensability Effect Analysis**

In connection with the analysis of the effect of excluding one pillar at a time, the next question is the amount of compensability effects. Compensability is the “existence of trade-off, i.e., the possibility of offsetting a disadvantage on some criteria by a sufficiently large advantage on another criterion” (Munda 2008 71. p.). The Asian Index of Digital Entrepreneurial Systems (AIDES) will be the base for the comparison. More methods are applied. The ordered weighted averaging (OWA) approach is used for the pillars to present one aspect of compensability in case of AIDES (Yager 1996). This technique looks for different scenarios of weights to put together more variables into a single index. The variables are to be in descending order. From our point of view, there are three special cases defined for the OWA operators (set of weights, where the sum of the weights is 1).

- (i) Purely optimistic operator (o): the highest variable (in our case pillar) gets all of the weight (1). So the sub-index gets the highest pillar value. This concept expresses an “or” multiple criteria condition, where the satisfaction of at least one criterion is enough to have a good position.
- (ii) Purely pessimistic operator (p): the lowest pillar gets the weight 1. So the overall index will include only the value of the lowest pillar. It can be understood as an “and” condition. No compensation is allowed, all criteria must be satisfied at the same time.

- (iii) From our point of view an operator, which calculates a simple arithmetic mean of the pillars is interesting as well, to see, how far the penalty weighted results from the average situation are.

In each case, the final index value is calculated as a simple arithmetic mean from the sub-indices. So OWA operators are applied for the pillars.

Going further, the best/worst/average possible outcomes two other well-known weighting schemes are also considered:

- (i) Equal weights for the pillars (simple arithmetic mean) to get the sub-indices and geometric mean to receive the final index values (arithmetic+geometric).
- (ii) Geometric mean of the pillars to get the sub-indices and also geometric mean to receive the final index values (geometric+geometric).

Geometric mean, similarly to our penalized weighting scheme, supports the “and” condition as it gives the lower results if the distribution of the pillar values is uneven.

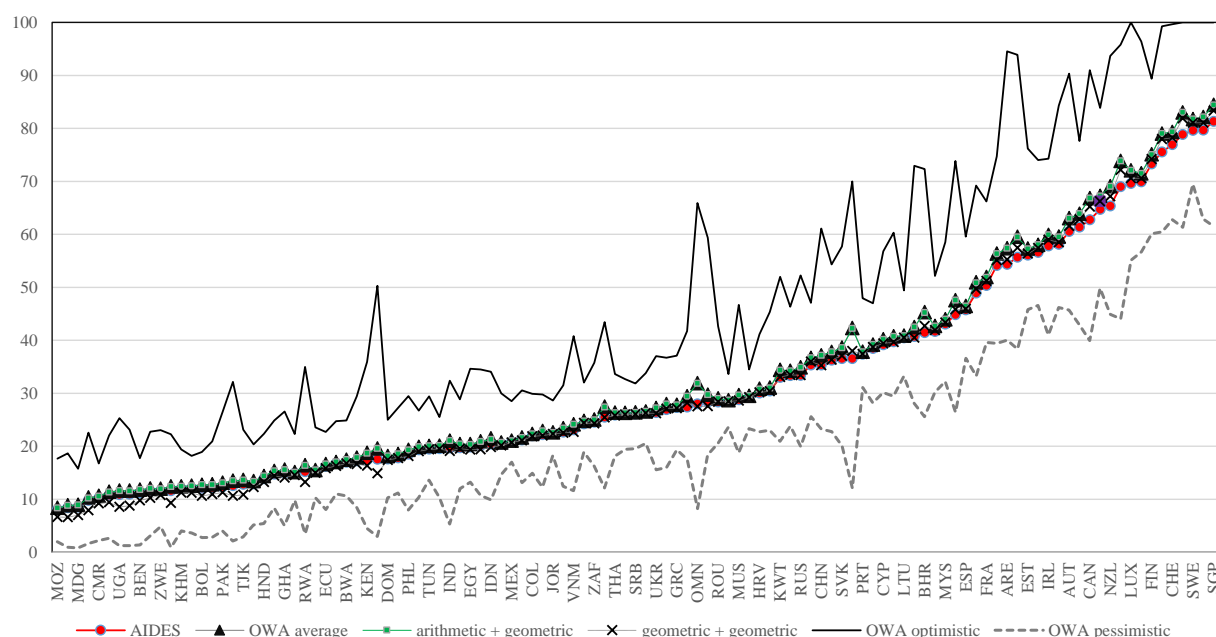
Monte Carlo experiments are often applied in case of robustness checks, where random weights within a given range are simulated. In our case, the penalized weighting accounts for different weights by countries according to the consistency of the pillar values. Therefore, this type of simulation is not sufficient in our case. That is why we apply the abovementioned “extreme” (optimistic, pessimistic) scenarios together with different combination of the geometric mean, as its concept is closer to the idea behind the AIDES weighting.

Altogether we have five weighting scenarios, which will be compared to our (original) AIDES values. Besides comparing the final AIDES values, the ranks based on the different scenarios are also confronted. The results are presented in Figures A3.1–A3.2.

As an obvious result, pessimistic and optimistic lines frame all the rest of the scenarios. It is also clear that the aim of the penalty weighting was reached, as the AIDES are always below the average line. It means that compensability is restricted within the AIDES indicator, and balanced performance is rewarded. Introducing the geometric mean in most of the cases results in similar values with the AIDES and the simple arithmetic mean concepts. AIDES is a little bit more below the different averages at the best positions of the ranking. This is also logical as the best counties can lose the most through the imbalance of the pillar scores.



**Figure A3.1: Asian Index of Digital Entrepreneurship Systems Values Calculated with Different Weighting Scenarios**



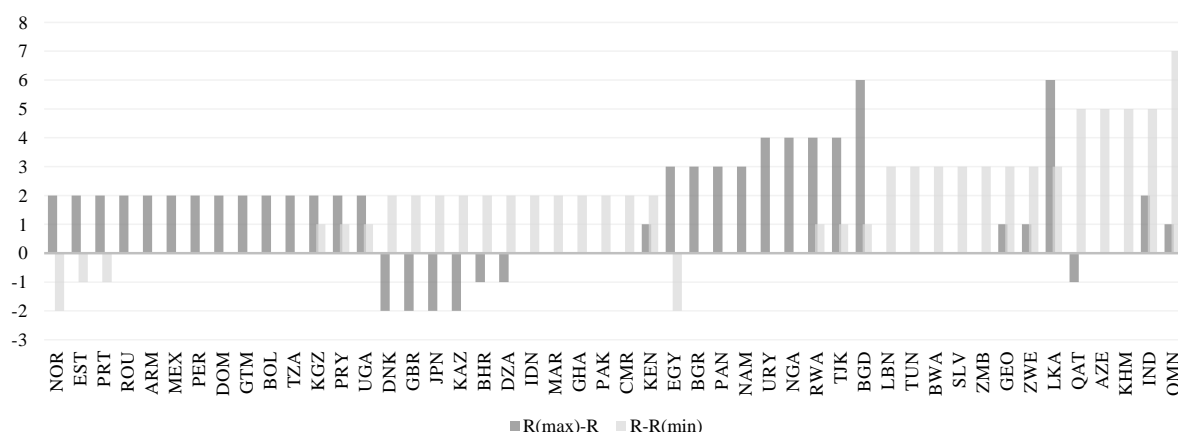
AIDES = Asian Index of Digital Entrepreneurship Systems; ALB = Albania; ARE = United Arab Emirates; ARG = Argentina; ARM = Armenia; AUS = Australia; AUT = Austria; AZE = Azerbaijan; BEL = Belgium; BEN = Benin; BFA = Burkina Faso; BGD = Bangladesh; BGR = Bulgaria; BHR = Bahrain; BIH = Bosnia and Herzegovina; BOL = Bolivia; BRA = Brazil; BWA = Botswana; CAN = Canada; CHE = Switzerland; CHL = Chile; CHN = China, People's Republic of; CMR = Cameroon; COL = Colombia; CRI = Costa Rica; CYP = Cyprus; CZE = Czech Republic; DEU = Germany; DNK = Denmark; DOM = Dominican Republic; DZA = Algeria; ECU = Ecuador; EGY = Egypt, Arab Rep.; ESP = Spain; EST = Estonia; FIN = Finland; FRA = France; GBR = United Kingdom; GEO = Georgia; GHA = Ghana; GRC = Greece; GTM = Guatemala; HND = Honduras; HRV = Croatia; HUN = Hungary; IDN = Indonesia; IND = India; IRL = Ireland; ISR = Israel; ITA = Italy; JOR = Jordan; JPN = Japan; KAZ = Kazakhstan; KEN = Kenya; KGZ = Kyrgyz Republic; KHM = Cambodia; KOR = Korea, Republic of; KWT = Kuwait; LBN = Lebanon; LKA = Sri Lanka; LTU = Lithuania; LUX = Luxembourg; LVA = Latvia; MAR = Morocco; MDA = Moldova; MDG = Madagascar; MEX = Mexico; MKD = North Macedonia; MLI = Mali; MLT = Malta; MNE = Montenegro; MNG = Mongolia; MOZ = Mozambique; MUS = Mauritius; MYS = Malaysia; NAM = Namibia; NGA = Nigeria; NLD = Netherlands; NOR = Norway; NPL = Nepal; NZL = New Zealand; OMN = Oman; OWA = ordered weighted averaging; PAK = Pakistan; PAN = Panama; PER = Peru; PHL = Philippines; POL = Poland; PRT = Portugal; PRY = Paraguay; QAT = Qatar; ROU = Romania; RUS = Russian Federation; RWA = Rwanda; SAU = Saudi Arabia; SEN = Senegal; SGP = Singapore; SLV = El Salvador; SRB = Serbia; SVK = Slovak Republic; SVN = Slovenia; SWE = Sweden; THA = Thailand; TJK = Tajikistan; TUN = Tunisia; TUR = Turkey; TZA = Tanzania; UGA = Uganda; UKR = Ukraine; URY = Uruguay; USA = United States; VNM = Viet Nam; ZAF = South Africa; ZMB = Zambia; ZWE = Zimbabwe.

Source: Own calculations.

Figure A3.1 focuses on the scores. It is clear that the penalized weighting scheme performs similarly as the non-extreme (extremes are the optimistic and pessimistic OWA solutions) weightings. These different (non-extreme) weighting scenarios indicate very similar final scores. Additionally, the penalized weighting idea also reaches its objective of rewarding the balanced and unrewarding the unbalanced distribution of the pillar scores. Therefore, in the followings where the ranks are compared, we only focus on the non-extreme scenarios.

Figure A3.2 represents the differences of the maximum and minimum ranks by the non-extreme weighting scenarios compared to the original AIDES rank (R). Only those countries are indicated where both of these differences are less than two positions. In case of 24 countries, the ranks are perfectly stable, which means that the original AIDES rank is exactly the same as the ranks based on the other weighting scenarios. There are 41 countries with maximum one position difference and other 26 countries with maximum two position differences. Altogether the proportion of these countries is almost 60%. There are only seven countries (Azerbaijan, Bangladesh, Cambodia, India, Oman, Qatar, and Sri Lanka) with five, six, or seven position differences. As we have 113 countries in this analysis, these are still relatively low differences. It can be concluded that the weighting scheme of AIDES is free from distortions, while its penalizing aim is sufficiently gained.

**Figure A3.2: Rank Differences of Non-extreme Weighting Scenarios Compared to the Original Asian Index of Digital Entrepreneurial Systems Ranks**



ALB = Albania; ARE = United Arab Emirates; ARG = Argentina; ARM = Armenia; AUS = Australia; AUT = Austria; AZE = Azerbaijan; BEL = Belgium; BEN = Benin; BFA = Burkina Faso; BGD = Bangladesh; BGR = Bulgaria; BHR = Bahrain; BIH = Bosnia and Herzegovina; BOL = Bolivia; BRA = Brazil; BWA = Botswana; CAN = Canada; CHE = Switzerland; CHL = Chile; CHN = China, People's Republic of; CMR = Cameroon; COL = Colombia; CRI = Costa Rica; CYP = Cyprus; CZE = Czech Republic; DEU = Germany; DNK = Denmark; DOM = Dominican Republic; DZA = Algeria; ECU = Ecuador; EGY = Egypt, Arab Rep.; ESP = Spain; EST = Estonia; FIN = Finland; FRA = France; GBR = United Kingdom; GEO = Georgia; GHA = Ghana; GRC = Greece; GTM = Guatemala; HND = Honduras; HRV = Croatia; HUN = Hungary; IDN = Indonesia; IND = India; IRL = Ireland; ISR = Israel; ITA = Italy; JOR = Jordan; JPN = Japan; KAZ = Kazakhstan; KEN = Kenya; KGZ = Kyrgyz Republic; KHM = Cambodia; KOR = Korea, Republic of; KWT = Kuwait; LBN = Lebanon; LKA = Sri Lanka; LTU = Lithuania; LUX = Luxembourg; LVA = Latvia; MAR = Morocco; MDA = Moldova; MDG = Madagascar; MEX = Mexico; MKD = North Macedonia; MLI = Mali; MLT = Malta; MNE = Montenegro; MNG = Mongolia; MOZ = Mozambique; MUS = Mauritius; MYS = Malaysia; NAM = Namibia; NGA = Nigeria; NLD = Netherlands; NOR = Norway; NPL = Nepal; NZL = New Zealand; OMN = Oman; PAK = Pakistan; PAN = Panama; PER = Peru; PHL = Philippines; POL = Poland; PRT = Portugal; PRY = Paraguay; QAT = Qatar; ROU = Romania; RUS = Russian Federation; RWA = Rwanda; SAU = Saudi Arabia; SEN = Senegal; SGP = Singapore; SLV = El Salvador; SRB = Serbia; SVK = Slovak Republic; SVN = Slovenia; SWE = Sweden; THA = Thailand; TJK = Tajikistan; TUN = Tunisia; TUR = Turkey; TZA = Tanzania; UGA = Uganda; UKR = Ukraine; URY = Uruguay; USA = United States; VNM = Vietnam; ZAF = South Africa; ZMB = Zambia; ZWE = Zimbabwe.

Source: Own calculations.

## B. Analysis by Development Stages

Based on the final sub-index and the AIDES values the following stages were determined:

- 5: Tailenders (AIDES equal to or below 20)
- 4: Laggards ( $20 < \text{AIDES} \leq 35$ )
- 3: Catchers-up ( $35 < \text{AIDES} \leq 45$ )
- 2: Followers ( $45 < \text{AIDES} \leq 60$ )
- 1: Leaders (AIDES over 60)

First, the contribution of the final pillar values and the sub-indices to this grouping idea by development stages is to be checked. Analysis of variance (ANOVA)<sup>1</sup> is applied to see if the means are equal in the five groups, or, putting it another way, if the final pillars and the sub-indices show significant stochastic relationship with the development stages. Table AA3.6 includes the results by pillars and Table AA3.7 includes the results by sub-indices.

In Table A3.6 and Table A3.7, the empirical F values, p-value indications (\* $p < 0.100$ ; \*\* $p < 0.050$  \*\*\* $p < 0.001$ )<sup>2</sup> and the deviation ratio are included. The p-values are below 0.001 in all cases, which means that the sub-indices as well as the pillars have significant relationship with the development stages. The deviation ratio suggests how strong is the relationship between the grouping criterion (development stage) and the quantitative variables (sub-indices and pillars). Relationships above 0.70 are considered as strong, between 0.30 and 0.70 as moderate, and below 0.30 as weak. All the sub-indices and pillars produce deviation ratio above 0.70, so they indicate strong stochastic relationship with the development stage and the sub-index or pillar, which clearly justifies the classification power of the development stages.

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<sup>1</sup> The assumption of homogeneity of variances is not violated in any case. However, as the size of the groups is very limited, the results were double-checked by Kruskal-Wallis nonparametric procedure, and it had led to the same conclusions.

<sup>2</sup> The indication of asterisks are the same all across the tables in Appendix 3.

**Table A3.1. Analysis of Variance Results for Development Stages and Pillars**

| Structure                     |          | Pillar                                       | F          | Deviation Ratio |
|-------------------------------|----------|--|------------|-----------------|
| Contextual influences         |          | Culture and informal institutions            | 233.20 *** | 0.947           |
|                               |          | Formal institutions, regulation and taxation | 213.19 *** | 0.942           |
|                               |          | Market conditions                            | 200.82 *** | 0.939           |
|                               |          | Physical infrastructure                      | 84.56 **   | 0.871           |
| Entrepreneurship sub-dynamics | Stand-up | Human capital                                | 183.53 *** | 0.934           |
|                               |          | Knowledge creation and dissemination         | 287.07 *** | 0.956           |
|                               |          | Finance                                      | 164.28 *** | 0.927           |
|                               |          | Networking and support                       | 182.83 *** | 0.933           |
|                               | Start-up | Human capital                                | 158.06 *** | 0.924           |
|                               |          | Knowledge creation and dissemination         | 174.53 *** | 0.931           |
|                               |          | Finance                                      | 118.47 *** | 0.902           |
|                               |          | Networking and support                       | 267.43 *** | 0.953           |
|                               | Scale-up | Human capital                                | 114.22 *** | 0.899           |
|                               |          | Knowledge creation and dissemination         | 193.58 *** | 0.937           |
|                               |          | Finance                                      | 151.87 *** | 0.921           |
|                               |          | Networking and support                       | 205.21 *** | 0.940           |

Source: Own calculations.

**Table A3.2: Analysis of Variance Results for Development Stages and Sub-indices**

| Sub-Index | F      |     | Deviation Ratio |
|-----------|--------|-----|-----------------|
| Stand-up  | 607.86 | *** | 0.979           |
| Start-up  | 535.90 | *** | 0.976           |
| Scale-up  | 519.72 | *** | 0.975           |

Source: Own calculations.

Going more into the details, the pairwise comparison of the development stages was performed. As the group sizes are relatively small, the pairwise comparisons of the Kruskal-Wallis procedure were applied (instead of the post hoc tests of ANOVA). (Bonferroni adjusted<sup>3</sup> p-values are indicated.)

<sup>3</sup> This procedure is rather conservative as it multiplies the pairwise p-values with the number of potential pairs (the number of multiple comparison tests). And as we have five groups and 10 potential pairs, this leads to many nonsignificant results.

**Table A3.3: Kruskal-Wallis Pairwise Comparisons of Development Stages by Pillars**

| Structure                     |          | Pillar                                       | 1–2   | 1–3   | 1–4 | 1–5 | 2–3   | 2–4 | 2–5 | 3–4   | 3–5 | 4–5   |
|-------------------------------|----------|--|-------|-------|-----|-----|-------|-----|-----|-------|-----|-------|
| Contextual Influences         |          | Culture and informal institutions            | 0.999 | 0.285 | *** | *** | 0.999 | *   | *** | 0.319 | *** | ***   |
|                               |          | Formal institutions, regulation and taxation | 0.999 | 0.112 | *** | *** | 0.999 | *   | *** | 0.607 | *** | 0.001 |
|                               |          | Market conditions                            | 0.999 | 0.492 | *** | *** | 0.999 | *   | *** | 0.178 | *** | ***   |
|                               |          | Physical infrastructure                      | 0.999 | 0.387 | *** | *** | 0.999 | *   | *** | 0.359 | *** | 0.001 |
| Entrepreneurship sub-dynamics | Stand-up | Human capital                                | 0.999 | 0.289 | *** | *** | 0.999 | *   | *** | 0.214 | *** | ***   |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.324 | *** | *** | 0.999 | *   | *** | 0.314 | *** | ***   |
|                               |          | Finance                                      | 0.999 | 0.204 | *** | *** | 0.999 | **  | *** | 0.184 | *** | 0.009 |
|                               |          | Networking and support                       | 0.999 | 0.223 | *** | *** | 0.999 | *   | *** | 0.261 | *** | 0.001 |
|                               | Start-up | Human capital                                | 0.999 | 0.196 | *** | *** | 0.999 | *   | *** | 0.331 | *** | 0.001 |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.289 | *** | *** | 0.999 | *   | *** | 0.340 | *** | ***   |
|                               |          | Finance                                      | 0.999 | 0.273 | *** | *** | 0.999 | **  | *** | 0.178 | *** | 0.006 |
|                               |          | Networking and support                       | 0.999 | 0.333 | *** | *** | 0.999 | **  | *** | 0.108 | *** | 0.003 |
|                               | Scale-up | Human capital                                | 0.999 | 0.398 | *** | *** | 0.999 | *   | *** | 0.218 | *** | 0.001 |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.237 | *** | *** | 0.999 | *   | *** | 0.571 | *** | ***   |
|                               |          | Finance                                      | 0.999 | 0.161 | *** | *** | 0.999 | **  | *** | 0.181 | *** | 0.022 |
|                               |          | Networking and support                       | 0.999 | 0.377 | *** | *** | 0.999 | **  | *** | 0.158 | *** | ***   |

Source: Own calculations.

**Table A3.4: Kruskal-Wallis Pairwise Comparisons of Development Stages by Sub-indices**

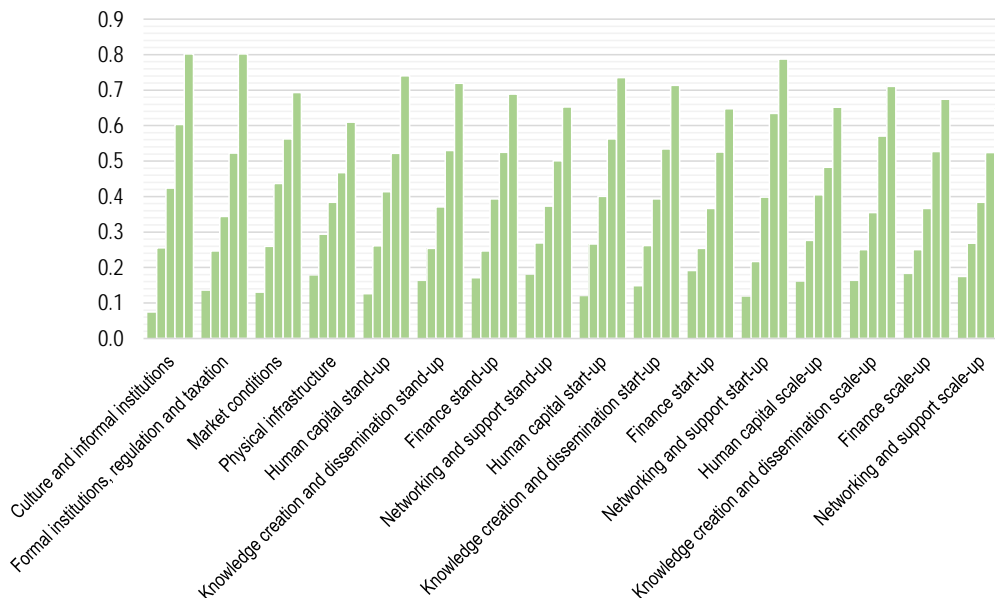
| Sub-index | 1–2   | 1–3   | 1–4 | 1–5 | 2–3   | 2–4 | 2–5 | 3–4   | 3–5 | 4–5 |
|-----------|-------|-------|-----|-----|-------|-----|-----|-------|-----|-----|
| Stand-up  | 0.999 | 0.367 | *** | *** | 0.999 | *   | *** | 0.219 | *** | *** |
| Start-up  | 0.999 | 0.337 | *** | *** | 0.999 | *   | *** | 0.220 | *** | *** |
| Scale-up  | 0.999 | 0.377 | *** | *** | 0.999 | *   | *** | 0.202 | *** | *** |

Source: Own calculations.

Table A3.3 and Table A3.4 present the p-values of the Kruskal-Wallis pairwise comparisons by development stages. There are several pairs with nonsignificant differences, which might support the idea of having less development stages. The best three clusters might have been handled together. However, the interpretability and the policy guidelines (so practical reasons) justify the distinction of these groups as well. Additionally, if we pay attention to the actual mean values of the pillars by development stages (Figure A3.3), a clear increasing pattern of these means can be

recognized from left to right (development stages from left to right are as follows: tailenders, lag-guards, catchers-up, followers, and leaders). It suggests that the creation of the five development stages is meaningful.

**Figure A3.3: Mean Final Pillar Values by Development Stages**



Source: Own calculations.

The same comparison steps had been applied to the so called “raw” pillars. Those pillar values of the conceptual influences were utilized that had been formulated from the basic variables, before any transformation of these pillars. They might be considered as raw pillar values.<sup>4</sup> The same idea of analyzing the original entrepreneurship sub-dynamics pillars was applied by using the “raw” values before normalization, average adjustment, and the penalized weighting (the latest stage before the transformation of the pillar values). It is also important to discover the relationship of the “original” values, e.g., the values of the pillars before adjustments, transformations, and normalization or before the weighting. The same ANOVA procedure, as described above, is proceeded for the raw pillar values. Table A3.5 presents the results.

<sup>4</sup> As it is described in the paper, there are some missing values at this point of the composite index formulation. The number of valid cases is 71 for “Human Capital start-up”, 109 for “Finance start-up”, 110 for “Human Capital scale-up”, and 111 for “Finance stand-up”.

**Table A3.5: Analysis of Variance Results for Development Stages and Raw Pillars**

| Structure                     |          | Pillar                                       | F          | Deviation Ratio |
|-------------------------------|----------|--|------------|-----------------|
| Contextual influences         |          | Culture and informal institutions            | 81.38 ***  | 0.867           |
|                               |          | Formal institutions, regulation and taxation | 138.06 *** | 0.915           |
|                               |          | Market conditions                            | 128.68 *** | 0.909           |
|                               |          | Physical infrastructure                      | 45.74 ***  | 0.793           |
| Entrepreneurship sub-dynamics | Stand-up | Human capital                                | 61.14 ***  | 0.833           |
|                               |          | Knowledge creation and dissemination         | 92.84 ***  | 0.880           |
|                               |          | Finance                                      | 104.66 *** | 0.893           |
|                               |          | Networking and support                       | 61.85 ***  | 0.834           |
|                               | Start-up | Human capital                                | 28.52 ***  | 0.796           |
|                               |          | Knowledge creation and dissemination         | 57.66 ***  | 0.825           |
|                               |          | Finance                                      | 10.90 ***  | 0.544           |
|                               |          | Networking and support                       | 32.93 ***  | 0.741           |
|                               | Scale-up | Human capital                                | 95.31 ***  | 0.885           |
|                               |          | Knowledge creation and dissemination         | 62.28 ***  | 0.835           |
|                               |          | Finance                                      | 27.73 ***  | 0.712           |
|                               |          | Networking and support                       | 91.00 ***  | 0.878           |

Source: Own calculations.

The stochastic relationship between the development stages—set by the final AIDES values—and the raw pillars is significant and strong in each case (except for “Finance start-up”, where it is still moderate).

**Table A3.6: Kruskal-Wallis Pairwise Comparisons of Development Stages  
by Raw Pillars**

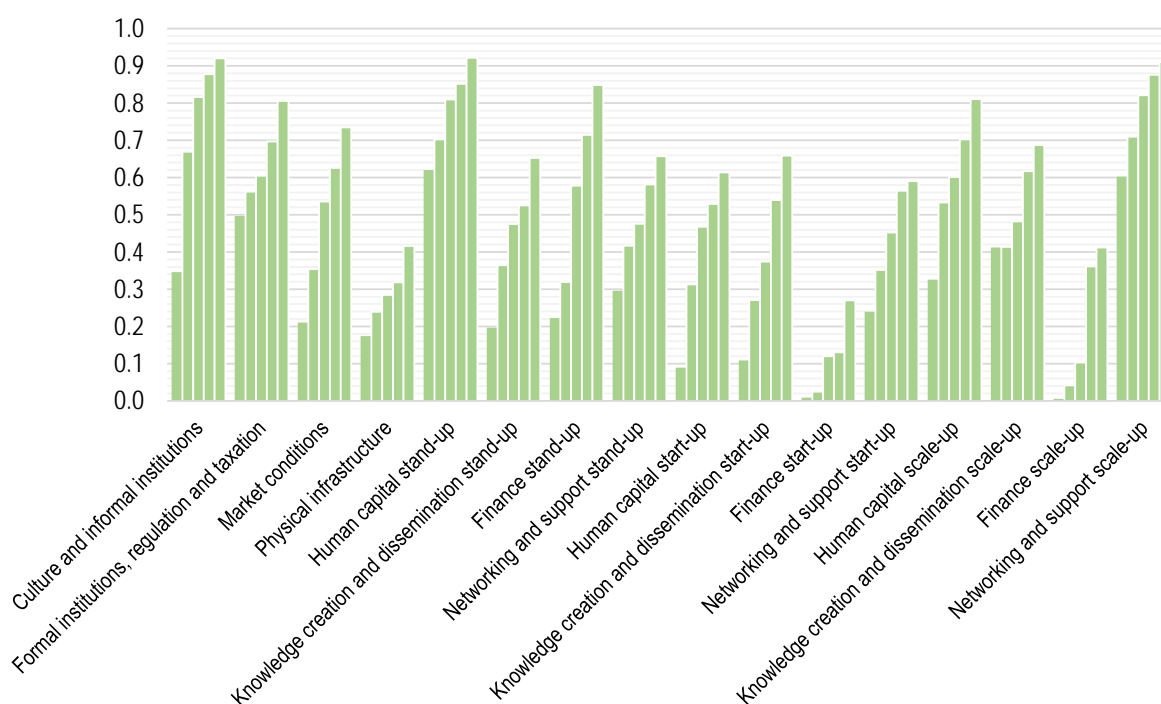
| Structure                     |          | Pillar                                       | 1–2   | 1–3   | 1–4   | 1–5 | 2–3   | 2–4   | 2–5 | 3–4   | 3–5 | 4–5   |
|-------------------------------|----------|--|-------|-------|-------|-----|-------|-------|-----|-------|-----|-------|
| Contextual Influences         |          | Culture and informal institutions            | 0.999 | 0.999 | **    | *** | 0.999 | 0.066 | *** | 0.343 | *** | ***   |
|                               |          | Formal institutions, regulation and taxation | 0.999 | 0.122 | ***   | *** | 0.999 | **    | *** | 0.491 | *** | **    |
|                               |          | Market conditions                            | 0.999 | 0.999 | ***   | *** | 0.999 | *     | *** | 0.101 | *** | ***   |
|                               |          | Physical infrastructure                      | 0.999 | 0.244 | ***   | *** | 0.999 | 0.105 | *** | 0.683 | *** | **    |
| Entrepreneurship sub-dynamics | Stand-up | Human capital                                | 0.999 | 0.492 | ***   | *** | 0.999 | *     | *** | 0.058 | *** | *     |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.315 | ***   | *** | 0.999 | 0.302 | *** | 0.903 | *** | ***   |
|                               |          | Finance                                      | 0.999 | 0.413 | ***   | *** | 0.999 | **    | *** | *     | *** | 0.175 |
|                               |          | Networking and support                       | 0.999 | 0.247 | ***   | *** | 0.999 | *     | *** | 0.999 | *** | ***   |
|                               | Start-up | Human capital                                | 0.999 | 0.999 | 0.067 | *** | 0.999 | 0.364 | *** | 0.999 | *** | **    |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.118 | ***   | *** | 0.999 | 0.176 | *** | 0.999 | *** | ***   |
|                               |          | Finance                                      | 0.999 | 0.651 | ***   | *** | 0.999 | 0.123 | **  | 0.441 | **  | 0.491 |
|                               |          | Networking and support                       | 0.999 | 0.710 | ***   | *** | 0.999 | *     | *** | 0.441 | *** | **    |
|                               | Scale-up | Human capital                                | 0.999 | 0.131 | ***   | *** | 0.999 | 0.053 | *** | 0.999 | *** | ***   |
|                               |          | Knowledge creation and dissemination         | 0.999 | 0.060 | ***   | *** | 0.391 | ***   | *** | *     | *   | 0.999 |
|                               |          | Finance                                      | 0.999 | 0.227 | **    | *** | 0.999 | 0.060 | *** | 0.999 | *** | ***   |
|                               |          | Networking and support                       | 0.999 | 0.999 | ***   | *** | 0.999 | **    | *** | 0.071 | *** | **    |

Source: Own calculations.

The pairwise comparisons results (Table A3.6) of the raw pillars are very similar to the results of the final pillars in their pattern, which verifies the transformation procedures.

Figure A3.4 clears up the situation of the mean raw pillar values by development stages. (Development stages from left to right are again as follows: tailenders, laggards, catchers-up, followers, and leaders.)

**Figure A3.4: Mean Raw Pillar Values by Development Stages**



Source: Own calculations.

Even for the raw pillars, we can see that the mean of a lower development stage never exceeds the higher development stage means.

It can be concluded that the comparisons by development stages represent similar results after and before transformations of the pillars. The level of the performance of the countries seems to be captured correctly by the weighted pillars and the sub-indices. These facts supports the theoretical and methodological background of AIDES.



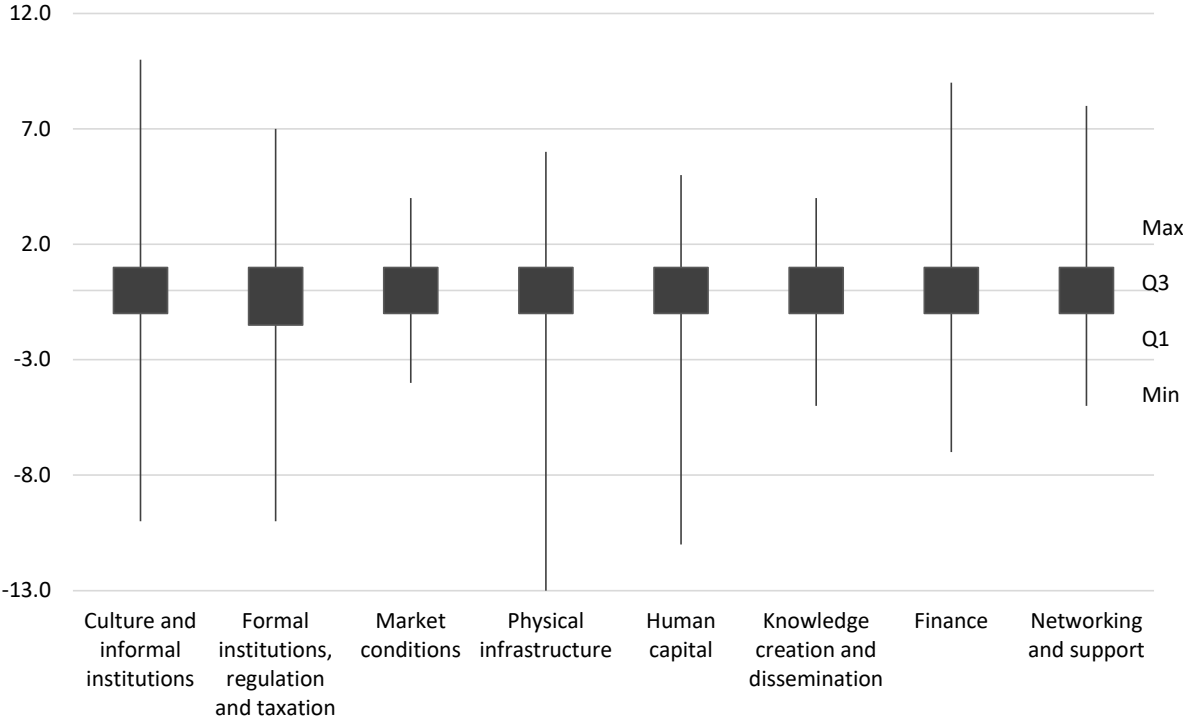
### C. Dropout Effect of the Pillars

A typical test of the robustness of the result is to drop out one pillar at a time and view the changes in the rank of the regions (Organisation for Economic Co-operation and Development 2008). It is an appropriate method to evaluate the balance among the pillars in AIDES. During this analysis, AIDES values are calculated with the original methodology and the penalized weighting method, but we discarded one pillar at a time. So, basically, the weights just slightly changed (within a country the weight can be the lowest or the second lowest value during these simulations). However, the effect of the missing pillar can be evaluated. The contextual influence pillars were dropped out individually before the average adjustment procedure. The entrepreneurship sub-dynamics pillars were removed from each phase (stand-up, start-up, scale-up) at the same time. Eight simulations were run to see the effect of excluding a pillar.

The box-plot figure (Figure A3.5) refers to the different simulations. It displays the minimum–maximum values together with the lower and upper quartile ( $Q_1$ ,  $Q_3$ ) values (range and interquartile range) of the distribution of the difference between the modified ranks, obtained by discarding one pillar at a time, and the reference rank, which is computed on the basis of the original AIDES scores. The horizontal axis labels tell us which pillar was excluded.

The maximum of the interquartile range (difference of the upper and lower quartile:  $Q_3 - Q_1$ ) is 3, but it appears only in case of Formal institutions, regulation, and taxation. But, in all other cases, the interquartile range is only 2 positions ( $Q_1$  is -1 and  $Q_2$  is +1). This means that, in each case, the middle 50% of the rank changes is at most only one position. It proves that the main characteristics and the order of the countries are captured correctly by the AIDES methodology. There are no pillars prevailing over the rest of the aspects and the overall result is a balanced outcome of the pillars. Looking at the full range (maximum–minimum) the lowest is -13, while the highest is +10. These are only modest differences compared to the number of the observations (113 countries), and there are only six countries concerned: Bangladesh, Georgia, India, Oman, Sri Lanka, and Tajikistan.

**Figure A3.5: Distribution of the Rank Differences, Discarding One Pillar at a Time**



Source: Own calculations.

Robustness analysis results of three different aspects support the robustness of the AIDES indicator. The results justify that the index provides a synthetic picture of the Asian Index of Digital Entrepreneurship Systems for the included countries, while representing a balanced diversity of the different aspects (pillars).

## APPENDIX 4: STRUCTURE AND DESCRIPTION OF ASIAN INDEX OF DIGITAL ENTREPRENEURSHIP SYSTEMS COMPONENTS

### A. General Framework Conditions (GFC)

| GENERAL FRAMEWORK CONDITIONS (GFC)                        |           |   |                       |   |   |  |              |                           |
|---|-----------|---|-----------------------|---|---|--|--------------|---------------------------|
| Indicators  | Code      | Dataset   | Type of Data          | Unit of Measurement                                 | Description   | Sources  | Date         | Correspondence with EIDES |
| <b>CULTURE, INFORMAL INSTITUTIONS (GFC_P1)</b>            |           |   |                       |   |   |  |              |                           |
| <i>Efficiency of legal framework in settling disputes</i> | GFC_P1_I1 | WEF, The Competitiveness Index 4.0 2019 Dataset | Indicator             | Likert scale (1–7)                                  | Survey response: "In your country, how efficient are the legal and judicial systems for companies in settling disputes?" [1 = extremely inefficient; 7 = extremely efficient]   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same                      |
| <i>Corruption Perception Index</i>                        | GFC_P1_I2 | Transparency International                      | Aggregate             | Score (0-100, 0 = highly corrupt, 100 = very clean) | See "Source description" file for detailed information about each country survey  | <a href="https://www.transparency.org/en/cpi/2020/index/nzl">https://www.transparency.org/en/cpi/2020/index/nzl</a> (12/08/2021)   | 2020 edition | Same                      |
| <i>Corporate governance</i>                               | GFC_P1_I3 | WEF, The Competitiveness Index 4.0 2019 Dataset | Aggregate (sub-index) | Score, 0-100 (best)                                 | Aggregate of (1) survey response: "In your country, how strong are financial auditing and reporting standards?" [1 = extremely weak; 7 = extremely strong]; (2) conflict of interest regulation index score; (3) shareholder governance index score | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same                      |
| <i>Attitudes towards entrepreneurial risk</i>             | GFC_P1_I4 | WEF, The Competitiveness Index 4.0 2019 Dataset | Indicator             | Likert scale (1–7)                                  | "In your country, to what extent do people have an appetite for entrepreneurial risk?"  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same                      |
| <i>Reliance on professional management</i>                | GFC_P1_I5 | WEF, The Competitiveness Index 4.0 2019 Dataset | Indicator             | Likert scale (1–7)                                  | "In your country, who holds senior management positions in companies?"  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same                      |
| <i>Willingness to delegate authority</i>                  | GFC_P1_I6 | WEF, The Competitiveness Index 4.0 2019 Dataset | Indicator             | Likert scale (1–7)                                  | "In your country, to what extent does senior management delegate authority to subordinates?"  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same                      |

| <b>FORMAL INSTITUTIONS, REGULATION, TAXATION (GFC_P2)</b>       |           |   |                    |                         |   |  |              |      |
|---|-----------|---|--------------------|-------------------------|---|--|--------------|------|
| <b>Rule of law (Property rights)</b>                            | GFC_P2_I1 | Economic Freedom Index, Rule of Law pillar, Heritage Foundation   | Aggregate          | Score                   | Average of the following scores: Physical property rights; intellectual property rights; strength of investor protection; risk of expropriation; quality of land administration. <a href="http://www.heritage.org/index/book/methodology#rule-of-law">http://www.heritage.org/index/book/methodology#rule-of-law</a> (12/08/2021) | <a href="https://www.heritage.org/index/explore">https://www.heritage.org/index/explore</a> (12/08/2021)   | 2021 edition | Same |
| <b>Rule of law (Judicial Effectiveness)</b>                     | GFC_P2_I2 | Economic Freedom Index, Rule of Law pillar, Heritage Foundation   | Aggregate          | Score                   | Average of the following scores: Judicial independence; quality of the judicial process; likelihood of obtaining favorable judicial decisions. <a href="http://www.heritage.org/index/book/methodology#rule-of-law">http://www.heritage.org/index/book/methodology#rule-of-law</a> (12/08/2021)                                   | <a href="https://www.heritage.org/index/explore">https://www.heritage.org/index/explore</a> (12/08/2021)   | 2021 edition | Same |
| <b>Distortive effect of taxes and subsidies on competition</b>  | GFC_P2_I3 | WEF, The Competitiveness Index 4.0 2019 Dataset   | Indicator          | Likert scale (1–7)      | "In your country, to what extent do fiscal measures (subsidies, tax breaks, etc.) distort competition?"   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same |
| <b>Total tax rate (reciprocal)</b>                              | GFC_P2_I4 | World Bank, Doing Business project  | Indicator          | % of commercial profits | Total tax rate (% of commercial profits) measures the amount of taxes and mandatory contributions payable by businesses after accounting for allowable deductions and exemptions as a share of commercial profits.  | <a href="https://data.worldbank.org/indicator/IC.TAX.TOTL.CP.ZS">https://data.worldbank.org/indicator/IC.TAX.TOTL.CP.ZS</a> (12/08/2021)                                   | 2019         | Same |
| <b>Efficiency of legal framework in challenging regulations</b> | GFC_P2_I5 | WEF, The Competitiveness Index 4.0 2019 Dataset   | Indicator          | Likert scale (1–7)      | Efficiency of legal framework in challenging regulations: "In your country, how easy is it for private businesses to challenge government actions and/or regulations through the legal system?" [1 = extremely difficult; 7 = extremely easy]   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same |
| <b>MARKET CONDITIONS (GFC_P3)</b>                               |           |   |                    |                         |   |  |              |      |
| <b>Domestic market size</b>                                     | GFC_P3_I1 | WEF, The Competitiveness Index 4.0 2019 Dataset   | Aggregate (pillar) | Score, 0–100 (best)     | Combines gross domestic product (GDP) valued at purchasing power parity with imports of goods and services, expressed as a percentage of GDP.   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition | Same |
| <b>Urbanization</b>   | GFC_P3_I2 | United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization | Indicator          | %                       | Percentage of urban population: urban population refers to people living in urban areas as defined by national statistical offices. The data are collected and smoothed by United Nations Population Division.  | <a href="https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS">https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS</a> (12/08/2021)                                   | 2020         | Same |

|  |           |   |                        |                     |   |  |                     |             |
|--|-----------|---|------------------------|---------------------|---|--|---------------------|-------------|
|  |           | Prospects: The 2018 Revision, custom data acquired via website. |                        |                     |   |  |                     |             |
| <b>Extent of market dominance</b>        | GFC_P3_I3 | WEF, The Competitiveness Index 4.0 2019 Dataset                 | Indicator              | Likert scale (1–7)  | "In your country, how do you characterize corporate activity?" [1 = dominated by a few business groups; 7 = spread among many firms]  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b> |
| <b>Economic complexity (re-scaled)</b>   | GFC_P3_I4 | Observatory of Economic Complexity                              | Aggregate              | Score               | "The complexity of an economy is related to the multiplicity of useful knowledge embedded in it.... We ...measure economic complexity by the mix of ...products that countries are able to make." <a href="http://atlas.media.mit.edu/en/resources/economic_complexity/">http://atlas.media.mit.edu/en/resources/economic_complexity/</a> | <a href="http://atlas.media.mit.edu/en/rankings/country/eci/">http://atlas.media.mit.edu/en/rankings/country/eci/</a> (12/08/2021)   | <b>2019</b>         | <b>Same</b> |
| <b>Prevalence of non-tariff barriers</b> | GFC_P3_I5 | WEF, The Competitiveness Index 4.0 2019 Dataset                 | Indicator              | Likert scale (1–7)  | "In your country, to what extent do non-tariff barriers (e.g., health and product standards, technical and labelling requirements, etc.) limit the ability of imported goods to compete in the domestic market?" [1 = strongly limit; 7 = do not limit at all]  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b> |
| <b>PHYSICAL INFRASTRUCTURE (GFC_P4)</b>  |           |   |                        |                     |   |  |                     |             |
| <b>Electricity infrastructure</b>        | GFC_P4_I1 | WEF, The Competitiveness Index 4.0 2019 Dataset                 | Aggregate (sub-pillar) | Score, 0–100 (best) | Aggregate of two indicators that measure the electrification rate and electric power transmission and distribution losses.  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b> |
| <b>Transportation infrastructure</b>     | GFC_P4_I2 | WEF, The Competitiveness Index 4.0 2019 Dataset                 | Aggregate (sub-pillar) | Score, 0–100 (best) | Aggregate of eight indicators that measure roads, railroads, air transport and water transport infrastructure.  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b> |

## B. Systemic Framework Conditions (SFC)

| SYSTEMIC FRAMEWORK CONDITIONS (SFC)              |              |   |                    |                          |  |  |              |                           |
|--|--------------|---|--------------------|--------------------------|--|--|--------------|---------------------------|
| STAND-UP (S1)                                    |              |   |                    |                          |  |  |              |                           |
| Indicators                                       | Code         | Dataset   | Type of Data       | Unit of Measurement      | Description  | Sources  | Date         | Correspondence with EIDES |
| HUMAN CAPITAL (S1_SEC_P1)                        |              |   |                    |                          |  |  |              |                           |
| <b>Quality of education</b>                      | S1_SEC_P1_I1 | WEF, Global Information Technology Report       | Aggregate          | Likert scale (1–7, best) | <p><b>Quality of the education system</b> In your country, how well does the education system meet the needs of a competitive economy? [1 = not well at all; 7 = extremely well];</p> <p><b>Quality of management schools</b> In your country, how do you assess the quality of business schools? [1 = extremely poor—among the worst in the world; 7 = excellent—among the best in the world]</p> <p><i>Average value of the two above-mentioned indicators.</i></p>  | <a href="https://tcdata360.worldbank.org/indicators/entrp.ed.qual?country=BRA&amp;indicator=3415&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.ed.qual?country=BRA&amp;indicator=3415&amp;viz=line_chart&amp;years=2012,2016</a> (12/08/2021)<br><a href="http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf">http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf</a> (12/08/2021) | 2018         | Proxy, different database |
| <b>Future workforce</b>                          | S1_SEC_P1_I2 | WEF, The Competitiveness Index 4.0 2019 Dataset | Aggregate (pillar) | Score 0-100 (best)       | Aggregate of three indicators: (1) Total number of years of schooling (primary through tertiary) that a child of school entrance age can expect to receive (Source: UNESCO); (2) Response to the question “In your country, how do you assess the style of teaching?” [1 = frontal, teacher based, and focused on memorizing; 7 = encourages creative and critical individual thinking] (Source: WEF); (3) Average number of pupils per teacher, based on headcounts of both pupils and teachers. (Source: World Bank) | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | 2019 edition | Same                      |
| KNOWLEDGE CREATION AND DISSEMINATION (S1_SEC_P2) |              |   |                    |                          |  |  |              |                           |

|  |              |  |           |                    |   |  |                   |                           |
|--|--------------|--|-----------|--------------------|---|--|-------------------|---------------------------|
| <b>Skillset of graduates</b>             | S1_SEC_P2_I1 | WEF, The Competitiveness Index 4.0 2019 Dataset  | Indicator | Likert scale (1–7) | Average score of the following questions: “In your country, to what extent do graduating students from secondary education possess the skills needed by businesses?” and “In your country, to what extent do graduating students from university possess the skills needed by businesses? ” In each case, the answer ranges from 1 (not at all) to 7 (to a great extent).]  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2019 edition      | Same                      |
| <b>Professionals &amp; researchers</b>   | S1_SEC_P2_I1 | Global Talent Competitiveness Index  | Aggregate | Score (0–100)      | Professionals (%)   Full-time equivalent researchers (per million population)   | <a href="https://www.insead.edu/global-indices">https://www.insead.edu/global-indices</a> (12/08/2021)   | 2014–2020 average | Same                      |
| <b>Attracting and retraining talents</b> | S1_SEC_P2_I3 | WEF, The Competitiveness Index 4.0 2019 Dataset  | Indicator | Likert scale (1–7) | <p><b>Country capacity to attract talent</b></p> <p>Does your country attract talented people from abroad? [1 = not at all; 7 = attracts the best and brightest from around the world]</p> <p><b>Country capacity to retain talent</b></p> <p>Does your country retain talented people? [1 = the best and brightest leave to pursue opportunities in other countries; 7 = the best and brightest stay and pursue opportunities in the country]</p> <p><i>The average value of the two above-mentioned indicators.</i></p> | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | 2018 edition      | Proxy, different database |
| <b>FINANCE (S1_SEC_P3)</b>               |              |  |           |                    |   |  |                   |                           |
| <b>Domestic credit to private sector</b> | S1_SEC_P3_I1 | International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates. | Indicator | % of GDP           | Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. Domestic credit to private sector (% of GDP)  | <a href="https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS">https://data.worldbank.org/indicator/FS.AST.PRVT.GD.ZS</a> (12/08/2021)                                   | 2016–2020 average | Same                      |

|  |              |   |                     |  |   |  |                                 |                                  |
|--|--------------|---|---------------------|--|---|--|---------------------------------|----------------------------------|
| <b>Financing SMEs</b>                            | S1_SEC_P3_I2 | WEF, The Competitiveness Index 4.0 2019 Dataset | Indicator           | Likert scale (1–7)   | “In your country, to what extent can small- and medium-sized enterprises (SMEs) access finance they need for their business operations through the financial sector?” [1 = not at all; 7 = to a great extent]                                       | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b>             | <b>Same</b>                      |
| <b>NETWORKING AND SUPPORT (S1_SEC_P4)</b>        |              |   |                     |  |   |  |                                 |                                  |
| <b>Social capital</b>                            | S1_SEC_P4_I1 | WEF, The Competitiveness Index 4.0 2019 Dataset | indicator           | %  | Score on the Social Capital pillar of the Legatum Prosperity Index™, which assesses social cohesion and engagement, community and family networks, and political participation and institutional trust. The scale ranges from 0 (low) to 100 (high) | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019</b>                     | <b>New</b>                       |
| <b>START-UP (S2)</b>                             |              |   |                     |  |   |  |                                 |                                  |
| <b>Indicators</b>                                | <b>Code</b>  | <b>Dataset</b>                                  | <b>Type of data</b> | <b>Unit of Measurement</b>                                       | <b>Description</b>  | <b>Sources</b>   | <b>Date</b>                     | <b>Correspondence with EIDES</b> |
| <b>HUMAN CAPITAL (S2_SEC_P1)</b>                 |              |   |                     |  |   |  |                                 |                                  |
| <b>Tertiary education enrollment</b>             | S2_SEC_P1_I1 | UIS. Stat                                       | Indicator           | %  | Gross enrolment ratio for tertiary education, both sexes (%)  | <a href="http://data.uis.unesco.org/">http://data.uis.unesco.org/</a> (14/08/2021)   | <b>2016–2019 average</b>        | <b>Proxy, different database</b> |
| <b>Percentage of universities in top ranking</b> | S2_SEC_P1_I2 | Webometrics Ranking of World Universities, CSIC | Indicator           | Number of universities in TOP1000 / total number of universities | Number of universities in TOP1000 ranking divided by the total population, by country   | <a href="http://www.webometrics.info/en/node/54">http://www.webometrics.info/en/node/54</a> (14/08/2021)   | <b>2020</b>                     | <b>Same</b>                      |
| <b>STEM education</b>                            | S2_SEC_P1_I3 | UIS. Stat                                       | Indicator           | Per million inhabitants  | Percentage of graduates from tertiary education graduating from engineering, manufacturing, and construction programs, both sexes (%), UIS. Statistics.   | <a href="http://data.uis.unesco.org/?queryid=74#">http://data.uis.unesco.org/?queryid=74#</a> (17/08/2021)   | <b>2012 (2013)–2019 average</b> | <b>Proxy, different database</b> |



|   |                     |  |           |                          |  |  |                          |                                  |
|---|---------------------|--|-----------|--------------------------|--|--|--------------------------|----------------------------------|
|   |                     |  |           |                          | Percentage of graduates from tertiary education graduating from Natural sciences, mathematics, and statistics programs, both sexes (%), UNESCO Institute for Statistics<br><i>The indicator is the sum of the two above-mentioned indicators.</i>  |  |                          |                                  |
| <b>Researchers in R&amp;D (per million people)</b>      | <b>S2_SEC_P1_I4</b> | UNESCO Institute for Statistics  | Indicator | Per million people       | Researchers in R&D are professionals engaged in the conception or creation of new knowledge, products, processes, methods, or systems and in the management of the projects concerned. Postgraduate PhD students (ISCED97 level 6) engaged in R&D are included. Weighted average. Data on researchers and technicians in R&D are measured in both full-time equivalent and headcount but are shown in full-time equivalent only. | <a href="https://tcdata360.worldbank.org/indicators/SP.POP.SCIE.RD.P6?country=BRA&amp;indicator=2014&amp;viz=line_chart&amp;years=1996,2014">https://tcdata360.worldbank.org/indicators/SP.POP.SCIE.RD.P6?country=BRA&amp;indicator=2014&amp;viz=line_chart&amp;years=1996,2014</a> (17/08/2021) | <b>2014–2018 average</b> | <b>Proxy, different database</b> |
| <b>KNOWLEDGE CREATION AND DISSEMINATION (S2_SEC_P2)</b> |                     |  |           |                          |  |  |                          |                                  |
| <b>Quality of research institutions</b>                 | <b>S2_SEC_P2_I1</b> | WEF, The Competitiveness Index 4.0 2019 Dataset new name: Research institutions prominence | Indicator | Index                    | The prevalence and standing of private and public research institutions, calculated as the sum of the inverse ranks of all research institutions of a country included in the SCImago Institutions Rankings  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | <b>2019 edition</b>      | <b>Same</b>                      |
| <b>Technicians and associate professionals</b>          | <b>S2_SEC_P2_I2</b> | International Labour Organisation (ILO)  | Indicator | % per capita             | Employment distribution by occupation (by sex): Technicians and associate professionals  | <a href="https://www.ilo.org/shinyapps/bulkexplorer11/?lang=en&amp;segment=indicator&amp;id=EMP_2EMP_SEX_OCU_NB_A">https://www.ilo.org/shinyapps/bulkexplorer11/?lang=en&amp;segment=indicator&amp;id=EMP_2EMP_SEX_OCU_NB_A</a> (12/08/2021)   | <b>2019</b>              | <b>Same</b>                      |
| <b>Quality of math and science in education</b>         | <b>S2_SEC_P2_I3</b> | WEF, Global Information Technology Report  | Aggregate | Likert scale (1–7, best) | Quality of math and science education In your country, how do you assess the quality of math and science education [1 = extremely poor—among the worst in the world; 7 = excellent—among the best in the world]  | <a href="https://tcdata360.worldbank.org/indicators/entrp.ed.qual?country=BRA&amp;indicator=3415&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.ed.qual?country=BRA&amp;indicator=3415&amp;viz=line_chart&amp;years=2012,2016</a> (12/08/2021)         | <b>2018</b>              | <b>New</b>                       |
| <b>FINANCE (S2_SEC_P3)</b>                              |                     |  |           |                          |  |  |                          |                                  |

|   |                       |   |                     |                                     |   |   |                     |                                  |
|---|-----------------------|---|---------------------|-------------------------------------|---|---|---------------------|----------------------------------|
| <b>Venture capital availability</b>           | S2_SEC_P3_I1          | WEF, The Competitiveness Index 4.0 2019 | Indicator           | Likert scale (1–7)                  | "In your country, how easy is it for start-up entrepreneurs with innovative but risky projects to obtain equity funding? [1 = extremely difficult; 7 = extremely easy]" | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)  | <b>2019 edition</b> | <b>Same</b>                      |
| <b>Venture capital funding</b>                | S2_SEC_P3_I2          | Dealroom                                | Indicator           | € million per capita                | Venture capital funding, € billion, per million capita  | <a href="https://app.dealroom.co/markets/countries/overview">https://app.dealroom.co/markets/countries/overview</a> (12/08/2012)  | <b>2021</b>         | <b>New</b>                       |
| <b>Number of venture capital investors</b>    | S2_SEC_P3_I3          | Dealroom                                | Indicator           | Investors per capita                | Number of venture capital investors, per capita   | <a href="https://app.dealroom.co/markets/countries/overview">https://app.dealroom.co/markets/countries/overview</a> (12/08/2012)  | <b>2021</b>         | <b>New</b>                       |
| <b>NETWORKING AND SUPPORT (S2_SEC_P4)</b>     |                       |   |                     |                                     |   |   |                     |                                  |
| <b>International co-inventions</b>            | S2_SEC_P4_I2S2_SEC_P4 | WEF, The Competitiveness Index 4.0 2019 | Indicator           | Per million population              | Number of patent family applications with co-inventors located abroad per million population  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (14/08/2021)  | <b>2019 edition</b> | <b>New</b>                       |
| <b>Joint venture/strategic alliance deals</b> | S2_SEC_P4_I2S2_SEC_P4 | The Global Innovation Index             | Indicator           | Score 0–100 (per billion PPP\$ GDP) | Joint ventures/strategic alliances: Number of deals, fractional counting  | <a href="https://tcdata360.worldbank.org/indicators/3aa2eb70?country=BRA&amp;indicator=40712&amp;viz=line_chart&amp;years=2013,2020">https://tcdata360.worldbank.org/indicators/3aa2eb70?country=BRA&amp;indicator=40712&amp;viz=line_chart&amp;years=2013,2020</a> (014/08/2021) | <b>2020</b>         | <b>New</b>                       |
| <b>SCALE-UP (S3)</b>                          |                       |   |                     |                                     |   |   |                     |                                  |
| <b>Indicators</b>                             | <b>Code</b>           | <b>Dataset</b>                          | <b>Type of Data</b> | <b>Unit of Measurement</b>          | <b>Description</b>  | <b>Sources</b>  | <b>Date</b>         | <b>Correspondence with EIDES</b> |
| <b>HUMAN CAPITAL (S3_SEC_P1)</b>              |                       |   |                     |                                     |   |   |                     |                                  |

|   |               |  |           |   |   |  |                     |                                  |
|---|---------------|--|-----------|---|---|--|---------------------|----------------------------------|
| <b>Extent of staff training</b>                         | S3_SEC_P1_    | WEF, The Competitiveness Index 4.0 2019  | Indicator | Likert scale (1–7)  | "In your country, to what extent do companies invest in training and employee development?" [1 = not at all; 7 = to a great extent]   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b>                      |
| <b>Skilled labour</b>                                   | S3_SEC_P1_    | WEF, The Competitiveness Index 4.0 2019  | Indicator | Likert scale (1–7)  | "In your country, to what extent can companies find people with the skills required to fill their vacancies?" [1 = not at all; 7 = to a great extent]   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Proxy, different database</b> |
| <b>Labour freedom</b>                                   | S3_SEC_P1_I3_ | Heritage Foundation  | Aggregate | Score   | Indicator of labor market regulation based on (1) ratio of minimum wage to the average value added per worker; (2) hindrance to hiring additional workers; (3) rigidity of hours; (4) difficulty of firing redundant employees; (5) legally mandated notice period; (6) mandatory severance pay | <a href="https://www.heritage.org/index/explore">https://www.heritage.org/index/explore</a> (12/08/2021)   | <b>2021</b>         | <b>Same</b>                      |
| <b>KNOWLEDGE CREATION AND DISSEMINATION (S3_SEC_P2)</b> |               |  |           |   |   |  |                     |                                  |
| <b>Gross domestic expenditure on R&amp;D (GERD)</b>     | S3_SEC_P2_I1_ | The Global Innovation Index (UNESCO Institute for Statistics, UIS online database; Eurostat, Eurostat data base, 2020; OECD, Main Science and Technology Indicators MSTI database, 2020) | Indicator | Gross expenditure on research and development (R&D (% of GDP) | Gross domestic expenditure on R&D   | <a href="https://www.globalinnovationindex.org/analysis-indicator">https://www.globalinnovationindex.org/analysis-indicator</a> (12/08/2021)                               | <b>2020</b>         | <b>Proxy, different database</b> |
| <b>PCT patent applications</b>                          | S3_SEC_P2_    | WEF, The Competitiveness Index 4.0 2019  | Indicator | Number of patent / million population                         | Number of applications filed under the Patent Cooperation Treaty (PCT) per million population   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021) | <b>2019 edition</b> | <b>Same</b>                      |
| <b>Knowledge absorption</b>                             | S3_SEC_P2_    | The Global Innovation Index  | Aggregate | Score   | Aggregate of: Intellectual property payments, % total trade; High-tech net imports, % total trade; ICT services imports, % total trade; FDI net inflows, % GDP; Research talent, % in business enterprise   | <a href="https://www.globalinnovationindex.org/analysis-indicator">https://www.globalinnovationindex.org/analysis-indicator</a> (12/08/2021)                               | <b>2020</b>         | <b>Same</b>                      |

|   |              |   |           |                    |   |  |              |                           |
|---|--------------|---|-----------|--------------------|---|--|--------------|---------------------------|
| <b>University-industry collaboration in R&amp;D</b> | S3_SEC_P2_   | WEF, The Competitiveness Index 4.0 2019   | Indicator | Likert scale (1–7) | "In your country, to what extent do business and universities collaborate on research and development (R&D)?" [1 = do not collaborate at all; 7 = collaborate extensively]  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | 2019 edition | Same                      |
| <b>FINANCE (S3_SEC_P3)</b>                          |              |   |           |                    |   |  |              |                           |
| <b>Market capitalization</b>                        | S3_SEC_P3_I1 | WEF, The Competitiveness Index 4.0 2019   | Indicator | % of GDP           | Total value of listed companies as a percentage of GDP (end-of-year values)   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | 2019 edition | Same                      |
| <b>Financing through local equity market</b>        | S3_SEC_P3_I2 | WEF, The Competitiveness Index, 2017-2018 | Indicator | Likert scale (1–7) | "In your country, to what extent can companies raise money by issuing shares and/or bonds on the capital market?" [1 = not at all; 7 = to a great extent]   2016–17 weighted average  | <a href="http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf">http://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf</a> (12/08/2021) | 2018 edition | Proxy, different database |
| <b>NETWORKING AND SUPPORT (S3_SEC_P4)</b>           |              |   |           |                    |   |  |              |                           |
| <b>State of cluster development</b>                 | S3_SEC_P4_I1 | WEF, The Competitiveness Index 4.0 2019   | Indicator | Likert scale (1–7) | "In your country, how widespread are well-developed and deep clusters (geographic concentrations of firms, suppliers, producers of related products and services, and specialized institutions in a particular field)?" [1 = non-existent; 7 = widespread in many fields]   | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | 2019 edition | Same                      |
| <b>Multi-stakeholder collaboration</b>              | S3_SEC_P4_I2 | WEF, The Competitiveness Index 4.0 2019   | Aggregate | Likert scale (1–7) | Average score of the following questions: "In your country, to what extent do people collaborate and share ideas within a company?" [1 = not at all; 7 = to a great extent]; "In your country, to what extent do companies collaborate in sharing ideas and innovating?"; "In your country, to what extent do business and universities collaborate on research and development (R&D)?" | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (12/08/2021)   | 2019 edition | Same                      |

|                       |             |            |           |                    |  |  |             |             |
|-----------------------|-------------|------------|-----------|--------------------|--|--|-------------|-------------|
| <b>Logistic index</b> | S3_SEC_P4_I | World Bank | Aggregate | Likert scale (1–5) | Logistics performance index: Overall (1=low to 5=high) | <a href="https://lpi.worldbank.org/international/aggregated-ranking">https://lpi.worldbank.org/international/aggregated-ranking</a> (12/08/2021) | <b>2018</b> | <b>Same</b> |
|-----------------------|-------------|------------|-----------|--------------------|--|--|-------------|-------------|

### C. Digital Framework Conditions (DFC)

| DIGITAL FRAMEWORK CONDITIONS (DFC)             |           |  |              |                     |  |  |   |                           |
|--|-----------|--|--------------|---------------------|--|--|---|---------------------------|
| Indicator                                      | Code      | Dataset  | Type of data | Unit of measurement | Description  | Sources  | Date (all available years)  | Correspondence with EIDES |
| <b>CULTURE, INFORMAL INSTITUTIONS (DFC_P1)</b> |           |  |              |                     |  |  |   |                           |
| <b>Households with a computer at home</b>      | DFC_P1_I1 | ITU World Telecommunication, ICT Indicators Database | Indicator    | % households        | Percentage of households equipped with a personal computer HH5% = [(number of in-scope individuals using a computer) / (total number of in-scope individuals)]*100 (pp. 51–52) | <a href="https://tcdata360.worldbank.org/sources">https://tcdata360.worldbank.org/sources</a> (09/08/2021) | <b>Average 2014–2019</b> (2010–2019, but majority of the data are missing), <b>latest available 2016–2019</b> | Proxy, different database |
| <b>Households with Internet access</b>         | DFC_P1_I2 | ITU World Telecommunication, ICT Indicators Database | Indicator    | % households        | This is the proportion of households with internet access at home. HH6% = [(number of in-scope households with internet) / (total number of in-scope households)]*100. (p. 53) | <a href="https://tcdata360.worldbank.org/sources">https://tcdata360.worldbank.org/sources</a> (09/08/2021) | <b>Average 2014–2019</b> (2010–2019, but majority of the data are missing), <b>latest available 2016–2019</b> | Proxy, different database |
| <b>Individuals using Internet</b>              | DFC_P1_I3 | ITU World Telecommunication, ICT Indicators Database | Indicator    | % individuals       | This is the proportion of individuals who used the internet from specified locations in the last 3 months. HH8% internet users home = [(number of in-scope individuals         | <a href="https://tcdata360.worldbank.org/sources">https://tcdata360.worldbank.org/sources</a> (09/08/2021) | <b>Average 2014–2019</b> (2010–2019, but majority of the  | Proxy, different database |

|   |           |   |           |           |  |  |  |                           |
|---|-----------|---|-----------|-----------|--|--|--|---------------------------|
|   |           |   |           |           | using the internet at home) / (total number of inscope individuals using the Internet)]*100. (pp. 55–56)   |  | data are missing), latest available 2016–2019  |                           |
| <b>Percent of firms having its own website</b>            | DFC_P1_I4 | WBG Enterprise survey                             | Indicator | % firms   | Percentage of firms using website for business related activities, i.e. sales, product promotion etc. (p. 113)   | <a href="https://govdata360.worldbank.org/indicators/inn.pct.site?country=BRA&amp;indicator=271&amp;viz=bar_chart&amp;years=2009">https://govdata360.worldbank.org/indicators/inn.pct.site?country=BRA&amp;indicator=271&amp;viz=bar_chart&amp;years=2009</a> (09/08/2021) | Average of 2005–2009, 2010–2014, and 2015–2020 (2002–2020, majority of the data are missing) | Proxy, different database |
| <b>FORMAL INSTITUTIONS, REGULATION, TAXATION (DFC_P2)</b> |           |   |           |           |  |  |  |                           |
| <b>Future orientation of government</b>                   | DFC_P2_I1 | The Global Competitiveness Index 4.0 2019 Dataset | Aggregate | DTF score | Former indicator 1.13, Future orientation of government, which is comprised of four indicators derived from the Executive Opinion Survey, is now sub-pillar H of Pillar 1. The four indicators remain and are complemented by three new indicators: energy efficiency regulation (indicator 1.24), renewable energy regulation (1.25), and environment-related treaties in force (1.26), which collectively measure a government's commitment to sustainability, an indication of its future orientation. As a result of these changes, the numbering of indicators in Pillar 1 was modified according to the new order (p. 613) | <a href="https://govdata360.worldbank.org/indicators/inn.pct.site?country=BRA&amp;indicator=271&amp;viz=bar_chart&amp;years=2009">https://govdata360.worldbank.org/indicators/inn.pct.site?country=BRA&amp;indicator=271&amp;viz=bar_chart&amp;years=2009</a> (09/08/2021) | 2019 edition   | Same                      |

|   |           |  |           |                           |   |  |                     |                           |
|---|-----------|--|-----------|---------------------------|---|--|---------------------|---------------------------|
| <b>Percent-<br/>age of<br/>network<br/>attacks<br/>by<br/>Kaspersk<br/>y (recip-<br/>rocal)</b>   | DFC_P2_I2 | Securelist   | Indicator | % of users                | It shows the percentages of users on whose devices Kaspersky Lab products intercepted Network attacks in the Last month. KL products' users are always protected from all – even the very latest – threats.   | <a href="https://statistics.secure-list.com/intrusion-detection-scan/month">https://statistics.secure-list.com/intrusion-detection-scan/month</a> (09/08/2021)   | <b>05/07/2021</b>   | Same                      |
| <b>Percent-<br/>age of<br/>WEB<br/>treats (re-<br/>ciprocal)</b>                                  | DFC_P2_I3 | Securelist   | Indicator | % of users                | It shows the percentages of users on whose devices Kaspersky Lab products intercepted Web threats in the Last month. KL products' users are always protected from all – even the very latest – threats.   | <a href="https://statistics.secure-list.com/web-anti-virus/month">https://statistics.secure-list.com/web-anti-virus/month</a> (09/08/2021)   | <b>05/07/2021</b>   | Same                      |
| <b>Software<br/>piracy<br/>rate (re-<br/>ciprocal)</b>  | DFC_P2_I4 | WEF, Global Information Technology Report  | Indicator | % software in-<br>stalled | Unlicensed software units as a percentage of total software units installed   | <a href="https://tcdata360.worldbank.org/indicators/entrp.piracy?country=BRA&amp;indicator=3377&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.piracy?country=BRA&amp;indicator=3377&amp;viz=line_chart&amp;years=2012,2016</a> (09/08/2021) | <b>2016</b>         | Same                      |
| <b>Competi-<br/>tion in<br/>network<br/>services</b>  | DFC_P2_I5 | The Global Competitiveness Index 4.0 2019 Dataset  | Indicator | Likert scale (1–7)        | "In your country, how competitive are the provision of the following services: c. Network sector (telecommunications, utilities, postal, transport, etc.)" [1 = not at all competitive; 7 = extremely competitive]  | <a href="http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf">http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf</a> (09/08/2021)   | <b>2019 edition</b> | Same                      |
| <b>E-govern-<br/>ment</b>   | DFC_P2_I6 | United Nations Department of Economic and Social Affairs Division for Public Administration and Development Management | Aggregate | Score                     | E-Government Development Index (EGDI) incorporates the access characteristics, such as the infrastructure and educational levels, to reflect how a country is using information technologies to promote access and inclusion of its people. The EGDI is a composite measure of three important dimensions of e-government, namely: provision of online services, telecommunication connectivity and human capacity. | <a href="https://publicadministration.un.org/egovkb/Data-Center">https://publicadministration.un.org/egovkb/Data-Center</a> (09/08/2021)   | <b>2020</b>         | Same                      |
| <b>MARKET CONDITIONS (DFC_P3)</b>   |           |  |           |                           |   |  |                     |                           |
| <b>Used the<br/>internet<br/>to pay<br/>bills or to<br/>buy<br/>some-<br/>thing<br/>online in</b> | DFC_P3_I1 | The Global Findex Database, WBG  | Indicator | % age 15+                 | The percentage of respondents who report using the internet to pay bills or buy something online in the past 12 months.   | <a href="https://tcdata360.worldbank.org/indicators/hdec76eb6?country=BRA&amp;indicator=3364&amp;viz=line_chart&amp;years=2014,2017">https://tcdata360.worldbank.org/indicators/hdec76eb6?country=BRA&amp;indicator=3364&amp;viz=line_chart&amp;years=2014,2017</a> (09/08/2021)       | <b>2017</b>         | Proxy, different database |

|  |           |  |           |               |  |  |   |                           |
|--|-----------|--|-----------|---------------|--|--|---|---------------------------|
| <i>the past year (% age 15+)</i>   |           |  |           |               |  |  |   |                           |
| <i>Used the internet to buy something online in the past year(% age 15+)</i> | DFC_P3_I2 | The Global Findex Database, WBG                      | Indicator | % age 15+     | The percentage of respondents who report using the internet to buy something online in the past 12 months.   | <a href="https://global-findex.worldbank.org/">https://global-findex.worldbank.org/</a> (09/08/2021)   | <b>2017</b>   | Proxy, different database |
| <i>Internet shopping</i>   | DFC_P3_I3 | Network Readiness Index (The Global Findex Database) | Indicator | Score         |  | <a href="https://networkreadiness-index.org/">https://networkreadiness-index.org/</a> (09/08/2021)   | <b>2020 edition</b>   | Proxy, different database |
| <i>% of firms using email to interact with clients/suppliers</i>             | DFC_P3_I4 | WBG, Enterprise Survey                               | Indicator | %             | Percentage of firms using email to interact with clients or suppliers. (p. 114)  | <a href="https://tcdata360.worldbank.org/indicators/pct.email?country=BRA&amp;indicator=272&amp;viz=bar_chart&amp;years=2009">https://tcdata360.worldbank.org/indicators/pct.email?country=BRA&amp;indicator=272&amp;viz=bar_chart&amp;years=2009</a> (09/08/2021) | <b>Average 2005–2020</b> (majority of the data are missing) | <b>New</b>                |
| <i>B2C E-commerce Index</i>  | DFC_P3_I5 | UNCTAD   | Indicator | Score (0–100) | The UNCTAD B2C E-commerce Index measures an economy's preparedness to support online shopping. The index consists of four indicators that are highly related to online shopping and for which there is wide country coverage. (p. 1) | <a href="https://knoema.com/UNCTAD-BECI2019/unctad-b2c-e-commerce-index">https://knoema.com/UNCTAD-BECI2019/unctad-b2c-e-commerce-index</a> (09/08/2021)   | <b>2020</b>   | <b>New</b>                |
| <i>T-index</i>   | DFC_P3_I6 | Translate.net  | Indicator | Score         | The T-Index is a percentage value that estimates the market share of each country in relation to global e-commerce. The higher the T-Index, the higher the online sales potential of a given country.                                | <a href="https://www.translated.net/en/languages-that-matter">https://www.translated.net/en/languages-that-matter</a> (09/08/2021)   | <b>2021</b>   | Same                      |
| <b>PHYSICAL INFRASTRUCTURE (DFC_P4)</b>                                      |           |  |           |               |  |  |   |                           |



|  |           |  |           |                 |  |  |                  |                           |
|--|-----------|--|-----------|-----------------|--|--|------------------|---------------------------|
| <b>Prepaid mobile cellular tariffs</b>                       | DFC_P4_I1 | WEF - Global Information Technology Report | Indicator | PPP \$/Min      | Average per-minute cost of different types of mobile cellular calls (PPP \$)   | <a href="https://tcdata360.worldbank.org/indicators/entrp.mob.pre-paid?country=BRA&amp;indicator=3409&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.mob.pre-paid?country=BRA&amp;indicator=3409&amp;viz=line_chart&amp;years=2012,2016</a> (09/08/2021)                   | <b>2016</b>      | Same                      |
| <b>Data-only mobile-broad-band basket (1.5 GB and above)</b> | DFC_P4_I2 | ITU, ICT Price baskets 2018-2020           | Indicator | GDPpc           | The data-only mobile-broadband basket (1.5 GB, 3G and above) refers to the cheapest plan providing at least 1.5GB of high-speed data (>=256Kbit/s) over a 30-day (or 4-week) period of time from the operator with the largest market share in each economy. | <a href="https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx">https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx</a> (09/08/2021)   | <b>2020</b>      | Proxy, different database |
| <b>Fixed broadband Internet tariffs</b>                      | DFC_P4_I3 | WEF - Global Information Technology Report | Indicator | PPP \$/month    | Monthly subscription charge for fixed (wired) broadband internet service (PPP \$)  | <a href="https://tcdata360.worldbank.org/indicators/etrade.entrp.broad-band.tar?country=BRA&amp;indicator=3411&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/etrade.entrp.broad-band.tar?country=BRA&amp;indicator=3411&amp;viz=line_chart&amp;years=2012,2016</a> (09/08/2021) | <b>2016</b>      | Same                      |
| <b>Fixed broadband 5GB</b>                                   | DFC_P4_I4 | ITU, ICT Price baskets 2018-2020           | Indicator | GDPpc           | The fixed broadband basket (5GB>= 256Kbit/s) refers to the cheapest plan providing at least 5GB of monthly high-speed data (>=256Kbit/s) from the operator with the largest market share in each economy.  | <a href="https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx">https://www.itu.int/en/ITU-D/Statistics/Dashboards/Pages/IPB.aspx</a> (09/08/2021)   | <b>2020</b>      | Proxy, different database |
| <b>Median Download speed</b>                                 | DFC_P4_I5 | Fastmetrix                                 | Indicator | Score           | Speed test data is collected by M-Lab and their Network Diagnostic Tool. M-Lab measures median download and upload speeds for 192 countries, on a weekly basis. This internet speed data is current as of week ending August 30th, 2020.                     | <a href="https://www.fastmetrics.com/internet-connection-speed-by-country.php#median-internet-speeds-2020">https://www.fastmetrics.com/internet-connection-speed-by-country.php#median-internet-speeds-2020</a> (09/08/2021)   | <b>2020</b>      | Proxy, different database |
| <b>Median Upload speed</b>                                   | DFC_P4_I6 | Fastmetrix                                 | Indicator | Score           | Speed test data is collected by M-Lab and their Network Diagnostic Tool. M-Lab measures median download and upload speeds for 192 countries, on a weekly basis. This internet speed data is current as of week ending 30 August 2020.                        | <a href="http://testmy.net/country">http://testmy.net/country</a>  | <b>2020</b>      | Proxy, different database |
| <b>Mobile network coverage</b>                               | DFC_P4_I7 | WEF - Global Information Technology Report | Indicator | % of population | Percentage of total population covered by a mobile network signal  | <a href="https://tcdata360.worldbank.org/indicators/entrp.mob.cov?country=BRA&amp;in-">https://tcdata360.worldbank.org/indicators/entrp.mob.cov?country=BRA&amp;in-</a>  | <b>2012-2016</b> | Same                      |

|                                |           |  |           |                                |  |  |             |      |
|--------------------------------|-----------|--|-----------|--------------------------------|--|--|-------------|------|
|                                |           |  |           |                                |  | <a href="#">dicator=3403&amp;viz=line_chart&amp;years=2012,2016</a> (09/08/2021)   |             |      |
| <b>Secure Internet servers</b> | DFC_P4_I8 | Netcraft (netcraft.com) and World Bank population estimates. | Indicator | servers per million population | The number of distinct, publicly-trusted TLS/SSL certificates found in the Netcraft Secure Server Survey. The number of secure internet servers comes from the Netcraft Secure Server Survey. The survey examines the use of encrypted transactions through extensive automated exploration, tallying the number of web sites using HTTPS. This analysis relates to those sites found in the survey where the certificate is valid for the host-name, and the certificate has been issued from a publicly trusted root. The geographical location is derived from the hosting location of the sites using the certificates. Data are divided by the mid-year population and multiplied by one million. | <a href="https://data.worldbank.org/indicator/IT.NET.SECR.P6">https://data.worldbank.org/indicator/IT.NET.SECR.P6</a> (09/08/2021) | <b>2020</b> | Same |

## D. Systemic Digital Conditions (SDC)

| SYSTEMIC DIGITAL CONDITIONS (SDC) |              |  |              |                          |  |  |                            |                           |
|-----------------------------------|--------------|--|--------------|--------------------------|--|--|----------------------------|---------------------------|
| STAND-UP (S1)                     |              |  |              |                          |  |  |                            |                           |
| Indicators                        | Code         | Dataset                                    | Type of data | Unit of measurement      | Description  | Sources  | Date (all available years) | Correspondence with EIDES |
| HUMAN CAPITAL (S1_SDC_P1)         |              |  |              |                          |  |  |                            |                           |
| <b>Internet access in schools</b> | S1_SDC_P1_I1 | WEF - Global Information Technology Report | Indicator    | Likert scale (1–7, best) | "In your country, to what extent is the internet used in schools for learning purposes?" [1 = not at all; 7 = to a great extent] | <a href="https://tcdata360.worldbank.org/indicators/enterprise.inet.school?country=USA&amp;indicator=3465&amp;countries=BRA&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/enterprise.inet.school?country=USA&amp;indicator=3465&amp;countries=BRA&amp;viz=line_chart&amp;years=2012,2016</a> (10/08/2021) | <b>2017</b>                | Proxy, different database |

|   |              |  |           |  |   |  |                     |                           |
|---|--------------|--|-----------|--|---|--|---------------------|---------------------------|
| <b>Digital Skills Among Population</b>                  | S1_SDC_P1_I2 | The Global Competitiveness Index 4.0 2019 Dataset                        | Indicator | Likert scale (1–7)                     | "In your country, to what extent does the active population possess sufficient digital skills (e.g., computer skills, basic coding, digital reading)?" [1 = not all; 7 = to a great extent]   | <a href="https://tcdata360.worldbank.org/indicators/h945a9708?country=BRA&amp;indicator=41400&amp;viz=line_chart&amp;years=2017,2019">https://tcdata360.worldbank.org/indicators/h945a9708?country=BRA&amp;indicator=41400&amp;viz=line_chart&amp;years=2017,2019</a> (10/08/2021) | <b>2019 edition</b> | Same                      |
| <b>KNOWLEDGE CREATION AND DISSEMINATION (S1_SDC_P2)</b> |              |  |           |  |   |  |                     |                           |
| <b>Number of OA journals by country DOAJ</b>            | S1_SDC_P2_I1 | Morrison, Heather, et al. 2019, "OA APC longitudinal study dataset 2019" | Indicator | % population                           | Open access of scientific documents   | <a href="https://sustaining-knowledgecommons.org/2019/11/20/oa-main-2019-dataset-documentation-and-open-peer-review-invitation/">https://sustaining-knowledgecommons.org/2019/11/20/oa-main-2019-dataset-documentation-and-open-peer-review-invitation/</a> (10/08/2021)           | <b>2019</b>         | Proxy, different database |
| <b>Scientific and technical journal articles</b>        | S1_SDC_P2_I2 | National Science Foundation, Science and Engineering Indicator           | Indicator | % million population                   | Scientific and technical journal articles refer to the number of scientific and engineering articles published in the following fields: physics, biology, chemistry, mathematics, clinical medicine, biomedical research, engineering and technology, and earth and space sciences. | <a href="https://data.worldbank.org/indicator/IP.JRN.ARTC.SC">https://data.worldbank.org/indicator/IP.JRN.ARTC.SC</a> (10/08/2021)   | <b>2018</b>         | <b>New</b>                |
| <b>Wikipedia yearly edits</b>                           | S1_SDC_P2_I3 | The Global Innovation Index  | Indicator | Per million population 15–69 years old | Wikipedia yearly page edits (per million population 15–69 years old)  | <a href="https://tcdata360.worldbank.org/indicators/21355dd9?country=BRA&amp;indicator=40704&amp;viz=line_chart&amp;years=2017,2020">https://tcdata360.worldbank.org/indicators/21355dd9?country=BRA&amp;indicator=40704&amp;viz=line_chart&amp;years=2017,2020</a> (10/08/2021)   | <b>2020</b>         | Same                      |
| <b>YouTube video uploads</b>                            | S1_SDC_P2_I4 | The Global Innovation Index  | Indicator | Scaled by population 15–69 years old   | Number of video uploads on YouTube (scaled by population 15–69 years old)   | <a href="https://tcdata360.worldbank.org/indicators/8211d3c5?country=BRA&amp;indicator=40709&amp;viz=line_chart&amp;years=2013,2017">https://tcdata360.worldbank.org/indicators/8211d3c5?country=BRA&amp;indicator=40709&amp;viz=line_chart&amp;years=2013,2017</a> (10/08/2021)   | <b>2017</b>         | Same                      |
| <b>Mobile app creation</b>                              | S1_SDC_P2_I5 | Network Readiness Index, GSM Association, The GSMA Mobile                | Indicator | Per person                             | Number of active mobile applications developed per person, 2018   | <a href="https://networkreadiness-index.org/">https://networkreadiness-index.org/</a> (10/08/2021)   | <b>2018</b>         | <b>New</b>                |

Connectivity Index  
2019

**FINANCE (S1\_SDC\_P3)**

|   |              |                             |           |   |  |   |             |                           |
|---|--------------|-----------------------------|-----------|---|--|---|-------------|---------------------------|
| <b>Made or received digital payments in the past year</b>   | S1_SDC_P3_I1 | Global Findex Database, WGB | Indicator | % | The percentage of respondents who report using mobile money, a debit or credit card, or a mobile phone to make a payment from an account, or report using the internet to pay bills or to buy something online, in the past 12 months. It also includes respondents who report paying bills, sending or receiving remittances, receiving payments for agricultural products, receiving government transfers, receiving wages, or receiving a public sector pension directly from or into a financial institution account or through a mobile money account in the past 12 months | <a href="https://global-findex.worldbank.org/">https://global-findex.worldbank.org/</a><br>(10/08/2021) | <b>2017</b> | Proxy, different database |
| <b>Used a mobile phone or the internet to access a financial institution account in the past year (% age 15+)</b> | S1_SDC_P3_I2 | Global Findex Database, WGB | Indicator | % | The percentage of respondents who report personally receiving money from their business, from selling goods, or from providing services (including part-time work) in the past 12 months.  | <a href="https://global-findex.worldbank.org/">https://global-findex.worldbank.org/</a><br>(10/08/2021) | <b>2014</b> | <b>New</b>                |
| <b>Used a mobile phone or the internet to check account balance in the past year (% age 15+)</b>                  | S1_SDC_P3_I3 | Global Findex Database, WGB | Indicator | % | The percentage of respondents who report using a mobile phone or the internet to check their balance for a financial institution account in the past 12 months.  | <a href="https://global-findex.worldbank.org/">https://global-findex.worldbank.org/</a><br>(10/08/2021) | <b>2017</b> | <b>New</b>                |

**NETWORKING AND SUPPORT (S1\_SDC\_P4)**

|   |              |  |           |   |   |  |             |                           |
|---|--------------|--|-----------|---|---|--|-------------|---------------------------|
| <b>Generic top-level domains (gTLDs)</b>    | S1_SDC_P4_I1 | Global Innovation Index 2019               | Indicator | Per thousand population 15–69 years old       | Generic top-level domains (gTLDs) (per thousand population 15–69 years old)   | <a href="https://tcdata360.worldbank.org/indicators/f3754ef0?country=BRA&amp;indicator=40694&amp;viz=line_chart&amp;years=2013,2020">https://tcdata360.worldbank.org/indicators/f3754ef0?country=BRA&amp;indicator=40694&amp;viz=line_chart&amp;years=2013,2020</a> (10/08/2021)                   | <b>2020</b> | Same                      |
| <b>Use of virtual social networks</b>       | S1_SDC_P4_I2 | WEF - Global Information Technology Report | Indicator | Likert scale (1–7, best)                      | In your country, how widely are virtual social networks used (e.g., Facebook, Twitter, LinkedIn)? [1 = not at all used; 7 = used extensively] | <a href="https://tcdata360.worldbank.org/indicators/entrp.soc.net-work?country=BRA&amp;indicator=3435&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.soc.net-work?country=BRA&amp;indicator=3435&amp;viz=line_chart&amp;years=2012,2016</a> (10/08/2021) | <b>2016</b> | Proxy, different database |
| <b>Use of virtual social networks</b>       | S1_SDC_P4_I3 | We Are Social and Hootsuite                | Indicator | Score (0–100, best)                           |   | <a href="https://wearesocial.com/digital-2020">https://wearesocial.com/digital-2020</a> (10/08/2021)   | <b>2020</b> | Proxy, different database |
| <b>Use of virtual professional networks</b> | S1_SDC_P4_I4 | Global Talent Competitiveness Index, 2020  | Score     | LinkedIn users (per 1,000 labor force)   2015 | LinkedIn users (per 1,000 labor force)  | <a href="https://knowledge.insead.edu/talent-management/global-talent-competitiveness-index-2932">https://knowledge.insead.edu/talent-management/global-talent-competitiveness-index-2932</a> (10/08/2021)   | <b>2020</b> | Same                      |

| <b>START-UP (S2)</b>                                  |              |                |              |                                |  |  |                            |                                  |
|---|--------------|----------------|--------------|--------------------------------|--|--|----------------------------|----------------------------------|
| Indicators  | Code         | Dataset        | Type of data | Unit of measurement            | Description  | Sources  | Date (all available years) | Correspondence with EIDES        |
| <b>HUMAN CAPITAL (S2_SDC_P1)</b>                      |              |                |              |                                |  |  |                            |                                  |
| <b>Employees by occupations, Information and com-</b> | S2_SDC_P1_I1 | ILO statistics | Indicator    | Employees per total population | Employees are all those workers who hold paid employment jobs, which are those where the incumbents hold employment contracts which give them a basic remuneration not directly dependent upon the revenue of the unit for which they work. Data are disaggregated by occupation according to the latest version of the International Standard Classification of Occupations | <a href="https://www.ilo.org/shinyapps/bulkexplorer49/?lang=en&amp;segment=indicator&amp;id=EAP_2WAP_SEX_AGE_RT_A">https://www.ilo.org/shinyapps/bulkexplorer49/?lang=en&amp;segment=indicator&amp;id=EAP_2WAP_SEX_AGE_RT_A</a> (17/08/2021) | <b>2012–2020 (average)</b> | <b>Proxy, different database</b> |

|   |              |  |           |                                 |   |  |  |                                     |
|---|--------------|--|-----------|---------------------------------|---|--|--|-------------------------------------|
| <i>munica-<br/>tions tech-<br/>nicians</i>  |              |  |           |                                 | (ISCO) available for that year and presented for cate-<br>gories at the 2-digit level of the classification.  |  |  |                                     |
| <b>KNOWLEDGE CREATION AND DISSEMINATION (S2_SDC_P2)</b>                             |              |  |           |                                 |   |  |  |                                     |
| <b>Employ-<br/>ment in<br/>knowledge<br/>intensive</b>                              | S2_SDC_P2_I1 | The Global Innova-<br>tion Index   | Indicator | % of workforce                  | Employment in knowledge-intensive occupations (% of<br>workforce); sum of people in categories 1– 3 as a per-<br>centage of total people employed, according to the In-<br>ternational Standard Classification of Occupations<br>(ISCO)             | <a href="https://tcdata360.worldbank.org/indicators/97be8845?country=BRA&amp;indicator=40465&amp;viz=line_chart&amp;year=s=2013,2020">https://tcdata360.worldbank.org/indicators/97be8845?country=BRA&amp;indicator=40465&amp;viz=line_chart&amp;year=s=2013,2020</a> (10/08/2021) | <b>2018–2020</b>                               | Proxy, dif-<br>ferent da-<br>tabase |
| <b>Software<br/>developers</b>  | S2_SDC_P2_I2 | Developer survey   | Indicator | % of professional<br>developers | Number of software developers per 1,000 capita  | <a href="https://insights.stackoverflow.com/survey">https://insights.stackover-<br/>flow.com/survey</a> (10/08/2021)   | <b>2017–2020</b>                               | Same                                |
| <b>FINANCE (S2_SDC_P3)</b>  |              |  |           |                                 |   |  |  |                                     |
| <b>Market Vol-<br/>umes of Al-<br/>ternative<br/>Finance<br/>Transac-<br/>tions</b> | S2_SDC_P3_I1 | The Global Alterna-<br>tive Finance Mar-<br>ket Benchmarking<br>Report 2020 (Cam-<br>bridge) | Indicator | \$ per capita                   | Alternative market volume per capita  | <a href="https://www.jbs.cam.ac.uk/fac-&lt;br/&gt;ulty-research/centres/alterna-&lt;br/&gt;tive-finance/">https://www.jbs.cam.ac.uk/fac-<br/>ulty-research/centres/alterna-<br/>tive-finance/</a> (10/08/2021)   | <b>2020</b>                                    | Same                                |
| <b>NETWORKING AND SUPPORT (S2_SDC_P4)</b>   |              |  |           |                                 |   |  |  |                                     |
| <b>Availability<br/>of local<br/>content</b>  | S2_SDC_P4_I1 | The Network Read-<br>iness Index,  | Indicator | Likert scale (1–7,<br>best)     | Average answer to the question: In your country, to<br>what extent are internet content and services tailored<br>to the local population (e.g. in the local language,<br>meeting local demand)? (1 = Not at all; 7 = To a great<br>extent]   2018–1 | <a href="https://networkreadiness-&lt;br/&gt;index.org/">https://networkreadiness-<br/>index.org/</a> (11/08/2021)   | <b>2018–2019<br/>average</b><br>(2020 edition) | <b>New</b>                          |
| <b>SR score</b>   | S2_SDC_P4_I2 | Startupranking.com   | Indicator | Per capita                      | SR Score is a number between 0 and 100,000. It re-<br>flects the importance of a startup on the internet and its<br>social influence. It is calculated based on SR Web and<br>SR Social.  | <a href="https://www.startuprank-&lt;br/&gt;ing.com/countries">https://www.startuprank-<br/>ing.com/countries</a> (11/08/2021)   | <b>2021</b>                                    | <b>New</b>                          |
| <b>SCALE-UP (S3)</b>  |              |  |           |                                 |   |  |  |                                     |

| Indicators   | Code         | Dataset                                    | Type of data | Unit of measurement      | Description   | Sources  | Date (all available years)      | Date (EIDES 2020)         |
|--|--------------|--|--------------|--------------------------|---|--|---------------------------------|---------------------------|
| <b>HUMAN CAPITAL (S3_SDC_P1)</b>                               |              |  |              |                          |   |  |                                 |                           |
| <b>Technology Adaptation</b>                                   | S3_SDC_P1_I1 | Cisco Readiness Index                      | Indicator    | Score                    | Technology adoption is the demand for digital products and services. Mobile device penetration ITU, 2017; internet usage ITU, 2017; cloud services (Spend, IT Forecast Data) Gartner, 2019  | <a href="https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-sources/digital-readiness-index.html#/">https://www.cisco.com/c/m/en_us/about/corporate-social-responsibility/research-sources/digital-readiness-index.html#/</a> (11/08/2021)                                 | <b>2017–2018 (2019 edition)</b> | <b>New</b>                |
| <b>KNOWLEDGE CREATION AND DISSEMINATION (S3_SDC_P2)</b>        |              |  |              |                          |   |  |                                 |                           |
| <b>Total computer software spending</b>                        | S3_SDC_P2_I1 | The Global Innovation Index                | Indicator    | Score (0–100)            | Total computer software spending (% of GDP); computer software spending includes the total value of purchased or leased packaged software such as operating systems, database systems, programming tools, utilities, and applications. It excludes expenditures for internal software development and outsourced custom software development. The data are a combination of actual figures and estimates. Data are reported as a percentage of GDP. Source: IHS Markit, Information and Communication Technology Database | <a href="https://tcdata360.worldbank.org/indicators/hbf029e29?country=BRA&amp;indicator=40707&amp;viz=line_chart&amp;years=2018,2019">https://tcdata360.worldbank.org/indicators/hbf029e29?country=BRA&amp;indicator=40707&amp;viz=line_chart&amp;years=2018,2019</a> (11/08/2021)                     | <b>2017–2020 (2013–2020)</b>    | Proxy, different database |
| <b>Impact of ICTs on business models, 1-7 (best)</b>           | S3_SDC_P2_I2 | WEF - Global Information Technology Report | Indicator    | Likert scale (1–7, best) | “In your country, to what extent do ICTs enable new business models?” [1 = not at all; 7 = to a great extent]   | <a href="https://tcdata360.worldbank.org/indicators/en-trp.ict.biz.model?country=BRA&amp;indicator=3455&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/en-trp.ict.biz.model?country=BRA&amp;indicator=3455&amp;viz=line_chart&amp;years=2012,2016</a> (11/08/2021) | <b>2012–2016</b>                | <b>New</b>                |
| <b>Impact of ICTs on new organizational models, 1-7 (best)</b> | S3_SDC_P2_I3 | WEF - Global Information Technology Report | Indicator    | Likert scale (1–7, best) | “In your country, to what extent do ICTs enable new organizational models (e.g., virtual teams, remote working, telecommuting) within companies?” [1 = not at all; 7 = to a great extent]   | <a href="https://tcdata360.worldbank.org/indicators/en-trp.ict.org.mdl?country=BRA&amp;indicator=3459&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/en-trp.ict.org.mdl?country=BRA&amp;indicator=3459&amp;viz=line_chart&amp;years=2012,2016</a> (11/08/2021)     | <b>2012–2016</b>                | <b>New</b>                |

|  |              |  |           |                                |   |  |                     |            |
|--|--------------|--|-----------|--------------------------------|---|--|---------------------|------------|
| <b>ICT PCT patents, applications/million pop.</b>                | S3_SDC_P2_I4 | WEF - Global Information Technology Report | Indicator | Per million population         | Number of applications for information and communication technology-related patents filed under the Patent Cooperation Treaty (PCT) per million population  | <a href="https://tcdata360.worldbank.org/indicators/entrp.ict.patents?country=BRA&amp;indicator=3457&amp;viz=line_chart&amp;years=2012,2016">https://tcdata360.worldbank.org/indicators/entrp.ict.patents?country=BRA&amp;indicator=3457&amp;viz=line_chart&amp;years=2012,2016</a> (11/08/2021)                     | <b>2012–2016</b>    | <b>New</b> |
| <b>FINANCE (S3_SDC_P3)</b>                                       |              |  |           |                                |   |  |                     |            |
| <b>Fintech</b>   | S3_SDC_P3_I1 | dealroom.co                                | Indicator | Businesses per million capital | Number of financial technology businesses per 1,000,000 capita  | <a href="https://app.dealroom.co/companies/f/industries/fintech/locations/Europe">https://app.dealroom.co/companies/f/industries/fintech/locations/Europe</a>  | <b>2021</b>         | Same       |
| <b>NETWORKING AND SUPPORT (S3_SDC_P4)</b>                        |              |  |           |                                |   |  |                     |            |
| <b>ICT use for business-to-business transactions, 1-7 (best)</b> | S3_SDC_P4_I1 | WEF - Global Information Technology Report | Indicator | Likert scale (1–7, best)       | Sharing information electronically in the supply chain: (1) all types of information with suppliers and/or customers to coordinate the availability and delivery of products or services; (2) information on demand forecasts, inventories, production, distribution or product development | <a href="https://tcdata360.worldbank.org/indicators/hf0d27aa9?country=DZA&amp;indicator=3443&amp;countries=BRA&amp;viz=line_chart&amp;years=2013,2016">https://tcdata360.worldbank.org/indicators/hf0d27aa9?country=DZA&amp;indicator=3443&amp;countries=BRA&amp;viz=line_chart&amp;years=2013,2016</a> (11/08/2021) | <b>2016</b>         | <b>New</b> |
| <b>Business-to-consumer internet use</b>                         | S3_SDC_P4_I2 | WEF - Global Information Technology Report | Indicator | Likert scale (1–7, best)       | In your country, to what extent do businesses use the internet for selling their goods and services to consumers? [1 = not at all; 7 = to a great extent]   | <a href="https://tcdata360.worldbank.org/indicators/hf0d27aa9?country=DZA&amp;indicator=3443&amp;countries=BRA&amp;viz=line_chart&amp;years=2013,2016">https://tcdata360.worldbank.org/indicators/hf0d27aa9?country=DZA&amp;indicator=3443&amp;countries=BRA&amp;viz=line_chart&amp;years=2013,2016</a> (11/08/2021) | <b>2016</b>         | <b>New</b> |
| <b>Business use of digital tools</b>                             | S3_SDC_P4_I3 | Network Readiness Index                    | Indicator | Score (0–100), normalized      |   | <a href="https://networkreadiness-index.org/">https://networkreadiness-index.org/</a> (11/08/2021)   | <b>2020 edition</b> | <b>New</b> |



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