

# INTRODUCTION TO THE GII 2020 THEME WHO WILL FINANCE INNOVATION?

**Francesca Guadagno**, Independent Consultant, World Intellectual Property Organization (WIPO)  
**Sacha Wunsch-Vincent**, World Intellectual Property Organization (WIPO)

To boost entrepreneurship and economic growth, how best to finance innovation is a top business and policy concern in the 21st century—and these innovation finance ambitions are only more pressing amidst the personal and economic toll of the coronavirus disease (COVID-19) pandemic.

The GII 2020 and the following 15 chapters by leading policymakers, academic experts, and business leaders shed light on the state of innovation finance by investigating the evolution of existing financing mechanisms and by pointing to progress and remaining challenges.

## Recent developments in innovation financing

The lack of financing sources—due to imperfections in the capital market, and other causes—can lead to a worrying underinvestment in innovation. This is particularly true when the technological risk associated with an innovation is too high for investors, when entrepreneurs have only intangible assets as collateral, or in emerging and developing economies where financial markets are still to be strengthened.

Today, innovators enjoy an increasingly broad spectrum of funding mechanisms, including from a range of new actors, such as not-for-profit organizations, sovereign wealth funds (SWFs), wealthy individuals, and celebrities.

- Traditional innovation financing mechanisms include public support schemes, firm-specific innovation investments, and market-based mechanisms targeting innovation specifically, such as loans, private equity, and venture capital (VC).

- New mechanisms include corporate venturing, intellectual property (IP) marketplaces, microfinance, crowdfunding, and technology solutions.

Despite the recent fall in VC deals caused by the COVID-19 pandemic, VC investments had surged in the past two decades (Chapter 1 and Chapter 5–Nanda). While VCs have usually been successful in selecting entrepreneurs, few winners usually take all (Chapters 1, 2–Cornelius, and 4–Lerner). Even in the United States of America (U.S.), VC funding is a rather uncommon event: only around a sixth of 1% of new businesses obtain VC financing (Chapter 2). In recent years, these “winners” are increasingly found among scale-ups, later-stage firms, and “unicorns”—young and generally tech-focused companies valued at US\$1 billion or more.

Sovereign wealth funds have partly contributed to this trend with conspicuous rounds of financing to companies, such as Uber and WeWork. SWFs differ from many other investors in their character, risk tolerance, and time horizons—investing in disruptive technologies and early-stage companies while balancing technological investments with investments for economic competitiveness and well-being (Chapter 3–Engel et al.). While their financial resources have helped many start-ups flourish, their investments have raised national concerns in certain countries, related to the recent revival in economic nationalism (Chapter 3).

The following additional findings emerge on the topic of “Who Will Finance Innovation?”.

## Access to innovation finance is skewed across countries and sectors

While the U.S. has traditionally been the largest VC market globally, other countries have also embraced the VC model. New VC hotbeds have emerged, first in Israel (Chapter 12–Daniely) and Europe, more recently in China and India, and, to a lesser extent, in some countries in South East Asia, Latin America, and Africa.

Despite this welcome sign, VC penetration rates remain uneven across countries at different stages of development—and even across countries at similar income levels (Figure T-1.1 and Chapter 2). Within these countries, VC investments are concentrated in a few cities. For example, 11 cities—6 in the U.S., 3 in China, London, and Bengaluru—account for over 60% of total venture disbursements worldwide (Chapter 4). This divide is likely to become even more pronounced in the years following the current economic crisis (Chapter 1).

Other forms of financing, such as investments by SWFs, are also concentrated—mainly in the U.S. and Asia, and much less in Europe and elsewhere (Chapter 3). For this reason, some SWFs have been specifically created to invest in their domestic economies to foster economic development, diversification, and improved living standards. Examples include initiatives in France, Ireland, Turkey, Kazakhstan, Morocco, Oman, and Singapore (Chapter 3).

A subset of innovations—in particular, those that can generate returns in the short term—attract most VC investments (Chapter 5). By contrast, more complex nascent technologies that build on new science have received less capital, despite great societal need (Chapter 5 and Chapter 6–Dassault Systèmes). Indeed, VC investments are highly concentrated in IT software and services as well as consumer products and services, business products and services, and financial services. These sectors not only absorb the bulk of the financial resources available through VCs, but their growth has been quite fast in the last 10 years. Healthcare, IT hardware, and energy, materials, and resources have not kept up with the overall growth of VC investments (Figure T-1.2 and Chapter 5). The current crisis is likely to further deepen this tendency, with sectors and firms that have longer research horizon facing the most severe financial constraints (Chapter 1).

Interestingly, with much more patient capital at hand, SWFs are better suited to invest in firms with longer incubation times, including healthcare (Chapter 3). Beyond healthcare, SWFs have shown interest in business software, consumer services with high-tech elements (such as e-commerce), and consumer technology, while preferring practical technologies that solve daily problems and create new opportunities for customers (Chapter 3).

Currently, however, the need to finance disruptive innovations—“the unknown” referred to in Chapter 6—is stronger than ever. Significant societal changes call for large investments in science-intensive technological fields with long research horizons that can help shape the unknown (Chapter 6). Funding innovations that can contribute to societal challenges is a cornerstone of European innovation policies, as described in the case of, for example, the Czech Republic (Chapter 9–Havlíček et al.).

## Sound innovation ecosystems must balance start-ups, scale-ups, and mature firms

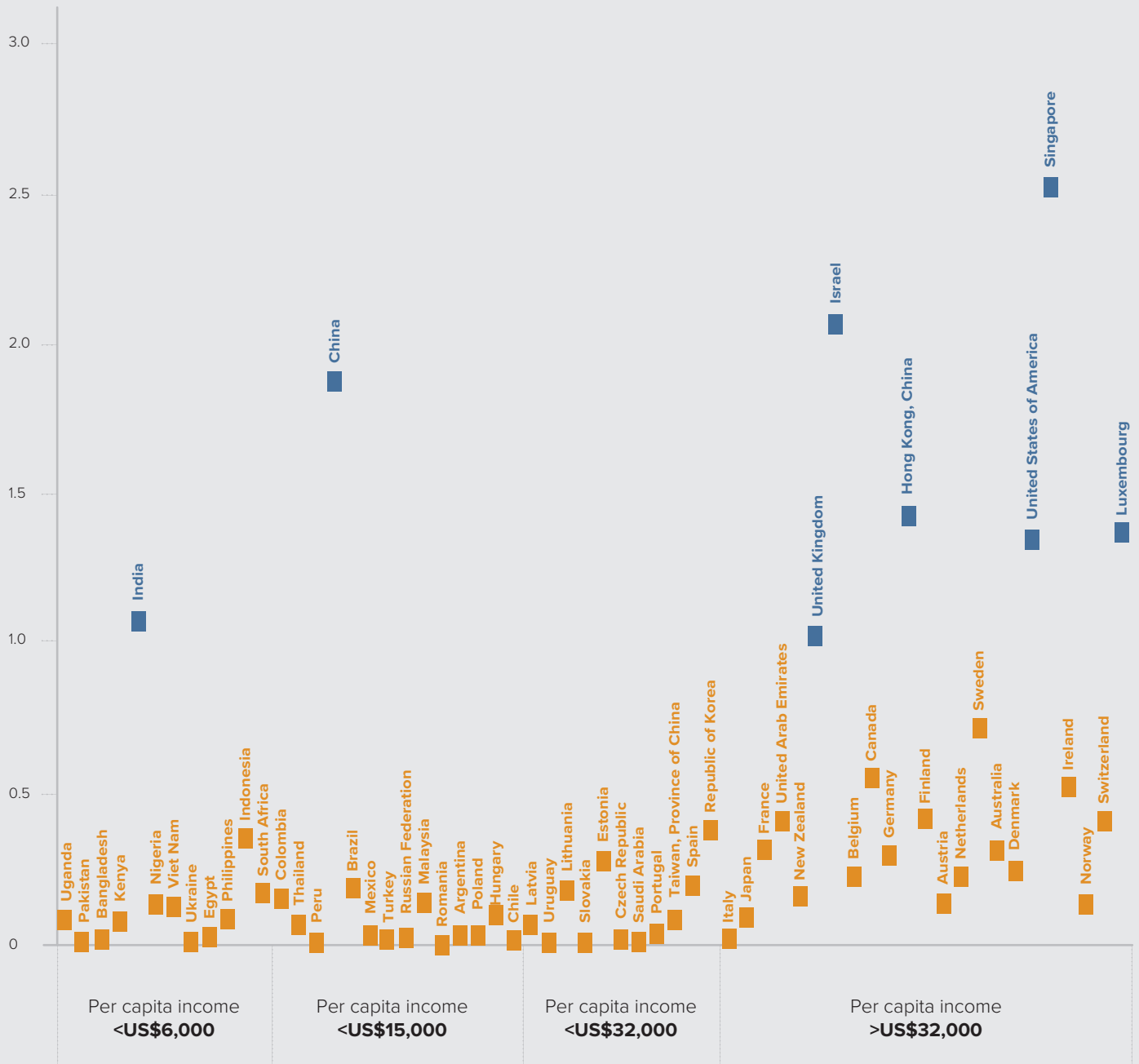
Since the emergence of the private equity industry, investing in innovation has been conflated with investing in start-ups (Chapter 7–Parpaleix et al.). Finding the right balance between financing start-ups, scale-ups, and mature firms, however, is crucial for innovation ecosystems (Chapters 2, 7, 11–Chattopadhyay, 12, and 13–Mwangi).

In many parts of the world, start-ups still attract most of the resources of innovation financiers, even though “scale-up” is the real litmus test for innovation (Chapter 7). In Israel, for example, the tendency of investors to push for early exits through acquisitions by foreign multinational companies contributes to a myopic situation where a brilliant entrepreneur is more interested in becoming a “start-upist” than in building a global multibillion-dollar company (Chapter 12). India also boasts a vibrant start-up ecosystem, hosting 6 of the top 100 most entrepreneurial cities in the world, with Bengaluru occupying the 11th position (Chapter 11). Even in other middle- and low-income economies, including Kenya, investing in start-ups has become a cornerstone of innovation policy, despite the fact that the “missing middle” phenomenon—i.e., the shortage of mid-sized firms—threatens innovation ecosystems (Chapters 7 and 13).

In recent years, a shift from seed funding to later-stage and expansion rounds has occurred, reflecting the interests of non-traditional investors, including SWFs and mutual funds (Chapters 2, 3, and 11, in the case of India). Thanks to easier access to expansion and growth capital, firms remain private longer than was previously the case (Chapters 2 and 3). Exits, which were already compromised in 2019, have become even more rare during the pandemic crisis (Chapter 1). While the void created by this shift has been partially bridged by angel investors, accelerators, and crowdfunding platforms, overall innovation financing has become disproportionately available to less risky and already successful later-stage companies. This tendency is further reinforced by the current crisis, as risk aversion grows and investors specialized in early-stage deals are more responsive to business cycles (Chapter 1).

FIGURE T-1.1

### Venture capital penetration in selected economies, 2016-2018

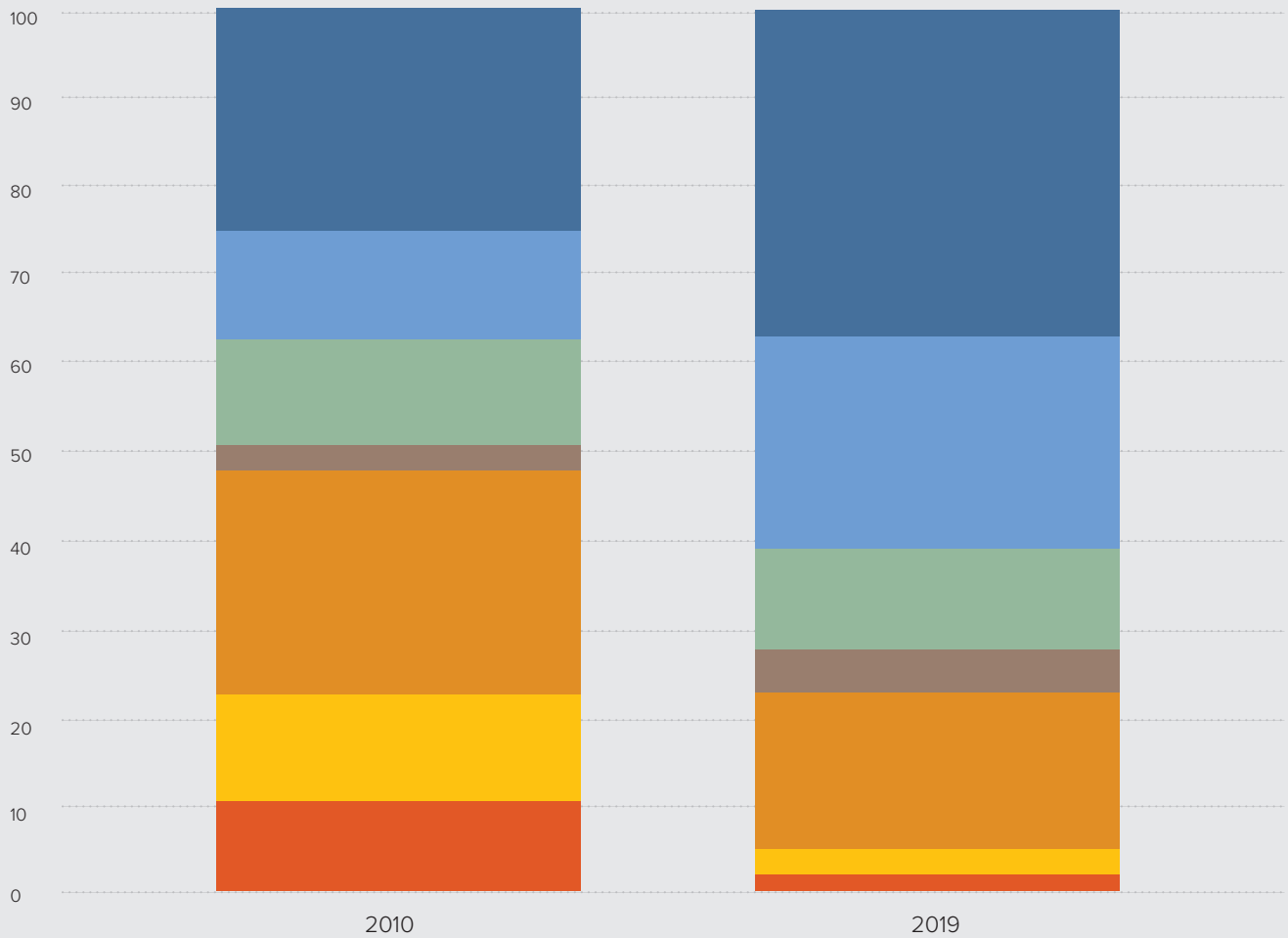


▲ % Venture capital investments/GDP

Source: Figure 2.3 in Chapter 2.

FIGURE T-1.2

### Share of global venture capital investment, by sector



- ▲ % share
- IT software and services
- Consumer products and services
- Business products and services
- Financial services
- Healthcare
- IT hardware
- Energy, materials, and resources

Source: Figure 5.2 in Chapter 5.

Mature, established firms also need access to finance to be able to introduce new innovations—including radical innovations—and to avoid growing obsolete. As Chapter 7 shows, these firms lack sources of finance who can support their regenerative strategies in the long run. Such strategies entail investments in new concepts, knowledge and shared imaginaries that are difficult to appraise on a financial market, leading to a risk of undervaluation and liquidity gaps (Chapter 7).

This need for mature and existing firms to be able to access innovation capital is a vital and often overseen point. Generally, policymakers and the financiers of innovation are obsessed with funding start-ups, and thus new ventures only. Recently that attention has shifted to unicorns as the sacred source of innovation. Existing, mature firms are in, in turn, regularly forgotten. That is a mistake. Many countries would first and foremost benefit from the innovation rate of firms on the market, be they in the technology sector or in more traditional sectors or linked to natural resource. Unfortunately, often that is not how support schemes are currently conceived. Often, and understandably, new ventures instead attract all the excitement and attention.

## Finding the right balance between under and overinvestment in the search for unicorns

In recent years more and more VC has been available, specifically for later-stage ventures—with SWFs particularly focused on targeting the next unicorn (Chapters 2, 3, and 5). In 2018, megadeals accounted for 47% of total capital invested in the U.S. and unicorns for 35%.<sup>1</sup>

There are compelling reasons for the growth in unicorns: 1) greater ability of firms to raise capital as private entities, 2) technological changes that facilitate “winner takes all” markets (rise of technology platforms), 3) the poor experience of the late 1990s when too many very small companies went public and underperformed, 4) securities regulation, and 5) other reasons which are amply documented in the literature.<sup>2</sup> The winner-takes-all notion is backed by the idea that, due to network effects and economies of scale, only one or a few players are able to survive in some markets; hence, it is worth pouring large sums of money into those potential winners.

The fact that so much money is being invested in late-stage and growth capital transactions—including unicorns—is also, to a large extent, a reflection of a huge increase in private capital. With benchmark yields having been extremely low for more than a decade, private equity and VC funds have attracted substantially more capital. Even mutual funds have invested in VC transactions.

This development of vast amounts of money chasing a few winners comes with a number of risks:

First, overfunding of firms during booms might stimulate creativity, but it might also generate wasteful duplication of efforts as multiple companies pursue the same opportunity—with few followers adding concrete value and most, in fact, doomed to go out of business rapidly (Chapter 4). This is a problem of too much VC being spread indiscriminately to many similarly promising—and most likely failing—ventures. Before a slowdown in 2019 and, finally, in 2020 due to COVID-19, the Chinese VC market was said to have been significantly overheated with capital-backed business ventures that had no promising or original business plan or technology.

Second, and related to the first point, we have witnessed large investment funds and SWFs focusing on a limited number of unicorns or prominent venture-backed firms. Often this is fueled by the incentives of the winner-takes-all notion—a rationale for aggressive investment strategies aimed at gaining market share while running substantial losses at the expense of revenue or profits. Recently, however, that approach has led to investment bubbles which eventually burst, in particular when paired with significant governance failure.

While this heavy focus on one company enables that company to build market share while “burning cash”, it also drives out competitors who cannot sustain this rate of loss, possibly inducing anti-competitive effects in the market place at the expense of smaller, more innovative ventures.

As with financial investments generally, it is important to maintain balanced investment strategies that encourage a healthy level of VC and unicorn investments, while avoiding combining enormous sums with bad governance to create bubbles. The recent months have provided an important wake-up call, which may help investors and regulators alike to find this critical balance.

## New instruments—that have raised expectations—are helping, but have not fully eased financial constraints in developing economies

Microcredit has been hailed as a major financial innovation, helping to alleviate credit constraints faced by underserved communities. Microlending has made credit easily accessible to poor entrepreneurs, women, and rural areas. To this day, however, microcredit has not been used to foster transformational entrepreneurship and innovation. Many borrowers of microcredit lines are subsistence or “reluctant” entrepreneurs with limited interest in innovation (Chapter 2). Yet, as evidenced in the GII 2020, advances in digital finance could help microlenders become more efficient, thereby allowing them to achieve scale.

Indeed, advances in financial technology (fintech) are transforming the way capital is intermediated. Financial technologies have enormous potential, including the possibility of relaxing financial constraints on firms—especially small firms in developing countries. New technologies enable businesses and individuals to become connected to a digital payment infrastructure via mobile phones, computers, and point-of-sale devices. Employing new technologies in artificial intelligence (AI) and machine learning, fintech lenders provide loans through Internet-based platforms for individuals, called peer-to-peer (P2P) lending, or through institutional funders, referred to as marketplace lending.

Fintech is spreading across the board, affecting advanced economies as well as emerging and developing countries. Kenya, for example, is among the earliest and most prominent African innovators in mobile money, with ambitions to replicate its success in financial inclusion and small firms' financing in other sub-Saharan African countries (Chapter 13). Another example is India Stack, a set of technologies that allows governments and businesses to utilize a digital infrastructure to make cashless payments for service deliveries, helping to solve the challenges of digital and financial inclusion (Chapter 11).

Since the financial crisis of 2008-2009, crowdfunding has emerged as an alternative financial mechanism to fund innovation, especially for small and medium-sized enterprises (SMEs). Crowdfunding today is taking various forms—donations, rewards, loans, and equity—and is spreading geographically, from the U.S. to Europe, Asia, Australia, Latin America, and Africa. While some hoped that crowdfunding could “democratize” innovation, only a few projects account for the bulk of the financial resources raised in crowdfunding platforms (Chapter 2).<sup>3</sup> At the same time, crowdfunding is particularly suited to the pre-seed phase of an innovation project—which is also the phase where financing is drying up the most (Chapters 1 and 5). Crowdfunded projects often attract other investors too, including venture capitalists and angel investors.

Despite these encouraging prospects, the real impact of fintech and other instruments remains difficult to assess at this early stage. Data on new fintech adoptions across the world are of critical importance to understand if, where, and how these technologies are changing the global innovation finance landscape. Regulatory frameworks and other policies to encourage the development and uptake of fintech are paramount to fulfill the optimistic expectations that they have generated (Chapter 2). As shown in the case of Abu Dhabi, for example, the government can offer a regulated and controlled environment to fintech start-ups to safely test innovative solutions (Chapter 14—Bin Hendi).

## The market for ideas and IP is growing, but barriers remain

IP has long been used to signal the quality and viability of an innovation project. This has proved useful to reduce financing costs, attract new investors, qualify for government programs, and enter international consortia. IP also constitutes a sort of “insurance policy”: should the company go bust, its ideas and intangible assets can still be sold or licensed. IP is also increasingly used as collateral for loans, with many governments around the world facilitating these practices to reduce firms' difficulties in collateralizing their investments in IP (Chapter 15—Hall). As this edition of the GII argues, IP can also be used as a tool that directly generates money (Chapter 16—Radauer).

Today, there are still neither IP marketplaces that have the size and volume of the New York Stock Exchange nor large Internet platforms for trading physical goods—despite numerous initiatives to establish IP marketplaces emerging and some seemingly succeeding in niche markets (Chapter 16). So why do so many initiatives fail, and none reach a considerable size?

Several issues still endanger markets for ideas and IP (Chapters 15 and 16). The first and most important is valuation: IP differs from common stocks and commodities for which there are exchanges. The value of IP is highly context-specific and heterogeneous. This creates substantial information asymmetries, which essentially prevent “commoditized” trading. Valuation is also hampered by the fact that, to date, there is still no standard method for valuing IP that is uniformly accepted (Chapters 15 and 16). Until IP is properly and systematically valued, the potential asset value of innovative companies might be seriously undervalued—including, and especially, for companies that do not consider themselves technology or knowledge-based, such as creative brands and manufacturers (Chapter 15). Other barriers to the establishment of IP marketplaces include a lack of a clear inventory of IP and intangibles, lack of awareness of IP's role as a valuable asset, banking regulations, and other issues related to the re-deployability of intangible assets (Chapters 15 and 16).

Despite these challenges, there is, however, growing evidence that incentives to invest in IP-rich companies are strengthening (Chapter 15). Governments have a role to play in supporting this trend: IP audits, for example, can provide a good impression of the IP situation of a firm and identify potentially valuable assets. IP audits are currently implemented with various degrees of success in countries such as Austria, France, and the United Kingdom (U.K.) (Chapters 15 and 16). These instruments can and should be used more. In the U.K., for example, there are fewer than 5000 IP valuation reports commissioned per annum, and the market is somewhat underdeveloped versus what might be considered optimal (Chapter 15). At lower income levels, challenges are even more evident. Yet countries are becoming increasingly aware of the value of IP, as shown, for example, by the Philippine Innovation Act, which aims at promoting a vibrant intellectual property culture (Chapter 8—de la Peña).

## A carefully designed policy mix is essential to improving the innovation finance landscape

An overarching policy message emerges from the chapters of this GII: no single innovation policy instrument can solve all the issues that a country might face in relation to its innovation financing landscape. Governments across the world should think of a carefully designed policy mix that tackles the various obstacles to innovation financing while maximizing complementarities between financing mechanisms and sources of funds. Indeed, government support can be direct or indirect. Similarly, sources of funds can be public, private, or a mix of the two (Chapter 4). Some combinations might stimulate innovation, while others might make related efforts useless.

Three additional policy actions are recommended in the GII 2020.

First, governments can play a significant role in de-risking technologies.

Historically, when start-ups with substantial technology risk were successfully commercialized by VCs, government helped with de-risking the technology and/or reducing market risk (Chapters 5, 6, and 11). This role of the government is even more important today, given the current decline in fundamental innovation coming from large corporations and the reduced appetite of VCs for early-stage ventures and science-based sectors (Chapters 5 and 6).

Examples of how governments can intervene in this area include the use of subsidies to finance prototyping, new firms, and SMEs—along with grants (including challenge grants, as in the case of India, Chapter 11), procurement, and advance purchase commitments (Chapters 4, 5, 8, 9, 10–Braga de Andrade, 11, and 13). These instruments can be used in developed and developing countries alike. In France, for example, a new legal status—the “profit-with-purpose company”—has been created to protect and reinforce the capacity of a company to explore less researched and highly strategic technological fields (Chapter 6). In the Czech Republic, together with funds for basic research, purpose-specific support is channeled into industry—in particular, towards science-intensive industries including medical sciences and biosciences (Chapter 9). Similarly, and as Chapter 11 on India shows, these instruments can effectively be used to foster investments in important sectors that are receiving relatively less funding, including biotech. In Kenya, procurement has helped micro and small enterprises to access new markets (Chapter 13).

As the work of the GII over the past years has shown, continuous investment in R&D and science, including from public organizations, is important to fuel innovation and counteract business cycles. Because “tough tech” ventures, as labeled in Chapter 5, are often based on new science or

technology developed in universities, academic institutions can play a central role in helping to de-risk technologies prior to start-ups raising risk capital from investors (Chapter 5 and Chapters 8 and 9, in the cases of the Philippines and the Czech Republic). Investments in basic science are also a way to produce “unexpected knowledge” that, while not driven by daily problems or necessities, might still have a tangible impact on innovation processes (Chapter 6).

SWFs are also contributing to the effort of de-risking innovation. Examples include the Russian Direct Investment Fund, the Ireland Strategic Development Fund, and the Abu Dhabi Investment Authority, which are playing a pivotal role in implementing government’s innovation policy (Chapters 3 and 14, in the case of the Abu Dhabi Investment Authority). Second, acknowledging the persistent financing gaps across the world, governments are making concrete efforts to develop vibrant VC markets (Chapter 12).

Beyond providing tax incentives to venture capitalists, governments might decide to become venture capitalists. Examples of governments that have set state-owned venture funds include Australia, Israel, China, Malaysia, Jordan, Morocco, and Senegal (Chapter 7). Brazil also has some public initiatives for venture capital investment funds, albeit still incipient (Chapter 10). Israel is among the earliest and most well-known cases of success in government-run venture capital funds. Established in the 1990s, the Israeli program managed to build a vibrant venture capital industry from scratch. After roughly seven years from its inception, private investments surpassed public ones (Chapter 12). While some of these programs, including those in Australia, Israel, China, and Singapore, have proved relatively successful, government VC funds are less effective than private VC.

The unfortunate outcomes from government attempts at promoting entrepreneurial activity can be reconnected to structural characteristics of government VC funds, which make them inherently different from private VC funds. First, lack of business and technical information on the part of the government makes it challenging to assess potential investees and permits opportunistic behavior. Second, over time, private venture capitalists have developed an efficient screening process that enables them to select the best investment opportunities. Third, private venture capitalists usually make investments with other investors, who provide a second opinion and help avoid mistakes. Finally, compared to government VCs, private VCs are free from political pressures (Chapter 4).

To overcome these bottlenecks, governments might decide to insulate entrepreneurial policymaking from policy pressures by, for example, establishing a separate organization dedicated to venture capital. Matching funds, including by foreign venture capitalists (as in the case of the Israeli program, Chapter 4), are another way to reduce risks and possibly improve the results of these programs.

Governments also support business angels by, for example, providing financial support for the creation and operation of business angel networks and federations. Policies of this sort are available in a variety of countries, including in Europe, Turkey, the Russian Federation, India, and Malaysia. As Brazil shows, angel investors can flourish where VC markets have still not taken off, providing important sources of innovation funding (Chapter 10).

Another innovation in entrepreneurial finance is accelerator and incubator programs (Chapters 2, 5, 11, and 12). On the rise since the mid-2000s, they provide short- or medium-term support and resources to start-ups, helping them speed up their product development and time to market. Today, China and India have particularly active accelerator ecosystems (Chapter 11, in the case of India). Accelerator programs are also proliferating in several countries in Africa, Asia—including in the United Arab Emirates (UAE) and the Philippines—and Latin America (Chapters 2, 8, and 14). In the UAE, for example, the Ghadan 21 accelerator program is investing US\$13.6 billion to boost Abu Dhabi's knowledge-based economy, supporting over 50 initiatives that promote the establishment of start-ups and spur innovation and R&D efforts (Chapter 14). Another well-known initiative in this area is the Israel Innovation Authority's Incubators Program, which awards millions of dollars to promising start-ups, allowing them to access early-stage financing (Chapter 12).

Thirdly, and specifically in regard to developing and emerging economies, policies are needed to enable financial markets to become mechanisms that spur innovation.

For example, several legal and regulatory barriers to the development of the VC market persist, even in a large middle-income economy such as Brazil (Chapter 10). Inadequate taxation, the lack of tax incentives for venture capitalists, as well as lack of regulation for entrepreneurial capital and other business-related regulations are clear obstacles to the establishment of a fully functioning VC market in the country. But making progress in these areas is not "mission impossible". India, for example, has made great progress in nurturing its start-up ecosystem and, today, over 280 Indian investors are ready to support local start-ups (Chapter 11).

The GII 2020 identifies a number of specific policy actions that could help countries in these endeavors. First, to foster access to loans, lenders need to have access to accurate and timely credit information, with clearly defined legal rights in secured transactions. Turning to the equity side, and as shown by the GII over its history, the protection of minority shareholders is paramount to foster VC activity and innovation overall. Shareholder protection has to go hand in hand with developing a market for initial public offerings (Chapter 2, and Chapters 10 and 12, in the cases of Brazil and Israel).

Finally—and as shown in the cases of the Czech Republic (Chapter 9), the Philippines (Chapter 8), India (Chapter 11), Kenya (Chapter 13), and the UAE (Chapter 14)—entrepreneurship policies might aim at more than finance, and include initiatives to promote a culture of innovation and entrepreneurship and skills development. In this regard, financial literacy training is a key skill to develop financial capability and to understand and consume financial products. In the Philippines, for example, the Philippine Innovation Act is an action plan for the development of the country's capacity for, and success in, innovation through improvements in science, technology, and innovation (STI) culture, awareness of R&D activities, and improvements in human capital (Chapter 8). In the UAE, a key pillar of the National Innovation Strategy is promoting skills and establishing a national culture of ideas and entrepreneurship (Chapter 14). Spreading information about public and private instruments to finance innovation projects can also help to strengthen the innovation finance landscape. In Brazil, for example, a periodic publication summarizes the innovation support mechanisms available in the country (Chapter 10).

The current economic scenario poses a number of questions on the evolution of the innovation finance landscape in the short and long run. In this uncertain scenario, policies that stimulate investments and innovation and encourage the pursuit of longer-term goals will be key for future growth and well-being.

#### Notes:

- 1 NVCA, 2019.
- 2 This section has benefited importantly from comments and suggestion of Peter Cornelius (Chapter 2), Josh Lerner (Chapter 4), and Carsten Fink (WIPO).
- 3 For a review of this literature, see Guadagno, 2020.

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