

SOURCES OF FUNDING INNOVATION AND ENTREPRENEURSHIP

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Economic development and financial development are inextricably intertwined. Originating from Schumpeter's "Theory of Economic Development,"¹ finance and growth literature identifies several channels through which the financial sector may spur economic prosperity.² Innovation is believed to play a particularly critical role, with well-functioning financial markets allocating capital to companies with the greatest potential for productivity gains thanks to the implementation of innovative processes and the commercialization of new technologies.³ Additionally, the funding of innovation itself requires sophisticated financial markets, with the allocation of risk capital found to shape the focus and nature of research and development (R&D).⁴

Much of the earlier finance and growth literature has focused on traditional financial markets.⁵ However, even in advanced economies, bank loans and capital intermediated through public equity markets and bond markets are generally available only to mature companies. Financial constraints are particularly acute in the early and expansion stages of the life cycle of a company when their business model is still untested. This includes tech start-ups that aim to disrupt entire industries by developing new products, services, and production processes. Their survival usually depends on their access to entrepreneurial finance in their early stages and subsequently to growth capital to scale up their businesses.

Many of the world's largest and most innovative tech companies, including Amazon, Apple, Facebook, Google, Microsoft, and Tencent, have initially been backed by venture capital (VC), helping explain why this form of funding has attracted substantial interest among researchers and policymakers alike. However, over the past couple of decades,

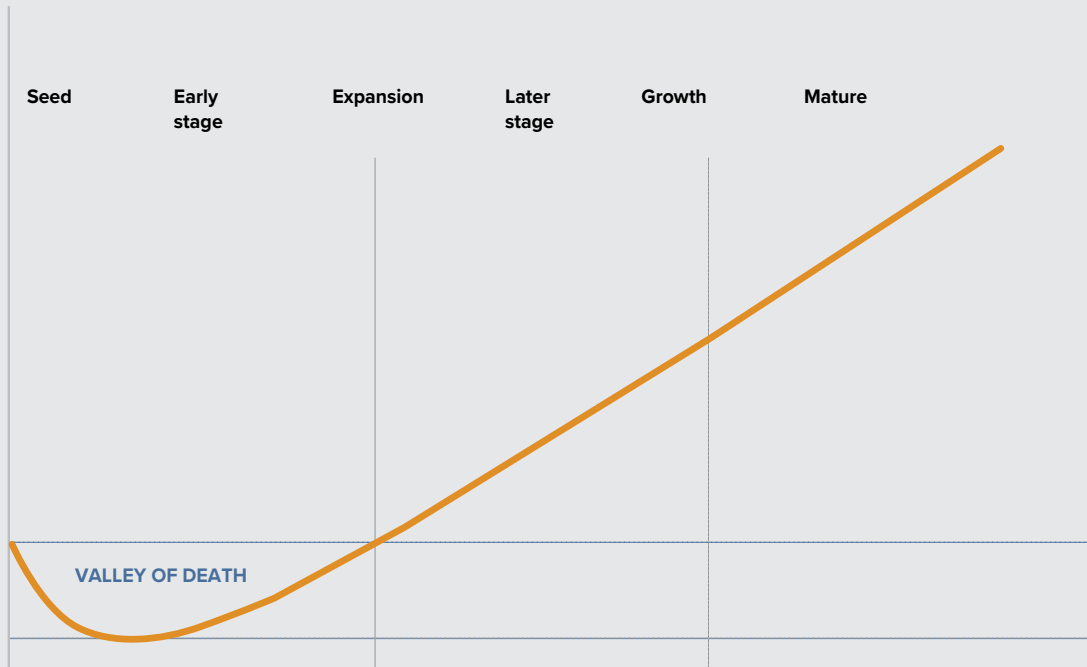
the financing of innovation has been subject to significant changes as new funding sources have emerged and important advances in financial technology (fintech) are transforming the way capital is intermediated. These developments affect companies in all stages of their life cycle. In developing a taxonomy of funding sources for innovation, this paper focuses especially on the start-up phases when young firms face particularly severe financing challenges, paying particular attention to non-traditional forms of entrepreneurial finance.

A taxonomy of funding sources for entrepreneurship and innovation

In organizing a taxonomy for the funding of innovation, one can think of a matrix along two dimensions: 1) the company's age and maturity and 2) the position of funding in the company's capital structure. As far as the first dimension is concerned, six phases can be distinguished. In the *seed* phase, entrepreneurial start-ups usually do not generate revenue, and as they build their business, their cash flow becomes increasingly negative (Figure 2.1). In the *early stage*, companies are typically completing development, with products being in testing or pilot production. In the *expansion stage*, companies are already producing and have growing accounts of receivable and inventories. In the *later stage*, start-ups have already reached a fairly stable growth rate. In the *growth* phase, companies begin to generate positive earnings.⁶ Finally, companies reach their *mature* phase.

FIGURE 2.1

Revenues during different stages of a company's life cycle



- ▲ Revenues
- ▶ Time

Source: Author.

Companies typically have access to different forms of finance throughout their life cycle. Initially, the most common form is the entrepreneur's own resources, which may be provided as a personal loan from the entrepreneur, who then holds levered equity claims in their firm.⁷ Additionally, start-ups may have access to resources from their family and friends, may receive government grants or philanthropic grants from foundations, or obtain funding through reward-based crowdfunding platforms.⁸

While many entrepreneurs would prefer to avoid borrowing or diluting equity by bringing on board external investors, their own resources are often insufficient to build their business in the absence of revenues. In the seed phase, cash flows are increasingly negative. This phase is particularly critical, and it is not without reason that this is often described as the "valley of death." According to the Global Entrepreneurship Monitor, one of the most common reasons for discontinuing a business is the lack of capital, especially in emerging and developing economies.⁹

To bridge the valley of death, entrepreneurs must identify alternative funding sources. On the debt side, these generally include credit card debt, loans from microfinance institutions, crowdlending, venture debt, and government loans (Figure 2.2). On the equity side, VC is widely considered as the money of invention, which may be provided by independent VC firms or corporate venture capitalists. In several countries, governments themselves have become venture capitalists.

Although VC remains the most important funding source for tech start-ups, in recent years the focus of VC investing has shifted from seed capital to expansion- and later-stage rounds. Several VC firms also provide growth capital to allow nascent companies to scale their businesses. This is particularly true in emerging economies where companies are challenged to access capital to exploit opportunities in rapidly growing markets.

The void created by the shifting investment focus of VC firms from seed to expansion- and later-stage rounds has been filled, to some degree, by the proliferation of angel investor groups and the emergence of Internet-based equity crowdfunding. At the same time, accelerators have supported an increasing number of entrepreneurs, and although their financial contribution is generally minimal, they do provide important mentorship and critical networking opportunities.

For entrepreneurial start-ups that succeed in bridging the valley of death, different forms of financing become available in their expansion and later stages. Apart from retained profits, banks are likely to become more willing to lend as companies have accumulated tangible assets and shown a viable business model. In the growth stage, companies may also gain access to non-traditional lenders, such as private credit funds. Similarly, external investors could include sovereign wealth funds who have recently shown significant appetite for backing technology-driven companies. At the same time, growth equity funds can provide significant amounts of capital, typically taking minority positions in a company.

As companies reach their mature stage, the universe of available debt capital becomes even wider—at least in advanced economies with well-developed financial markets—encompassing leveraged loans, subordinated debt, mezzanine debt, and corporate bonds. Companies that decide to go public gain access to a broad investor base that includes both institutional and retail investors. Finally, as institutional investors have substantially increased their investments in private equity funds, this source has become increasingly important for companies seeking capital. In fact, in some markets, there are more private-equity backed companies than publicly listed firms.

Based on this taxonomy, the following sections discuss entrepreneurial finance options in the early stages in more detail.

Fintech and the emergence of new debt solutions

Traditional bank loans are generally difficult to obtain by young companies whose risk profile is typically inferior to that of more mature companies. In emerging markets, credit constraints tend to be particularly severe, impeding firm growth and helping explain why these countries usually show a higher density of micro and small firms.¹⁰ Against this background, microcredit has been hailed as a major financial innovation, helping to alleviate credit constraints faced by underserved communities in both developing and advanced economies.¹¹ However, the main idea behind microcredit is the alleviation of poverty rather than the support of transformational entrepreneurship and innovation. In fact, as randomized controlled experiments have shown, many borrowers turned out to be subsistence or "reluctant" entrepreneurs who started a business because they were unable to find a job.¹²

Another factor impeding the role of microcredit as a source of entrepreneurial finance is seen in the limited efficiency of such operations. By relying primarily on manual processes and cash, microcredit organizations generally have high transaction costs that restrict their ability to achieve scale and act as lenders beyond their original business model. Looking forward, however, it is believed that advances in digital finance could help not only traditional bank lending but also microcredit lenders to play a more meaningful role as a funding source for entrepreneurs.¹³ Importantly, new technologies enable businesses and individuals to become connected to a digital payments infrastructure via mobile phones, computers, and point-of-sale devices, replacing cash transactions and bridging long distances.

Digital finance refers to a system in which financial services are delivered over digital infrastructure, with fintech enhancing the efficiency and reducing the costs of such transactions. At the same time, fintech has helped develop new forms of intermediation. Around the world, fintech lenders have emerged that employ new technologies in artificial intelligence and machine learning. Thanks to these technologies, fintech lenders are expected to be in a superior position to address friction in the traditional lending market and help narrow the credit gap faced in particular by young companies.¹⁴

FIGURE 2.2

Main funding sources over the life cycle of a company

| | Seed/ early stage | Expansion/ later-stage/growth | Mature |
|------------------------------------|----------------------|----------------------------------|--------|
| OWNER & NON-DEBT/EQUITY | | | |
| Personal/family savings | █ | | |
| Government grants | █ | | |
| Philanthropy | █ | | |
| Reward-based crowdfunding | █ | | |
| Retained profits | | █ | █ |
| DEBT | | | |
| Friends & family | █ | | |
| Credit card debt | █ | | |
| Microcredit | █ | | |
| P2P/market-based lending | █ | | |
| Fintech balance sheet lending | █ | | |
| Government loans | █ | █ | |
| Venture debt | █ | █ | |
| Bank loans | | █ | █ |
| Trade credit | | █ | █ |
| Private credit funds | | █ | █ |
| Leveraged loans | | | █ |
| Subordinated debt/mezzanine | | | █ |
| Corporate bonds | | | █ |
| EQUITY | | | |
| Accelerators | █ | | |
| Equity crowd-investing | █ | | |
| Business angels | █ | | |
| Independent VC | █ | █ | |
| Corporate VC | █ | █ | |
| Government VC | █ | █ | |
| Non-traditional VC | | █ | |
| Growth equity | | █ | |
| Private equity | | | █ |
| Public equity | | | █ |
| Private placements/PIPEs | | | █ |

Source: Author.

Fintech lending comes in different forms. To begin with, fintech lenders may provide loans from their own balance sheets. Alternatively, borrowers may obtain loans through Internet-based platforms from individuals, called peer-to-peer (P2P) lending, or institutional funders, referred to as marketplace lending. While the first fintech lenders emerged in the early 2000s, fintech has gained significant momentum after the global financial crisis of 2008–2009. Since then, the number of fintech lenders has risen progressively. According to the Cambridge Center for Alternative Finance database, balance sheet fintech lending totaled around US\$14.2 billion worldwide in 2017. This amount was dwarfed by P2P/marketplace lending, which amounted to almost US\$100 billion.¹⁵

In both areas, fintech lending has shown substantial momentum in recent years, which could hold steady or even accelerate, especially if fintech credit innovations were increasingly adopted by traditional banks.¹⁶ However, for fintech and crowdlending to continue to follow its steep trajectory, it will be important to put in place a regulatory framework that fosters market entry and competition, ensures adequate risk management policies, and protect lenders and investors.

Finally, entrepreneurial firms may have access to venture debt to fund working capital or capital expenses. Venture debt is provided by specialized banks and venture debt funds. Borrowers are usually VC-backed start-ups and growth companies whose cash flows are still negative. While they typically lack tangible assets at this stage, patents are frequently pledged as collateral.¹⁷ Furthermore, venture loans are usually combined with warrants to compensate lenders for the higher risk of default in such transactions. Between 2010 and 2019, venture debt funds raised an average annual amount of US\$1.3 billion from investors globally, a fraction of the US\$72 billion of annual commitments to VC funds.¹⁸

Equity-based innovations in entrepreneurial finance

Venture capital

Venture capital has been described as the money of invention.¹⁹ Focusing on investments in tech companies, this form of funding seems to be particularly predestined to foster innovation and growth.²⁰ While these investments are highly risky and subject to significant agency problems,²¹ robust due diligence, appropriately designed VC contracts and the staged infusion of capital help mitigate these risks. Very few start-ups qualify for VC investments—for the United States of America (U.S.), Kaplan and Lerner estimate that only around a sixth of 1% of new businesses obtain VC.²² However, the economic impact of VC is much larger than this small percent suggests. In fact, of all U.S. companies that went public in the past 20 years, around 60% were VC backed.²³

In the past, information technology (IT)—including hardware and software, Internet-related services, cloud computing, mobile applications, and e-commerce—have absorbed the bulk of VC investments. While a significant number of start-ups in the life

sciences have also been backed by VC, investments in this sector are more challenging. Generally, VC is intermediated by limited partnership funds that have a life of 10 to 12 years, which is often too short for biotech where the journey from basic scientific discovery to fully approved drugs may take 15 to 20 years. Given that the VC model may not be appropriate for long-gestation, science-based businesses and hence fail to solve R&D funding issues in biotech and similar industries,²⁴ it has been proposed to set up “project-focused organizations” to conduct a specific R&D project.²⁵ However, such organizations come with their own important challenges as they do not address the agency problems that are inherent in funding high-risk ventures.²⁶

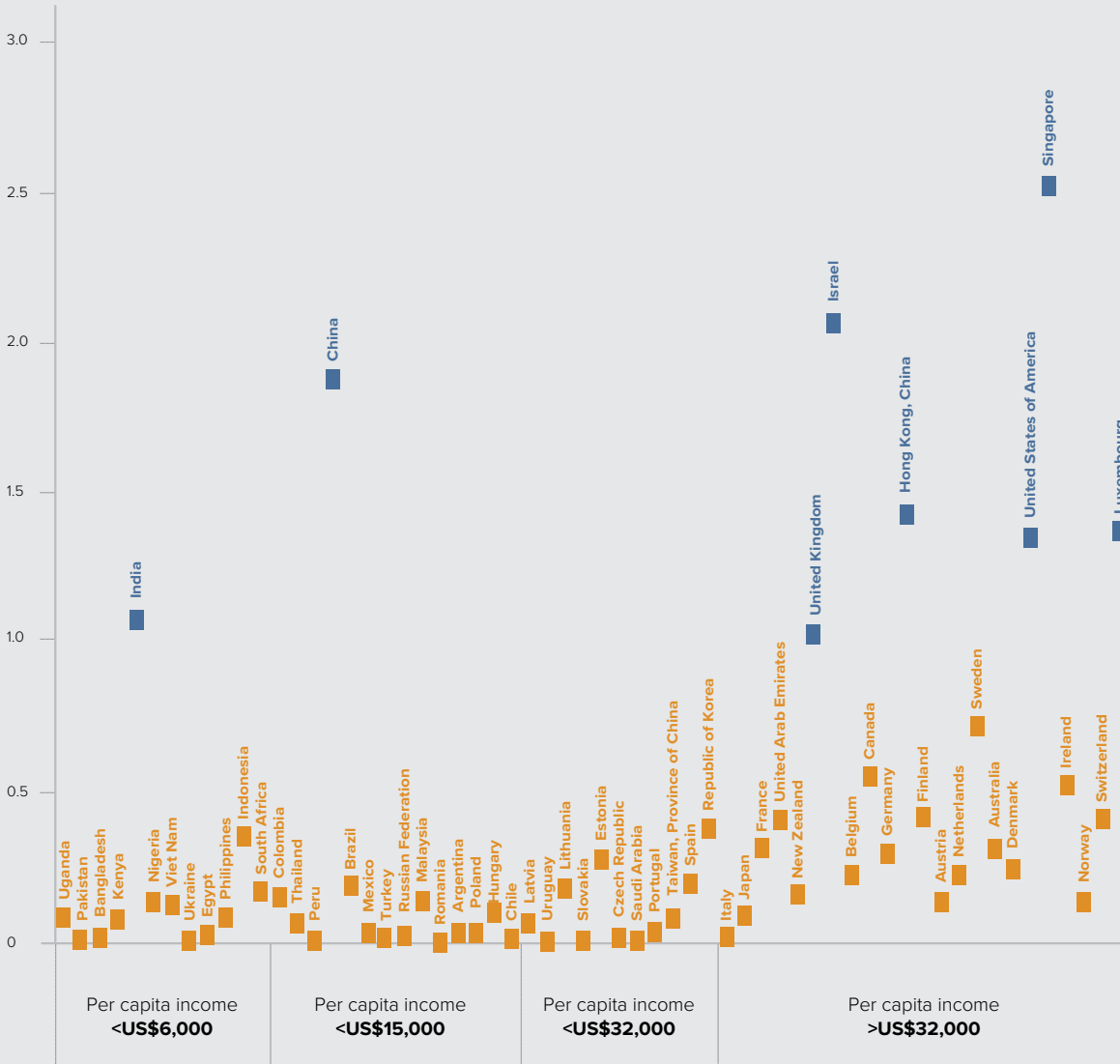
As an asset class that emerged after World War II, VC has been subject to important changes in the past two decades. For starters, there has been a shift from seed funding to later-stage and expansion rounds, with the latter generally perceived to be less risky—albeit at the expense of less upside potential on the return side. At the same time, nontraditional investors—such as sovereign wealth funds and mutual funds—have entered the VC market, focusing on investment opportunities in companies in their expansion and growth stages. The most visible sign of this is the rise of unicorns—young and generally tech-focused companies valued at US\$1 billion or more—whose access to expansion and growth capital has allowed them to stay private for longer than was previously the case.

But perhaps most importantly, the VC model has been exported to other regions. New VC hotbeds have emerged first in Israel and in Europe, and more recently in emerging economies—especially in China and India and, to a lesser extent, in some countries in South-East Asia, Latin America, and Africa. This process has benefited from the cross-fertilization between leading VC firms from the United States that have expanded abroad and the rise of an indigenous VC industry in these countries. However, penetration rates have remained uneven across countries at different stages of development—but even across countries that have reached a similar level of economic prosperity (Figure 2.3). While it is too early to tell whether the huge increase in VC investments in some countries can be absorbed without compromising investors’ returns, there appears to be substantial potential in many other economies to play catch up, with a growing VC industry fueling innovation and economic growth.

Independent VC firms are not the only suppliers of venture capital. Many mature companies have implemented corporate venture capital (CVC) programs, complementing internal R&D programs by investing in external knowledge.²⁷ There are several reasons why CVC may achieve superior results over R&D alone.²⁸ First, corporate venturing provides an insight look at new technological developments and a path to possible ownership or use of new ideas, allowing companies to respond quickly to market transformations. This is particularly important in science-based industries that require large long-term and risky R&D investments in an environment where companies face considerable capital market pressures for short-term financial results. Second, corporate venturing can serve as an intelligence-gathering initiative, helping a company identify

FIGURE 2.3

Venture capital penetration in selected economies, 2016-2018



▲ %, Venture capital investments/GDP

Source: Author's calculations based on data from Pitchbook and IMF WEO database, 2019.

Notes: Penetration rates refer to the annual average from 2016 to 2018. The x-axis refers to average per capita income figures for the years 2016-2018.

emerging competitive threats. Third, by pooling its own capital with that of other venture capitalists, it is possible for a CVC program to magnify its impact, which can be particularly advantageous when technological uncertainty is high. Finally, corporations may use CVC as leverage to encourage technologies that rely on the parent company's platform.²⁹

Angel investing

As venture capitalists have focused more on opportunities in expansion and later stages, angel investments in entrepreneurial start-ups have become more prominent. Angel investors, or *business angels*, typically invest in relatively early stages of development, with their investments usually not exceeding US\$1 million per start-up—in most cases, significantly less. Increasingly, angel investors are organized as semi-formal networks, allowing them to make larger investments as a group and permitting each individual angel to diversify their investment portfolio.³⁰

Angel investors are often entrepreneurs—or former entrepreneurs—themselves and share several important features with venture capitalists. Like VC firms, angels and their networks fund entrepreneurial companies in their start-up phases, following intensive due diligence. They usually provide concrete guidance to the entrepreneur, as venture capitalists do. As mentors, angels often adopt a hands-on role in the transactions in which they engage, offering industry-specific insights based on their own experience and knowledge, and facilitating new business connections that help start-ups grow.

On the other hand, angel investors might be more risk-averse than venture capitalists, whose investment portfolios tend to be well-diversified. Thus, angels might be less willing to invest in truly disruptive and highly complex technologies. In fact, while most VC investments have funded high-tech start-ups, angel investments have historically funded a broader range of industry sectors.³¹ Further, angel investors themselves might be subject to idiosyncratic liquidity shocks, implying that entrepreneurs relying on angel investments could face higher funding risk.³²

Research on angel investing has remained scarce.³³ While there is some evidence that angel funding could be a stepping stone for VC investing, there is little systematic information about the size of the global angel market. However, anecdotal evidence suggests that angel investing has gained in importance over time. In the United States, 275 angel networks are members of the Angel Capital Association. In Europe, the European Trade Association for Business Angels counted 115 organizations as members at the beginning of 2020. In emerging economies, angel groups are proliferating, as evidenced by the number of seed financing rounds in which these groups are reported to have been involved.³⁴

Accelerators

Another innovation in entrepreneurial finance in recent years is accelerator programs. These programs provide short- or medium-term support and resources to start-ups, helping them speed up their product development and time to market. Typically, they have a fixed time span, lasting no more than

a few months. Offering mentorship, education, networking opportunities, and co-working space in many cases, accelerator programs culminate in a public pitch event. Many accelerator programs—but not all—provide a stipend or small seed investment. In return, the accelerator receives an equity stake in the venture, typically ranging from 5 to 8 percent.³⁵ Improved access to potential follow-on investors, including angels and venture capital firms, is an additional, and perhaps even more important, advantage for start-ups participating in an accelerator program.

Since the foundation of Y Combinator in 2005, accelerator programs have become increasingly widespread, not only in the United States but worldwide. While some programs operate internationally, including in emerging economies, others are run nationally. China and India have particularly active accelerator ecosystems, with their programs generally following the structure of their counterparts in advanced economies. However, accelerator programs are also proliferating in several countries in Africa and Latin America. While accelerators are a relatively recent phenomenon, early evidence suggests that accelerators may have a significantly positive impact in the sense that they do accelerate venture development.³⁶ The key driver of these accelerator effects is found to be a novel learning mechanism, which could also be relevant for independent entrepreneurs, educational programs, and corporate innovation.

Equity crowdfunding

Finally, entrepreneurial start-ups in their seed phase may seek finance from equity crowdfunding platforms, which have emerged in parallel with other crowdfunding mechanisms. Like its cousin on the debt side, equity crowdfunding is an Internet-based mechanism that is designed to reduce search friction and improve matching between start-ups and potential investors. Start-ups looking for funding may list themselves on the platforms and post relevant information about themselves, while potential investors can screen their investment proposals. In the equity-based version of crowdfunding, funders receive compensation in the form of the fundraiser's equity-based revenue- or profit-share arrangements. Importantly, online platforms are not financial intermediaries and hence are not involved in investment decisions. Instead, the ultimate decision to back a company is made by the individual crowdfunder, a characteristic they share with business angels.

Equity crowdfundering has been described as the democratization of entrepreneurial funding.³⁷ While historically investing in start-ups has been reserved only for venture capitalists and highly connected angel investors, these online platforms allow a broader investor community to access start-up investment opportunities with small amounts. Interestingly, VC funds and business angels often use equity crowdfunding as a screening mechanism to identify attractive investment opportunities.

While equity crowdfunding has been welcomed as a business model with the potential to reshape the VC landscape and early-stage funding as a whole,³⁸ it entails important risks both for entrepreneurs and investors. Entrepreneurs must understand

that no investor is willing to provide funds for a start-up without first assessing its potential value. When seeking funding from venture capitalists and angel investors, the entrepreneur usually provides detailed information about the business idea on the basis of a legally binding nondisclosure agreement (NDA). However, the basic idea of crowdinvesting excludes individual NDAs, requiring entrepreneurs to publicly disclose their business ideas and strategy. This early disclosure might harm start-ups with an innovative business model that can easily be copied. Thus, one might expect equity crowdfunding to be more industry-diverse than VC, which has been actively focused on tech start-ups.

As far as crowdinvestors are concerned, their ability and incentive to perform detailed due diligence is likely to be limited. Given the lack of necessary resources and experience to undertake proper due diligence and post-investment monitoring, individual crowdinvestors may decide to free ride on the investment decisions of others. However, this raises the risk of herd behavior and the risk of selecting underperforming entrepreneurial projects.³⁹ Additionally, while angels and venture capitalists typically use covenants in their contracts with entrepreneurs, crowdinvesting is usually based on standard contracts that are provided by the crowdinvesting platforms. The staged infusion of capital, a key management tool in venture investing, is usually not available in crowdfunding, and to the extent that crowdinvestors are unable to participate in follow-on investment rounds, their shares get diluted. Moreover, while venture capitalists typically develop a clear exit strategy at the time when they make an investment, crowdinvestors have little, if any, influence and may wait considerably longer for their invested capital to be returned. Finally, there remains considerable regulatory risk as regulations must catch up with evolving forms of alternative finance.

According to data reported by the Cambridge Centre for Alternative Finance,⁴⁰ the market for equity crowdfunding has remained far smaller than the market for crowdlending. In 2017, the global volume was estimated at around US\$800 million. While the United States, Europe, and Asia Pacific accounted for around US\$225 million each, the rest was due to investments in emerging markets in Africa, the Middle East, and Latin America.

Conclusions

Innovators enjoy an increasingly broad spectrum of funding sources across different stages of their companies' life cycles. However, while the emergence of new sources has helped alleviate funding gaps, it has not eliminated them. This is particularly true for many developing and emerging economies where financial markets have remained underdeveloped. But there is ample evidence that many entrepreneurial firms in advanced economies face severe funding constraints as well. New research suggests that these constraints are felt especially by female entrepreneurs and minority groups.

To alleviate existing bottlenecks in entrepreneurial finance, it is imperative for emerging and developing economies to put in place appropriate policies that aim at developing financial

markets. Individual circumstances vary substantially from country to country, which makes it difficult to identify priorities that are applicable across the board. Thus, the following examples are meant to be illustrative rather than to imply specific recommendations.

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.⁴¹ Second, while sovereign bonds generally serve as risk benchmarks, such markets have remained embryonic in many countries. Third, turning to the equity side, it is critical for minority shareholders to be adequately protected. Countries where investors are better protected, for example, through disclosure requirements and liability standards, typically enjoy more VC activity.⁴² Given that the vast majority of VC investments focus on tech companies, enhancing minority shareholder protection may help spur innovation and growth. Finally, shareholder protection goes hand in hand with the importance of developing a market for initial public offerings (IPOs). There is considerable evidence that VC activity is closely related to the depth and breadth of stock markets.⁴³ Unless VC firms are able to exit via an IPO, they will need to convince new shareholders to buy the stock of their portfolio companies. However, investors are likely to be reluctant to purchase stakes in an environment with sub-par shareholder protection.

Recent advances in fintech are expected to help overcome some of the current constraints in entrepreneurial finance. However, for fintech to fulfill these optimistic expectations, it will be critical for governments to put in place a regulatory framework that fosters fintech lending, equity crowdinvesting, and other emerging forms of financing start-ups. This need is equally important for developing countries and advanced economies. For countries that are "getting it right," new technologies offer substantial potential to leapfrog, unleashing growth forces by facilitating the funding of entrepreneurship and innovation.

Notes:

- 1 Schumpeter, 1934.
- 2 For a discussion of the various channels between economic and financial development, see Levine, 2005.
- 3 Kerr et al., 2015.
- 4 Scherer, 1999; Hall et al., 2010.
- 5 An exception is Allen et al., 2013.
- 6 Ritter, 2020; In the United States, only 35% of tech companies that went public in 2001–2019 were profitable. In the biotech industry this percentage was even lower (5%).
- 7 Rob et al., 2012.
- 8 Estimate by the Cambridge Centre for Alternative Finance, 2020; In the reward-based crowdfunding model, backers provide funding to individuals, projects or companies in exchange for non-monetary rewards or products. Reward-based crowdfunding platforms enable "project creators" to post project or product descriptions and videos in order to solicit funding. Project creators set a funding goal and a deadline. Importantly, crowdfunding campaigns are all or nothing. If the

- target funding goal is met within the given timeframe, the pledges are automatically collected from the donors; otherwise no money changes hands. However, although the volume of reward-based crowdfunding has increased in recent years, it is still relatively small, totaling around US\$1.2 billion. The vast majority of this amount is due to transactions in China.
- 9 Global Entrepreneurship Monitor, 2019.
 - 10 Chavis et al., 2012; The SME Forum estimates that more than 40 percent of micro-, small- and medium-sized enterprises in emerging markets are financially constrained, with an estimated credit gap totaling \$4.75 trillion. SME Finance Forum MSME database, 2020.
 - 11 Casanova et al., 2018.
 - 12 Banerjee et al., 2011.
 - 13 McKinsey Global Institute, 2016.
 - 14 Mills, 2018.
 - 15 Cambridge Centre for Alternative Finance, 2018; Of this amount, \$97 billion was due to lending in China.
 - 16 Claessens et al., 2018; Philippon, 2016.
 - 17 Nguyen & Hille, 2018; As companies grow and start to accumulate tangible assets, patents typically lose in significance as collateral. While patents are often the most valuable asset of tech companies, traditional banks are found to show a significant aversion against their use as collateral in their lending operations.
 - 18 Preqin Database, 2020.
 - 19 Gompers et al., 2001.
 - 20 Kortum et al., 2000; Kortum and Lerner find a significant impact of VC on innovation across different industries in the U.S. While the U.S. remains the world's largest VC market, there is less systematic evidence for other economies.
 - 21 Kaplan et al., 2003; Agency problems in VC are fourfold: (a) the entrepreneur may not work hard enough to maximize value after the investment is made; (b) the entrepreneur may know more about his capabilities than the venture capitalist; (c) after the investment is made, there may be circumstances in which the venture capitalist disagrees with the entrepreneur and wants the right to make decisions; and (d) the entrepreneur may "hold up" the venture capitalist by threatening to leave the venture when the entrepreneur's human capital is particularly critical to the company.
 - 22 Kaplan et al., 2010.
 - 23 Jay Ritter IPO Database, 2020.
 - 24 Nanda et al., 2017.
 - 25 Lo et al., 2016; Fagnan et al., 2013.
 - 26 Lerner, 2016.
 - 27 Dushnitsky & Lenox, 2005; Companies will prefer CVC if the marginal innovative output is expected to be higher than that of internal R&D; Ma, 2020; However, the differential between the marginal innovative output of CVC and internal R&D may not be static. Instead, firms searching for innovation use the knowledge in their portfolio companies to jumpstart internal R&D and terminate their CVC programs when the informational benefit diminishes.
 - 28 Lerner, 2013.
 - 29 To attain this goal, companies have chosen different organizational forms of CVC. Some companies have established internal corporate venture groups to analyze VC opportunities and invest in start-ups. As an alternative, other companies have set up external CVC funds as a separate entity outside the company. Finally, other CVC programs involve commitments to IVC funds, with the option to co-invest in entrepreneurial start-ups alongside these funds.
 - 30 Kerr et al., 2014.
 - 31 OECD, 2012.
 - 32 Lerner et al., 2018.
 - 33 Exceptions are Kerr et al., 2014; Hellmann et al., 2019; Lerner et al., 2018.
 - 34 Casanova et al., 2018.
 - 35 Hochberg, 2016; Some accelerators offer a larger, guaranteed investment in the start-up upon graduation, usually in the form of a convertible note.
 - 36 Hallen et al., 2020.
 - 37 Afuah et al., 2012.
 - 38 For a detailed description of equity crowdfunding platforms, see Bernstein et al., 2017.
 - 39 To help mitigate this risk, some platforms, such as AngelList in the United States, offer the opportunity for investors to form syndicates. These syndicates usually include experienced angels and venture capitalists. Less experienced investors may co-invest with a syndicate, in exchange for a share in the profit, a model that could help reduce the information asymmetry problems that arise due to the lack of appropriate due diligence by the majority of the investors.
 - 40 Cambridge Centre for Alternative Finance, 2018.
 - 41 World Bank, 2019.
 - 42 Lerner et al., 2009; Consistent with this evidence, Lerner & Schoar (2005) find that VC deals in low-enforcement countries are based to a comparatively larger degree on equity and board control as opposed to convertible preferred stock with covenants, a more common form in high-enforcement countries.
 - 43 Black et al., 1998.
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