

The Role of Development Finance Institutions in Enabling the Technology Revolution

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THE ISSUE

- The fourth industrial revolution is fast disrupting the global economic, political, and social norms and institutions. Developing countries, who are also undergoing a massive demographic disruption, will feel this revolution's impact the most. Without the right human capital and adequate financial investments, developing countries will likely miss out on the promises and potential offered by this revolution.
- By strategically recalibrating their focus, **development finance institutions (DFIs)** can position themselves as critical players. DFIs can help channel private investments into new technologies and help emerging markets accelerate their efforts to achieve the sustainable development goals.

INTRODUCTION

“New technologies offer enormous possibilities for change. Technological change affects all aspects of social and political life. Through social protections and investments in education, people can feel that they have the possibility to be a part of this change and benefit from it. DFIs and development corporations have a key role to play in facilitating this.”

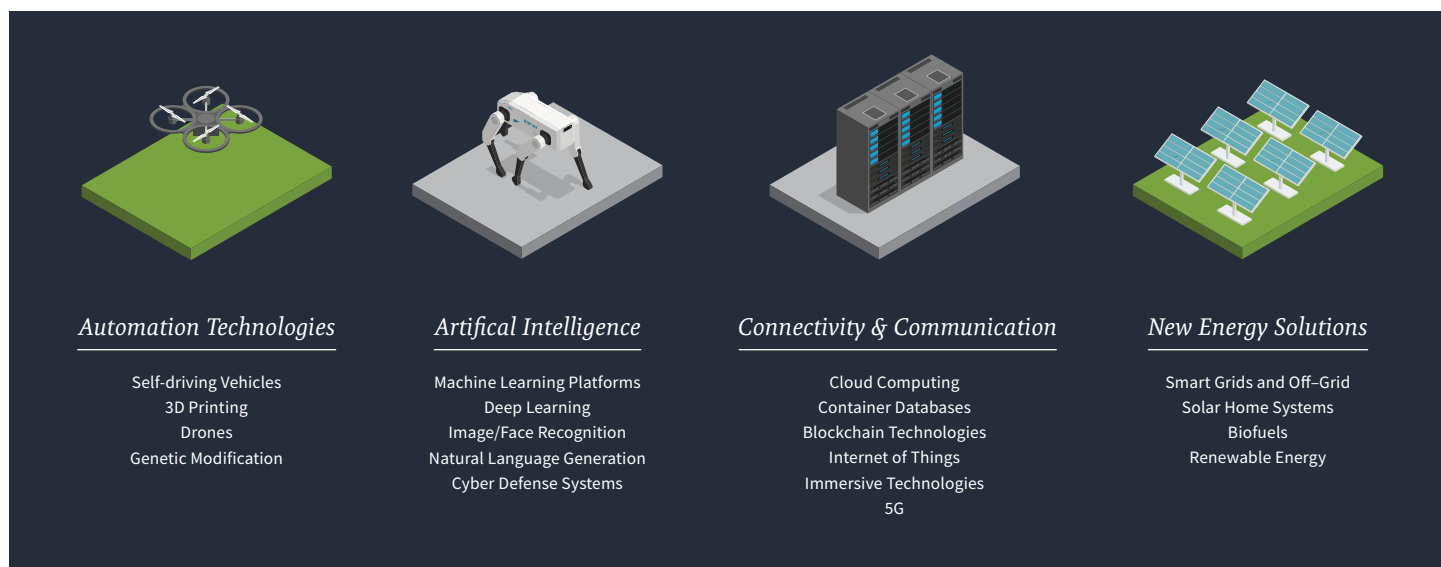
— Peter Eriksson, Swedish Minister for International Development Cooperation, at the Washington, D.C. roundtable held in April 2019.

The current technological revolution, more commonly referred to as “Industry 4.0” or “The Fourth Industrial Revolution – (4IR),” is rapidly disrupting and transforming economic institutions, social norms, and political systems.² Globally, the interaction of different technologies such as automation, robotics, artificial intelligence, and others (Figure 1) can have a profound disruption in terms of the

“velocity, scope, and systems impact.”³ The developing world has a unique opportunity to harness the potential of these transformations and increase global prosperity, efficiency, and quality of life.

However, the 4IR can quickly turn into a missed opportunity if nations fail to make the necessary investments in critical infrastructure and good governance frameworks. Technology can institutionalize discrimination and inequality in developing countries that have underdeveloped markets and private sectors.⁴ If less developed countries continue to underperform economically and fail to create jobs, they further risk alienating youth.⁵ At the same time, a lack of investment (either public or private) that will develop a set of basic digital skills in the workforce can leave many economies unequipped to compete in the global markets, given the rapidly evolving nature of the businesses that are looking to use technology to become more efficient.⁶ This, in turn, will limit the middle class’s ability to enjoy the gains of

Figure 1: What are the Technologies of the 4IR?



Source: Compiled by CSIS Project on Prosperity and Development

the fourth industrial revolution.⁷ Moreover, with only half the world on the Internet and one out of every six persons on the planet lacking access to electricity (prerequisites to adapt many of the new technologies discussed in Figure 1), significant portions of the developing world are underprepared for the forces of the fourth industrial revolution, leaving many behind.

The global population is expected to reach 8.5 billion by 2030, with developing countries driving much of that growth.⁸ Yet, few have the institutional capacity, the education and skills, and the infrastructure to harness the potential of the fourth industrial revolution to meet their economic development goals. Absent the right institutional, educational, regulatory, and infrastructure support, such changes can quickly undermine the developing world's capacity to achieve sustainable growth and development, with societies struggling to adjust and assimilate to new technologies.

"We need to internalize technology and leverage innovative technologies to advance the SDGs and improve the lives of the marginalized. Outsiders to the field of development finance need to embrace that role. At the same time, we must also talk about the disruptive effects they have on the existing norms on ethics, privacy, and security in our lives."

— Paul Lamontagne, Managing Director,
FinDev Canada

With significant support from the donor community, the developing world needs to realign the public policy

framework to prepare its societies for a changing technological landscape. Given the current global economic forces at work, countries can make their workforce and businesses most resilient when they switch to a knowledge-based ecosystem that is centered on science, technology, and innovation.⁹ This will include increased emphasis on digital skills, development of local financial institutions and capital markets, decentralization and building capacity of sub-sovereign governments, and fostering an enabling environment for innovation-led economic growth.

In this regard, technology can be transformational for achieving the sustainable development goals (SDGs). In 2015, more than 193 countries adopted 17 SDGs.¹⁰ These goals range from ending extreme poverty, ensuring energy sustainability, and securing gender equality on a global scale. While many countries have already undertaken significant investments and policy changes that put them on the right path to achieving the SDGs, the advent of new technologies can help further accelerate that pursuit.

Multilateral institutions have recognized the seismic impact that new technologies, with the help of private capital, can have on development efforts. This is exemplified in the 2015 Financing for Development Agenda, adopted at the Third International Conference in Addis Ababa, which made it clear that the task of mobilizing trillions of dollars for investments in SDGs could not be achieved without private sector participation that will pursue innovative financing solutions.¹¹ In September 2018, the secretary-general of the United Nations issued a strategy on leveraging new technologies to support the ongoing global efforts to achieve



Source: Compiled by CSIS Project on Prosperity and Development

the SDGs.¹² The document emphasized on a set of principles that aims to protect and promote the shared global values encompassed in the UN charter. Further, the strategy calls for deeper partnerships with actors in governments, markets, and the broader civil society space.

TECHNOLOGIES BRING CHALLENGES AND OPPORTUNITIES FOR ACHIEVING THE SDGs

The evolved technological landscape opens new avenues that the development community can pursue to achieve the SDGs. Digital technology, in particular, has had a profound impact. Likewise, there is a myriad of other technologies that are changing every facet of the political economy and society. A broad range of new technologies like 3-dimensional printing, artificial intelligence, autonomous machines, big data analytics, blockchain, next-generation wireless communication systems, and robotics are some of the technologies that are revolutionizing our endeavors to approach the SDGs (Figure 2). Big data analytics and digital technology have a significant role in shaping urban planning and the development of smart cities.¹³ Artificial intelligence, partial (or full) automation of manufacturing, and 3-D printing technologies can help tackle the challenges to scaling essential services like housing and post-disaster reconstruction services.¹⁴ Blockchain technology and the Internet of Things (IoT) have already demonstrated their value by helping urban communities without adequate

governance capacity establish a credible and secure system for conducting transactions in the power and utility sector.¹⁵ Over the past few years, smart technologies and electronic devices have helped forge new and ground-breaking digital platforms that have embedded themselves into the everyday lifestyle and are fast modernizing the elements of the global economy.¹⁶

However, the sheer complexity of contemporary geopolitics, varied objectives of the SDGs, diversity in institutional setups, and demographic changes makes it difficult for a single technology—or even a group of technologies—to serve as a silver bullet that can solve the challenges to achieving global development goals. Technology is a catalytic tool that can help stakeholders fast-track their attempts to achieve the goals. In specific cultural and political contexts, technology can help democratize the citizens' ability to access information and make more optimum economic decisions. However, technology itself cannot be a substitute for strong partnerships between the state and the civil society—a precondition for good governance. Countries also need to create an enabling environment for science, technology, and innovation to take root in order for a twenty-first century knowledge-based economy to develop.

“New technologies come with both opportunities and challenges, and the development finance world needs to understand it better to benefit from it. In more recent years, DFIs have started to tap into the

potential of digitization of the financial sector to achieve inclusive growth.”

— Maria Håkansson, CEO, Swedfund

It should be clear that while new technologies have tremendous potential to facilitate faster and more efficient ways to achieve inclusive economic development—with many individual technologies demonstrating their usefulness in addressing local development problems—the most pressing challenge continues to be financing the scale-up and replication of successful models. Global aid agencies and development finance institutions have an indispensable role in filling the missing gap.

Figure 2: New Technologies and their Impact on SDGs

BLOCKCHAIN AND SDG #16

Reduces and secures transactions costs (cash/digital capital transfers) by removing intermediaries and improves monitoring, reporting, and collaboration, thereby enhancing policy implementation efficiency

Improves financial inclusion in developing communities and generates more stable and trustworthy economies through its immutable qualities

MACHINE LEARNING AND SDG #11

Make resource allocation easier and production, water access, and sanitation more accessible through real-time satellite imaging

Virtualized education platforms can respond to SDG Quality education needs by providing responsive and personalized learning

By processing millions of bytes of data without the need for human guidance, Machine Learning technology can independently recognize patterns to track populations, data flows, and trends to increase efficiency and sustainability

THE UNIQUE ROLE OF DEVELOPMENT FINANCE INSTITUTIONS (DFIs)

Meeting the SDGs by 2030 is not impossible but it will require over US\$11.5 trillion in investments, according to

United Nations estimates.¹⁷ Donors and aid agencies have been playing an indispensable role in helping low- and middle-income countries achieve these goals. Development finance institutions (DFIs) have emerged as one of the fastest growing agencies¹⁸ pursuing innovative financial solutions to support development efforts worldwide. DFIs' investments now equal half of all official development assistance (ODA), outpacing other forms of foreign aid in terms of annual growth. They are much sought after in the developing world and also carry the reputation of being a trusted partner of private capital (Box 1).

Box 1: A Short History of DFIs

DFIs have been around for over half a century, with the first one (the UK's CDC Group) established in 1948.¹⁹ DFIs are specialized development finance institutions that aim to foster the private sector in developing countries. However, for much of the twentieth century, their ability to finance development was severely limited. Until the mid-1980s, many developing countries relied heavily upon centralized state economic planning and foreign aid. The financial crises of the 1980s and 1990s that began with Mexico²⁰ and other economies like Argentina,²¹ India,²² and Poland²³ pushed countries to open up their markets and liberalize their economies from state control. Private sector activity began to grow and, subsequently, so did the relevance of DFIs.

The twenty-first century saw the footprint of DFIs expand.²⁴ The diverse portfolio ranged from investments in the mobile telephony industry in Africa to renewable energy projects in South Asia. A study undertaken by the CSIS Project on Prosperity and Development²⁵ reveals that the annual investments of DFIs have witnessed a seven-time increase, going from US\$12 billion in 2000 to US\$87 billion in 2017. By comparison, official development assistance (or foreign aid) only tripled, going from US\$54 billion to US\$146 billion during the same period.

Nearly two decades after DFIs took flight, they find themselves charged with the authority to make higher levels of investments and leverage more than one form of financing instruments. Donor countries, through various legislations,²⁶ have either established or expanded the functions of their DFIs,²⁷ thereby significantly enhancing the soft-power toolkit to help meet sustainable economic development. Today, shareholders of some of the world's largest DFIs are

also asking them to make greater investments in countries hit by conflict and fragility.²⁸ Businesses and ventures in these tough places have a high-risk profile, making it near-impossible to attract quality investments. This creates a vicious cycle where fragility deters private investments that stunt economic growth, ultimately sustaining poverty levels. The prevalence of a technology sector that is eager to expand its product coverage, and a DFI capable of partnering and financing this sector can help the world get closer to achieving the sustainable development goals.

Today, emerging markets once again approach a new inflection point and are bracing for new technologies to either decimate their growth models or help them transition into a new age of accelerated and sustainable economic development. The role of DFIs—as development finance institutions making impact investments for sustainable development, generating profits—allow them to be a catalytic intermediary between private capital and the markets in the developing world. DFIs can once again take center stage and use their resources to mitigate the risks posed by new technologies while creating an enabling environment that will foster innovations that can spur long-term economic development.

DFIs were transformational for many countries in their digital revolution (Box 2) and they can continue to play an important role as developing countries undergo the fourth industrial revolution. DFIs can help finance the expansion of new technologies in the emerging markets that will bring us closer to achieving the sustainable development goals. By making targeted investments to fund innovative ventures, they can leverage many additional billions of dollars and turn the hopes and aspirations of the developing world into real opportunities.

Box 2: DFIs and the Digital Revolution

At the start of the twenty-first century, virtually no mobile phone users existed in the African continent. There were more fixed-line telephone subscriptions in Manhattan (population 1.5 million) than in all of sub-Saharan Africa (population 645 million).²⁹ By 2017, there were more than 444 million unique mobile phone subscribers in the region, representing nearly 45 percent of the population in sub-Saharan Africa and one-tenth of the global mobile subscribers.³⁰ The protagonists in this story of development are DFIs. The British CDC Group, in particular, is credited with the explosion of cell phone subscriptions in emerging

markets as it invested in Dr. Mo Ibrahim's Celtel mobile network in Africa.³¹ Other regions are witnessing this explosion of the mobile telephony sector as a result of the role played by DFIs. Afghanistan, Bangladesh, India, and many other countries in Asia have experienced similar growth in mobile penetration in the last two decades.³² Developing countries made the right bets and are now economically more competitive, inclusive, and vibrant than ever before.³³

Digital technologies have started to transform emerging markets. For instance, smartphone and mobile phone penetration range from 64 percent in India to 93 percent in South Africa, with an average of 78 percent across the emerging markets. Significant portions of the emerging markets now have access to the Internet with over 71 percent of Latin American, 46 percent Asian, and 30 percent of African populations actively logged on to the Internet. With these numbers expected to rise exponentially in the next few years, and with digital technological forces capturing virtually every economic function, there is no doubt that digital literacy will become an indispensable skill set that will be required for investments in modern enterprises to lift off.

DFIS CAN ACCELERATE TECHNOLOGICAL ADOPTION IN DEVELOPING COUNTRIES

The global DFI community is quite diverse, with some DFIs more risk averse than others conditional upon the specific mandate and goals set by their stakeholders. However, the conventional *modus operandi* for the plurality of DFIs involves the use of direct loans, various types of loan guarantees, equity investments, and support for investment funds in developing countries to achieve market rates of return and earn profits in a short period of time.³⁴ Often under pressure to hold on to their investment grade ratings, this risk-averse culture disincentivizes many DFIs from making any early-stage investments in riskier, smaller companies in low- and lower-middle income markets.

For the development finance community to help countries harness the potential of new technologies, it must depart from its current practices. There are five sets of actions that DFIs can take to help bridge the gap between the developing world and the technology and innovation hubs in the West:

ACTION #1: RESETTING DFI'S VISION AND STRATEGY IN THE TECHNOLOGY SPACE

To meet contemporary challenges and fully realize the opportunities, DFIs will need to better orient their strategy

and vision to emphasize investments in early-stage innovation in low-income countries. Such investments will be inherently riskier and will require a longer gestation period to fully mature. Some bilateral DFIs are already adopting this new approach to make riskier investments.³⁵ The UK's CDC Group, for example, shifted its strategy to lower its financial returns from an annual average of 10.6 percent and instead is committing 20 percent of its investment portfolio to address specific market failures that undermine economic development. With adequate investments in countries' fundamentals, this game-changing strategy will help propel the lowest of the developing countries into the modern economy that is powered by digital and technological platforms offered by the fourth industrial revolution.

Additionally, DFIs can further promote their focus on building lasting partnerships between private capital investors and innovation hubs in developing countries. This, in part, can be done by facilitating the creation of an enabling environment in countries that can help scale up and expand early stage investments in innovations.

ACTION #2: HELPING COUNTRIES INVEST IN THE FUNDAMENTALS: BUILDING REGULATORY FRAMEWORKS, STRENGTHENING GOVERNMENT CAPACITY, AND DEVELOPING CAPITAL MARKETS

Every investment, both in the developed and the developing world, is subject to a diverse set of risks. These risks are shaped and modeled by different institutions that govern the investment ecosystem. Risks can arise out of undertrained human capital, weak courts and justice systems, inadequate legal frameworks covering contracts and anti-trust issues, complicated tax codes, underdeveloped financial markets, inept central banking systems, pervasive corruption, and others. Low-income countries and countries grappling with conflict and fragility have the greatest SDGs funding gaps. Unfortunately, these are also the same countries where fractures and fault lines exist within the political economy that can pose risks to investments and deter their prospects of achieving sustainable development.³⁶

DFIs, which are constantly improving their well-developed risk-investment framework to strengthen their business strategy, are best positioned to both assess and mitigate the risk posed by less-developed countries. Some of these fault lines can be addressed by using mechanisms that address political risk while pushing for reforms that can help revamp the regulatory architecture, encourage the development of human and financial capital markets,

bring in investments into basic infrastructure, increase the public's access to information, and build local capacity.³⁷ But a vital pre-requisite that underlies any reform effort is the willingness of a country's political leadership to commit to the reforms faithfully.

Money alone will not fix weak fundamentals of political and economic governance. Developing countries must make their regulatory frameworks more transparent and less ambiguous to create an enabling environment for investments and innovation to grow. To that end, the technical expertise available at the multilateral development banks, bilateral aid agencies, and the DFIs is unique. There are three areas where these institutions can play a significant role.

First, reforms are needed in essential legal frameworks that govern bankruptcy, contracts, land-acquisition, auctioning of natural resources, and insurance laws. Investors are more likely to park their capital in markets that are transparent and predictable. An ambiguous regulatory environment leaves much of the rules to speculation and political whims. Moreover, countries should undertake serious measures to ensure the independence of their central banks while also strengthening their judicial systems by providing greater access to fiscal resources.

Second, efforts must be directed towards building local government capacity. Today, 54 percent of the world lives in an urban setting. By 2050, urbanization is expected to reach 66 percent globally.³⁸ An overwhelming majority of the global urban population will be in Africa and Asia. Many of these countries continue to make their development goals contingent upon decisions taken by bureaucracies in the national capital. National governments need to decentralize and devolve their development functions to officials in local municipal bodies and subnational governments to ensure a higher and more targeted impact on its population. Such devolution of powers must be accompanied by investments in training and capacity-building modules for such public officials who, often, are inept at performing critical but modern bureaucratic functions like a life-cycle cost analysis before infrastructure procurement.³⁹

Finally, many developing countries are unable to harness the full potential of their local capital and finance due to the lack of infrastructure and enabling institutional design. In 2018, Indian and South African pension funds each had an asset value of over US\$130 billion.⁴⁰ Meanwhile, economies in the Indo-Pacific have capital worth over US\$800 billion that remains untapped due to the lack of deep capital markets.⁴¹ These snapshots are indicative of

the fact that vast pools of local capital, valued at several trillion dollars, exist in emerging markets in the form of pension funds, national savings, assets, bonds, and bank deposits. Local capital helps finance major development projects at a lower cost due to the reduced dependency on foreign debt. It also helps protect its economies from experiencing a large-scale exodus of foreign capital that may be triggered by the actions (or inaction) of the political class of countries with autocratic regimes or young democracies that have elected leaders with no clear mandate (as is often the case).

By coordinating with bilateral aid-and-development agencies, DFIs can help low and lower-middle income countries address the fundamental risks posed by the structural problems in its political economy. DFIs can use conditional loans and loan guarantees that help host governments undertake serious reforms to their legal and regulatory framework that can help mitigate some of the political risk threatening private investors and undermining market confidence.

ACTION #3: SUPPORTING LOCAL EFFORTS THAT CAN BRING SOLUTIONS TO SCALE

The challenges faced by the developing world are complex and diverse. Consequently, development solutions need to respond to the needs of local communities. While holding fast to that principle, DFIs should scale up their ongoing strategies that are demand-driven in approach. By facilitating a partnership between the investor, project stakeholders and managers, local government officials, and the extended civil society, this demand-driven approach increases the chance for the investment to be successful.

The development finance community should back business models that use new technologies to help solve local problems more effectively. A quintessential example of this phenomena is the M-Pesa system, developed due to the instrumental role played by DFIs.⁴² Launched in 2007, this platform was built to enable mobile phone users to conduct basic banking functions without having to access the physical banks itself. Mobile telephony in Africa, as outlined above, is pervasive and this technology has only helped democratize the formal banking sector in a continent where the goal of financial inclusion was mostly unrealized.⁴³ M-Pesa's success in using the best technology at the time to organically solve a prevalent socioeconomic challenge is not unique. Similar game-changing technologies, which rely on grassroots partnerships at a local level, are impacting health care challenges and food security concerns across the developing world.⁴⁴

Such small-scale solutions, driven by individuals and communities on the ground who co-opt new technologies with a digital platform, have proven to be indispensable and are emerging as a key player in the broader consolidation efforts (Box 3).⁴⁵ DFIs can not only back such early-stage technological solutions in small and local contexts but should also be prepared to scale such innovations globally.

Pursuing a demand-driven development is a strong strategy for several reasons.⁴⁶ First, by making this tactical shift, the development finance sector will make the deployment of its resources more prudent. Second, it allows DFIs to assume the role of seed funders in the developing world, particularly since early-stage funders for untested technological solutions are hard to come across. Third, it empowers local communities (and the developing world at-large) to be in control of how they prioritize competing policy options. Finally, it gives greater stakeholders of a given development investment greater ownership of the project and better control to respond to ground realities promptly.

Box 3: Blockchain Addresses Energy Access Issues

Blockchain technology can be described as a cloud-based network of distributed digital ledgers that is universally accessible and virtually tamperproof.⁴⁷ Originally featured in the fintech world, blockchains are now being used by various economic sectors, public institutions, and the broader international development community, delivering on the promise to offer people a secure, transparent, and low-cost platform for transactions.⁴⁸

The energy sector, in particular, has used blockchain technology most effectively in addressing the challenges of developing a feasible business model in smaller markets while addressing the broader risks of operating commercially. Startups and small-scale enterprises in the power and utility sector are providing low-cost renewable energy to consumers using a “pay-as-you-go” model.⁴⁹ These players use a blockchain-enabled accounting system that provides a secure and transparent platform for accounting and financial transaction between the consumer and the service provider.⁵⁰ Rural and sparsely populated towns in the developing world that are often left out of the gains of large national power grids are the biggest benefactors of this model. Scaling up these players and replicating their models will get the developing world much closer to achieving global energy access goals.

ACTION #4: ENGAGING WITH VENTURE CAPITAL AND IMPACT INVESTORS

As DFIs reorient themselves to increase their investments in innovations and ideas—all the way to the scale stage—they should continue to work effectively with the investment community. By their very design, venture capitalists and impact investors are agile and flexible.⁵¹ They are structured to make fast decisions and judge the profitability and investment risks using very individualized terms. A partnership between a DFI and the venture capital/impact investment institutions must emphasize increasing the scale of investments in innovation and ideas while focusing on sustainable business solutions.

While supplementing all of the efforts and investments mentioned above, it is worthwhile to note that blended finance can also be used as a tool to mobilize private capital investment. Blended finance can be broadly defined as an approach where international donors mix concessional terms with private investment to reduce or mitigate risk, adjust risk-reward profiles, and attract needed private investment into certain regions or countries.⁵² There remains no question that investments in certain countries are riskier than others. Countries that have been plagued by prolonged periods of conflicts, violent extremism, and weak state capacity inherently pose higher risks to any innovation-financing and investment than even a lower-middle income country. Even so, such countries are not exempt from the broader pursuit of lasting and sustainable

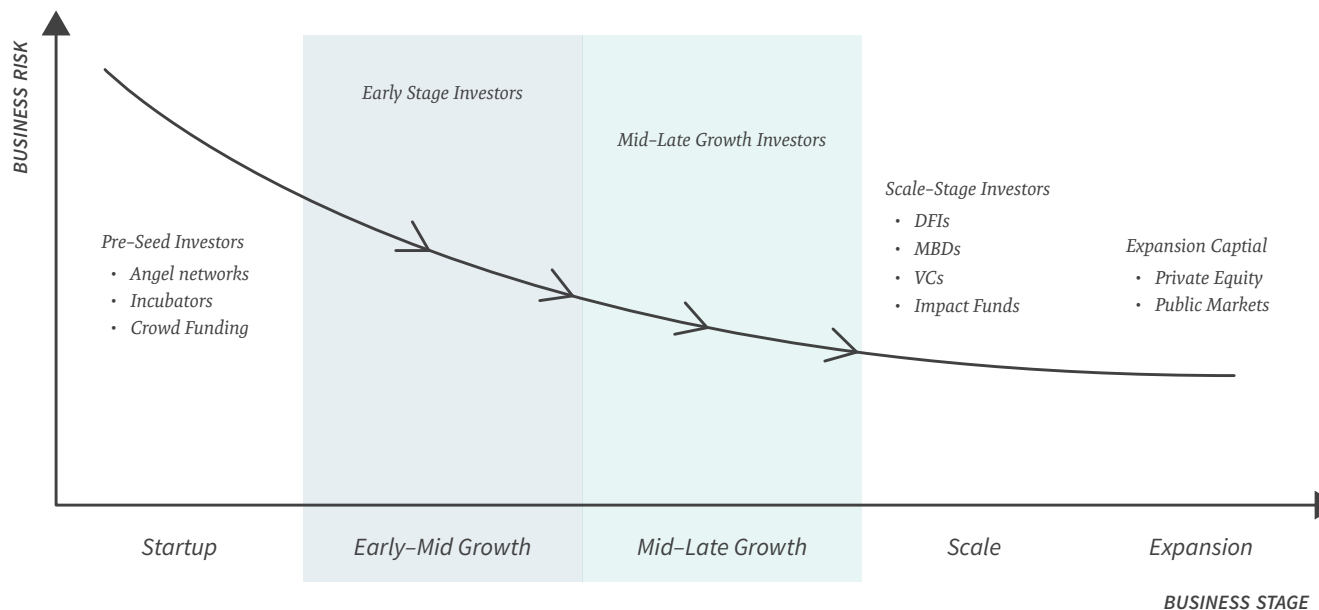
economic development, peace, and prosperity.⁵³ To that end, blended finance can be used to accept lower-than-market-rate financial returns willingly, mitigate the risks to mobilizing much-needed private capital, and finance innovations in tougher countries and offering them a real chance at peace and prosperity.⁵⁴

ACTION #5: FILLING THE “EARLY GROWTH” FUNDING GAP FOR INNOVATIVE BUSINESSES

Within the product or service business cycle, any innovative idea that aims to be commercially successful follows five stages: 1) startup, 2) early-mid growth, 3) mid-late growth, 4) scale, and 5) expansion (Figure 3).⁵⁵ As the risk of investment reduces progressively with each stage, the source of finance also varies for each stage. For instance, the startup stage is riskier than other stages as the product idea is still not fully tested for commercial viability. Consequently, the most pliable way has been to seek crowdfunding and angel investments. Alternatively, businesses that are at the scale stage (where the product has become market-ready and is expected to boost sales and increase profits) find it easier to get funding from traditional financial institutions such as multilateral development banks and venture capitalists.

Innovative ideas that are in the startup stage have some access to capital from angel networks, incubators, and crowdfunding institutions. To a greater extent, innovative ideas that do reach the scale and expansion stage can also

Figure 3: The Five Stages of Innovation



Source: Neil C. Churchill and Virginia L. Lewis, “The Five States of Small Business Growth.”

secure funding from MDBs, DFIs, and venture capitalists, who seek to monetize on the product's potential. The real challenge is the lack of credible funding mechanisms in the critical early-middle growth stages of innovative ideas (often the stage when untested ideas turn into profit-making businesses) that hinders the development of an innovation led-economic model.

This missing link in the innovation pipeline can be an opportunity for DFIs to create investment vehicles for the early-middle growth stage innovations. Structurally, bilateral development finance agencies are government-sponsored institutions that facilitate private investments into commercially sustainable private-sector projects in the developing world. However, since these institutions draw their funds from the public exchequers of donor countries, they remain accountable to vigilant national legislatures and their portfolio of investments are put through intense scrutiny. Some DFIs are incentivized to prioritize low-risk and high-yield investments in relatively better-developed sectors in upper-middle income countries. Overcoming the funding gap will require DFIs to reconsider its strategy of engagement in low-income and lower-middle income countries and demonstrate the willingness to finance riskier innovations. This can be done through new partnerships with investors operating in the mid-late growth stage and align efforts to focus on crowding in more private capital.

CONCLUSION

DFIs are uniquely placed to provide financial assistance and technical expertise in ways that can attract private capital investments in emerging markets. Through such investments, DFIs can help unlock the full potential of new technologies and accelerate the international community's ongoing efforts to achieve the SDGs. To help DFIs be more instrumental in this phenomenon, this paper proposes a series of five critical actions that can be undertaken:

1. reorienting the vision and strategy of DFIs to better channel the potential of the technology sector;
2. helping countries invest in solutions that address the fundamental problems that impede full economic

growth, including clearer regulatory frameworks, increased state capacity, and deeper capital markets;

3. supporting successful local technology-driven solutions and scaling up such efforts;
4. engaging with venture capital and impact investment communities to scale up the investment levels, and;
5. filling the “early-growth” funding gap for innovative businesses that have developmental goals

Furthermore, this is a call to action for the DFI community and beyond. There is an urgent need to further this important dialogue between (and through) the existing DFI institutional network that includes members of the Association of bilateral European Development Finance Institutions (EDFI), the DFI Alliance, the Gender Finance Collaborative, the World Economic Forum's Global Future Council on Development Finance, and other industry forums and global economic councils.⁵⁶ Through these platforms, the DFI community and the private sector must come to a consensus on how best to capitalize the disruptions posed by the fourth industrial revolution and make the economic growth models in the developing world stronger, more resilient, and sustainable. ■

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ENDNOTES

1. Thanks to the generous contribution made by FinDev Canada and Sweden, the Center for Strategic and International Studies (CSIS)'s Project on Prosperity and Development commissioned this project to study the implications of disruptive technologies in the operations of development finance institutions (DFIs). To that end, CSIS organized the "Development Finance and Technology Roundtable" in April 2019 and sought to understand how DFIs can enable technological advancement in the developing world and harness such disruptions as a force of prosperity. This brief was produced as an outcome of that expert roundtable, which was attended by representatives from the DFI, academic, finance, government, multilateral, non-profit, and philanthropic sectors.
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