TOT hardware startups

With hundreds of billions of dollars poised for impact investing, India is emerging as a testing ground for creative social enterprise and impact finance. Numerous factors in India are enabling an environment well suited for impact-minded capital. Economically, India is one of the fastest growing large countries in the world; it is also set to become the most populous by 2022. Socially, India's growing middle class signals economic possibility and mobility. And politically, India is a stable country whose government is setting ambitious targets to combat climate change and socioeconomic inequality. Yet, there is still great need: more than 20 percent of the population lives in poverty.





India's impact tech boom

India's drive for social and economic progress has created enormous opportunity for technology innovators and investors to play an instrumental role. The public and private sectors are both turning to technological innovation to improve and accelerate the delivery of essential products and services. At national, state, and local levels of government, policymakers are seeking ways to encourage clean energy investment, local manufacturing, improved sanitation, and technical innovation through entrepreneurship. Initiatives like *Startup India* and *Make in India* represent a culmination of these efforts. Meanwhile, private sector giants like GE and Tata Group are directing resources to affordable products and services to cater to India's growing middle and lower-middle classes. A few are serving rural and poorer demographics, like rural mini-grid developers or the numerous telemedicine providers that are targeting hard-to-reach, low-income patients.



Much of the social impact experimentation is happening in India's booming startup communities.

Much of the social impact experimentation is happening in India's booming startup communities. Globally, India ranks third behind the U.S. and the U.K. for startup activity. The strength of India's entrepreneurial culture is cultivated through an advanced system of higher education and supported by academic programs, business plan competitions, incubators, and a highly qualified technical and professional workforce. Bangalore continues to be

India's key technology hub, though numerous national programs and individual Indian states, including Kerala and Maharashtra, are encouraging tech entrepreneurship through seed funds, incubators, and other incentives.

Amid the swell of startup activity, an increasingly socially-driven cohort of India's engineers, designers, and entrepreneurs are seizing the notion that science and technology-based innovation are the keys to driving material and lasting change. Some are modifying tried and tested technologies that improve quality of life, like water filters and flush toilets, for underserved segments of the population. Others are entirely new breakthrough ideas that aim to increase productivity and drive economic prosperity.

Safe, well-built, and in-demand products take a long time to reach the market, however—particularly those breaking into new geographies and demographics. (A good rule of thumb is that it can take a new product seven to 10 years and as much as \$25 million in capital to reach scale and begin turning consistent profits.) To succeed, product-based entrepreneurs need access to the right tools, laboratories, workshops and materials to

develop, test, and refine prototypes. Often their resource needs are greater and costlier than software-based innovations, which make their capital requirements unique.



THE OPPORTUNITY FOR IMPACT

Fast economic growth: 7.9% GDP growth in 2015-2016

Progress at work: Official poverty rate declined from 45% to 22% between 1994 and 2012

Continued need: 300 million without electricity, 50% of households without improved sanitation, 500 million without secondary education and job skills, 120 million unbanked

Interested investors: \$5.2 billion invested via private equity and venture capital firms, including 50 active impact investors, between 2010 and 2016

Source: McKinsey

Capital needs of India's builders and makers

Unlike in the U.S., where "hardware" is a growing theme in the venture capital world, most investors in India's startup ecosystem—particularly in the impact space—do not recognize hardware design and product development as its own investment category. Those backing product-based businesses tend to select them because they fit into other investment themes, like energy or agriculture. This can make it difficult for product-based entrepreneurs to find adequately aligned sources of capital.

Product designers, regardless of industry sector, tend to have similar funding needs, which fit into several categories (see below). For investors to be effective partners—and to ensure successful returns on their investments—it is important to be aware of these specific needs and to design a range of tailored financial tools to meet them.

- · Upfront investment in research and development
- Funding for early product design and prototyping
- Funding for product piloting, market testing, and iteration
- Equipment financing
- Funding for manufacturing, marketing and distribution
- Working capital*

Of course, it takes more than money to launch a successful product. Hardware entrepreneurs need competent technical-service providers and intermediaries to help them build viable businesses and financial models. In India's social impact ecosystem, intermediaries that are dedicated to product-based entrepreneurs would offer valuable strategic support on strategic financial, and operational business matters. This kind of support could, in turn, mitigate investors' perception of investment risks.

^{*} While all startups need working capital, product developers' day-to-day operating costs are typically higher than other entrepreneurs. Many have to cover expensive laboratory equipment or manufacturing facilities in addition to standard expenses like salaries and office space. Those delivering on contracts with government entities—which is key to enabling impact at scale in India in sectors like energy, sanitation, and healthcare—often face large working capital needs owing to uncertain timing of payments.

The right money at the right time

Prior research by The Lemelson Foundation and Enclude revealed that as early stage enterprises grow, they encounter several "trigger points," when access to flexible, appropriate types of financing can make or break the business.

The first trigger point typically occurs when a business has demonstrated basic proof of concept but has exhausted initial seed-capital commitments. Financing needs at this point average between \$50,000 and \$500,000, or three million to 30 million rupees.

The second trigger point happens after early market validation, when capital for scaling market presence and supporting revenue growth is critical.

The transitional period between these two trigger points is often the most vulnerable time for an impact startup. Product-based businesses have more acute capital needs during this time because of the time and cost intensity of product prototyping, iteration, testing, and launch. Types of early stage capital that help product-based startups smooth the path to market include:





Proof of Concept Funding

Proof of concept funding to test-drive preliminary product ideas and designs. Most impact startups try to finance this stage through personal investments, awards, or grants. Because most products require multiple cycles of testing, these initial sources of capital can be depleted quickly. Traditional forms of financing, however, are rarely available at the proof of concept stage.



Research & Development Funding

After demonstrating proof of concept, product development often requires additional research, prototyping, and testing—the design iteration and fine-tuning that is necessary to ensure that well-built, safe, and effective products reach the market. Traditional sources of bridge funding to carry businesses through this juncture are difficult for Indian entrepreneurs to secure.



Working Capital

Working capital to cover day-to-day operating expenses, such as paying contractors and advisors, covering equipment purchases, and renting offices and lab space. Working capital needs can run into the hundreds of thousands of dollars annually (tens of millions of rupees), which exceeds most early stage "angel" investments, business-competition awards, and bootstrap funds. Early-stage businesses rarely have access to commercial lenders, however.

What financial tools are available?*

The spectrum of financing options for India's impact entrepreneurs is narrower than more advanced entrepreneurial markets like the U.S. and U.K., but it is growing.

Grants remain the most common and accessible form of early-stage financing, followed by traditional equity. The prevalence of equity investments is linked to India's historical regulatory restrictions on debt financing from foreign investors, however the Indian government is beginning to open up new avenues for outside investors to offer loans to startups.

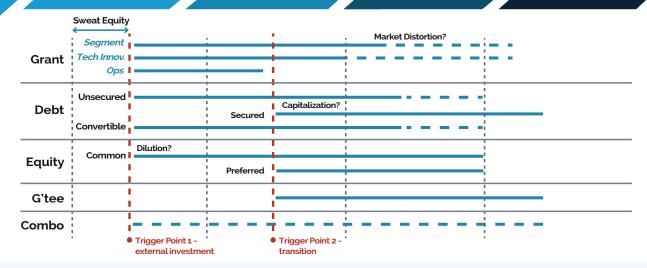
Accelerating the availability of debt will be crucial to the acceleration of India's tech startup ecosystem, particularly in high-priority sectors like manufacturing. This is because makers and builders beyond the proof of concept and early piloting stages, including those in the impact space, need access to debt to cover product iteration, first round manufacturing, and high working capital costs. Many entrepreneurs are hesitant to accept grants as they move past the validation stage because they feel that ongoing grant-based support signals a weak business model to future investors. Equity partnerships, on the other hand, require careful cultivation for impact entrepreneurs, to ensure there is mission alignment. This can take more time than their businesses can afford.

For foreign investors, direct debt investment options have been limited and complicated to transact. This is now changing, however. The Indian government recently revised the requirements for rupee-issued bonds, or "Masala bonds", making it easier for foreign investors to issue smaller-ticket debt to Indian companies. (More on Masala bonds below.)



^{*} Compliance with the prescribed regulations of the Reserve Bank of India is required for any of the financing models mentioned in this document





Other debt-related options include:



Full and partial debt guarantees, which ensure that investors are repaid on a portion or all of the loan. Guarantees encourage more traditional lenders to underwrite on behalf of early stage businesses, most of which are seen as too risky to lend to otherwise. Guarantees have only been tested in a few cases in India, but they represent an opportunity for philanthropies to help unlock India's debt markets.



Convertible debt, is a loan that can either be repaid or converted to equity as a business matures. This structure offers the potential for higher returns to investors. Convertible debt is still an uncommon financial tool in the Indian startup market.

The most readily deployable financing tools that foreign investors can use to structure Masala bonds, guarantees and convertible debt include:



"Smart grants" or repayable grants that function as no-interest loans. These are being put to use by philanthropies and development finance institutions.



Program-Related Investments (PRIs) are made by foundations to support charitable activities. PRIs are usually structured as no- and low-interest loans but can also be set up as equity investments or loan guarantees.

Both smart grants and PRIs can be structured flexibly. These tools can also be deployed as indirect investments through startup funds (including debt funds) and incubator support services for early-stage impact ventures. For example, some Indian investment funds are experimenting with models for providing technical assistance to startup founders through repayable or partially repayable service fees.

Innovative finance at work: Masala bonds

In 2017, medical diagnostics company Biosense Technologies executed a Masala bond with The Lemelson Foundation.

The partnership stands out as the first charitable Masala bond transaction and an example of how philanthropic organizations like The Lemelson Foundation can succeed in unlocking new and creative funding streams for high-impact enterprises.





What are Masala bonds?

Masala bonds are a financing tool that was introduced by the Reserve Bank of India in 2015 to allow foreign investors to invest in rupee-denominated bonds. Any Indian corporate entity, bank, or Real Estate Investment Trust (REIT) can issue a Masala bond to overseas investors. The maximum amount of issuance is 50 billion rupees. The minimum length of maturity is three years. Interest rates for Masala bonds can range between 5% and 10%, making them a much cheaper option for entrepreneurs than more conventional forms of debt.



Masala bonds are the most direct debt financing option available to foreign investors backing companies in India. When Masala bonds were launched, the Reserve Bank of India intended for them to be used for deals in the \$10 million to \$50 million range. The Bank has since amended the rules to permit smaller ticket bonds that are better suited for early-stage companies.

Masala bonds are the most direct debt financing option available to foreign investors backing companies in India.

Masala bonds for impact

Biosense launched in 2008 to develop a low-cost test to check rural mothers for anemia during pregnancy. The company's founders faced numerous setbacks in the product development path; in all, it took Biosense four years to build a working product and a viable business around it.

Last year, Biosense reached a critical juncture. With the product near ready for launch, the company needed a fresh injection of working capital and funding to begin marketing its product. The founders had not yet taken on any outside investments. They were concerned about accepting new grants, because of the appearance of ongoing grant dependency to future investors; at the same time, they did not feel that the business was at the right stage to bring on equity partners.



The Lemelson Foundation approached

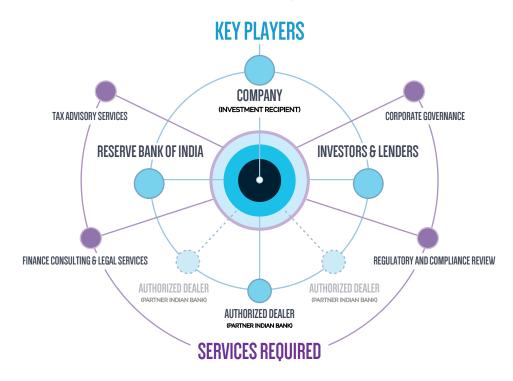
Deloitte India to explore options for issuing a loan to Biosense. Deloitte, along with impact investing consultant Anuj Sharma, supported Biosense and the Foundation through the bond exploratory and execution process. Most of the upfront lift centered around understanding what kinds of small-ticket

Masala bonds the Reserve Bank of India wanted to encourage, and then developing the investment terms and bond agreement with Biosense. Once the bond agreement was finalized, the transaction took approxamately 90 days to close.



Masala bonds: getting started

Interested in learning about the Masala bond process? Our website includes contact information for our partners, a copy of our full contract agreement with Biosense, and other resources. Visit www.lemelson. org/resources to learn more, or contact our team directly.



KEY STEPS:

- Prepare draft of Masala Bond Agreement (led by consultant–I-2 weeks)
- 2. Review/modify the Agreement and confirm the draft (led by the appointed legal team—I-2 weeks)
- Stamp duty payment (0.20% of bond value, left by the Company registering for the bond Agreement—I day)
- Sign agreement and send scanned copy to the Indian banking partner for their review (signatures by both parties, led by consultant, 2 days)
- Address bank queries, if any (2-3 days)
- Send finalized proposal to the Foreign Affairs Department in Delhi for clearance and Issue of Loan Registration Number (LRN) from the Reserve Bank of India (10-15 days)
- Company begins process of opening a bank account to receive the bond proceeds (2-3 days)
- Once LRN is issued, funds can be disbursed (I day)

Important considerations for foundations:

The company applying for the Masala bond will have ongoing compliance requirements they must meet. There are also considerations for U.S. based philanthropies purchasing Masala bonds as part of their PRI portfolio.

- Building the term sheet, in which the charitable investment purpose of the Masala bond must be clearly defined.
- 2. Meeting PRI regulatory requirements, which must be backed by audited financial statements, annual reports, and other documents detailing the business operations and financials of the PRI recipient

SUPPORT IMPACT ENTREPRENEURS



SPARK

future impact entrepreneurs to begin their journey through inspiration, education, and guidance



NURTURE

impact entrepreneurs through challenges in the Blueprint and Validate stages



SCALE-UP

impact entrepreneur models by helping to address key scaling barriers in the Prepare stage



AMPLIFY

the ultimate impact of new hardware ideas through networks and partnerships

Want to know more about innovative financing options to support entrepreneurs in India?

Visit our website for additional information and resources, including contact information for our partners and our full contract agreement.

www.lemelson.org/resources

