



# New Ventures and Manufacturing: the Unfinished Agenda

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## ■ **New Ventures and Manufacturing: the Unfinished Agenda**

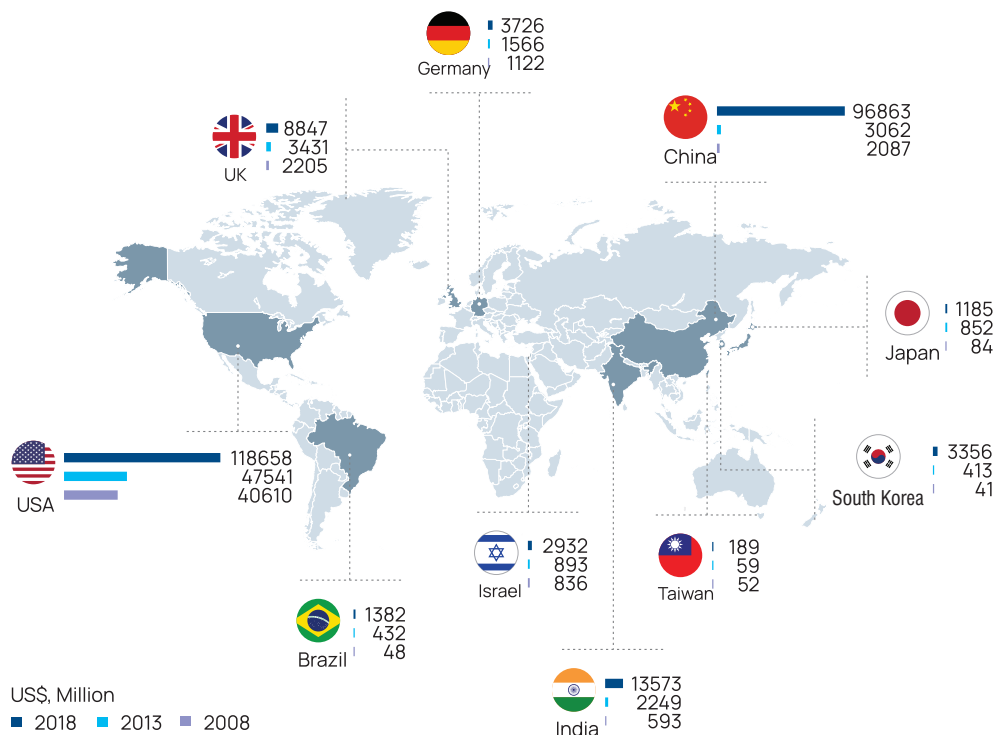
Growth in Indian manufacturing has been stunted. Manufacturing contributed 17.4 percent of Indian GDP in fiscal year 2020 which was slightly higher than its contribution to GDP over the last two decades. Unfortunately, employment in manufacturing increased by “just one percentage point, compared with a five-point increase for the services sector”. (Dhawan and Sengupta, 2020) Several emerging countries around the world have doubled their growth in manufacturing during the similar period. With automation and new manufacturing technologies, productivity growth is seen to be coming from such new investments rather than from labour productivity. The worrisome picture is that labour productivity in manufacturing seems to be declining over the last eight years. (Jethmalani, 2019) There is one other fact that needs some attention. In Japan, small and medium enterprises account for 99.7 percent of all enterprises, 70 percent of employees, and more than 50 percent of the amount of value-added (in the manufacturing industry). They are the backbone of the Japanese economy. However, “as per the ASI, an overwhelming 72 percent of the firms in India have 0-49 employees, although the output share of such firms is just 6.9 percent”. (Jethmalani, 2019) So how does a nation grow its manufacturing gross value add per worker, how does it increase the involvement of more employees in the manufacturing sector in light of growth in new technologies, and how does it grow its labour productivity?

It is our estimate that if we want to have about 50 medium size companies in manufacturing (with at least INR 250cr turnover), we will need about 5,000 small enterprises to progress towards becoming medium in size. To get 5,000 enterprises to become stable small enterprises, about 50,000 would need to be started. This is a staggering estimate as the mortality rates of Indian manufacturing is high. Interestingly, as many more become medium sized, the number of startups required decreases since most small startups grow as part of subcontracting network and employment opportunity increases. Growing such an ecosystem of interdependent firms has the potential to grow the manufacturing activity especially when capital available for manufacturing is highly irregular. There has been a belief amongst the policy makers in India that if they can convince large producers globally

to make India as part of their manufacturing supply chain, it would lead to growth in gross value added as well as employment. While the end result could become true, what they fail to recognize is that large global firms get attracted to a country where the ecosystem of suppliers and skilled manpower exists strongly. This often comes from medium enterprises.

Let us look at how venture investments have been supporting startups in manufacturing in India which is the starting point for building of a sizeable ecosystem of medium enterprises (See Figure 1). While India ranks third in terms of venture capital (VC) investments (across all sectors including services) behind US and China, it is an order of magnitude lower than what they have received. VC Investment in India is about 14 percent of what China received and about 11 percent of what was invested in the US. The growth in investment in China has been 31 times as opposed to 3 times in India over a five year period ending in 2018. I hope the policy makers are asking, why?

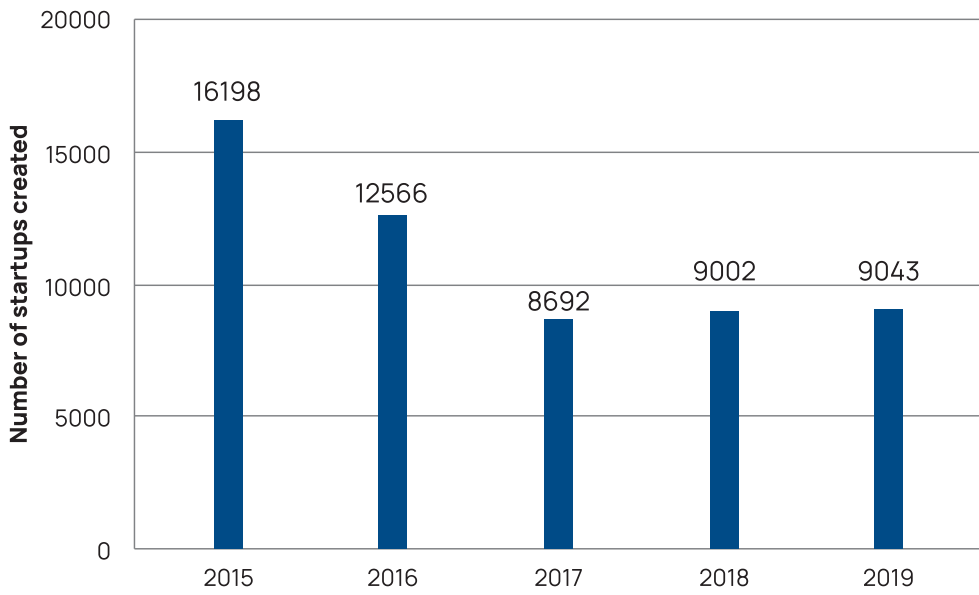
**Figure 1 Venture Capital Investment (USD million) in Select Countries**



Source: National Science Foundation (NSF), Science & Engineering Indicators 2020, Invention, Knowledge Transfer and Innovation - Global Venture Capital Investment, by financing stage, selected region, country or economy: 2008-18; Tracxn data for India for the years 2013 and 2018, data downloaded on 8 September 2020 from the platform

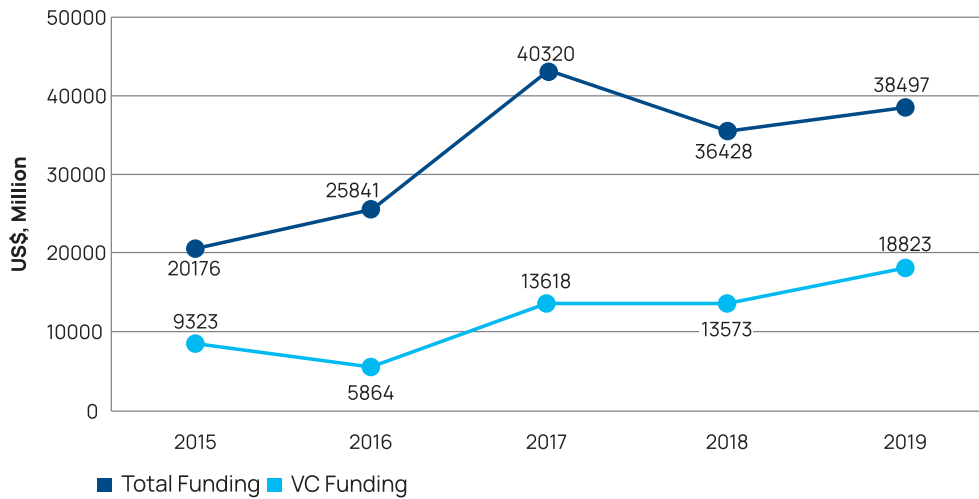
Between 2015 and 2019 (both years included), India created 55,501 startups (See Figure 2) and saw a venture capital funding and total funding (VC, PE, Private Equity, Angel and Debt) of USD 61.2 billion and USD 161.3 billion respectively. (See Figure 3) This amounts to an average total funding of about USD 2.9 million per startup. There is an assumption in this figure that all the funding went only to startups created during this period. However, if funding went to startups created earlier (which is highly likely) then the average total funding per startup drops even further. This is indicative of the fact that much of the funding is happening in the tech sector that is not manufacturing oriented as manufacturing requires much higher investments in plant and machinery (and related software). Maharashtra, Karnataka, and National Capital Region (Delhi, Noida and Gurugram) attracts most of the funds and also has the largest number of startups. But there are some interesting anomalies – Tamil Nadu, Gujarat, Rajasthan and Bihar see higher number of new companies registered with the Ministry of Corporate Affairs (compared to other States) but do not receive commensurate investments. Three possible hypotheses that may explain this phenomenon are as follows: one, some of these States are more manufacturing oriented in terms of their economy than others while funders (as mentioned above) are not looking to support new manufacturing ventures and innovations; two, the productivity of Indian manufacturing is not sufficient to support any programme of scaling of operations; and three, since manufacturing requires a broader ecosystem of government and private entities than services in terms of capabilities, it is that much more difficult to get equivalent returns via manufacturing than through a service enterprise in the short run.

Figure 2 Number of Startups Created in India (2015 - 2019)



Source: Tracxn, data downloaded on 8 September 2020 from the platform

Figure 3 Funding for New Startups (USD million) in India (2015 - 2019)



Source: Tracxn, data downloaded on 8 September 2020 from the platform

Data shows that over the last five years (2015-2019), the largest source of funding has been conventional debt (USD 56.7 billion) followed by IPO (USD 32.3 billion). Series A, B, C, and D funding have been around USD 6.7 billion, USD 9.6 billion, USD 9.2 billion, and USD 9 billion respectively. Interestingly, Angel investing has been around USD 0.8 billion. (See Table 1) This points towards an inherent weakness in funding manufacturing startups which not only require more funds to set up a production unit but also require higher risk capital than most service and tech ventures. Conventional debt is often conservative as well. Later stage funding, as mentioned above, are largely for scaling and rarely help in developing new products or processes by new ventures.

**Table 1 Total Funding for Startups (and New Companies) by Type of Financing**

Total Round Amount (US\$, Million)	2015	2016	2017	2018	2019
Angel	151	177	178	222	78
Conventional Debt	5535	11469	12494	14544	12677
Venture Debt	453	54	66	102	164
Mezzanine Debt	0	0	0	0	0
Other Debt	578	3130	0	0	0
Grant (prize money)	21	3	8	16	16
PE	1198	996	1187	1620	651
Post IPO	2907	4148	12769	6352	6088
Seed	400	399	408	425	544
Series A	1399	1321	1035	1316	1597
Series B	1402	1167	2014	2004	3001
Series C	1711	752	1472	2605	2618
Series D	1148	1026	1082	1816	3883
Series E	1187	771	313	2328	963
Series F	607	205	1810	877	3090
Series G	560	0	468	750	2394
Series H	150	219	17	1152	150
Series I	760	0	1100	267	104
Series J	0	4	3900	33	479
Unattributed	10	0	0	0	0

Source: Tracxn (Data downloaded on 8 September 2020 from the platform)

It is no surprise then that of all the new companies registered with MCA in 2018-19 (i.e., 1,47,545), only 12.6 percent were in manufacturing. States (and UTs) that are above this average percent are Dadra and Nagar Haveli, Gujarat, Meghalaya, Puducherry, Assam, Punjab, Madhya Pradesh, Chhattisgarh, Manipur, Rajasthan, Uttarakhand, Andhra Pradesh and Maharashtra. In terms of absolute number of new manufacturing companies, the top ten States (UT) were Maharashtra, Delhi, Gujarat, Uttar Pradesh, Karnataka, Tamil Nadu, Telangana, Haryana, West Bengal, and Rajasthan (the States that also attract the maximum investment). The three top areas that saw the largest number of new firms were Metals & Chemicals (and products thereof), Machinery & Equipment, and Food stuff. (See Table 2) Textiles was a distant fourth. At an average investment of less than USD 3 million per start-up across both tech and manufacturing sectors, it is not difficult to see why there is low growth in new ventures in manufacturing. Having said that, one encouraging trend is the increasing investment in Logistics and Road Transport Technologies – this is essential in completing the manufacturing ecosystem and ensuring that existing supply chains of manufacturing companies are operating efficiently.

**Table 2 New Companies Registered with Ministry of Corporate Affairs (MCA) in 2018-19 by Manufacturing Sectors**

<b>Manufacturing Sectors</b>	<b>Number of new companies</b>
<b>Metals &amp; Chemicals, and products thereof</b>	4645
<b>Food stuffs</b>	4225
<b>Machinery &amp; Equipments</b>	4168
<b>Textiles</b>	2097
<b>Paper &amp; Paper products, Publishing, printing and reproduction of recorded media</b>	1521
<b>Others</b>	1513
<b>Leather &amp; products thereof</b>	267
<b>Wood Products</b>	182
<b>Total Manufacturing Companies</b>	<b>18618</b>

Source: Ministry of Corporate Affairs (MCA), Government of India, Annual Reports (various years), <http://www.mca.gov.in/MinistryV2/incorporatedordclosedduringthethmonth.html>, Centre for Technology, Innovation and Economic Research (CTIER)

Mint reported in 2019 on a State Bank of India Research study which estimates that India's output per worker will rise to USD 6,414 by 2021 versus USD 16,698 in China. (Jethmalani, 2019) This has been a real challenge in India. Productivity is a function of managerial & technological capabilities, adoption of world class manufacturing practices like lean production systems, product & process innovation, and new technology. While large manufacturers have deployed many of the above, new and small enterprises appear to be in a perpetual bootstrapped mode – waiting to grow before investing in productivity enhancing methods. Two outcomes are common: either they remain in a low productivity state as it prevents them from growing, or when they grow they cannot shed their practices and mindset of the past and they rarely become high gross value add producers. Many of India's manufacturing sectors need massive upgrade in technology and processes. A government policy that incentivises process technology upgrade is essential for attracting orders for higher value add products as well as higher paying customers and consequently, investments. While some sectors like auto & auto-components, machine tools, and pharmaceuticals are ahead of the curve by adopting automation and connected systems, a large majority of Indian firms do not use sharp analytics on their shop floors to make decisions. It is not a surprise that RBI's estimates are that Indian manufacturing's capacity utilization across sectors is around 60-70 percent. (Dhawan and Sengupta, 2020) Indian firms also underinvest in training of their employees in advanced manufacturing and managerial practices. The point being made is simple: if a new venture or a small producer wants to get higher returns, they must have an innovative product, a very competitive and high quality design facility and shop floor (one that solves a variety of complex problems rather than one that tries to produce a simple product in large volumes), vendors who supply raw materials & parts competitively and reliably, highly skilled workforce with contemporary technological understanding, and strong managerial capabilities across the supply chain. Such a facility is attractive to investors and customers alike. New ventures must be job shops that deliver quality through superior engineering skills and process advantage. They are the quintessential problem solvers. There is little systematic effort by engineering associations and government to help firms build such capabilities. Most try to build extensive supply chains around a single or limited product range which is how large firms compete and not startups

or new ventures unless they have a very innovative product that is first of its kind with deep consumer potential (e.g., Electric Scooter). Chemicals, for example, a sector where Indian manufacturing is doing reasonably well, comprises of a large number of small firms that have never been able to scale. One has to look at their shop floors to understand why a young and innovative engineer would never like to work there as they don't see any technical or managerial growth at many such places. Technological capabilities fundamentally reside in people and machines. The latter is easily procured but the former needs to be nurtured. Indian startups and small firms don't invest in technological capabilities of their engineers. When compensation is not a competitive advantage of a firm, as is the case of startups and small firms, time and opportunity to take up challenging projects can be a big draw in retaining talented engineers and building deep capabilities in a firm. This approach is missing in Indian firms. Higher productivity is also linked with better organization of shop floors and the accompanying managerial capabilities. Once again, new enterprises rarely pay attention to the same at the start of the journey.

There are four key drivers of change that is taking place around the world – globalization is under stress, technology is challenging the way we do things and live, urbanization is forcing societies to think afresh how cities and services engage with each other, and the climate crisis is making the world think differently about how we consume, produce, and live. There are several implications and opportunities for manufacturing and especially for new ventures. These range from newer products and services, newer markets, changing preferences to new application areas of existing technologies, redefining of risks and uncertainty including phasing out of an entire industry to new compliance requirements, new channels, and new partnerships in a highly polarized world. Most important, it is clear that post-Covid the world of products and services will get re-written. In such volatile and complex times, resilience and agility become very crucial. Firms that can control effectively the exchange of resources and whose consumption of resources remain commensurate with knowledge that it generates and the output that it produces will survive. Interestingly, in the world of biology, as a cell's size increases, its volume increases much faster than its surface area, making it less efficient in the exchange of material and energy. Large firms are at a relative disadvantage at this juncture and in these environments. This is the time for new ventures and small firms as new opportunities for new products and processes emerge. However, it will also require the

emergence of a network firm – a collection of small firms that are part of the same product and process ecosystem. Network firms are nimble; they are experts in a process; each requires limited resources; each can build definitive capability and the network builds flexible capabilities and market channels. They need to be curated. This is where policy has failed Indian manufacturing. Indian policy makers are driven by a poor understanding of the dynamics of new manufacturing as well as by the prejudiced view of large manufacturers in the country and outside. They have failed to understand that it is in micro-ecosystems that new and small ventures incubate & survive before they go on to become medium and large firms within the country and outside. Traditional thinking on clusters, industrial estates that are terribly managed, subsidies that don't encourage building of technological capabilities, and bureaucratic & archaic laws surrounding manufacturing (and yes, they have yet to vanish) continue to plague creation of new ventures in manufacturing.

In conclusion, policies in India around creation and enabling of new ventures and their growth are out of kilter with the changing times and its needs. Unless it becomes extremely easy to setup and close down manufacturing ventures, to become part of a micro-ecosystems that enable growth of new ventures, to find enabling resources for upgrading of technologies and technical capabilities especially for new and small ventures, to deal with government bureaucracy, and to find local talent, it will be difficult to attract extensive venture funding and innovators to manufacturing in India.

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