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How Does the Institutional Context of an Emerging Economy Shape the Innovation Trajectory of Different Types of Firms? A Case Study of India

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Abstract

Institutional context impacts the innovation trajectory of an economy. Impact of institutional voids in an emerging economy on firm level innovation strategies, and output is a less researched topic. Using India as a case study, this paper presents a qualitative assessment of the impact of institutional context in the emerging economy on innovation strategies and consequent outputs of Indian private firms across various firm sizes, and ages. The paper finds that in India, most innovations are imitative in nature, and/or driven by customer requirements, and/or international quality norms. "New-to-the-world" innovations are scarce and are mostly driven by MNCs, government institutions, and to some extent large Indian firms. The paper concludes that in India, large firms are more innovative because of their resilience, and the internal systems and capabilities that can overcome voids, and exploit opportunities. In start-up firms and SMEs, the fast-paced transitions create unequal opportunities for innovation to different sizes and ages of firms.

Keywords: Innovation trajectory India • Institutional theory • Institutional context • Institutional voids • Innovation strategies • emerging economy • Innovation outputsTransformational leadership •Organizational performance and outcome

Introduction

Numerous studies show that institutional context characterized by a system of laws, and formal and informal mechanisms that define how a country's industry, economy, and society should operate, impacts innovation in an economy [1,2]. Casper's study posited that firms focus on innovation strategies that are supported by the dominant national institutional context. According to Lewin and Volberda environments or contexts with dominating technical and economic demands favor radical innovations, whereas contexts with dominating social demands foster incremental ones. Whitley identified five types of innovation strategies across six different economic organizations or business systems that evolved from variations in institutional contexts in market economy [3].

Emerging economies present a wide range of variations in their institutional contexts. For example, in emerging economies such as India, there are several institutional voids such as weak policy and governance frameworks, lack of technical support, interactions with formal science and technology organizations, absence of social and economic safety nets, and absence of formal credit mechanisms that come in the way of innovation. To overcome these voids, firms devise strategies for survival that are specific to their environment. These strategies also differ according firm characteristics, such as size and age. Research on the relationship of such institutional voids with the innovation inputs, outputs, and varying firm level coping strategies according to its characteristics are limited, specifically in the domain of emerging economies. Accordingly, this qualitative research study uses the case study of India to address this gap. The study at hand uses India as a case study as it is an important, rapidly emerging economy with varied degrees of complexities, voids, and unique opportunities in its institutional context. For example, India's rank was 66 out of 142 countries in 2013 in the Global Innovation Index (GII) ranking and score of innovativeness computed by World Intellectual Property Organization (WIPO) and INSEAD. In 2019, India ranked 52 out of 129 countries. A further look at the input sub-indices of the ranking and score showed an improvement in the human capital and research, infrastructure, market sophistication, and business sophistication input sub-indices while institutions input sub-index ranking and score remained the same over the same period [4]. The output sub-index knowledge and technology ranking and score also remained the same, while the output sub-index creative outputs saw a decline over 2013 to 2019. Such transitions provide an interesting assortment of challenges and prospects for innovation by private sector firms, which then pose certain questions. Are the institutional voids and opportunities different for larger firms as compared to smaller firms; younger firms as compared to older firms? Which of these firms are more innovative? What are the innovation vehicles for each of these firm categories? What innovation strategies do each of these firms adopt? What are innovation outputs and how do they differ?

The study at hand uses both primary and secondary data from India to identify the institutional voids and opportunities, and to recognize different innovation strategies used by private sector firms distinguished by size and age. Based on these observations, the study gives a qualitative assessment of the innovation trajectory of Indian private industry. Such an assessment is unique since the study maps voids and opportunities in each pillar of the institutional context to the innovation strategies and outputs of Indian firms across different sizes and ages. This study is distinctive because of its comprehensive nature, and coverage [5].

The rest of the paper is organized as follows. Section two presents a literature review of the three pillars of institutional context, their linkages with firm level innovation outputs, and strategies to arrive at the research gap. The next section offers hypothesis. Section four outlines the model and methodology for the study. Section five offers the results. The following section discusses the results and presents an assessment of the innovation trajectory of Indian private industry. Section seven provides suggestions for future research [6].

Literature Review

Institutional context 3 pillars

Voeten summarized the definition of institutions as ""rules of the game in a society", the existence of "formal laws defining a playing field, facilitating

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the activities of certain players while constraining the efforts of others" and "prevalent methods of doing things in contexts" [7].

Other authors categorize institutions into formal and informal. Scott [8] identified three pillars of institutional context viz. regulatory, normative, and cognitive. Laws, regulation and government policies, and the resultant investment in innovation inputs represent the regulatory pillar. Culture provides cues that shape the behavior and education in a society. It constitutes the normative pillar. The cognitive pillar comprises education, knowledge and skills in a country [9]. In this study we use Scott's frame to analyze the institutional context of India.

Institutional voids, opportunities, and firm level innovation strategies, and outputs

Studies that evaluate the impact of institutions on firm level innovation output or performance, conceptualize institutional context as a single variable constructed from multiple factors; or look at the impact of one single aspect of institutional context such as public R&D subsidies, or government support on firm level innovation performance; or use a multi-dimensional construct to explore the distinct dimensions in institutional environments. For example, the maturity of market environment in host country has been differentiated from Intellectual Property Rights (IPR) protection. Almost all these studies concentrate solely on regulatory pillar either as a single construct or multi-dimensional construct [10].

In these studies, firm level innovation output or performance is measured using several variables such as IPRs product novelty, process novelty, type of innovation - incremental or radical, number of innovation over the previous year etc.

As far as firm level innovation strategies are concerned, measures such as R&D intensity (ratio R&D expenditure to sales), R&D personnel, presence of a dedicated R&D department, new management practices, organization culture, collaboration with other firms, academia and/or scientific institutions are commonly used [11].

Research focused on emerging economy that use multiple constructs to represent impact of institutional context on firm level innovation output or performance, and firm level innovation strategy, either concentrate on a particular category of firms such as multinational enterprises from emerging markets or group affiliated firms (GAFs) vs stand-alone firms (SAFs) etc.; or study one single construct of institutional context such as IPR [12].

Studies that assess impact of institutions of emerging economies on innovation outputs of the economy as a whole focus mainly on the regulatory pillar and to some extent cognitive pillar of institutions for assessing institutional voids, and opportunities. They use output measures that are indicative of innovation capability of an economy such as research and development (R&D) expenditure, FDI flows, quantity and quality of research publications, and the number and quality of patents issued. Such studies also fail to capture the impact of these country level innovation outputs on innovation performance at firm-level [13].

In addition to the above, it has been observed that in emerging economies that are rapidly transitioning, the normative pillar plays a vital role in areas where regulative and cognitive pillars have voids. Additionally, different types of firms adapt differently in such economies. For example, comparative study of firms in Latin American countries revealed that GAFs are more resilient to rapid transitions as compared to SAFs, and hence are more innovative. Hence, impact of institutional context on the innovation trajectory of private industry is incomplete without a comprehensive exploration of effect of the opportunities and voids resulting from each of the pillars of the institutional context on innovation strategies and outputs of firms differentiated by characteristics such as size and age.

Hypotheses

Voids and opportunities in the regulatory pillar in India and their implications for innovation in large and small Indian firms

The intellectual property laws, tax incentives, governance mechanisms and programs/initiatives including investment in public R&D determine the quality of the regulatory pillar of institutional environment for innovation for a country. Appendix 1 summarizes the prospects and problems in the policies and programs in the regulatory environment that promote and hinder innovation, respectively, in India. New IP laws though thorough, face bottlenecks in enforcement. Awareness of IP law and practices is also limited. Tax incentives for R&D are only partially effective in a few sectors due to lack of accountability for outcomes and high transaction costs in deriving benefits. There are gaps in governance such as weak and delayed enforcement of laws, excessive regulation, political instability, and security concerns. On the positive side, Indian government introduced several programs and incentives (Appendix 2) to promote startups and Foreign Direct Investments (FDI) [14].

In emerging markets, according to the institutional void thesis, large business groups, make up for the lack of well-functioning institutions, tend to perform better and be more innovative in countries with weaker and less efficient institutional set ups. Further, when confronted with a process of institutional transition and marketdevelopment, these large firms being resilient organizations, will respond by becoming more efficient and more innovative over time according to the organization resilience thesis.

Similarly, India has the characteristics of oligopolistic capitalism where the benefits of economic growth are disproportionately appropriated the wealthiest and have failed to trickle down to the poor [15]. About 10 families control more than 80% of the stock in the country's largest corporations [16]. According to the Asian Development Bank, large Indian companies have won most of the lucrative government contracts, hold power over the country's natural resources and have "privileged access to land". They also effectively build internal systems to fill the gaps in the institutional infrastructure. On the other hand, there are around 42.50 million, registered & unregistered small and medium enterprises (SMEs) amounting to 95% of the total industrial units in the country. SMEs employ 40% of India's workforce and contribute to 45% of manufacturing output, but only 6.11% of manufacturing GDP[1]. Theoretical arguments as well as secondary data indicate large firms are better positioned to take advantage of the transitions in the regulatory pillar of Indian institutional context. Therefore, it is expected that:

H1a: Large Indian firms are more innovative as compared to small and medium enterprises (SME), and start-up firms, in response to the voids and opportunities in the regulatory pillar of institutional context due to access to more resources.

Public R&D spending, subsidies, and incentives is an important input of the regulatory pillar of any economy impacting firm level innovation. Research indicates a positive effect of public R&D financing on private R&D expenditure. However, the impact of such financing on size of firms is conflicting. In Finland, public R&D funding increases private funding in larger firms than in smaller firms, while the smaller firms benefitted more than larger firms in Israel and Spain. Iris, Thomas, & Fischer in their study of Austiran transport sector, evidenced that small, young and technologically specialized firms are more likely realize behavioral additionalities such as private investment in newer, bigger, and collaborative projects. Research also indicates that public R&D financing stimulates private R&D spending in certain sectors more than others depending on the country [17].

In emerging economies such as China, Ruifa found that private R&D investment in Chinese agricultural sector would grow more rapidly if the government shifted public resources from technology development to basic R&D.

In India, while the ratio of R&D expenditure to GDP has been declining from 2008-09 (NSTMIS, 20172), India's share of global R&D increased substantially from 1.8% in 1996 to 2.9% in 2017. R&D continues to be mainly driven by government sector in India, even more by central government. Accordingly, based on the literature reviewed, the study posits that,

H1b: Public R&D financing stimulates private R&D financing in India

H1c: The positive effect of public R&D financing on private R&D financing differs according to firm size, age, and industry sector in India.

Studies support the view that public R&D support helps to create cooperation's with new or diversified partners in the public and private sector. Such collaborations and joint R&D activities are continued even if the project has expired. They proved that additionality effects of collaboration are highest in SME and start-ups, specifically technology start-ups. They also demonstrated that firms with less experience in a specific research field benefitted more from such collaborations. Accordingly, the study hypothesizes,

H1d: Younger and smaller firms benefit most from collaborative R&D between public sector and private firms and/or amongst private firms.

Foreign Direct Investment (FDI) inflows bring new product, new technology and advanced management experience into the recipient countries. They create competition for domestic companies and force these companies to innovate to survive the competition. There is knowledge spillover, and development of ancillary and service companies to cater to the foreign companies, thereby fostering innovation in the recipient countries. FDI inflows (Figure 1) rose consistently in India thanks to the liberalized FDI policy and the Make in India (MII) campaign. During 2015 India had surpassed China in capital investment.

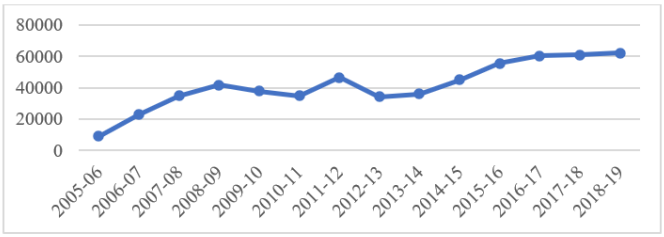

Figure 1. FDI flows in India.

Source: Fact sheet on FDI, Department of Promotion of Industry and Internal Trade

Therefore, the author hypothesizes that,

H1e: FDI inflows foster innovation in Indian private firms.

Voids and opportunities in the normative pillar in India and their implications for innovation in large and small Indian firms

Culture serves as the normative pillar as it provides cues that shape behavior and education in a society. Pro-innovative and entrepreneurial culture is characterized by high individualism combined with low power distance and weak ambiguity avoidance. The barriers to innovation in Indian culture range from high power distance exhibiting itself in a strong need for control, individualism demonstrated by poor teamwork, high uncertainty avoidance leading to weak strategic outlook, achievement culture driven more by philosophical and intellectual pursuits rather than an action-orientation and physical activity, and moderate levels of masculinity affecting degree of experimentation [18].

Since 95% of Indian organizations are family-owned, their ability to innovate and adapt to new technologies is also a major challenge by virtue of their ownership structure and management style. In recent years however, entrepreneurship is being perceived by the young generation as a worthwhile pursuit[3] and India is witnessing increasing levels of entrepreneurship. Hence, older firms that are typically family-owned could be less innovative as compared to new-age startups [19].

H2: Newer start-ups are more innovative as compared to older firms in India because the traditional Indian cultural context did not support innovation in firms while the evolving cultural context does.

Voids and opportunities in the cognitive pillar in India and their implications for innovation in large and small Indian firms

Cognitive pillar comprises knowledge and skills in a society represented by the demographic constitution. Innovation is impacted by demographics such as population size, age and gender, education, and the level of immigration. In small populations, complex technology will tend to be lost because of random loss or incomplete transmission (the Tasmanian effect). Large populations have more inventors and innovators and are more resistant to loss by chance. Research has found that people aged 50 and over prefer to use their innovation skills significantly less than those between ages 20 to 29 and 40 to 49. People with high levels of education, have a higher likelihood of being innovative due to their advanced education and training. Immigration helps in cross-pollination of ideas and promotes creative entrepreneurship [20].

India will have the advantage of large human capital, as its working age population will increase in the next 20 years (Figure 2). However, this GDP projection may not be attainable if the skill sets of this young population is not improved.

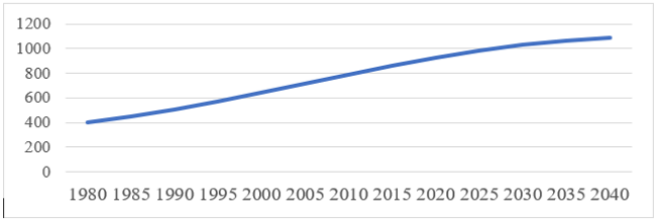

Figure 2. Changes in India's Working Age Population (15-64) in Millions.

Source: (United Nations; Department of Economic and Social Affairs; Population Divisiton, 2019)

According to the 2011 Census, 37% of Indians 25 years or older were illiterate and 89.7 % of them had higher secondary or lower level of education and only 9.1 % had an undergraduate degree or above qualification. In addition to the low levels of education, the Indian primary and secondary education system places emphasis on the rote memorization-based approach and grades. In the higher education system, there is a huge quality variation with very few good institutions at the higher end of spectrum. This has led to many students going abroad for higher education that resulted in brain drain for a long period of time. These highly skilled immigrants who were once considered a "brain drain" have, now turned into an advantage for India as the cross-pollination of ideas and cultures has become an important source of intellectual, entrepreneurial, and capital investments in India. Indian innovation is now being driven to a significant extent by these transnational's, Non-Resident Indians (NRIs)s. The influx of knowledge networks and capital through Indian diasporas though encouraging, is not enough to fill the skill gap. Indian demographic dividend can only be an advantage if the education system is adequate to provide the necessary skill sets.

H3: Lack of adequate skills is a void in the Indian normative institutional context for innovation in Indian firms, across large, SME and start-up firms, despite a massive demographic dividend in the country [21].

Model and methodology

The following table outlines the measures used across each of the large, SME and startup firm categories in India, to test the hypotheses identified in the previous section. These measures have been identified from the literature review in section two.

The author used case study of Indian private industry to aide her research, as she could explore in detail, the patterns and relationships that emerged out of such a study, instead of relying solely on general knowledge of a problem domain, or making associations along generalized relationships between problem descriptors and conclusions. The study at hand used multiple sources of information to conduct a detailed, descriptive, and qualitative inquiry and analysis (Table 1).

The study involved primary data collection by way of surveys, in-depth interviews, and secondary data sources including government reports, the World Bank and the United Nations reports, research articles and the

Table 1. Hypotheses and measures.

Hypotheses	Measures
H1a: Large Indian firms are more innovative as compared to small firms in response to the voids and opportunities in the regulatory pillar of institutional context.	1.. Perception about the quality of regulatory context, and access to resources 2. Patents 3.Types and sources of innovations
H1b: Public R&D financing stimulates private R&D financing in India. H1c: The positive effect of public R&D financing on private R&D financing differs according to firm size, age, and industry sector in India. H1d: Younger and smaller firms benefit most from collaborative R&D between public and private sector and/or amongst firms.	3. Private and public R&D 4. Collaborative R&D
H1e: FDI inflows foster innovation in Indian private firms.	6. FDI
H2: Newer start-ups are more innovative as compared to older firms in India because the traditional Indian cultural context did not support innovation in firms, while the evolving cultural context does.	8. Mindset
H3: Lack of adequate skills is a void in the Indian normative institutional context for innovation in Indian firms, both large and	9. Quality and quantity of talent, and strategies for skills training

following three major exhaustive surveys:

Indian National Innovation Survey of 9001 largely Micro Small and Medium Enterprises (MSMEs)(CSIR-NISTADS;, 2014);

GE Global Innovation Barometer – India report based on interviews of 150 Innovation Business Executives from large companies (Edelman Intelligence, 2018);

Research project involving in-depth case studies of five SME firms in India by Tilburg University and Radboud University in the Netherlands.

Primary data was collected by surveys through survey monkey website from 40 innovation professionals (14 from large firms, 13 from SME, 13 from micro firms) from India. The survey was validated and corrected for ambiguities by testing on a small sample before conducting the actual survey. It had both multiple choice and open-ended questions. The author followed up the survey up with in-depth interviews with eight of the respondents (list provided in Appendix-3) carefully picked based on the survey results [22].

Results

Perception about the quality of regulatory context, and access to resources

While large firms are optimistic about the government policies, SME firms are finding it difficult to innovate. Knowledge acquisition and transfer are far more challenging for SMEs than larger firms. Access to finance for SMEs in general, and for innovation, is a limiting factor in India. The primary survey and interview results corroborated the above views. For example, large established Indian pharmaceutical companies find it easier to produce in India than in the US, as the FDA regulations are more stringent as compared to its counterparts in India. Oversight and enforcement are weaker, and hence are more conducive for larger companies. The new China substitution policy encourages indigenous manufacturing. However, large and SME firms find the pre-requisites cumbersome. According to the respondents, SMEs in general, grapple with limited formal credit, no fall back mechanism for failure, and limited resources for innovation. They rely on network of family and friends for funding and resources [23].

However, several government programs and incentives (Appendix 1) have resulted in a massive boom in startups, albeit in few sectors such as eCommerce, aggregators, fintech, edutech and healthtech[4]. According to the start-up founders that were interviewed, there are many incubation centers, accelerators, and co-working spaces across the length and breadth of country, encouraging student start-ups, and entrepreneurs with start-up ideas. Universities, and government institutions support such start-up with technological, mentorship, funding support, and buyer-seller meet facilitation [24]. Over the last five to seven years, there has also been an influx of venture capital, and angel investment, including global investors such as Alibaba, Softbank, Sequoia, and Foxconn, backing new start-ups. However, when it comes to scaling up, from start-up stage to SME level, there are several bottlenecks. The average size of first round startup-funding is about $250,000 as compared to $1 million in the US. This amount is barely sufficient to meet all expenses. Therefore, due to lack of adequate opportunity to scale-up, and realize economies of scale, many of these start-ups fail. For example, according to Kathak Mehta, co-founder of Gentle washer, the initial rounds of angel funding that her venture received came in spurts, only sufficient to take care of the crisis at hand. In retrospect, she thinks, if the initial rounds of funding had been sizeable, they would have been able to produce in larger scale, and reduce the per unit cost, thereby the price of the product. Eventually, they had to discontinue their venture because they did not have sufficient revenues to justify next round of funding [25].

Patents

The introduction of stronger IPR laws in India has given rise to an increase in the number of patent applications in India. It has also led to increasing trend of MNCs entering India through various routes such as FDI, contract research and manufacturing, outsourced manufacturing, joint ventures, setting up of green field ventures, etc. There is also an increase patenting in India by foreign R&D centers in India [26]. The total number of patents granted during 2017-18 was 13,045 out of which only 1,937 (15%) were granted to Indian applicants. Number of Patents in force as of 2018 was 502,864, out of which only 8,830 (16%) patents belonged to Indians, major part of which belonged to large companies and government organizations (Office of the controller general of patents, 2017-18) [27].

Large and innovative companies have benefitted from the new IPR laws. However, small, and medium size companies, especially in the pharmaceutical industry are facing difficulties[5].According to the respondents, lack of awareness, absence of tangible returns out of IP, and high legal costs are major disincentives in the IPR process [28].

Out of the total granted patents in India, the top four categories were Chemicals (25.44%), Mechanical (19.27%), Computer and Electronics (10.28%), and communications (10.31%) totaling 65.30% of the patents granted in 2017-18 (Office of the controller general of patents, 2017-18) [29].

Types and sources of innovation

Innovations through structured R&D, technology licensing or employing skilled manpower such as engineers and scientists is more prevalent in larger firms. Around 35% of the large firms introduce break-through technologies through in-house research. 70% of the respondents from large firms confirmed that their firms had an in-house R&D facility. However, most of them said R&D as an activity was only moderately significant in their firms, and only 38% of the large firm respondents said that their firms had patents. Most of the innovations were imitations of products and services in the western countries, or driven by customer requirements, or compliances to international standards such as ISO or European or American standards [30].

Amongst the larger firms, there is excitement about smart cities, digitization, and 3D printing technology, as per the primary data. Digitization has helped large firms to measure ROI on innovations and get further funding. Regulations around privacy and data are, however, preventing businesses from adopting more radical/ transformative innovations [31].

On the other hand, SMEs are minimizing risks. According to primary data, SMEs grapple with survival and operational issues, leaving little scope for innovation. Only 35% of the 9001 largely MSME firms surveyed by the Indian National Innovation Survey were innovative, and most of these innovations are 'new to firm' and not "new to the world". These new-to-firm innovations were either acquisition of a new machine or non-R&D type innovation such as marketing or organizational innovation or incremental Informal exchange of knowledge through network of friends domestic and sometimes from Indian diaspora are common. According to the interviews and survey, most of these innovations are driven by customer requirements, or are mere imitations of

existing products and services. Start-ups, in contrast, are more patent and R&D oriented, striving to bring if not new-to-the-world innovations, at least innovations that are new to India [32].

Hence, the hypothesis that large Indian firms are more innovative as compared to small firms in response to the voids and opportunities in the regulatory pillar of institutional context is accepted. However, start-ups are also fueling innovations in India.

Public and private R&D

While the total R&D expenditure is inadequate, public investments have been constrained by the demands from other public service demands and private investment is not as forthcoming as these involve long gestation periods and uncertain returns. The increase in business/private R&D is not substantial. In fact, India's GII ranking in the 'R&D performed by Business' category has gone down from 42 in 2013 to 49 in 2019. According to a study by Forbes, there are only 26 Indian companies in the list of the top 2,500 global R&D spenders with no firms in five of the top ten R&D sectors. As mentioned in the previous section, the respondents confirmed that R&D as an activity was considered only moderately significant in large firms. Many of the SME firms did not have a dedicated R&D department, according to the survey and interviews [33].

Besides, R&D is concentrated in just three sectors: pharmaceuticals, automobiles, and software. In fact, most of the R&D is on servicification of R&D with growth of Information and Communication Technologies (ICT) sector. The same trend continues in FDI in R&D. ICT, natural sciences and engineering, pharmaceuticals and clinical research are the most prominent sectors that attract highest FDI in R&D [34].

Collaborative R&D

Almost all interviewees agreed that education and R & D systems work in silos and often do not align with industry needs. In house research in industry is straight jacketed and has limited collaborative efforts with the education and government institutions. Wherever there was collaboration, they were limited to use of testing facilities, or use of labs. The respondents cited three reasons for this. First, the academia does not have a commercial mindset. Secondly, the technology transfer process is not streamlined; information regarding technologies available for patenting is not readily accessible on the institutions' websites. Of late, the public R&D institutions are under pressure to be self-sustainable. Therefore, the process of making available information regarding patents and technologies on their respective websites is underway. Thirdly, in cases where there is collaboration, universities and public R&D institutions are more inclined towards collaborating with larger firms than SMEs. SMEs' collaboration is customer driven and therefore is collaborative with clients [35].

Many start-ups, however, are housed in universities, incubation centers, and scientific institutions. They get technological and R&D support from such institutions.

Therefore, the hypothesis public R&D financing stimulates private R&D financing in India is rejected.

The hypothesis that positive effect of public R&D financing on private R&D financing differs according to firm size, age, and industry sector in India is accepted. Larger firms, and start-ups rather than SMEs witness more collaboration with academia and public R&D institutions. Many of the collaborations are for product testing, and sector specific. SMEs collaborate with their clients for innovation [36].

FDI

Indian FDI policy has largely aimed at attracting investment without harnessing the benefits of retaining investment and accessing technology to the extent possible. FDI policy requires a review to ensure that it facilitates greater technology transfer, leverages strategic linkages and innovation.

Multinationals, government and public authorities are perceived as drivers of innovation among Indian business executives. However, despite a consistent increase in FDI in R&D ($1047.1 M in 2005 to $ 14,063.5 B in 2015), and leadership in R&D of 'Design, Development and Testing' in terms of the number of companies investing, the number of projects created, and the jobs made possible between 2003 to 2018, the investment so far is more focused on meeting market demands of the parent companies of the MNCs located outside than the local Indian market. Spillover effects to the local firms and R&D with the intent to augment the knowledge of local economy are limited. The linkages with domestic companies are limited only to the IT sector and only to a certain extent. In other sectors these linkages are missing. In fact, some of the respondents mentioned that MNCs that manufacture and sell in India, produce products that are obsolete in western markets, but are new to Indian market. The Indian firms that are interested in collaborating with MNCs, find them to less cost competitive.

FDI inflows are again focused in few sectors such as services sector (that includes financial sector, outsourcing, R&D, technical analysis and testing etc.), IT, automobile, drugs and pharmaceuticals, and chemicals (Fact sheet on FDI, Department of Promotion of Industry and Internal Trade). India has been a preferred recipient of outsourcing contracts which is reflected by a consistently high level of FDI inflow in services sector.

Hence, the hypothesis FDI inflows foster innovation in Indian private firms is rejected.

Mindset

According to the respondents, culturally, Indians are not inclined towards early adoption of new and innovative products. They prefer tried and tested products and solutions. They also felt that in larger firms because of bureaucracy, hierarchy, paternalistic culture, and less proclivity to delegate, there is lack of freedom to innovate. Amongst SME firms, survival is the focus, rather than growth or innovation. The newer generation, however, is more optimistic, innovation oriented, and open to new entrepreneurial options. Most of the respondents from start-ups and younger generation emphatically stated that as regards to innovation, Indian culture, mindset, and government policies have seen a massive improvement in the last five to seven years.

Consequently, the hypothesis that newer start-ups are more innovative as compared to older firms in India because the traditional Indian cultural context did not support innovation in firms, while the evolving cultural context does, is accepted.

Quality and quantity of talent, and strategies for skills training

Based on the primary survey and interviews, it was found that there is a lot of talent available; however, they are not readily employable. Therefore, lack of talent/inadequate skills is a key challenge for all Indian firms irrespective of size, not to mention the impact of such inadequacy on innovation capability. One of the main reasons for this, according to most respondents was that the Indian school curriculum does not prepare students to innovate and dissuades them from thinking out-of-the box.

To fill the skills gap, larger firms send their employees for training in institutions abroad or with collaborators to fill the gap in their skill sets. In some companies, according to the respondents, there is a rigorous two-year induction program to fill the gap.

In a typical Indian MSME firm, the average share of scientists and engineers is a meagre 7%. The primary data revealed that SMEs acquire skills either through "learning by doing" or in-house training. Training in institutions abroad or with collaborators are rare initiatives for SMEs.

As a result, the hypothesis lack of adequate skills is a void in the Indian normative institutional context for innovation in Indian firms, both large and small, despite the massive demographic dividend, is accepted.

Discussion and Key Insights

Emerging economies like India that are constantly striving to transition

to the next level of development, present interesting set of institutional contexts for innovation. The regulatory, normative, and cognitive pillars of institutional contexts are evolving and hence present a mix of opportunities and challenging bottlenecks. The study at hand has answered the questions raised in the first section such as, are the institutional voids and opportunities different for larger firms as compared to smaller firms; younger firms as compared to older firms? Which of these firms are more innovative? What are the innovation sources for each of these firm categories? What innovation strategies do each of these firms adopt? What are innovation outputs and how do they differ?

The regulatory pillar of institutional environment shows many initiatives and reforms that have provided the impetus to the birth of successful startups and inflow of FDI amongst other positive outcomes for innovation. However, there are concerns relating to implementation of the reforms such as bureaucratic delays, major infrastructure bottlenecks, and weak governance that impede the process of innovation. An examination of normative pillar reveals that culturally, India is less innovative. Nevertheless, the new wave of entrepreneurship is changing the course now. The cognitive pillar shows promise in terms of an enormous demographic dividend with highest percentage of working age population in the world. A thriving diaspora that contributes capital, knowledge and innovation is a massive plus. However, a vast skill gap owing to an insufficient education system is a major concern for all types of Indian firms – large and small.

The institutional context presents more barriers for SMEs than large firms, and start-up firms. As a result, start-up firms, and large firms are more innovative as compared to SMEs. Most of the Indian innovations are imitative, client driven, or are compliances to international quality norms. MNCs, government institutions, and large Indian firms to some extent, are the drivers of innovation in India. There are limited innovation spillovers from MNCS. Most of these innovations are limited to a few sectors. The larger firms though are more optimistic about the digital transformation and innovation landscape, still face obstacles in accessing data.

Incubation centers, accelerators, co-working spaces, university, and government institutions support start-up innovations. Small sized venture capital, and angel investor funds are also available for these firms. Larger firms have in-house R&D centers, collaborative arrangements with public R&D systems to drive their innovations. They have the economies of scale and scope to build internal systems to develop high-value innovations. Since SME firms, do not have access to such resources, they use informal networks and resources as substitutes. All Indian firms address gaps in skill sets through training.

SMEs are focused on new-to-the-firm, new equipment, and customer-driven innovations. Most of the patents granted belong to large firms, MNCs, and government institutions. Collaborative research with academia/public research institutions is scarce in India.

Overall, the start-up eco-system for innovations have been strengthened over the last five to seven years. If the eco-system for innovation in SMEs is also bolstered, Indian private industry will continue the innovation trajectory set by the start-ups. Support in the form of access to capital, skill development, stronger regulatory support, and improvement in educational system starting at school level, are some of the measures government should implement for the SMEs. Indian firms on their part should create a culture that gives freedom to innovate. Table 2 sums up the assessment of the innovation trajectory of start-up firms, SMEs, and large firms in India.

Therefore, the conclusion that in a rapidly transitioning institutional context of an emerging economy like India, large firms are more innovative because of their resilience and the internal systems and capabilities that can overcome voids and exploit opportunities. As far as start-up firms and SMEs are concerned, the fast-paced transitions create unequal opportunities to different sizes and ages of firms. In the case of India, as mentioned earlier, the opportunities favor start-ups. Hence, the author posits that in emerging economies, the changes in institutional context provide unequal opportunities and problems for innovation for various groups of firms differentiated by characteristics such as size and age. Each group characterized by its size and age has a distinct coping strategy to overcome barriers and exploiting the opportunities. This study makes an important contribution to literature since such a comprehensive investigation of impact of every pillar of institutional context on innovation trajectory across various firm sizes and ages in an emerging economy is unique (Table 2).

Table 2. Assessment of the innovation trajectory of start-up firms, SMEs, and large firms in India.

Small/Large firms	Drivers by type of institutional pillar	Opportunities	Barriers	Coping strategies and mechanisms
Small firms	Government support (Regulatory)	Startup India initiative has led to many new startups, albeit in few sectors, and not in high technology sectors.	Governance hurdles due to weak enforcement of laws and lack of fallback mechanism in case of failure.	Reliance on informal network of family, friends, and businesses in personal sphere, for support.
	Innovation funding (Regulatory)	New venture capital funds, many government grants, loans and incentives for start-ups.	The size of initial rounds of start-up funding is small. Funding for scaling up of innovations is scarce. Lack of access to formal funding sources.	Informal credit made available by personal and family contacts
	Knowledge generation and innovation (Regulatory)	Newer start-up firms have more access to technology support from, and collaboration with, academia/research institutions.	Lack of access to knowledge generation exacerbated by lack of collaboration between industry-academia/research institutions. Weak IPR orientation amongst SMEs in general due to lack of awareness, absence of tangible returns, high legal costs associated with IPR.	Informal exchange of knowledge through network of friends domestic and sometimes from Indian diaspora. Driven by customer requirements, and international quality norms. 'New to firm' and not "new to the world" innovations are initiated by the entrepreneurs
				themselves to survive. Imitation is common.
	Growth mindset (Normative)	Newer generation is more entrepreneurial and innovation oriented. They have better risk appetite.	Lack of early adapters as customers.	Survival more than growth is the focus for most SMEs.
	Skill sets (Cognitive)	Huge demographic dividend	Gap in skill sets required for innovation.	Skills acquired from "learning by doing" or in-house training
Large firms	Government support (Regulatory)	Many government incentives and programs for innovation are beneficial. Lax monitoring of regulations in some sectors is sometimes beneficial	Governance hurdles due to weak enforcement of laws.	Scale and scope related advantages facilitate compensatory internal systems.
	Knowledge generation and Innovation (Regulatory)	Patenting, and introduction of break-through technologies in few sectors.	Lack of collaboration between industry-academia/research institutions. Slow adaptation of modern technologies. Regulations around privacy and data prevent large firms from adopting more radical/ transformative innovations.	Structured R&D, technology licensing, or employing skilled manpower such as engineers and scientists. Imitation is common.
	Innovation funding (Regulatory)	Access to formal sources of funding available.		
	Innovation culture (Normative)		The management style of family-owned or controlled large firms constrain the ability of these firms to innovate and adapt to new technologies.	Compensatory, size endowed "privileged access to land".
	Skill sets (Cognitive)		Gap in skill sets required for innovation.	Employees get trained in institutions abroad or with collaborators to fill the gap in their skill sets

Suggestions for Future Research

This study has presented a qualitative assessment of the innovation trajectory

of Indian private industry. Such an assessment is unique since the study maps voids and opportunities in each pillar of the institutional context to the innovation strategies and outputs of Indian firms across different sizes and ages, to reveal important insights. The study suffers from the drawback of a qualitative analysis that does not allow generalizations to be drawn to other emerging economies. However, a comparative study of similar economies using the above framework is required to validate, modify, or invalidate the assessment and provide a generalized theory. Further, a longitudinal, quantitative, and rigorous analysis of data using different methodologies can provide more interesting insights into this growing field of study.

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