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IMPROVING INDIA'S INNOVATION SYSTEM THROUGH REFORMATION OF THE TECHNOLOGY-BASED START-UP SECTOR

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Introduction

It is a growing trend for youth in India to obtain two or three degrees yet remain unsuccessful at finding a job. The unemployment rate among college graduates under 25 is 40% (Sarkar, 2023). Higher education no longer provides the guarantee of a job in India like it used to. This is leading to what the World Economic Forum has called "widespread youth disillusionment", a source of economic instability for the country (Kumar, 2022). It is also a significant waste of talent and investment into the country's education systems and creates a pathway for brain-drain. This paper focuses on the technology-based startup sector for its proven potential for job creation, particularly among the educated workforce, employing roughly 4.2 million in 2021 (Kumar and Singh, 2023).

In the last decade, India has rapidly become the third-largest startup hub in the world after the US and China, according to number of startups. India is home to over 92,000 startups collectively valued at $350 billion. The country has over 100 unicorns and more than 100 "soonicorns" (companies approaching the $1 billion valuation mark) (Mittal, 2023). Apart from increasing the number of jobs, startups have played a key role in generating employment opportunities in Tier II and Tier III cities, highlighting their potential to generate employment for educated workers across India and not just in major cities (Kumar and Singh, 2023). This paper outlines current government policies supporting startups in India, identifies policy gaps and weaknesses preventing startups from scaling and generating more employment - namely a lack of funding – and proposes two policy recommendations to reform current funding mechanisms. The risks

and challenges of the proposed solution are discussed along with a comparison to the status quo and alternative solutions.

Current Policies: Startup India Initiative (SII)

The Government of India (GOI) defines a startup as an enterprise that has been incorporated/registered for no more than 10 years and has a turnover of no more than INR 100 crore, among other conditions (Singh, 2020). In 2016, the GOI launched the Startup India Initiative (SII) with a slew of measures to increase the ease of doing business and provide potential entrepreneurs with a launch pad and support system within the startup ecosystem (Singh, 2020, p. 4). This involved streamlining the intricate legal compliance regime for startups by introducing a self-certification mechanism, making it easier to start a business. An online Startup India Hub and Portal was created, bringing together the various stakeholders of the startup ecosystem - startups, investors, mentors, accelerators, incubators and government bodies - onto one platform, and providing startups with crucial networking and mentorship support.

The SII also created a panel of 400 facilitators within the Controller General of Patents, Designs, and Trademarks, the patent agency of India, to help startups obtain intellectual property rights at rebated rates and fast track their applications. Criteria for public procurement such as “prior experience” and “prior turnover” were eased for startups, allowing them to better compete with existing players for government contracts. A new insolvency law was enacted, the Insolvency and Bankruptcy Code 2016, which fast-tracks the mechanism for insolvency resolution of startups from the previous 270 days to 135 days. This allows for a faster exit for startups, helping to curb fear of failure

and lock-in of capital during exit. The SII tries to strengthen Industry-Academic partnerships through Startup Fests (where entrepreneurs showcase their innovation and collaborate), Research Parks (innovation centers at National Institutes) and innovation-focused student programs. The Atal Innovation Mission (AIM) seeks to create incubation centers that nurture startups to become scalable and sustainable in specific sectors like manufacturing, energy, agriculture, education, health, water and sanitation, and transportation (Singh, 2020, p. 8).

Finally, SII seeks to provide funding support to spawn more startups so that a higher number can become highly scalable businesses. This includes tax exemptions for startup capital gains and angel investors and a three-year tax holiday for new startups. A Credit Guarantee Scheme for Startups (CGSS) was also established with a corpus of INR 2000 crores, of which each SII recognized startup can get up to INR 500 lakhs through member lending institutions, enabling startups to raise business loans without incurring collateral. Finally, SII has created a Funds of Funds for Startups (FFS) managed by the Small Industries Development Bank of India (SIDBI) with a total corpus of INR 10,000 crores. Using the FFS, SIDBI supports different alternative investment funds (AIFs) registered with the Securities and Exchange Board of India (SEBI). As part of their agreement with SIDBI, AIFs extend funding support by contributing twice the SIDBI contribution (Singh, 2020). As of December 2020, SIDBI has committed INR 4326.95 crores to 60 AIFs which have raised a total corpus of INR 31,598 crores, a 7x catalyzing effect (Startup India, 2020). Overall the SII has had a positive impact on the startup ecosystem in India, improving the country's Ease of Doing Business (EODB) ranking from 142nd in 2014 to 63rd in 2020 (Singh, 2020).

Barriers to Indian Technology-Based Startups

While SII has had tremendous success in fostering traction for startups in India and making it the third largest startup hub in the world, one of the major barriers preventing Indian tech startups from scaling up and creating more jobs has been a lack of funding (Kumar and Singh, 2023). While other barriers include a lack of marketing and sales capabilities (Goswami, 2023), this paper focuses on funding as this can be more effectively addressed through policy reform within the SII. The pace and quantity of allocation, investment and disbursement under the FFS has been slow and inefficient (Tiwari et al., 2021, p. 48). In 2020, four years after its launch, the FFS committed only 31% (INR 3,123 crores) of its total announced corpus of INR 10,000 crores to support AIFs. The AIFs invested a total of 3,378 crores in startups, of which only 29% had been withdrawn from the FFS committed amount (INR 913 crores out of INR 3,123 crores). Moreover, investment from these AIFs only went to 1.1% of SII-recognized startups (320 of the 28,979 startups) (Tiwari et al., 2021). This highlights that the FFS has not yet committed its announced allocation of INR 10,000 crores, and even what it has committed has been severely underutilized and concentrated to a few startups, with 98.9% of startups not getting any funding.

Part of the reason for the latter issue is that investment has been heavily concentrated in a few commercial sectors (information technology, information technology enabled-services, fintech and ecommerce) and one specific business model - the platform model (Kamaluddin and Sridhar, 2021, p. 2). The e-commerce sector, with 25% of total investments between 2014 and 2020, stands as a testament to this

concentration, boasting 9 unicorns – the highest among all sectors. Other sectors like edtech, healthtech and agrotech are underfunded. The healthtech sector, for example, witnessed a meager 13% funding rate in 2017, indicative of a broader trend of concentration and bias in investment. This bias is driven by a preference for quick returns, directing attention away from social sectors like healthtech, edtech, and agrotech, which are perceived as having a higher gestation period (Kamaluddin and Sridhar, 2021). Another issue faced by Indian startups is the low amount of seed funding. Between 2015 and 2018, seed funding made up only 2% of total investment (Kamaluddin and Sridhar, 2021), and from 2018 to 2019, it grew by only 1.7% (Tiwari et al., 2021). Increased seed funding could provide the crucial support needed for more early stage startups to make it through the “valley of death” - the years before they break even (Tiwari et al., 2021).

Recommended Policy Solution

In this white paper, a growth-diagnostic approach à la Hausmann et al. (2008) will be taken to identify a policy program that can enhance the Indian technology-based startup sector’s ability to generate employment opportunities, especially for the highly educated. This section will first describe the growth-diagnostic approach, outline the policy solution proposed, and finally discuss comparable policies in other countries.

The focus of Hausmann et al.’s growth-diagnostic approach is on development, and specifically on promoting economic growth. While the scope of this paper is considerably more narrow, and focuses specifically on increasing the Indian technology-based startup sector’s capacity to generate sustainable jobs, the growth-diagnostic framework remains

applicable. Hausmann et al. argue that the most productive way to design policy is to define the desired outcome, identify the most binding constraints which impede that outcome, and finally determine the primary reasons for the existence of these constraints. Policy should then be targeted at removing these constraints by addressing the specific reasons for their existence. The advantages of this approach are that it generates solutions which are tailored to the unique context of a particular country or sector, and that it prioritizes policies which are likely to have the greatest effect, thereby reducing opportunity cost and utilizing government resources efficiently. Applying this diagnostic framework, technology-based startups will be better able to generate employment if they are more numerous and scalable. The most binding constraint on the former is a lack of initial seed funding (Kumar and Singh, 2023), and on the latter is a lack of investment capital (Goswami, 2023; Tiwari et al., 2021, p. 45). Therefore, this paper proposes a two-pronged policy solution which specifically aims to address each of these primary issues.

The first policy targets FFS, which has consistently fallen short of its projected allocation to startups (Kamaluddin and Sridhar, 2021, p. 13). As such, the primary constraint is efficiency of funding, rather than volume. The recommended policy addresses this by instituting a regulation wherein the remaining 71% of INR 3,123.20 crore of committed FFS funding must be disbursed to eligible startups within one year. In each successive year, a target disbursal of at least twenty percent of the corpus would be set and all the committed funds are to be disbursed within six months of commitment. In this way, startups receive the funding they were intended to receive and future distribution delays in the FFS are prevented. This approach also grants FFS time

to restructure its organization without putting it under immediate stress, which may actually impede its ability to allocate resources efficiently. Importantly, the disbursement of funds would target startups at different stages. Out of the committed funds, a mandatory 30% (or other amount deemed by the Department For Promotion of Industry and Internal Trade (DPIIT) will be reserved for startups in their initial stage.

This regulation would also stipulate that a certain percentage of FFS funding must go towards specific technology-based startup sectors which have traditionally lacked funding, such as greentech, agrotech, and biotech. This would increase employment among those educated in these neglected fields, counteracting the fact that investment is highly concentrated in the financial startup sector (Kamaluddin and Sridhar, 2021, p. 2). A final condition would be that at least 50% percent of annual FFS disbursement goes towards technology-based startups which are identified as having significant potential for job creation and scalability, as defined by the SIDBI. This policy is designed to ensure that government funds are directed towards startups with the greatest potential for scalability and sustainable job creation, thereby maximizing the impact of public investments in fostering innovation.

The second policy recommendation addresses scalability, the primary impediment to which is lack of capital investment. It entails the creation of a public program which provides zero-interest loans, payable within five years, to technology-based startups which have existed for at least three years and have proven success over this time period. This would lower fixed costs for startups that wish to scale-up, allowing the startup ecosystem to act as a testing-ground for ideas which can fuel the creation and growth of large, innovative domestic companies that employ India’s

educated youth. By lowering fixed costs for startups, the policy creates an environment conducive to experimentation and growth. This initiative is not just about providing financial support; it is a strategic investment in the potential of startups to become major contributors to India's economic landscape. To be eligible for this zero-interest loan program, startups would have to meet three conditions. The first condition would be that the startup must commit to increasing the number of employees in proportion to the size of the loan. This condition ensures that improved scalability directly translates into greater employment opportunities within the technology-based startup sector. The second condition would be that a certain percentage of the new roles created must be filled by women and/or individuals from underprivileged backgrounds. This addresses the issue of comparably high unemployment among marginalized demographics in the technology-based startup sector (Tiwari et al., 2021, pp. 48-50), and ensures that development is inclusive. The third condition would be that the startup increases its R&D expenditure proportional to the size of the loan. This makes sure that the startup utilizes its greater scale to accelerate innovation, thereby ensuring profitability and ability to pay back the loan, in recognition of the fact that lack of R&D investment has been found to contribute to the uncompetitiveness of Indian technology-based startups (Srikanth et al., 2020). It also aligns with the Indian government's commitment to foster a culture of research and development within the technology startup ecosystem. The long-term impact of this policy is envisioned in the form of a thriving ecosystem of technology-based startups that have successfully scaled up, generating employment and contributing to India's economic growth. Regular evaluations will be conducted to assess

the program's effectiveness in promoting scalability, inclusive hiring, and increased R&D expenditure.

Zero-interest loans for startups, payable within three to five years, have been implemented by the Philippine Department of Trade and Industry (Ilas-Panganiban and Mitra-Ventanilla, 2020, p. 696). This strategy, combined with others, has led the Philippines to show improvements in innovation indicators such as high-tech imports and exports, as well as research talent. In Italy, under the Italian Startup Act, zero-interest loans are also provided by public agencies to 'innovative startups', defined as those which invest at least fifteen percent of their budget in R&D(Antonietti and Gambarotto, 2020, p. 564). While the majority of startups benefit from this source of public capital, Menon et al. (2018) argue that the policy should be closely monitored because it might incentivize startups to pursue a slower growth path than if they faced higher interest rates (p. 76). The authors also find some evidence to suggest that startups which receive public loans are less likely to attract venture capital (VC) funding. However, evidence from a state-issued competitive R&D loan program in Michigan shows that, despite low interest rates, applicants which received funding were 20% to 30% more likely to remain in business four years following the program, and that VC investment was stimulated among these surviving startups (Zhao and Ziedonis, 2020). This highlights the importance of the recommended policy's condition that loans require a proportional increase in R&D investment, which would make such loans more likely to crowd-in rather than crowd-out private investment. Unlike in the case of Poland, this influx of R&D investment will be gradual and takes advantage of an already-established innovation ecosystem such that it will meet the pent-up employment demand of highly-

educated labour (Breznitz and Ornston, 2017). Finally, a study conducted on the Czech public programme 'START', funded by the European Regional Development Fund, found that companies supported by zero-interest loans reported lower profitability and higher average debt ratio than the control group, which the author attributes to problems of moral hazard and adverse selection, exacerbated by a lack of data upon which creditors could make judgements when approving loans (Dvouletý, 2017). This emphasizes the importance of the recommended policy's stipulation that zero-interest loans only be applied to startups which have existed for at least three years, as it enables the SII program to analyze startups' past financial data and make better-informed decisions when approving loans.

The policy program recommended above, a two-pronged approach which features efficiency-promoting regulations for seed funding disbursement alongside zero-interest loans for startup scaling, assists in bolstering the "third fundamental" of Breznitz's (2021) framework (p. 65). That is, it allows the startup ecosystem better access to the critical resource of capital, while reinforcing the firm-level provision of the public good of R&D through budgetary conditions. By enhancing the innovative capacity of the technology-based startup ecosystem, the recommended policy program will grow the sector and improve its capacity to generate employment for the highly educated in India.

Implementation of Policy Recommendations

The recommended policy program outlined above would be implemented through the DPIIT under the Ministry of Commerce and Industry. The FFS regulations would be

integrated into the existing FFS program under the SII, while the zero-interest loan policy would be introduced as a new program within the SII framework. The stakeholders include government entities, startups targeted by the policy program, and unemployed individuals educated in technology-related fields.

The first proposed solution aims to streamline and expedite the FFS funding disbursal process so that more startups are able to receive funding at the initial stages rather than at later stages, where most funding is currently concentrated. To expedite the process, a platform within the online Startup India Portal should be created for startups and AIFs to submit funding applications, ensuring a streamlined and paperless process. The approval process would be completed within an established timeline for each stage of the funding approval process to help reduce bureaucratic delays. A real-time monitoring and tracking of fund disbursement could be integrated in the proposed digital platform to ensure transparency and accountability. The cost of implementing this measure would be the initial investments in developing and maintaining the digital platform and training officials. The benefits would far exceed the costs as this measure would reduce the opportunity cost associated with delayed fund disbursement, as startups can utilize funds more quickly, contributing to early-stage growth. Faster growth of startups may contribute to increased employment, innovation, and economic development (Baumol, 2004).

The dynamic allocation criteria forms a pivotal aspect of the proposed policy strategy to enhance the efficiency of startup funding, both within the FFS framework as well as the zero-interest loan program. Currently, to be eligible for government incentives under the SII programme, a startup has to be registered with the Department

of Industrial Policy & Promotion. The proportion of startups that are ‘recognised’ (28,979 as of 2021) is considerably less compared with those who applied (367,171), meaning a low acceptance rate of around 5-7%. This may be because the tremendous increase in the number of applications in recent years has meant the government has been unable to process the same proportion, or that the criteria used are so stringent that very few qualify to be recognised (Kamaluddin, 2021). Under the new policy recommendation, a comprehensive set of criteria will be developed, taking into account not only the immediate scalability of the startup but also its long-term potential for generating employment. Criteria will include considerations such as business model viability, growth projections, and the ability to contribute meaningfully to job creation. Expert panels comprising industry veterans, economists, and startup specialists will be included within the existing National Startup Advisory Council to rigorously assess and evaluate proposals against these criteria (Singh, 2020). Furthermore, these criteria will be subject to periodic reviews and updates, ensuring adaptability to the evolving landscape of the startup ecosystem.

By targeting startups that exhibit both scalability and job creation potential, the recommended policy solution aims to contribute to reducing income inequality and fostering more inclusive economic growth. The increased scrutiny and evaluation processes may slightly extend the approval timeline; however, the potential for positive socio-economic impacts justifies this incremental cost. By consistently directing funds towards startups with sustainable job creation potential, the policy anticipates positive feedback effects. Successful startups contribute significantly to employment and may attract further investments and talent, creating a virtuous cycle of innovation and

economic growth. This policy is complementary to broader national strategies promoting innovation and economic development. It aligns seamlessly with other SII initiatives and contributes to the overall ethos of fostering a conducive environment for startups.

The present state of the Indian startup ecosystem reveals a paradox – despite an influx of substantial funds, a conspicuous investment concentration persists, with a mere 2% of deals accounting for a staggering 75% of funding in 2017. Sectors such as ecommerce get the majority of funding at the neglect of critical social sectors like healthtech and edtech due to the preference for quick returns (Kamaluddin and Sridhar, 2021). This paper suggests a comprehensive analysis in collaboration with industry experts and associations to identify sectors with significant growth potential within the technology domain. This analysis will inform the allocation of a specific portion of FFS funds exclusively for startups operating in these identified sectors. Furthermore, a dynamic mechanism will be established for periodic reassessment and reallocation of funds based on sectoral performance, ensuring adaptability to changing market dynamics. The policy recognizes the need to balance quick returns in sectors like IT and e-commerce with the potential long-term impact of startups in health, education, and agriculture and thus it is proposed that at least 50% of annual FFS disbursement, and all zero-interest loans, goes towards technology-based startups. By allocating a dedicated portion of Funds for Startups to technology-based startups within identified high-potential sectors, this policy solution aims to break the concentration and promote a more diverse and inclusive startup ecosystem. While there are initial costs associated with the analysis and collaboration efforts to determine sectoral allocation, the long-term benefits are substantial. By strategically directing funds to technology-based startups

within high-potential sectors, the government aims to amplify the impact of public investments, fostering economic growth, and technological advancement.

After initial implementation, the success of the recommended solution should continue to be monitored by SIDBI. Key performance indicators include increased growth rate in the number of technology-based startups, increased growth rate in the number of these startups in previously neglected subsectors, increased growth rate in the number of highly-educated individuals employed in this sector, increased survivability of technology-based startups, increased growth rate of marginalized people employed in this sector, and an increase in average startup R&D investment. SIDBI should assign researchers to collect this data and measure the percentage deviations from market trends before policy implementation; the higher these deviations the greater the degree of the policy's success. While this monitoring represents an additional cost, it will likely be a worthwhile investment since it will allow future policy makers to adjust the policy recommendation as well as other SII programs to better suit the needs of the startup sector.

Continuous coordination with industry experts and stakeholders, as well as periodic evaluations are critical to addressing potential negative effects and ensuring the relevance and effectiveness of the dynamic allocation criteria. By prioritizing startups with the greatest potential for scalability and job creation, the impact of public investments will be optimized, contributing to a vibrant and sustainable startup ecosystem in India that creates employment for all classes of people.

Challenges for Implementation

While the policy recommendation has notable benefits, a comprehensive assessment of potential challenges associated with its implementation is imperative. The potential challenges that may emerge primarily revolve around the eligibility criteria for the zero-interest loans, which encompass various cultural, financial, and political barriers.

Despite the potential for scalability through the zero-interest through the proposed policy initiative, a notable concern lies in the emergence of “zombie companies.” Zombie firms are economically unviable and manage to survive by leveraging banks and capital markets (Favara, at el., 2021). In practice, these entities exhibit inefficiency, limited growth potential, and make just enough money to stay afloat. The risks of zombie firms are particularly evident in India, where start-ups often introduce “me-too” products, which are nearly identical to existing goods (Srikhanth, et al., 2021). The zero-interest loan program outlined in this paper risks exacerbating this issue by creating debt dependency among startups and reducing pressures to maintain profitability, as found in the Czech policy discussed above (Dvouletý, 2017). The R&D investment condition and the applicability of zero-interest loans to only those startups which have proven success over the course of three years mitigates this risk. To further mitigate this risk, it is recommended that the DPIIT work with the Ministry of Corporate Affairs to streamline the process of exit from the loan program in case of bankruptcy.

Another notable challenge pertains to the lack of female representation within the Indian workforce, a concern addressed by the loan condition which requires a certain percentage of women among hired workers. While increasing female labor force participation is a critical component for an inclusive and sustainable development within India, navigating cultural barriers is complex. Despite recent advancements in gender

roles, traditional norms/practices remain constant. For instance, approximately one third of the adult population believe childcare should be solely the responsibility of women, and 56% strongly advocate for greater employment rights for men (Pew Research Center, 2022). It is evident that gender roles pose a major barrier, since many view women as the caregiver, and the man as the family's primary breadwinner. Consequently, the stipulation to hire a certain percent of women can yield culture shock challenges. From this perspective, some individuals may take offense, viewing it as a departure from traditional norms. From another, it is possible there might not be enough demand for female workers in these fields, which raises concerns that loans will breach contracts, which can lead to further barriers in the successful implementation of the policy.

The culture of risk aversion poses another challenge for policy implementation in India. The Indian bureaucratic system consistently struggles with risk aversion and indecision, leading to implementation delays, financial obstacles, or other unforeseen implications (Sinha, et al., 2021). In the context of India, the constant battle between capacity limits and electoral or policy considerations further complicate policy implementation (Sinha, et al., 2021). Moreover, given that the accountability for policy outcomes falls entirely on the individual rather than the institution, bureaucrats contend with heightened levels of indecision. The elevated levels of indecision are an attempt to safeguard their reputation in the event of policy failure, which can result in a career setback, or in extreme cases, accusations of corruption (Sinha, et al., 2021).

While these bureaucratic inefficiencies are expected to pose challenges in implementation, electoral political opposition is not. This is because the policy programs

outlined in this paper present a fairly modest reform to the already existing framework of the SII. Additionally, the unemployed highly-educated people of India are a large voting demographic that the proposed policies directly favour.

However, capacity constraints may pose another implementation challenge. This is one of the notable drawbacks of the publicly-funded zero-interest loan program, as it requires substantial public capital availability upfront. A final concern revolves around the potential scenario where the FFS is unable to meet the disbursement quotas stipulated by the policy's regulation. In this event, challenges emerge relating to potential penalties, underscoring the need to consider enforcement mechanisms to ensure they are held accountable for their failure to streamline the funding disbursement process.

Considering Alternatives and Summary of Approach

Given the existence of scarce resources, investing in technology-based startups comes with an implicit opportunity cost – the highest-valued forgone alternative. This paper has already explained how the benefits of the proposed policy solution outweigh potential costs, but the following section will examine in greater depth three potential sources of opportunity cost in order to summarize why this solution provides the best use of resource allocation for redressing the problem outlined by the paper. The three alternatives are as follows: 1) maintaining the status quo startup scheme offered by Startup India, 2) selecting another novel startup solution, or 3) investing in a different startup sector altogether. Each of these options will be considered in turn.

The first and most straightforward option is to continue utilizing the SII model without making any changes. As the mantra goes, “if something isn’t broken, don’t fix it.” However, as has been observed, there are numerous problems with the SII model, and continuing with the status quo is not an adequate option for the unemployment problem. Even when young Indians do manage to find entrepreneurial work in startups, a staggering 90% of startups fail in the first 3-5 years (Singh, 2020). This reality disincentivizes young Indians from taking future risks in investing in startups, and highlights that the status quo model is not working as effectively as it should.

SII was founded with the designated purpose of “supporting entrepreneurs, building a robust startup ecosystem and transforming India into a country of job creators instead of job seekers” (“About,” n.d.). Yet seven years after its foundation, it has fallen short of its stated objectives. It is true that the initiative has attained success in creating 860,000 jobs, an impressive feat in the realm of employment creation (Rathore, 2023). However, given that India boasts the world’s largest population, this achievement is still not sufficient. India will need to act decisively to create 90 million more non-agricultural jobs to adequately absorb new workers by 2030 (Madhok, 2020).

Further, as discussed, entrepreneurs who have made use of SII resources report a lack of funding and poor financial support. The FFS initiative has proven ineffective and insufficient in meeting the funding requirements of startups, and 50% of Indian entrepreneurs declared a lack of financial support as a “major strategic constraint” for their businesses (Tiwari et al., 2021, p. 45). While this proposal does not seek to replace the SII initiative, the plan is to build on the existing framework to disperse zero-interest

loans and ensure that funding is allocated more efficiently, thus enabling entrepreneurs to cover the expenses of scaling up their businesses.

As has been acknowledged, SII does currently reward new startups with a number of incentives, including seed funding and income tax exemptions for up to three years (“Government Initiatives”, n.d.). However, these incentives are flawed. In the first place, the funding offered by SII is unconditional; eligibility for seed funding is predicated on vague requirements such as “startup must have a business idea to develop a product or a service with market fit” and “startup should be using technology in its core product” (“Guidelines for Startup India Seed Fund Scheme”, n.d.). These funding programs lack a vital accountability mechanism to monitor the success and equitability of startups, which may contribute to the extremely high failure rate of these businesses. As such, it is important to introduce conditions, including the expansion of employment positions, mandatory R&D expenditure, and the allotment of jobs to women and underprivileged individuals.

When considering the goal of job creation for highly educated workers, it is imperative to take into account demographic factors and prioritize equity and inclusion for historically marginalized groups. In the 2020-2021 year, the percentage of female enrollment in higher education reached 49% (“Ministry of Education,” n.d.). Though not all of these female students necessarily graduated from their programs, it is clear that women constitute nearly half of the highly educated demographic. Indian women have been granted reserved seats in schools and public sector jobs, but these quotas have not yet been extended to private employment (Ahmed, 2023). Instead, gender-based disparities persist amongst India’s unicorn startups. The proportion of startups led by

women in 2022 was only 18%, though this number has increased by 8% in four years since 2018 (Jaswal, 2023a). Only four percent of all startup CFOs are female (Jaswal, 2023b). The existing SII framework has both neglected and perpetuated these inequities. While SII proclaims that it strives to promote a “strong and inclusive entrepreneurial system”, the initiative has remained silent on addressing discrimination against women and other marginalized groups (Tiwari et al., 2021, p. 48).

Another group that has been notably underrepresented and unacknowledged by the SII initiative is “low-caste” or low class individuals. India confronts a historical tradition of caste-based and class-based discrimination, which has thwarted innovation and economic growth (Tiwari et al., 2021). The hierarchical caste system has restricted the mobility and entrepreneurial potential of many individuals by the consequence of birth. This is not only a problem in India, but can be observed in innovation systems all over the world. Zehabi and Breznitz (2018) note that although innovation has been the primary engine for economic growth in developed countries, its economic impact is not often widely distributed to a country’s entire population. Typically, marginalized groups have been excluded from the benefits of expanded technology and innovation. Policy, however, can be transformed to distribute the gains of innovation more evenly across a broader audience, and actively promote distribution-sensitive innovation (Zehabi & Breznitz, 2018).

Again, it should be emphasized that this paper focuses on targeting *highly educated* workers, not the problem of equity or diversification in startups in particular. Unfortunately, many low-caste and low-income Indians lack resources and do not have the opportunity to attain higher education, and there should be suitable policies in place

to address this issue. Yet it is important to note that there are also a considerable number of individuals from rural or poor backgrounds who defied barriers and achieved higher education. In the mission to expand work opportunities to highly educated Indians, special consideration should be given to those individuals who have managed to receive an education in spite of class-based disadvantages, and extend to them opportunities for success in entrepreneurial careers.

Although SII has achieved notable achievement in reducing regional disparities affecting rural communities, it has not done enough to acknowledge caste-based or class-based disparities (Tiwari et al., 2021). By contrast, the proposed solution will target highly educated unemployed Indians of all backgrounds and socioeconomic classes, and the policy will offer a socially conscious approach and ethos of equal opportunity for historically underrepresented entrepreneurs – though the longstanding cultural perception of women and marginalized groups will likely present a challenge in implementing this resolution, as stated in the "Challenges to Implementation" section above. Through this paper's policy the distribution of innovation-related gains from startups can be widespread. In doing so, talented and educated individuals from marginalized groups will no longer be left behind from the net gains emanating from startups and other forms of innovation (Zehabi & Breznitz, 2018, p. 1).

In failing to acknowledge the social exclusion of marginalized groups – along with its absence of appropriate funding and accountability measures – SII clearly grapples with a number of shortcomings and is in need of refinement. Yet that does not necessarily prove that investing in the proposed solution will be the correct approach. The second alternative is to select a different policy solution for addressing the

unemployment problem. For instance, another potential policy solution is to incentivize highly educated Indians to become entrepreneurs by rewarding creative failure. Saxenian (1994) describes how the world-class innovation hub of Silicon Valley traditionally embodied a culture that was supportive of risk-taking and failure. Such an innovation ecosystem induced a “shared understanding that anyone could be a successful entrepreneur”, and there was “little embarrassment or shame associated with business failure” (p. 39). On the other hand, India is characterized by a profoundly risk-adverse culture that often discourages new ventures (Sinha, et al., 2021).

While the goal is certainly not to make India’s innovation ecosystem resemble Silicon Valley (nor could Silicon Valley feasibly be scaled to fit the vast innovative landscape of India), it may be worthwhile to invest in creative incentives to abate some of the cultural and systemic obstacles surrounding entrepreneurial risk taking in India. This will in turn help resolve the unemployment problem as more entrepreneurs gain the confidence to realize their potential and join or create startups. One method of coercing this kind of change has been proposed by Srikanth et al. (2021), who recognize that failure is an intrinsic and valuable part of the innovation process. The authors suggest that a risk-taking innovation environment can be fostered in India by introducing “Golden Egg” awards (p. 289). These awards are designed to support authentic failure by rewarding creative mistakes so that entrepreneurs can learn from their errors and missteps, and such awards have already been introduced in several other countries including Ireland, Sweden, and the USA (Srikanth et al., 2021).

While the Golden Egg awards provide an interesting model for encouraging risk-taking and necessary experimentation, there is no guarantee that they would work in

India. Potentially, such a strategy could lead to further humiliation and social alienation. Cultural attitudes and stigma regarding failure in India are well-entrenched, and there is no simple solution for overcoming these societal challenges. Thus, the root of the problem should be tackled directly, which is a lack of financial support and clear incentives. With proper incentives in place, the culture of failure aversion is more likely to be superseded. As such, the proposed policy offers a more comprehensive approach for encouraging risk-taking and supporting innovation rather than simply implementing a band aid-over-bullet-hole solution like the Golden Egg awards. By providing prospective entrepreneurs with access to funding and long-term incentives in the realm of tech startups, as well as ensuring equitability to marginalized groups who may be facing the most substantial barriers to innovation, this paper's policy approach will adequately boost job creation and provide direct incentives for young entrepreneurs to embrace risks and failure.

Throughout this paper, the argument advanced has been that the most promising avenue for entrepreneurship and job creation in India lies within technology-based startups. However, this begs the question of *why* it is recommended to invest in technology-based startups specifically. The evidence that startups enable job creation and economic growth is undeniable; startups have been found to create more jobs than large companies or enterprises in the same industry (Maddisetty, 2023). Startups solve unemployment problems in developing countries like India, and enhance people's quality of life overall (Maddisetty, 2023). Yet why not encourage, for instance, manufacturing startups instead of tech startups? This leads into the third possible alternative to tech startups: investing in a different variation of startups. However, the

reason that tech startups have been endorsed is that tech startups lean directly into India's comparative advantage.

India has exhibited strength in supplying "sophisticated, highly skilled, and technology-driven products" (Joshi, 2023, para. 6). As a result of this advantage, an advanced technological infrastructure is already in place in India, and an expansion of tech startups will contribute to a historical tradition of technological excellence. Further, Karp (2020) states that manufacturing entrepreneurs may find more difficulty attracting venture capital investment, and are confronted by lower profit margins. Manufacturing startups also often struggle to secure government funding (Karp, 2020). Considering that startups in India have already failed to access funding in general, it may not be worth overcomplicating the matter by investing in an under-resourced startup sector. Tech startups provide the most viable path forward for India's innovation growth, and our specific policy solution will allow for a more robust, sustainable, and equitable tech startup sector to generate employment opportunities for highly educated Indians of diverse backgrounds.

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