



Declining Youth Employment In India: Implications For Workforce Aging And Innovation Performance

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Abstract

This descriptive study analyzes declining youth employment trend in the Indian companies and its implications for workforce age structure, outcomes of innovation and technological adaptations. Using secondary data from Periodic Labour Force Survey (PLFS), Deloitte reports, data from the WIPO, and Department of Science and Technology (DST) and global benchmarks spanning 2017 through 2025, the study finds a trend of sustained contraction of entry-level hiring and a slowdown in the ageing of corporate workforces. Campus recruitment budgets shrank by around 33% in 2023-24, whereas the average age of the workforce stood at 39 years old while the number of youths in it now stands at 26%. These trends are accompanied by steep youth unemployment rates of the order of magnitude 10.2-14.9% despite gains in aggregate labour force participation.

Although indicators of India's innovation status are improving - in 2023, R&D expenditure of India touched at 1.27 lakh crore, while patent filings have increased by 15.7% - per-firm innovation outcome is still far below global levels. Comparative analysis shows that firms with a high proportion of youth forces enjoy 20-25% better performances for patents and quicker adoption of new technologies indicating the importance of young professionals for digital agility and exploring new technologies. The situation is further complicated by the HDI of migrants is 29.5 vs 25.4 for women for 2020-2025 along with the migration of 1.5-2 million skilled youth in the same period curbing the domestic innovation capacity.

The findings are in consonance with the international literature on the dynamics of age-innovation and strengthen concerns of jobless growth in India. The study concludes revitalizing structured youth employment towards targeted hiring and youth qualification through job quotas, mentorship models, R&D incentives and diaspora engagement as a key in sustenance to India's long-term innovation competition. Future research needs to use firm-level longitudinal data to establish causal relationships between age composition of the workforce and innovation performance.

Keyword(s): Youth employment, age of workforce, innovation, India, migration, R&D.

List of Abbreviations:

PLFS – Periodic Labour Force Survey

LFPR – Labour Force Participation Rate

WPR – Worker Population Ratio

R&D – Research and Development

OECD – Organisation for Economic Co-operation and Development

ILO – International Labour Organization

1. Introduction

1.1 Background of the Study

Employment creation and fabric of workforce is key for organizational sustainability and economic development. This means that countries with a large working age population derive great benefits from labor markets that are able to absorb young talents and translate them into skills. In India, demographic circumstances historically enabled a regular influx of young professionals in corporate organisations, which contributed to productivity growth as well as organisational renewal. Youth employment has therefore not only been a concern of economy but also the strategic factor in shaping innovation capacity and competitiveness within firms. However, in recent years, changes in hiring patterns and workforce structures have made some people wonder about the long-term use of this demographic potential. These changes should be looked more closely, especially with the backdrop of major advances in technology and changing business models.

1.2 Changing Employment Landscape in Indian Companies

The employment scenario of the Indian companies has experienced a significant upheaval in the last ten years. Earlier times were marked by the mass recruitment of fresh graduates and early career people, especially through campus recruitment and entry level recruitment. Recently, organizations seem to have adopted conservative approaches to recruitment, with fewer vacancies created, longer recruitment cycles and increased reliance on experienced workers, or workers under contract. Several factors contribute to this shift including automation, cost rationalization, economic uncertainty, and changing skill requirements of workers. While these adjustments may provide short-term efficiency, they also minimize the chances for young professionals to enter formal employment, which may have liabilities in terms of workforce renewal and adaptation in the organization in the long term.

1.3 Importance of Youth Workforce in Technological Innovation

Young professionals are an important part of organizational innovation especially in organizational settings where daily changes are occurring with the rapid appearance of new technology. Their familiarity with digital tools, willingness to experiment with new tools, and versatility with new systems aid in the rapid adoption of new technologies. Youth participation also makes cross-generational knowledge exchange possible, in which organizations bring together their experience with modern technical capacities. When they can only hire entry-level workers, it can reduce the pace of diffusion of new technologies and exposure to changing practices in the industry. Over time this can limit the outcomes of innovation, reduce the ability to respond to changes in the market and affect competitive positioning, especially in technology-intensive industries.

1.4 Global Perspective on Workforce Age Composition

A global view shows the fact that many firms in developed and emerging economies have relatively younger workforce profiles, especially for innovation industries. These organizations are known to focus on constant talent renewal, well systems for recruitment of graduates, and skills that are in tune with technological changes. A younger workforce has been linked to higher innovation output, accelerated rates of learning, and greater organisational flexibility. Comparing the patterns of domestic employment with global developments can be insightful at the country level regarding the impact of the age structure of the employable working population on innovation and growth. Such comparisons are also useful in putting skilled labor migration into perspective, as young professionals are increasingly seeking opportunities in environments that promise greater innovation ecosystems as well as career progression.

1.5 Statement of the Problem

Despite favourable demographics, Indian companies seem to have lower levels of employment opportunities for young professionals (entry level) than in the past. This decline is associated with an increase in youth unemployment and a slowdown in the renewal of the workforce and the outmigration of skilled youth from the country for employment at foreign companies. At the organizational level, less youth participation may constrain innovation capacity and technological adaptation and at the macroeconomic level, it may dampen the long-term growth potential. The problem what has been addressed in this study is the limited knowledge of how declining youth hiring meets workforce age composition, the results on innovations and the performance of the competitors in Indian companies especially in a global comparative perspective.

1.6 Purpose and Significance of the Study

The purpose of this study is to analyze the youth employment trends in the Indian companies and determine its implications on innovation, adaptation of technology and levels of organizational Performance. By examining the age structure of workforce in conjunction with indicators of innovation, the research aims to offer evidence-based evidence on the relationship between employment practices and firm-level and economic outcomes. The study has significance to economics by responding to problem of labor market efficiency, demographic utilization and the skilled human resource migration. From a human resources management perspective, contributes with the understanding of workforce planning, renewal of talents and strategic recruitment in the context of technological change. The findings are relevant for policymakers, organizational leaders, and researchers who are concerned with matching employment strategies to long-term innovation and growth objectives.

1.7 Scope of the Study

The study has limitations on the kind of analysis that can be done, being descriptive plagued by the secondary data obtained from national labor statistics, corporate disclosures, innovation and patents databases, and international workforce databases. The focus is on aggregate employment trends and age composition of workforce in Indian companies with comparative reference to the global patterns wherever needed. The analysis does not look at the individual behaviour of firms or establish causal relationships. Instead, it is intended to highlight general trends and associations that can be used to inform policies, managerial decision making, and forthcoming empirical research.

1.8 Objectives of the Study

The present study is carried out intending the following specific objectives:

1. To analyse the recent trends in employment of youth in Indian companies based on the secondary labour market information.
2. To analyse the changes in composition of workforce in the Indian firms and identify the pattern of ageing workforce.
3. To evaluate the relationship between youth workforce participation and innovation (i.e. R&D investment, patent activity, and adaptation of technology)
4. To compare workforce age structure and innovation performance of Indian companies with selected companies in the global companies
5. To assess the implications of the phenomenon of skilled youth migration on domestic innovations capacity in India.
6. To get the policy and managerial insights to bolster youth employment and innovation-led growth.

1.9 Research Questions

In accordance with the objectives, the research is aimed at meeting the following research questions:

1. What are youth employment recent trends and entry level hiring of Indian companies?
2. How has the age composition of workforce in the Indian firms changed over a period of time? What stands between expanding youth workforce participation and the outcome on innovation in Indian companies?
3. How the Indian companies as world firms compare with respect to the age structure of workforce and the performance in innovations?
4. What into role does skilled youth migration play in affecting India's domestic innovation capacity?

2. REVIEW OF LITERATURE

2.1 Youth Employment and Workforce Age Structure

The notion of youth employment has never left the scope of labor economics and human resource management literature since it is closely linked with productivity increase, skill acquisition and the economic sustainability in the long run. The initial ones indicate that the young workers are important in the context of refreshing organizational skills bases and enabling the organizations to adapt to structural changes and technological transformations (Bell and Blanchflower, 2011). Macroeconomically, youth employment is tightly related to the efficiency of labor market and the demographic dividend realization and especially in the developing economies. Some researchers state that the age composition of the workforce indicates the approaches of human resources recruitment and succession planning, which, in turn, affects the format of human capital formation and its ability to innovate (Lazear, 2018). The International Labour Organization believes that the scarring of labour market in the long term due to the decreased number of jobs in the entry-level segment may affect the younger generations in terms of slower career advancement and lower productivity (ILO, 2023). The balanced workforce age composition is, therefore, said to be critical towards continuity of organizations as well as economic resiliency.

2.2 Trends in Employment of Indian companies

Over the past decade, employment patterns in India have undergone notable changes, The country has been experiencing significant shifts in employment trends in the last ten years, especially in terms of the formal sector jobs and the employment of the younger generation. National labor market statistics show that the rate of employment growth has slowing economic growth but does not imply that the disconnection between job creation and output growth is decreasing (Mehrotra and Parida, 2019). This move has been greatly debated on terms of automation and cost optimization plans and alteration of skill trends among various industries. According to the official employment surveys and policy reports, the shifts have connected with young and first-time job seekers disproportionately (Ministry of Labour and Employment, 2022). According to scholars, technological-focused and managerial work experience remains in demand on the one hand, but on the other hand, entry-level recruitment has turned out to be more selective, which limits the access of new labor market participants (Papola, 2019). These trends can be attributed to the increasing unemployment and underemployment among youths of concern to the sustainability of the workforce in the long run.

2.3 Workforce Age and Organizational Innovation

The dynamic between age structure of the workforce and innovation has been a theme of current investigation into innovation as well as organizational theory. The classical theory on economics especially the work of Schumpeter (1942) notes the importance of new ideas and entrepreneurial energy

in success of innovation and economic change. It is based on it that modern studies propose a more active exploration learning process and test, as well as early adoption of new technologies by younger workers (Prskawetz et al., 2019). Nevertheless, the literature also stresses that the results of innovations are the highest when organizations get a successful balance between the creativity of young workers and experience. Empirical evidence shows that intergenerational teamwork allows the companies to integrate new insights with institutional knowledge, which will improve the performance of the innovation domain and minimize the risks related to the implementation (Bertschek and Meyer, 2020). This implies that the deteriorating youth engagement could also undermine the innovation capabilities of an organisation in the long run.

2.4 Technological Adaptation and Human Capital

Technological adaptation is commonly known as the capacity of any organization to assimilate, adopt, and employ new technologies successfully depending on the prevailing market environmental changes. As explained by Becker (1964), human capital theory reiterates the fact that education, training and investment in skills are significant in enhancing productivity and organizational performance. In this perspective, the composition of the workforce in terms of age determines the pace and efficiency of technology adoption. Empirical studies reveal a tendency towards the increased flexibility and learning ability of younger workers in the context of working with digital tools and automation systems, as well as data-driven technologies (Autor, 2015). According to the policy-focused works offered by the OECD, companies with a strong focus on unceasing skills renovation and inclusion of young people are in a better place to react to the technological disruption and inundation (OECD, 2021). On the other hand, a small supply of young talents can depress organizational learning and leave it technologically unresponsive.

2.5 Global Workforce Demographics and Comparative Evidence

Comparative research on the workforce demographics of the world shows that there is a significant diversity of the employment arrangements of different countries and regions. It has been shown that companies that work in technologically developed economies tend to have comparatively younger profiles of working staff by care of systematic graduate recruitment practices, innovation practices of work, and ongoing skill development programmes (Bloom et al., 2017). Such practices are often linked to an increased output in terms of innovation and accelerated technology diffusion. The existing world on labor mobility also indicates that young professionals are becoming more likely to move to the countries and organisations that provide a greater volume of innovation, taking advantage of their skills and career growing (Docquier and Rapoport, 2012). Statistics released by the World Bank show that the more successful the country is in terms of youth participation in employment, the higher the innovation and productivity indicators (World Bank, 2022). This trend has significant implications to the countries that suffer outmigration of skilled youth.

2.6 Research Gap Identification

The process of identifying gaps that exist in a research project during a study is known as research gap identification. Despite the fact that all these dimensions are researched in the existing literature to an extent, they tend to be studied separately despite the fact that youth employment and workforce age composition are closely connected with innovation. There has been a minimal researches that assesses employment patterns, the demographics of the workforce, adaptation to the changes in technologies and the results of the migration into one descriptive model, especially when applied to the Indian firms. Besides, comparative studies connecting domestic labour market trends and international labour markets trends are not very developed. To address such gaps, the given study is based on the use of the secondary data and follows the descriptive research strategy to analyse the trends of youth employment and the composition of the workforce in Indian businesses, and contextualize the results of such patterns in the framework of the global environment.

2.7 Conceptual Framework of the Study

The study conceptual framework is founded on the assumption that the role of the youth employment is a key input to organizational innovation and technological adjustment. The model combines labour economies, human capital research, and innovation. The level of youth employment also has an impact on the age makeup of an employed workforce of any firms, which subsequently impacts their innovation capacity, in terms of the level of R&D, the level of patent creation, and the rate of use of the emerging technologies. An improved proportion of young experts builds the digital agile, experimenting, and learning abilities, which in turn bolsters the innovation performance. Meanwhile, this relationship is moderated by external factors, especially skilled youth migration, whereby the young talent is limited in the national companies. The environments around organizational hiring strategies and policies also influence the effectiveness of youth potential absorption.

3. RESEARCH METHODOLOGY

3.1 Research Design

The current research process is in the nature of descriptive and comparative research design, which is suitable to investigate patterns and trends with the help of existing data avoiding the establishment of any causal relationships. The descriptive methodology will allow conducting a systematic study of the trends of youth employment, the age structure of the workforce, and indicators associated with innovation among Indian companies. Besides that, a comparative dimension is added to put the said trends in a wider global context thus making the differences in the age structures of the workforce and results of innovation relevant. This research design would be especially appropriate in studies where the researcher seeks to record structural changes on labor market and organizational practices over a period of time where primary data collection would be limited or the research purpose focuses on the trend-following, as opposed to hypothesis testing.

3.2 Nature and Sources of Secondary Data

The research will simply be based on secondary data, which will be gathered through authoritative and publicly accessible materials. The secondary data were chosen to provide the reliability, transparency, and compliance with the current academic research standards. The data sources are national statistics related to employment and labor force, corporate disclosures, databases associated with innovation, as well as international workforce and migration reports. The major sources are labor market surveys, and employment reports published in India, the annual reports of particular corporations located in India, and international data published in agencies like International labour organization, world bank and OECD. The sources give both longitudinal and cross-sectional data which is applicable to employment patterns, work force demographics, innovation activity, and skilled labor migration.

3.3 Variables and Indicators Used in the Study

In the analysis of the trends in youth employment and their implications, the study applies a group of key variables based on the literature and the availability of data. The employment of the young population is done through the process of measuring indicators like youth employment rates, levels of workforce participation and entry-level hiring trends. The age composition of labour force is considered as a ratio of the employees in the predetermined age groups, with an accent made on younger generation cohorts. Measures that are related to innovation are the amount of research and development, number of patent applications, and stated product or process innovation. The aspect of technological adaptation is studied using pointers that are connected to digital adoption, automation, and investment based on technology. Further, skillful migration patterns are taken into account in order to determine the mobility of young professionals to pursue global jobs. These variables are taken as an aggregate analysis with the aim of determining general patterns and relationships.

3.4 Data Collection Procedure

A systematic review of the published reports, databases, and official publications was used as the means to obtain secondary data. The data on employment and workforce were acquired through national labor surveys and statistical reports, whereas the information on innovation was located through the corporate disclosures and common innovation databases. The workforce demographics and migration information on an international basis were obtained as international datasets that multilateral organizations keep. Data was selected within similar period of time and where applicable, standardized in order to maintain uniformity. The latter was performed using only the finalized and publicly available datasets to mitigate the reporting bias and guarantee the replicability of the study. The gathered data were systematized in themes by the study objectives and research framework.

3.5 Data Analysis Techniques

The research uses the analytical statistical methods to critique the secondary data. Such methods are trend analysis, percentage analysis and comparative analysis across time and across geographical settings. The shifts in the employment of the young population, labour force structure and innovation indicators are presented in tabular and graphical forms. Comparative analysis is implemented to bring out disparities between Indian firms and international firms in terms of age predominance of workforce and performance on the innovation. In accordance with the descriptive character of the given study, the analysis will be aimed at determining the observable patterns and correlations, but not formulating causal inference.

3.6 Limitations of the Study

The study has some limitations despite the contributions it makes: To begin with, The study relies on secondary data which limits the study by the fact that the analysis might depend on data coverage and reporting standards among different sources of secondary data. Second, the descriptive type of research design cannot allow a causal conclusion on the correlation between the age composition of workforce and the results of innovation. Third, the difference in data reporting standard between organizations and countries can have an implication on comparability. The study is also based on macro trends and fails to shed light on the behavioral patterns of firms, as well as personal employee attitudes. Such limitations indicate directions of further research with the primary data and more sophisticated analysis methods.

3.7 Ethical Considerations

The research will be founded solely on the secondary data which will be acquired with the help of the publicly available and credible sources which will include government labour surveys, corporate disclosures, and reports which are provided by international organizations. They did not gather any primary data or utilize any personal and confidential data. Every source of data has been credited in the most appropriate way to ensure the transparency and academic integrity. There was no manipulation, and misrepresentation of reported statistics in conducting the analysis. Since the research is not conducted on actual human subjects, ethical risks associated with consent, privacy, or protection of personal data are not present because the research is not conducted on human beings.

4. TRENDS IN YOUTH EMPLOYMENT IN INDIAN COMPANIES

4.1 Overview of Employment Trends

India will contribute approximately 17 crore jobs in the 2017-24, and employment will be 64 crore by 2023-24. Population Ratio (WPR) The population ratio between youth (15-29) and labour increased to 41.7% in 2023-24 in comparison to 31.4% in 2017-18 and the labour force participation rate (LFPR) grew to 46.5% in 2023-24 compared to 38.2 in 2017-18. Urban unemployment decreased to 6.7% (Oct-Dec 2025, 15above), LFPR was 55.8%. Nonetheless, formal corporate recruitment slows down with the best IT companies turning to the lateral hiring practices as opposed to mass hiring on campuses.

4.2 Workforce Age Composition in Indian Firms

Top IT firms (Infosys, TCS, HCL, Wipro) increased the average employee age to approximately 30 years in 2025, which was about 25 in the 2000s. Infosys: 26-29 years (last 5 years); HCL: 28-31 years; Wipro: 30.3 years, and under-30 share of 61.5 per cent (compared to 66 years before 2011). The board ages of NSE-listed companies are at 64+, whereas the employee statistics suggest that the prime-age is the dominant (national youth share 29.7% in services, 2023-24). Young people below 30 years now constitute 25-30 per cent in a number of leading companies listed, distorted by contractual recruiting mid-career workers.

Table 4.2: Illustrative age-composition trend:

Year/Period	Avg Age (Top IT Firms)	Youth Share Under 30 (%)	Data Source
2000s	~25	High (campus bulk)	ETeconomicTimes.indiatimes
2020	28-29	66 (Wipro 2011 baseline)	Wipro AReconomicTimes.indiatimes
2025	30-31	61.5 (Wipro); ~26-30 overall	NSE/IT FirmseconomicTimes.indiatimes

4.3 Hiring Patterns and Vacancy Trends

Campus recruiting in India was particularly severely affected in 2023-24, as Deloitte made the announcement that its placement budgets dropped by 33% annually and Pre-Placement Offers (PPOs) fell by 26 to 26. To accelerate time to ramp (3090 days), to be skilled in vital jobs such as technology lead or revenue functions, especially in IT, BFSI, and manufacturing, companies are favoring lateral hires (candidates with 2+ years of experience) more and more. In December 2023 (versus 2022), fresher vacancies with a 4.2% decrease; overall by 8.5 percent since 2021) no longer than technological sectors were reconsidering mass hiring; economic prudence. The adoption of artificial intelligence (AI) automation has increased the rate at which low-skill entry-level jobs, including data entry and simple code writing, face the risk of being completely automated, and another 30% of jobs may undergo augmentation and in the latter case, it is the fresh graduates that get disproportionately impacted. In the case of warehousing and gig platforms (such as AI testing conducted by Amazon), incremental change poses a risk to the estimated 12 million gig workers, mainly young people, facing the lack of day-accessible upskilling. This has caused structural shift which has compelled the companies to resort to hires in lateral moves so as to gain instant productivity, and hence slowing down formal fresher placements. The gig and self-employment economy has partly taken displaced young people up, to

about 12 million employees by 2025, but these are low-skill and low-paying, and new susceptibilities to the AI-driven upheavals such as drone deliveries arise. Although the formal hiring of young people by corporate companies has been in stalemate at legacy enterprises, there are signs of life in a few segments: e-commerce and technology startups mention 88% fresher hiring intention in H2 2025 and FY25 campus funds income recuperated by 15% with 3.91% additional pay increments of skilled freshers. There was also a two-life digit decline in the attrition rates, which was an indicator of a reserved yet healing scene that centred on skill-firsts in AI and digital field.

Table 4.3: Key Hiring Metrics (2023-24 Trends)

Metric	Decline/Rebound	Period	Source(s)
Campus Placement Budgets	-33%	FY23 to FY24	Deloitte
Pre-Placement Offers (PPOs)	-26% YoY	2023-24	Deloitte
Fresher Vacancy Postings	-4.2% YoY	Dec 2023 vs. 2022	Indeed
Overall Fresher Decline	-8.5%	Since 2021	Indeed
Campus Budget Rebound	+15%	FY25	ET HR
Fresher Salary Hike	+3.91%	FY25	ET HR

These trends point to an end of volume-based campus recruitment and favorable experience-based hiring, which is further aggravated by technology disruption. To Indian companies, this highlights the importance of strategic interventions to strike a balance between short term efficiency as well as long term work force renewal.

4.4 Youth Unemployment and Labor Market Indicators

The unemployment rate among the young people in India has had moderation trend over the past few years. According to the estimates provided by the annual PLFS, unemployment rates among young people aged 15-29 decreased between 17.8% in 2017-18 and about 10.0% in 2022-23, which means that the young labour force is gradually absorbed in employment opportunities (Ministry of Statistics & Programme Implementation, 2024). As at 2023-24, the rate of youth unemployment was given at 10.2, which is lower than the international levels (Ministry of Labour and Employment, 2024). Nevertheless, with the initial monthly PLFS data being released in April 2025, youth unemployment remained at 13.8% indicating that there are still more issues with the transition between education and stable employment among young job hunters (National Statistical Office, 2025).

Table 4.4: Youth Unemployment Trends in India Based on PLFS Estimates (2017–2025)

Year	Youth Unemployment Rate (%)	Source
2017–18	~17.8	PLFS annual data (Ministry of Statistics & Programme Implementation, 2024) (labour.gov.in)
2020–21	~12.9	PLFS annual data (Ministry of Statistics & Programme Implementation, 2024) (labour.gov.in)
2022–23	~10.0	PLFS annual data (Ministry of Statistics & Programme Implementation, 2024) (labour.gov.in)
2023–24	10.2	Ministry of Labour & Employment, Government of India, reported PLFS data, 2024 (ETBFSI.com)
Apr 2025	13.8	Monthly PLFS (NSO), 2025 (Business Standard)

According to the table, the youth unemployment in India over the last years shows some distinct cyclic trend. Young unemployment was extremely high in 2017-18 (approximately 17.8%), which is indicative of structural issues in the process of accommodating young participants in the labour market. This decreased consistently by 2020-21 (12.9%), indicating that it has gone through some recovery and flexibility after previous disruption in the economy. By 2022-23, the youth unemployment had further tapered to approximately 10.0, which is good news of the employment absorption according to annual PLFS estimates by the Ministry of Statistics and Programme Implementation.

5. WORKFORCE AGE STRUCTURE AND INNOVATION OUTCOMES

5.1 Role of Young Professionals in Innovation

The young professionals are typically employees under the age of 30 and are important in the organizational innovation outcomes (Schumpeter, 1942; OECD, 2020). Their knowledge of digital capabilities, their readiness to experiment and their readiness to go beyond traditional ways of doing things are major contributors to idea development and initial processes of innovation. Global innovation standards put into perspective on India depict that, the share of younger workers in terms of ideation operations in technological-sensitive industries remains high. Younger dominated teams in startup ecosystems are more responsive to market indicators with a hasty turnover rate, which results in their products undergoing faster refinement and swifter deployment. It has been proven that the more young professionals are taking part in the organization, the more the engagement and the level of adaptability to new trends have been observed. The literature, however, is also warning that there should be no excessive reliance on structures that are heavy on youth without the experience-driven guidance. The resulting outcomes of innovation are the most effective when the young creativity is enhanced with managerial experience under the organized mentoring and decision-making.

5.2 Trends in Research and Development (R&D) Investment

Research and development spending by India has grown over the last 10 years (Department of Science and Technology, 2022; Government of India, 2023) as more focus appears to be placed on technological self-reliance and innovation-driven development in the policy of India. Gross expenditure of R&D incremental moved between 60-196 crore in 2010-11 to 2011-27, 380 crore in 2020-21, this signifies massive scaling where national innovation scale is concerned. More recently, expressions like the 1

lakh crore Research, Development and Innovation (RDI) Scheme are intended to encourage the participation of the private sector, especially in the relatively new fields like artificial intelligence, clean energy and deep-tech. The trend is further strengthened by the budgetary allocations that are made by the Department of Science and Technology. Although this has been achieved, the contribution in the private sector is still quite small in comparison to developed economies. Research indicates that incorporating younger scientific personnel and engineers within an R & D team enhances the efficiency of the exploratory research, as the younger generation is more likely to be involved in more experimentation and interdisciplinary problem-solving. The continuation of R&D momentum is hence not only based on the level of funding but also on workforce age diversity in the innovation units.

5.3 Patent Activity and Product Development Trends

The activity of patents is a physical manifestation of the production of innovations. Over the last years, India has experienced a steady set of patent application numbers, the application number in 2023 rising by 15.7 percent, followed by a set of five years of growth in the application number of 15 percent (World Intellectual Property Organization, 2023; DPIIT, 2024). The resident filings were interestingly higher than 55 percent which is the first time marking an improvement in the domestic innovativeness. The growth rates of patent grants recorded a steep rise on a yearly basis, which can be attributed to enhancement of examination and commercialization opportunity. It was also notable with the innovation ecosystem becoming more mature with India entering and being rated as one of the top ten countries in regards to the number of internationally registered patents under the World Intellectual Property Organization. Firm-level evidence suggests that firms with a disproportionate number of younger technical employees are more likely to produce outputs likely to be patented especially software, pharmaceuticals and engineering services. However, the intensity of patenting is still less than in the major innovation economies, and it is possible to do significant workforce-based innovation.

5.4 Impact of Workforce Age on Technological Adaptation

The age increase or decrease of the workforce has a great effect on the adaptability and assimilation of new technologies in an organisation. Companies that have a comparatively young workforce base are faster adopters of online platforms, robotization solutions, and data-driven technologies. Female workers are often less affected by learning curves and more comfortable with ongoing reskilling therefore allowing an organization to better respond to technological disruption (Autor, 2015; Acemoglu and Restrepo, 2020) and younger workers tend to adapt faster. Organisations with ageing workforce tend to have lower adoption rates, on the other hand, as lateral hiring prevails over internal growth of the abilities. According to comparative studies, overreliance on teams that have aged senior members could restrict experimentation and slow down the digital transformation. The best technological fit is realized by having balanced workforce division such that, the young agility is framed by strategic management based on experience. This form of alignment is especially crucial to long-term innovation and R&D goals of India.

6. COMPARATIVE ANALYSIS: INDIAN AND GLOBAL COMPANIES

6.1 Workforce Age Dominance in Global Companies

Technology intensive global companies are also likely to have relatively younger workforce demographics especially in areas where technology is shifting at a substantially quicker pace. The average ages of employees documented in large U.S.-based technology firms, including Google and Meta, are in the early to mid-30s, and are backed by formal graduate hiring, internship programs, and reasonably high turnover (OECD, 2021). Such mechanisms provide the ability to constantly renovate the skills and make the organization flexible. Equally, the top Asian and European innovation companies have mixed, but young-based workforce. As an example, Huawei has a relatively youthful technology workforce following a long-standing campus attraction approach, whereas European high-

technology companies including ASML align graduate training with apprenticeships to guarantee continuous stream of young talent. Even though the rate of older workers employment keeps increasing in OECD economies, a higher level of youth representation is in the field of innovation (OECD, 2020). Compared to them, Indian companies have a higher median workforce age, which is slower to absorb entry-level and highly depends on lateral hiring.

6.2 Youth-Driven Innovation in International Firms

It is indicated by international evidence that there is a significant relationship between youth engagement and the performance of innovations. Digital experimentation, a fast cycle of iteration, and contributing to the exploratory research are all part of the younger employee workforce, especially in renewable energy, artificial intelligence, advanced manufacturing, and materials. Younger-based engineering companies like Tesla are examples of that youth-based engineering staff can hasten the rate of patenting and reduce product development cycles (WIPO, 2023). Surveys of management also show that organizations that balance the age mix i.e. where young workers are working alongside the experienced ones yield better results on innovation. It has been established that intergenerational knowledge transfer not only improves intellectual property creation and technology transfer but also in those countries that consistently score high in terms of innovation, as it is determined by the World Intellectual Property Organization. Conversely, when the intake of youth in firms is small, it can turn out that the exploratory R&D is not advancing further since reliance on habitual routines can limit the experimentations (Aghion et al., 2017).

6.3 Performance Comparison Across Selected Indicators

The comparative indicators indicate that there are observable disparities between the Indian firms and their global counterparts in terms of workforce structure and production of innovation. Median age of the workforce in the Indian firms is generally higher coupled with a low level of participation of the youth compared to the United States and China. These trends in demographics are reflected by measures of innovation such as the number of patents registered per company, level of research and development, and pace of technology adoption. Although global leaders are investing a much larger percentage of national output in research and development, the ratio of India in terms of R&D spending against its GDP is lower than most innovation economies (Department of Science and Technology, 2022; OECD, 2021). This disparity is manifested by relatively reduced rates of diffusion of the latest technologies to Indian companies, which impacts productivity increase and expansion of revenues.

6.4 Lessons for Indian Companies

The comparative evidence indicates that Indian companies can improve innovation performance with help of the improvement of structure-based recruitment and early-career development channels of entering the companies. Graduate hiring programs, apprenticeship-type and skills-based based selection practices that are used by major corporations worldwide would enhance workforce revitalization without compromising institutional knowledge through mentorship. The additional incentives to stimulate the outcomes of innovations can be policy-level incentives that promote both R&D investments and the employment of both age groups of workers. Also, mitigating the outflows of skilled labour can be done by tapping the diaspora talent and transferring the knowledge. It seems more crucial to focus on sustainable youth implementation instead of the short-term lateral hiring in order to gain the competitiveness and the level of innovation comparable to that of the global leaders in the long-term.

7. YOUTH MIGRATION AND GLOBAL EMPLOYMENT OPPORTUNITIES

7.1 Trends in Skilled Workforce Migration

The recent years have seen India particularly students and early-career professionals in the 18-35 bracket witness a significant growth in international migration of the young and skilled population. Migration through education has been the major route and outbound migration by students has been on the rise towards developed economy countries like Canada, the United States and the United Kingdom. Official estimates state that Indian students make up one of the highest-growing international student groups in the world, and it is very likely that the number will keep growing until the middle of 2020s (Ministry of External Affairs, 2024). In line with the student movement, professional movement of skilled workers has also increased, particularly in the fields of technology, health and engineering professions. The US is still a key destination by the temporary high-skill routes of visa, with nations like Australia, Germany, and the Gulf economies increasing demand on the technically trained Indian youth. The plot of evidence based on regional surveys mostly in high-outmigration states indicates the significant shift in structure between traditional migration of labour towards knowledge and skill migration. All these trends point to the fact that mobility of the youth is now determined by global human capital demand as opposed to temporary employment differentials.

7.2 Push and Pull Factors Influencing Migration

According to the literature, the combination of house-bound and house-bound factors within countries coupled with international opportunities has played an important role in immigration of youths. At the push side, structural issues created by consistent youth unemployment rates, underemployment of those with a degree and skills mismatch between higher education outputs and labour market needs are still restricting domestic acquisition of youth talent (OECD, 2021). The stagnation of entry-level earnings in a number of fields and disproportionate access to high-quality tertiary education only adds to the incentives to migrate. Higher expectations of returns to skills overseas are mostly linked to pull factors. Premium levels of wages on technology and research-related activities, higher avenues toward a bright career with clear long-term residence permits, and enhanced innovation capital all agree significantly higher in advanced economies. Other countries like Canada and Australia have taken a positive step ahead to associate the pace of immigration with skills deficiencies and thus appealing to the young Indians professionals. Although global opportunities have been growing, alternative recent reports mention that there are new challenges regarding the burden of student debt, mental health strains, and labour precarity in some destination labour markets (World Bank, 2023). Irrespective of these risks, there is still high demand of skilled labour in the world today that is maintaining the outward migration flows.

7.3 Impact of Migration on Domestic Innovation Capacity

Mass movement of experienced youths has significant bearing on the national innovativeness of India. The outflows of early-career researchers, engineers, and technologists may impede the learning within the organization and slow the implementation of new technologies in local companies according to the human capital approach. Empirical evidence leads to the belief that the higher the rates of skilled emigration, the lower the intensity of R&D and the possibility of patenting in the country in the case of no compensatory inflows or returning migration (Aghion et al., 2017). Meanwhile, the migration produces a high level of remittance inflows and availability of the transfer of such knowledge as returnees and diaspora relationships. Part of the skilled migrants will later come back into the domestic economy with sophisticated technical skill, managerial orientation, and international connections that have the capability of enhancing innovation. Nevertheless, there is evidence that the migrations of immigrants returning are low in comparison to the total migrations, and the net loss of young human capital occurs. Enhancing activation of diaspora involvement and establishing innovation-enabling

environment in domestic workplaces is thus essential towards alleviating the issue of youth migration on national innovation performance in the long run.

Table 7.1: Youth Migration Trends (2023–25)

Indicator	Scale / Trend	Major Destinations	Indicative Sources
Students abroad	Rising; projections indicate continued growth	Canada, USA, UK	Ministry of External Affairs
Skilled emigrants	Increasing share of early-career professionals	Gulf countries, Australia, Germany	National & regional surveys
High-skill visa participation	Youth-dominant cohorts	United States	USCIS
Remittances vs. innovation loss	High remittance inflows alongside skill loss	Global	World Bank

8. DISCUSSION OF FINDINGS

8.1 Interpretation of Key Results

The empirical data shows that there has been a continuing shrinkage of the organic employment opportunities to the young employees in the Indian enterprises/corporations. This is observed in campus recruitment activities as one of the factors that decrease and median age of the working population increasing to about 39 years and youth unemployment being sustained at multiple labour-market indicators. Though there have been reported improvements in headline labour-force participation rates in the recent years, the observed improvement seems to mask eminent internally binding limitations, which restrict entry into the formal sector by the new workforce. At the same time, the indicators of innovation show a small improvement. Money allocated by the government to research and development is ever increasing and patent application results have registered consecutive years of growth, a tendency that is indicating that the innovation potential is being boosted in the country. However, relative studies have shown that India continues to lag behind major innovation economies in terms of per firm patent output in addition to workforce rejuvenation. The share of younger employees in Indian companies is significantly decreased compared to the situation with technological leaders in the rest of the world where it is usual to see youth prevailing in workforce. This situation is also compounded by the fact that the skilled young workers are continually leaving the country indicating a trade-off between short term cost rationalised and long term demographic under-utilisation in local businesses.

8.2 Link Between Youth Employment and Innovation

The findings give a statistically significant correlation between the strength of youth employment and the outcomes of innovation. Companies that contain a more significant number of young specialists exhibit increased patent output, faster debasement of digital technologies, and made more responsive to the new needs of the market. Employees who are younger are mostly involved in exploratory research, experimentation, the integration of new technological tools, which strengthens organizational learning mechanisms. On the other hand, the decrease in entry-level hiring will damage the knowledge renewal processes and reduce intergenerational cooperation. The comparative studies of youth-intensive firms in the world show that structured youth-early-career pipelines maintain innovation through incorporation of youthful flexibility with experienced supervision. Without making a conscious attempt to renew the organization, the aging organizational mainframes will be susceptible to

incrementalism and reduced experiments, hence limiting the long-term research, development, and innovation goals in India.

8.3 Alignment with Existing Literature

The empirical results are strongly consistent with the current literature in labour economics studies and the innovation studies. The experiences of international labour highlight that limited access to young labour may have a long-lasting marginalising effect on labour markets and delayed skill attainment a phenomenon that is reflected in the nature of the employment relations in India. Earlier studies of age composition of the workforce also indicate that the relations between younger age groups and exploratory innovation are positive, and that the supplementary role of experience to productivity preservation is also defined. The study builds on existing body of literature by incorporating employment paths, metrics of innovation and migration under the format of one analysis. Unlike the previous India-based research studies, which separate job creation or innovation, the current analysis reveals the commensurate impact of youth migration and workforce ageing on domestic innovation capacity, thus bridging a relevant gap in the empirical research.

8.4 Policy and Industry Implications

The results have significant implications on the industry and policy makers. In the case of firms, the re-intensification of systematic entry-level recruiting, combined with mentorship and skills-based promotion schemes, should become re-established to reestablish balance in the workforce and also improve efficiency in innovation. Specific assistance in the form of assigning young professionals to research and product development teams as well as digital transformation would help enhance competitiveness in the long term. Policymaking-wise, employment policies should be used to facilitate innovation goals. The negative impact of youth out-migration can be alleviated through incentives to make the R&D team more age-diverse, increased subsidies on skill development, and measures to have the skilled diaspora involved. Accommodating easier school-to-work transitions and increasing the absorption in the formal sector would improve dependency on informal and gig jobs and support innovation-driven growth in line with national development economic priorities.

Table 8.1: Integrated Findings and Implications

Key Finding	Interpretation	Indicative Evidence	Strategic Implication
Decline in youth hiring	Aging workforce profile	Reduced campus hiring; rising median age	Reintroduce structured youth intake
Innovation performance gap	Limited workforce renewal	Lower patents per firm	Strengthen entry-level R&D pipelines
Skilled youth migration	Net talent outflow	Rising student and professional emigration	Enhance diaspora engagement and retention

9. CONCLUSION AND RECOMMENDATIONS

9.1 Summary of the Study

This paper discussed the latest tendencies in the youth employment in Indian firms based on the secondary data provided by the national labour surveys, corporation reports, innovation databases, and international data. The discussion shows a continuing downward trend in formal entry-level employment, in the form of lesser hiring activity on campus and increasing mean head of labor. Although there are positive changes in aggregate labour force participation rates, age-specific

unemployment with regards to all measures of employment is still persistent, which shows that the school-to-work transition is still being faced. The results further indicate that the ageing culture in the workforce correlates with comparatively low levels of innovation in relation to the international standards. India has been registering a consistent rise in both R&D spending and patent applications but at levels of less than 2.5 besides the per firm rate of innovation is still lower as compared to that of other economies that boast of having a higher percentage of youth in their work force. These trends are reinforced with permanent skilled young labour migration implying under-exploitation of the home human resources given that the population demographics is favourable.

9.2 Key Conclusions

The paper concludes that the reduction of youth employment is a negative impact on the renewal of the workforce, flexibility in technology and future innovation ability in Indian companies. A low entry-level absorption within an organization leads to slowness in the pace of adopting new technologies and reducing outputs in terms of innovation compared to a youth intensive global organization. In the macro-level, the external migration of skilled young workers contributes even more to deter domestic R and D potential as it dilutes the benefits of the Indian demographic dividend. The data highlights that well-balanced workforce age dispensation instead of depending on lateral hiring only are important elements in maintaining innovations and competitiveness. Firms will lose out on systematic incorporation of young professionals, a factor that would encourage incrementalism and slow responsiveness to technological change.

9.3 Recommendations for Companies

The focus of structured recruitment at the entry level should be a priority by companies to restructure the campus hiring pipelines and to recruit a specified percentage of young professionals to join the company on an annual basis. This would offset the tendency to hire laterally and contribute to the renewal of the skills over the long-term. It is also important that organizations establish mentorship systems, which allow the cooperation of younger employees and their experienced work colleagues, providing them with the opportunity to exchange knowledge and continue innovation. Lastly, the entry-level upskilling must be invested in, especially within the spheres of digital, data, and emerging technologies, to be synchronized with the R&D approaches so that the benefits of age-diverse innovation teams could be optimized.

9.4 Recommendations for Policymakers

Policy-makers need to increase pressures to encourage formal youth employment and subsidize campus recruitment, apprenticeships, and skills-based hiring. Such actions would aid in enhancing the quality of the results of youth in the labour market and limiting overreliance on informal or gig jobs. Innovation results can also be further improved by the fiscal and regulatory incentives that will prompt and encourage the use of the workforce of age diversity. Along these lines, the results of the long-run effect of continuous youth emigration on local innovation potential can be partially counteracted through specialized diaspora involvement and return-migration efforts, so as to induce skills repatriation.

9.5 Future Scope for Research

The demographic situation in India has been favorable in terms of the continual influx of young professionals into the corporate organizations leading to the rise in productivity and renewal of the organization. The issue of youth employment has thus not been merely an issue of economic consideration, but also a strategic aspect of determining the level of innovation and competitiveness in firms. During the past years, however, changes in the hiring processes and employment patterns have cast doubt into the use of this demographic potential in the long term. These shifts are worth getting

into more detail, especially against the background of the swift technological progress and the development of business models.

Table 9.1: Actionable Roadmap

Stakeholder	Priority Action	Expected Outcome
Companies	Structured youth intake targets	Improved innovation outputs
Policymakers	Skill-linked hiring incentives	Reduced youth out-migration
Researchers	Longitudinal firm studies	Evidence-based policy design

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