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India: Keynes' Age Of Leisure And Ai's Impact On The Labour Market

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Abstract
Artificial Intelligence is a new age technology that is able to perform tasks expertly. This ability has lead to the common fear that humans will be replaced by AI, causing mass unemployment. This paper analyses the possibility of AI effecting the labour markets of India in the long-run and it evaluates Keynes' Age of Leisure from the perspective of India, topics that have yet to be explored thoroughly by academic literature. It aims to resolve any misconceptions one might have about the impact of AI on jobs. Evaluations are made using empirical discussions on the current literature and available labour market statistics of India. The Indian economy has 3 main sectors: the agricultural sector, manufacturing sector and the service sector. Each sector produces approximately 30% of the output of the country. The agricultural sector employs upwards of 50% of the labour force while the manufacturing sector and service sector employ approximately 20% each. Due to the nature of India having an extremely large informal economy, most workers are unable to employ AI due to insufficient funds and technological illiteracy. Furthermore, in India, most businesses are SMEs and over 75% of businesses in India employ 10 people or less. This makes it extremely inefficient to employ AI as the firms have a low production capacity which leads automation technology to be wasted. Currently, India's agricultural sector does not have the AI technology required to automate it and replace farmers. The service sector is highly diversified and largely requires human interaction(hospitality) which is unable to be replicated by AI. The manufacturing sector is effected by AI to the greatest extent of the three industries. The impacts are limited to industries that already rely on capital-based assembly line production processes. To conclude, AI will not have a large impact on the labour market of India in the near future and any jobs that AI replaces can be accommodated by reskilling of labour and new job availability due to AI implementation.

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I. Introduction

John Maynard Keynes. One of the most renowned and influential economists of all time. The father of Keynesian Economics authored a note titled: "Economic Possibilities for Our Grandchildren". Written in 1930, it envisages a bright future for mankind where work would no longer take precedence over all else. Individuals would be able to enjoy more leisure time and pursue other pursuits. The basic economic problem and basic needs satisfaction that has plagued humanity since its inception would no longer be a problem and people would thrive. Written almost 100 years ago, the period the paper speaks of as the far future has become the present. But, has what Keynes envisioned materialized? Do we enjoy the life that he imagined we would live? The first section of this paper aims to answer this question with a case study of India, the fastest growing economy in the world Sanyal(2024). Although the answer might seem simple, this paper will attempt to measure the progress of India in achieving each of Keynes envisioned goals for humanity, allowing us to get a better grasp on how far away we are from truly living the life Keynes visualized.

In Keynes' note, he foresees a world run by automation with the boon of technology. Today the pinnacle of this technology is Artificial Intelligence. The rise of AI has led to the emergence of a daunting question. "Will humans be replaced by artificially intelligent machines?"
This is the question that this paper aims to answer.

Labour markets are unique. They differ from nation to nation depending on the ratio of male to female employment, the unemployment rate, the size of the labour force, the average skill of the labour force, the prominent industries and sectors of the country, the per capita GDP of the country, etc. The effects of the introduction of new technology to the labour economy of a nation would vary depending on the multitude of factors. However, people have come to a consensus that low skill labour will be easily replaced by AI soon. This paper analyses this claim through the Indian labour market, a market defined by low skill and high informality.

II. Review Of Literature

To begin this paper, lets analyse the current literature available about the topics of AI, labour markets, the Indian labour market, Keynes' Possibilities for our Grandchildren, and the interplay between them. First, it is important to get a grasp on what labour markets are.

Kenton(2024) states that labour markets refer to the system of the supply and demand for labour. The employees or labourers provide the supply and the employers provide the demand. Like most concepts in economics, they can be analysed at macroeconomic(focused on the whole economy of a country) and microeconomic(focused on individuals and firms) levels. Analysis at the different levels provide insight into employment at varied scales. Labour productivity, working hours, unemployment rate and wages are some of the factors that are evaluated during a study of a labour market. I will use some of these factors as evidence to support claims made later in this paper.

Now that we have built a basic understanding of labour markets, lets briefly summarize what the first section of the paper will focus on: Keynes' Possibilities for Our Grandchildren.

Keynes(1930) envisions a future where technological advancements and economic progress alleviate the daily struggle for survival, liberating humanity from the shackles of scarcity. He predicts a shift towards a leisure-oriented society where individuals enjoy increased leisure time and pursue activities that augment lives beyond material accumulation. However, he warns that we could face potential challenges such as the erosion of traditional values and the a disproportionate distribution of wealth leading to the need for equitable distribution of wealth.

Over time, experts have begun to question whether Keynes' theory on leisure in the 21st century was true. This led to academic papers being written exploring the topic. One such paper was written by Raffaela Folgieri. According to Folgieri(2019), ongoing economic crises expose weaknesses in the global economic system which is heavily reliant on market fluctuations and geopolitical factors. As a result, unemployment is a major concern, particularly in economies driven by consumer spending and international finance. Folgieri aims to answer questions about the impact of technological progress, notably Artificial Intelligence, on unemployment rates. His analysis explores the link between technological advancement and employment, analysing the key economic themes implied with the advancement of technology. Folgieri concludes that a phenomenon called "jobless growth"(a state in which the output of an economy grows without generating additional jobs) in addition to other factors challenge Keynes' envisioned future.

Moving on from Keynes and his theories, we move to India where we have to explore the Indian labour market and its history. Romina Bandura and Casey Sword(2018) help us in our exploration with their paper: India's Future Workforce Trends: Challenges and Drivers. This paper is an overall analysis of the Indian labour market over the years. It discusses how it has adapted over time and how its various sub sectors behave. It aims to analyse its strengths and weaknesses and speculates what changes it might undergo in the future. The method of analysis is a combination of literature review and quantitative analysis. It concludes that India's challenges include high unemployment, high underemployment, large skill gaps, gender disparity and underdeveloped infrastructure, high income inequality and high informality. However, it doesn't fail to mention that India has numerous drivers which are government efforts to advance technology and AI, rapid urbanization, increasing number of youth entering the work force and growing aggregate demand. It is important to note that this paper will be referenced heavily in this paper hence it might prove helpful to read it before continuing.

Having looked through the past of India's labour market, looking at the present is the next step. Working Futures: The ILO, Automation and Digital Work in India by Filipe Calvao and Kaveri Thara(2019) help us learn about this aspect. This chapter takes a deep dive into the effects of new technology on the Indian labour market. The authors explore the possibility of capital- labour substitution in India as well as the new employment environment that has been created because of greater implementation of software in mediating work through literature analysis and empirical discussions. They found that it places special focus on non-standard employment in the Indian IT sector. They conclude that there is a high likelihood that employment environments will soon highly benefit employers and restrict the freedom and activity of employees (as discussed in examples of Uber and Air BnB). This implies that workers will be more pressured into accepting 'unfair' contracts due to the fear of being replaced by automation and AI. They support this claim by explaining that most sectors are likely to undergo labour downsizing with increased use of automation.

The previous paper introduces the nuanced employment relationship that has begun to be created due to technology, automation and AI in the labour economy. Flexibility, the 'gig economy' and the employment relationship by David Peetz takes a deeper dive into the subject. In this chapter, the Peetz(2019) explores the intersection of changing management structures and strategies with evolving trends in work. He inquires into how management responds to risks, cost pressures, and demands for accountability. He focuses on employers' pursuit of flexibility, its origins, and its impacts on employees. The growth of nonstandard employment, such as casualization and independent contracting is examined alongside disputes over whether these trends truly increase insecurity. Additionally, the impact of digital change on work and workplace relations is explored, including the

rise of freelancers and the gig economy. He concludes by stating that the gig economy brought up by integration of technology is a platform that promotes heightened flexibility of labour, income insecurity, minimal employee control, and barriers to labour organization because of a surge in freelance workers and employment.

In order to understand how AI can effect labour markets, we must first ask the question what AI and the 4th Industrial Revolution are and what they implicate. To answer this question Adhikari(2020) wrote a chapter titled Fourth Industrial Revolution: From Least Developed Countries to Knowledge Societies. This chapter seeks to explore the implications of a "4th Industrial Revolution" brought about by digital technology (including technology like AI which are structured on digital technology) in LDCs. It approaches this through an analysis based on the applications, accessibility, and affordability of digital technology in these nations. The chapter is structured in the form of a literature review. It suggests that AI will eliminate a number of jobs that require repetitive labour(such as assembly line workers, drivers, etc) but will create new jobs in the IT sector as well as those in creative industries. Furthermore, the chapter suggests that the service sectors in the impacted nations will emerge more prominent due to the inability of hospitality and good customer service to be replaced by AI.

Shiny object syndrome. A condition where someone focuses all their attention on something that is new and 'relevant. Are we looking at AI under the shiny object syndrome? Technology, Disruption, and Shiny Object Syndrome by James Andrew Lewis aims to answer this question. Lewis(2019) seeks to answer if markets and societies will adjust to digital technology and AI and will the "disruption" caused by it be both desirable and temporary. Lewis approaches this question by analysing digital technology, disruption caused by it and 'shiny object syndrome' through data analysis and theoretical discussion. His results supported the claim that digital technology is not unique. Society can adapt to it and receive its disruption in a positive manner.

Finally before moving on to the first section of the paper we will read through a paper about what threat AI may pose to jobs in the western world. In his paper, Cross (2023) answers questions about AI that include discussions ranging from its technical prowess to concerns about job loss and even some existential threats. Common sentiment states that while stock market surges due to AI reflect enthusiasm and an overall positive outlook on its use, there's apprehension that AI could exacerbate inequality by displacing middle-class jobs (especially repetitive and unskilled tasks). He states that contrary to most predictions, current AI's impacts on the labor market are minimal, demand for labor will remain high in the near future. Using data analysis and literature review as primary methods to explore his questions, he states that historical errors in forecasting technology's impact on jobs suggest an overestimation of AI's capabilities and an underestimation of human adaptability.

Through the literature review, one can notice a gap. When it comes to AI, there is little analysis of its impacts on India. As will be explored later in this paper, India has unique labour market whose conditions are not replicated by any other nation. Any analysis done on AI's impact done on the Indian labour market does not take into account its uniqueness and hence looks at it from a generic perspective. Most predict that India will face high labour substitution by AI in the near future. However, my paper disagrees with this claim and uses evidence to explain why India's labour market might not be as affected by AI as most believe. Furthermore, the paper adds a specific analysis of the current state of Keynes' Possibilities for our Grandchildren from the lens of India, a topic missing in academic literature.

III. Theory

Keynes Age of Leisure

Keynes (1930) speculated on the future course of economic development and the possibility of significant changes in society's relationship with labor and leisure. He brought up the term "age of leisure" - as technology advanced and productivity increased, countries would eventually be able to meet their basic demands with much less labour. He envisaged a future in which the pursuit of monetary prosperity and economic expansion were no longer the main goals of human endeavours. Instead, he proposed that people would have more spare time to engage in other activities, such as personal interests or hobbies, or cultural enrichment. His note can be characterized by 4 key ideas: automation and technological progress, satisfaction of basic needs, redefinition of the purpose of work, and cultural and intellectual enrichment.

1. Automation and Technological Progress: technological progress and automation would lead to increased productivity and efficiency in production processes of economies. This, in turn, would reduce the labor required to produce goods and services,thereby freeing up time for leisure activities.
2. Satisfaction of Basic Needs: in the future, societies would achieve a level of economic development that is adequate to satisfy the basic needs of their people, including food, water, shelter, sanitation and healthcare.
3. Redefinition of the Purpose of Work: the traditional notion of work to earn a living would become less central to human life. Instead, work would be viewed as a means to pursue personal fulfillment, creativity, and self-expression.
4. Cultural and Intellectual Enrichment: With increased leisure time, individuals would have the opportunity to engage in cultural and intellectual pursuits that were previously inaccessible due to time constraints. This could include activities such as reading, education, artistic endeavors, and participation in community life.

Now that the four central ideas of the Age of Leisure have been outlined, we can analyse weather or not Keynes was successful in predicting the future through the lens of India.

1. Automation and Technological Progress:

Over the last few decades, India has taken large strides in incorporating technology and automation in its production processes which has improved its efficiency significantly. PwC (2023) states that "India's manufacturing sector has seen a 20% increase in AI and machine learning (ML) adoption over the past two years, with 54% of Indian manufacturing companies using AI and analytics". Despite this progress in its manufacturing sector, India lags behind in adoption of automation in its agriculture sector which makes up approximately 45.76% of the total workforce according to Munda (2023). Currently, the nation machines that automate the farming process within farmers' small budgets financed by a monthly income of approximately only Rs. 10,000 according to Statista(2019). Hence, India has a difficult path ahead which involves overcoming challenges such as inadequate infrastructure, regulatory barriers, and skill shortages that hinder widespread adoption of automation technologies in Indian industries.

2. Basic Needs Satisfaction:

The satisfaction of basic needs is an issue that has plagued humans globally for centuries. It was highly likely that India, a country that gained independence from its colonial leaders in 1947 would be able to accomplish this goal within 100 years. Although it was unable to achieve this goal, The World Bank(2022) reports that India has made significant progress in reducing poverty levels over the past few decades. The poverty rate declined from 45.3% in 1993 to 12.92% in 2021 which indicates a large improvement in the provision of basis needs for the population. However, the poverty rate is still relatively high with over 100 million people residing under the poverty line. This indicates that their basic needs haven't been satisfied and that they face challenges related to basic food, healthcare, and sanitation, particularly in rural areas. According to the Global Hunger Index(2023), India ranked 111 out of 125 countries, having the implication that there is serious issue in the level of hunger and food insecurity which has yet to be resolved. Hence India has yet to achieve Keynes' envisioned future of complete satisfaction of basic needs.

3. Redefining the Purpose of Work:

India has a labour market centered around the values of hard work and traditional work. This is reflected in the large amount of unskilled labour in the economy as well as its agricultural sector. This has led to an overall stagnant view on the purpose of work. It remains as an indicator of respect from society and its primary role is to earn an income. PLFS(2023) states that labour force participation has increased in both genders. The male participation rate increased from 68.6% in 2017-2018 to 73.5% in 2022-2023 and the corresponding increase in participation rates for females was from 19.2% in 2017-2018 to 30.0% in 2022-2023. This increase suggests an increased importance given to employment which contradicts Keynes' prediction that work would no longer play a vital role in society. However, India has displayed a shift in some of its employment to 'less traditional' forms of work such as freelance and gig economy-based opportunities. Rao et al (2022) state that in 2020–2021, 7.7 million workers were employed in the Indian gig economy (1.5% of the total workforce in India). They expect the gig workforce to expand to 23.5 million workers by 2029–2030. Additionally, initiatives promoting entrepreneurship and skill development aim to foster a culture of innovation and self-employment which is slowly shifting the purpose of work towards fulfillment.

4. Cultural and Intellectual Enrichment:

India has undergone significant growth in sectors related to cultural and intellectual enrichment, such as education, media, and entertainment. However, as discussed above, there has not been an increase in leisure time as predicted by Keynes. Hence, although creative industries have grown, the proportion of time spent by the average man on cultural and intellectual enrichment has not increased.

IV. Empirical Discussions

Indian Labour Market:

The Indian labour market can be deemed unique when compared to the labour markets of nations with comparable GDPs. This can be partially attributed to its low GDP per capita of approximately $2400. This is an extremely low figure and lands India at the 140th spot on the ranking of GDP per capita around the world (World Bank, 2022). This figure is caused due to the following reasons: large population, major income inequality, large informal economy, bureaucratic red tape and dependency on agriculture.

When we look at India's main sectors, we observe that the service sector makes up approximately 50% of the GDP while the manufacturing sector makes up 26% and agriculture sector make up approximately 17% according to O'Neil (2024). Over the last 5 years, India has seen a trend of consistent growth in its manufacturing

sector which has been bolstered by government policies such as the Make in India Movement and Special Economic Zones tailored to benefit manufacturing firms in India. India has also worked towards expanding its service sector through promotion of tourism.

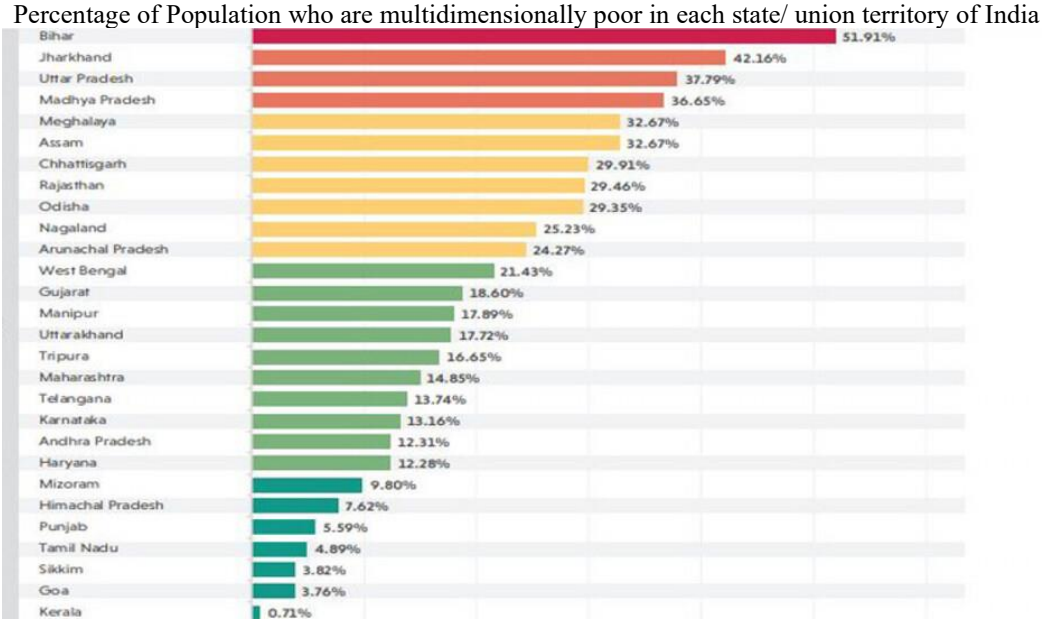
As of 2017, India had a labour force of 520 million people and was defined by high informality Bandura(2018). This sector encompasses various types of employment, including street vending, small-scale manufacturing, domestic work, agriculture, construction, and services such as transportation and small retail businesses.

Limited formal job opportunities and jobless growth: The formal sector in India is often unable to generate enough employment opportunities to absorb the growing workforce. As a result, many people turn to the informal sector for jobs to sustain their livelihood.

Low barriers of entry: The informal sector typically has low barriers to entry, requiring minimal capital, skills, or formal education. This makes it accessible to a wide range of individuals, including those with limited resources or qualifications. This plays an especially large role as according to Fig.1 India has a large, impoverished population with access to limited resources and education.

Fig 1.

Percentage of Population who are multidimensionally poor in each state/ union territory of India



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Lack of Enforcement of Labor Regulations: Enforcement of labor laws and regulations are often weak in the informal sector, allowing businesses to operate without adhering to minimum wage laws, safety standards, or other labor protections. This can lead to exploitation and poor working conditions for workers. While improvements have been made in recent years, labor regulations in India have historically been perceived as cumbersome and restrictive, particularly for businesses operating in the formal sector. According to the World Bank's Ease of Doing Business Index, which measures the ease of starting and operating a business in different countries, India has shown progress in certain areas but continues to face challenges regarding labor regulations. In 2019 India was ranked 63rd World Bank (2020), a great improvement from being ranked 142nd in 2015 according to World Bank(2016). The specific indicator related to the ease of employing workers, which measures factors such as flexibility in employment contracts, redundancy procedures, and difficulty of hiring and firing workers, sheds light on the issue.

Despite efforts to streamline regulations, India's ranking in the "Ease of Doing Business" index with respect to employing workers has been relatively low compared to other aspects of business regulation. According to World Bank (2022a), India ranked 103 out of 190 countries in the ease of employing workers indicator. This indicates that businesses in India may encounter obstacles related to labor regulations, which can affect their operations and decision-making processes. The challenges posed by labor regulations can incentivize businesses, particularly small and medium enterprises (SMEs), to operate in the informal sector where enforcement is less stringent. In the informal sector, businesses often evade formal labor regulations, including minimum wage laws and employment benefits, to reduce costs and bureaucratic hurdles.

Informal Social Networks: Informal networks and relationships play a crucial role in facilitating employment opportunities within this sector. Many informal jobs are acquired through word-of-mouth referrals

or connections within communities or social circles. This is a factor especially prevalent in India as people have a high tendency to work in their family business or are often referred to jobs in the informal sector by friends and family who have acquaintances employed there.

3/4th of the employment in India is in small establishments of 10 people or less Bandura (2018). Furthermore, majority Indian employment is characterized by work that Is low paying and highly unproductive. The working age population is growing at a rate of 16 million people per year while employment (measured by the Labour Bureau of India) has been growing by only 2 million Bandura (2018). As a result, the employment elasticity of output(Employment elasticity is a measure of the percentage change in employment associated with a 1 percentage point change in economic growth.) is decreasing and those in the labour force have no choice but to participate in low paying jobs.

Artificial Intelligence

Artificial intelligence (AI) is the simulation of human intelligence and problem-solving capabilities by computer systems. These processes include learning (the acquisition of information and the rules for using it), reasoning (the application of rules to obtain approximate or definite conclusions), and self-correction IBM(2024).

The Fourth Industrial Revolution:

World Economic Forum(2016) The Fourth Industrial Revolution (4IR) is a term being used by experts to describe the ongoing transformation of the way we live, work, and interact due to advances in technology. Before we discuss the Fourth Industrial Revolution, it is important to understand the development of technology and the 'revolutions' that have preceded the one we face today.

The First Industrial Revolution began in the late 18th century, with the mechanization of textile manufacturing and the introduction of steam power. It facilitated the transition of rural economies to industrialized ones.

The Second Industrial Revolution, occurred in the late nineteenth and early twentieth centuries, was marked by advances in steel production, electricity, and mass production processes. It aided the growth of industries and transportation networks.

The Third Industrial Revolution began in the second half of the twentieth century with the introduction of digital technology, telecommunications, and the internet transforming communication, automation, and information processing.

Coming back to the present, the Fourth Industrial Revolution is a new period of technological progress marked by the integration of digital, physical, and biological systems. The key technologies fueling this shift are: Artificial Intelligence (AI) and Machine Learning, Internet of Things (IoT), Robotics and Automation, Biotechnology and Genetic Engineering, Advances in materials science and Blockchain and Distributed Ledger Technology (DLT). It is transforming industries, economies, and societies by accelerating digital transformation across industries, developing new business models, and challenging established forms of production and consumption. While it offers huge opportunities for innovation, economic growth, and societal advancement, experts warn it also poses issues such as employment displacement, privacy, cybersecurity, and ethical concerns.

AI in the Labour Market

The current penetration of AI in the labour market can be broken down into 3 main sections: the automation of tasks, the augmentation of human abilities and impact on traditional industries.

AI technologies, including machine learning and robotic process automation (RPA), are increasingly being used to automate routine and repetitive tasks across industries such as manufacturing, retail, finance, and customer service. According to the World Robotics Report (2023) the number of industrial robots deployed worldwide increased by 12% in 2020, despite the challenges posed by the COVID-19 pandemic. This indicates a growing trend of automation in manufacturing and other sectors. This automation has implications for jobs that involve predictable, rule-based activities, potentially leading to job displacement for some workers. According to McKinsey Global Institute (2015), about 45% of the activities individuals are paid to perform can be automated by adapting currently demonstrated technologies. This includes routine physical and cognitive tasks across various industries.

AI is also being used to enhance human capabilities rather than replace them entirely. In many cases, AI systems are used to assist workers in performing tasks more efficiently and accurately. For example, AI-powered tools can analyze large datasets to provide insights and recommendations to workers who are the decision-makers. The use of AI-powered virtual assistants and chatbots is becoming increasingly common in customer service. According to Grand View Research(2022), the global chatbot market size was valued at USD 2.9 billion in 2020 and is expected to grow at a compound annual growth rate (CAGR) of 24.3% from 2021 to 2028. In healthcare, AI technologies are being deployed to assist medical professionals in tasks such as medical imaging analysis, drug discovery, and personalized treatment planning. For example, Rajpurkar et al (2022) demonstrate that an AI

system could diagnose certain medical conditions from medical imaging with a level of accuracy comparable to human experts.

Traditional industries such as manufacturing, transportation, and logistics are experiencing significant transformations due to AI adoption as replacement of labour(automation) and enhancement of labour productivity. IFR(2020) reports that industries such as automotive, electronics, and metalworking are the largest adopters of industrial robots. For example, the automotive industry accounted for 33% of total robot installations in 2020, followed by the electronics industry at 32%. AI technologies are optimizing supply chain operations, improving predictive maintenance of equipment, and enabling the development of autonomous vehicles and drones. While these advancements increase efficiency and reduce costs, they also make reskilling and upskilling of the workforce necessary to remain competitive in the evolving labor market. According to World Economic Forum(2020), 50% of all employees will need reskilling by 2025 as the adoption of AI, automation, and digitization accelerates. The report emphasizes the importance of upskilling initiatives to prepare the workforce for the jobs of the future.

Predictions

I predict that AI will not have a major impact on the Indian labour market in the near future. India's economy has 3 cornerstones. They are its manufacturing sector, service sector, and its agricultural sector. As mentioned above, over 90% of India's employment is in the informal sector. This statistic is even larger for the agricultural sector of India.

The agricultural sector is largely private, with plots of land being owned by individuals and not the government. In the agricultural sector, India does not have large enterprises that supply crops to the nation but instead has hundreds of thousands of self- employed farmers that have middle to low income(only Rs.10,000 per month) Statista(2019). Despite advancements in AI and agricultural technology, many smallholder farmers (defined as those marginal and sub-marginal farm households that own or/and cultivate less than 2.0 hectare of land - constitute about 78% of the country's farmers Food and Agriculture Organization of the United Nations (2003)) in India have limited access to these technologies due to factors such as affordability, infrastructure constraints, and digital literacy barriers. The adoption of AI in agriculture would require significant investment in rural infrastructure and capacity-building initiatives(capacity-initiatives help increasing production capacity of farms) to ensure that farmers can effectively utilize these technologies.

When AI technology is employed by firms, its intention is to increase efficiency and productivity with the goal of profit. The key decision makers of such firms are willing to sacrifice their labour and switch to capital intensive production methods on a large scale. In 2020, MSN was reported to have layed off dozens of journalists with the intention to replace them with AI O'Sullivan(2024).Another CEO of a startup in India called Dukaan laid off 90% of his work force and replaced them with AI-chatbots Cooban(2024). Indian agriculture is predominantly labor-intensive , with a significant portion of the population engaged in small-scale farming and manual labor. Unlike industries that are highly automated and capital-intensive, the agricultural sector relies heavily on human labor for tasks such as planting, harvesting, and tending to crops. Furthermore, the use of AI expert systems on such small scales would prove highly inefficient and very costly without being able to provide justifiable returns. While AI technologies may enhance certain aspects of agricultural production, such as precision farming(ensuring that crops receive exactly what they need to be at optimal health) and crop monitoring, they are unlikely to fully replace the need for human labor, especially in smallholder farming operations.

Furthermore, India's agricultural landscape is characterized by diverse farming practices, crops, and agro-climatic zones. For AI to be successfully adopted into the industry they must be tailored to suit the specific needs and conditions of different regions and crops. This diversity presents challenges for the widespread implementation of AI-driven automation, as solutions need to be adaptable and scalable across various contexts.

Moving on to the Indian service sector, the impact of artificial intelligence (AI) on the Indian service sector will not result in major unemployment. While concerns have been raised about the displacement of human workers by AI-driven automation, the following factors are why I believe that AI will not lead to widespread unemployment in the service sector. Firstly, the Indian service sector is characterized by a diverse range of activities, including IT services, business process outsourcing (BPO), healthcare, education, tourism, hospitality and financial services. Many of these service activities involve tasks that require purely human traits such as creativity, empathy, and cognitive skills. These are difficult to replicate adequately with current AI technology. Moreover, the service sector in India is highly labor-intensive (it employs 30.7% of the Indian population NEXT IAS(2023)), with a large workforce employed in areas such as customer support, software development, retail, and administrative roles. While AI has the potential to automate certain repetitive tasks and enhance efficiency in service delivery, it is unlikely to fully replace the need for human labor, particularly in roles that require complex problem-solving and interpersonal communication in the near future.

Additionally, much like the agricultural industry, the service sector also faces a high degree of informality which poses the challenge of affordability and lack of digital literacy in the industry. According to

RisingMax(2024), the cost of AI can range from $20,000 to $15,000,000 based on the size of manpower that is being hired to build the AI system. The cost of AI may also range depending on the complexity of the system required, ranging from $15,000 to $100,000 with the manpower being kept constant. This would serve as a large obstacle preventing AI from being integrated into the sector.

Furthermore, the adoption of AI in the Indian service sector is expected to create new job opportunities. AI-driven technologies such as chatbots, virtual assistants, and data analytics tools can improve human capabilities and service quality. This would lead to increased demand for skilled workers who can develop, deploy, and manage these technologies. Additionally, the Indian government and industry players have recognized the importance of investing in AI education and training initiatives to equip the workforce with the necessary skills to thrive in an AI-driven economy. Microsoft announced that it aims to equip over 2,000,000 workers in India with AI skills by 2025 TheHindu(2024). The Indian government has also announced a free AI training program that supports skill development in programming and machine learning Indiaai(2023).

Lastly, the manufacturing sector of the Indian economy. Of the three main sectors, AI is likely to have the most disruptive impacts on the manufacturing sector. The manufacturing sector in India is known for its significant reliance on labor-intensive processes, particularly in small and medium enterprises (SMEs) and traditional industries such as textiles sector, plastics, footwear, auto components, sports goods and agri/food processing which make up a large proportion of the manufacturing sector's output PIB(2022). While AI technologies offer opportunities for improved automation and efficiency, the widespread adoption of advanced robotics and AI-driven automation remains limited due to factors such as affordability, scalability, and compatibility with existing infrastructure.

Furthermore, the Indian manufacturing sector has structural hurdles like skill shortages, which limit the rate and scope of AI deployment. While large-scale firms may have the resources and capacity to engage in AI-driven automation, SMEs and informal enterprises, 96% of all industrial units in India belong to SMEs Tambe(2024), may lack the financial means and technical knowledge to apply such technology. Furthermore, the Indian government's emphasis on initiatives such as "Make in India" and industrial policy reforms emphasizes the necessity of supporting labour-intensive manufacturing and job development may subtly promote human labour over broad automation. This may further slow the penetration of AI in the Indian manufacturing sector.

Additionally, AI technologies in manufacturing are often designed to complement human labor instead of replacing it entirely. Collaborative robots (cobots) and AI-powered tools enhance the productivity and safety of manufacturing processes by working alongside human workers. Furthermore, the successful integration of AI in manufacturing requires investment in workforce training and upskilling initiatives to equip workers with the skills necessary to operate, maintain, and adapt to new technologies. By fostering a culture of innovation and human-AI collaboration, the manufacturing sector in India can harness the potential of AI to drive productivity, quality, and competitiveness while preserving and creating employment opportunities for its workforce.

V. Conclusions

Keynes' Possibilities for Our Grandchildren:

Through our analysis we can conclude that Keynes' Age of Leisure is inaccurate when being compared with the current situation of India. We can observe progress in the satisfaction of basic needs and automation of production but it is highly unlikely that the two goals will be achieved to the extent described in the Age of Leisure in the future due to prevailing high rates of income inequality in the nation(WID (2023) states that in 2022-23, 22.6% of national income went to just the top 1%) and low technological literacy rate. Contrary to Keynes' predictions, India has moved further away from the goal of the redefinition of work as labour force participation rates have increased. As a nation with a high illiteracy rate, one of the main goals of the government is to create a more educated population and a skilled workforce. Even with employment trends showing shifts towards freelance work and 'gig' economy style employment, it is very unlikely that India will see a change in attitude towards jobs in the future. Lastly, although there has been evidence to suggest that there has been growth in creative industries of India, they cannot be attributed to increased leisure and proportion of time spent on other pursuits(not employment) as average leisure time has not increased. Instead this could be viewed as a setback for India in terms of Keynes' indicators for his envisioned life for humanity as growth of creative industries could indicate the commercialization of such creative pursuits which would make it more difficult to "redefine work".

AI in the labour market of India:

In conclusion, the impact of artificial intelligence (AI) on the Indian labor market, is likely to be gradual rather than immediate and disruptive. The complexities of each sector present distinct challenges for the widespread adoption of AI-driven automation.

Starting with agriculture, the predominance of smallholder farmers and the labor-intensive nature of farming operations suggest that AI technologies, which may be promising in certain areas like precision farming and crop monitoring, are unlikely to fully replace human labor in the near future due to affordability issues and

lack of available infrastructure to adopt AI. The need for tailored solutions and significant investments in rural infrastructure and capacity-building initiatives further underscore the challenges of integrating AI into this sector.

Moving to the service sector, although AI has the potential to automate repetitive tasks and enhance efficiency, the diverse range of activities and the importance of labor-intensive roles requiring human traits like creativity and interpersonal skills suggest that AI will complement rather than replace human workers. Moreover, affordability and digital literacy barriers pose additional obstacles to widespread AI adoption in this sector.

Lastly, in manufacturing, while AI offers opportunities for improved automation and efficiency, its adoption remains limited by factors such as affordability, scalability, and compatibility with existing infrastructure, especially in SMEs and traditional industries. The emphasis on supporting labor-intensive manufacturing and job creation through existing initiatives may further delay the broad penetration of AI-driven automation.

Limitations of the Paper:

The data used in this paper is not always up to date and could hence result in inaccuracies when depicting trends. Furthermore, this paper is based mainly on theoretical analysis with speculation instead of heavy reliance on raw data which was unavailable for this subject. There were an extremely limited number of studies that connected AI to the Indian labour force which has prompted me to make connections and correlations with data from different sources to make arguments. The lack of this data may have resulted in an untrue precedence upon which my predictions were made. Lastly, I was unable to gain access to the latest information on AI development in specific to India which may have lead to false claims about the inability of integrating AI in the 3 main sectors of the Indian economy.

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