AUTOMATION AND LABOUR IN INDIA: POLICY IMPLICATIONS OF JOB POLARISATION PRE AND POST COVID-19 CRISIS

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ABSTRACT

This paper traces the conceptual evolution of job polarisation owing to automation and investigates it in the Indian context. India has been plagued by jobless growth and has witnessed jobless recoveries after recession, and this proclivity of Indian industries to substitute capital for labour raises social and public policy concerns. The ongoing COVID-19 pandemic has only further polarised jobs by pushing salaried employees into informal or agriculture-related jobs, and although numerous sectors have roughly regained their pre-pandemic economic position, workers who lost their jobs have not re-entered the workforce, signalling a jobless recovery. Additionally, the pandemic is set to catalyse automation due to multifarious reasons. Taken together, if deliberate attempts are not made to facilitate labour force participation and devise social policy, millions of Indians who became jobless due to the pandemic may find that their jobs have been automated.

Keywords: Automation, Job Polarisation, Labour, COVID-19, India

1. Introduction

Improvements in information communication systems that characterise the 3rd industrial revolution have resulted in a paradigm shift, leading to the same often being dubbed as the 4th industrial wave (Tandem Research, 2018) and having

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catapulted automation of labour. Such automation has led to a concerning phenomenon known as 'job polarisation'. This phenomenon involves the hollowing out of mid-skill jobs with a relative increase in the demand for low- and high-skill jobs (Acemoglu and Autor, 2011). Job polarisation naturally results in wage polarisation and widening of existing inequalities.

Advocates of automation have claimed that automation of labour would follow a Schumpeterian trajectory and that even if jobs are lost or polarised in the short-term, the evolving system will eventually provide newer and better job opportunities as a whole (The Economist, 2019). However, empirical evidence globally (Acemoglu and Restrepo, 2020) and from India (Tandem Research, 2018) suggests that firms have been merely replacing labour with capital, without any greater productivity goals.

Moreover, the ongoing health crisis (COVID-19) is expected to cause recession in India (BBC, 2020). Period revolving recessions has been shown to accelerate automation, resulting in a jobless recovery (Jaimovich & Siu, 2018). In India, over 12 crore Indians have lost their jobs (Vyas, 2020a), and an overwhelming number of these jobs can be automated (CSLF, 2020). We must be prepared for a situation wherein individuals who became jobless due to the COVID-19 crisis will not be able to re-enter the workforce as their jobs would be automated.

This paper attempts to understand the conceptual framework of job polarisation owing to automation and recessions, the state of automation-induced job polarisation in India, the impact of COVID-19 on this phenomenon, and the policy implications that have arisen from this problem.

The paper is organised into the following sections. Sections 2 and 3 discuss job polarisation as it has existed globally and in India. Section 4 seeks to understand how the COVID-19 crisis would impact automation and labour. Section 5 discusses policy implications that have arisen in India from this problem.

2.   Conceptual Framework of Job Polarisation

Job polarisation is used to indicate a drop in demand for mid-skill jobs, with a simultaneous increase in demand for high- and low-skill jobs, which results in the 'hollowing out' of mid-skill jobs (Jaimovich & Siu, 2018). Job polarisation linked to automation has been empirically observed in the USA (Acemoglu and Autor, 2011; Jaimovich and Siu, 2018); UK, Sweden, and other European Countries (Petropoulos, 2018), and even in developing countries such as Brazil and Colombia (Kuriakose & Iyer, 2018).

2.1 Canonical Method and Task-Based Analysis

Traditionally, any impact of automation on labour was analysed by considering

whole occupations such as bankers, IT professionals, machine operators and so on as the unit of analysis. These were further ranked as per skill levels (high, medium, and low). However, this method was unable to provide required explanations, such as how exactly automation interacts with and affects labour. Acemoglu and Autor (2011) conceptualised an innovative and revolutionary framework for understanding how automation interacts with various aspects of labour and results in polarisation. In their framework, jobs are not considered as strictly comprising of a single function or role, as was previously understood. Rather, they are considered as often made of multiple *tasks.* They termed this a 'task-based model' and held that tasks are fundamental units of jobs, and accordingly, every job can be broken down into various tasks to better analyse the effect of automation on them. Based on their repetitiveness and cyclical nature, tasks are categorised into two broad groups: routine and non-routine tasks. These tasks are further classified into mechanical and cognitive tasks, based on the complexity of the task involved (Table 1).

The aforementioned studies pertaining to empirical evidence on automation-induced job polarisation have reaffirmed the findings of Acemoglu and Autor (2011) that automation primarily displaces routine-based jobs. Depending on the tasks that comprise a given job, one can determine the skill level required. Routine tasks, whether cognitive or manual, both overwhelmingly constitute mid-skill jobs. On the other hand, automation augments the functioning of non-routine jobs that comprise low- and high-skill jobs.

Table 1: Occupational Typology

Repetitiveness/Complexity	Manual	Cognitive
Routine	Assembly-line	Clerical, Sales
	Middle Skill Substitutive Effect	Middle-Skill Substitutive Effect
Non-Routine	Personal Services, Security	Managerial, Creative
	Low-Skill Limited Effect	High-Skill Complementary Effect

Source: (Kuriakose & Iyer, 2018)

The twin effect of automation, that is, substituting routine tasks while simultaneously augmenting non-routine tasks, results in the hollowing out of mid-skill jobs and leads to job polarisation (Acemoglu & Autor, 2011).

3. Job Polarisation in India

3.1 Economy at a Glance

In a comprehensive study, Sarkar (2018) used National Sample Survey Office

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(NSSO) employment data covering 270 occupations in urban India from 1983–84 to 2011–12 to arrive at few key observations. First, a strict distinction exists between industries that generate output and ones that provide employment, which has had a role in shaping the demand for routine and non-routine jobs.

Second, the demand for routine tasks has dropped considerably and is attributable to the susceptibility of routine tasks to automation. Consequently, wages for low- and high-skill labour have increased from 1990 to 2010; whereas those for mid skill labour have declined after 1999, signalling a drop in the relative demand for mid-skill jobs resulting in wage polarisation associated with job polarisation.

Vashisht and Dubey (2018) reaffirmed the findings of Sarkar (2018) and furthered the understanding by stating that the demand for labour skilled in non-routine tasks increased substantially at the turn of the century, with a fourfold increase in the demand for labour skilled in non-routine cognitive tasks.

While these studies broadly highlighted automation-induced job polarisation in India, the effects would be better understood if we look at the manufacturing sector.

3.2 Manufacturing

Using NSSO employment data from 1993–94 to 2011–12 in the manufacturing sector, Vashist (2017) found a sharp decline in the share of routine-based occupations in total manufacturing jobs. He then noted that this decline in the demand for mid-skill routine jobs has been met with an increase in the share of low- and high-skilled workers in the aggregate labour composition. Vashisht (2017:8) states that, the share of both skilled- and unskilled-intensive occupations has increased at the cost of middle-level skill-intensive occupations such as machine operators, clerks and craft-related workers. The share of machine operators, clerks and craft-related occupations, which are generally concentrated at the middle of the skill distribution, has come down from 76.5% in 1993-94 to 70.2% in 2011-12. Their wage share, too, has come down from 70% in 1993-94 to 59.4% in 2011-12.

Apart from the manufacturing sector, increasing automation of routine-based jobs has been observed in industries such as automobiles, pharmaceuticals, IT services, agriculture and food processing, and textiles (ILO, 2018a).[1]

3.3 Persistence of Routine Tasks

A deviation from job polarisation observed in other economies is that, in India, routine jobs have managed to persist at a higher level than expected (Kuriakose and Iyer, 2018; Vashisht and Dubey, 2018). Kuriakose and Iyer (2018) argued

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1   For an updated, quantitative and tasked-based study on the effects of industrial robots on India's industries (albeit predicated on only one form of automation), see Mani (2019).

that routine task-intensive jobs have persisted in India for two reasons, neither of which are directly related to automation or technology. First, an oversupply of educated labour (secondary and tertiary education) has pushed educated workers who would find themselves in mid-skill jobs into low-skill jobs, and this has incentivised employers to employ well-educated labour for automatable tasks. Second, building on Sarkar (2018), the authors stated that labour-intensive industries, such as paper and textiles, continue to overwhelmingly comprise of routine-intensive jobs and labour continues to have a competitive edge owing to abysmally low wages in India.

3.4 Social Class and Task Profiles

Automation has the potential to bring in several new opportunities ripe for exploitation, and well-equipped people have already been reaping the new found opportunities. India is the largest supplier of online labour, accounting for 24% of the global supply (The iLabour Project, 2017).

However, (Vashisht & Dubey, 2018) found that jobs comprising non-routine cognitive tasks (high-skill, high-wages) are largely occupied by people belonging to socially forward castes. On the other hand, routine and non-routine manual task-intensive jobs (med- to low-skill) overwhelmingly comprise people belonging to backward classes (ibid.). An explicit example is the case of manual scavenging in India. First, technology to automate this task does exist (Tandem Research, 2018). Second, contracting workers to undertake manual scavenging is illegal. Despite this, prevalence of caste and other social relations has prevented the automation of this job.

Because mid-skill jobs often represent upward social mobility and an escape from poverty, many rural people in India aspire to occupy mid-skill formal jobs, which would increase the demand more than supply. As automation results in the substitution of manual task-intensive labour, the widening wage gap between high-skill and low- to mid-skill workers will exacerbate existing inequalities.

3.5 Trends Ahead

Studies have indicated that job polarisation is expected to rise. A total of 65% of global IT services and business processing is outsourced to India, chiefly comprising of jobs which are estimated to be automated by 2030 (Business Line, 2018). Moreover, 60% of the jobs in India's formal employment structures are routine jobs that are susceptible to automation (ILO, 2018b), and a whopping 69% of jobs in India are under threat from automation (World Bank, 2016).

3.6 Market and Socially Desirable Automation

Firms are often assumed to only opt to automate when the gains in efficiency far outweigh the costs of continuing with labour. Moreover, this substantial increase in efficiency increases the economy's overall productivity, creating

new jobs as economies evolve. Such an understanding is based on Schumpeter's (1943:83) famous words "process of industrial mutation—if I may use that biological term—that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one. This process of Creative Destruction is the essential fact about capitalism."

In such a system, automation may destroy jobs, but it will open new sectors and opportunities, creating new jobs. Acemoglu and Restrepo (2019) termed this as the *reinstatement effect* of automation, wherein the productivity of such technology is so high that displaced labour is reinstated in new forms within the economy.

If firms bring in technology that only substitutes existing labour and does not raise overall productivity, the displacement effect of automation would manifest in 'technological unemployment' (as termed by Keynes (1930)), that is, labour redundancy caused by the inability to generate new jobs at a rate faster than the rate at which technology substitutes labour.

The real situation is grim. Increasing evidence shows that firms have been automating job profiles to merely substitute labour globally (Acemoglu and Restrepo, 2020) and in India (Tandem Research, 2018). This is corroborated by the fact that labour productivity has remained largely stagnant for almost 60 years now (Mohan, 2017).

This gives rise to a few important concerns. First, the mere replacement of labour with automation decreases the share of workers at the original level of overall earnings; essentially, this is always observed with automation aimed at substituting labour as the number of workers engaged declines. Second, considering that automation in most probability will lead to at least some marginal improvements (but not so high productivity as to generate sufficient new opportunities), the increment in earning is now shared between an even smaller section of the society.

The question that next arises is whether the market is able to deliver socially desirable automation technology? Acemoglu and Restrepo (2020) noted that when multiple competing paths are available to automation, the market tends to become parochial and bandwagons on the most dominant path. Nothing guides the firms to pursue the 'right' or 'correct' technological paradigm, and considering the dynamic and yet to be understood 4th industrial wave, 'our trust in the market mechanism of getting it right should be even lower'(Acemoglu and Restrepo, 2020:31).

For technological progress to be productive enough to create additional jobs is not necessarily an economic need, but an equity-based social need. Such a need does not steer the market, which is hence not averse to merely substituting capital for labour. This is in line with the traditional understanding

that the efficient allocation of resources can, and often is, mutually exclusive to distributional concerns or how the pie is shared.

The foregoing clarifies that automation can have debilitating effects on existing labour structures, such as inter alia, lower labour shares, and increasing wage inequality.

4. Automation after COVID-19

Before the COVID-19 health crisis, almost all global research relied on studies based on trajectories. The crisis has left millions of people jobless, with an astonishing 122 million Indians having lost their jobs in the month of April 2020 alone (Vyas, 2020a). Moreover, industries affected by COVID-19 were considered susceptible to automation even before the crisis (CSLF, 2020). In addition, changes in attitudes and social dynamics, which prefer physical distancing and reduced human contact could potentially increase the rate of automation. This section highlights the concern that a substantial portion of the labour, which was rendered jobless due to COVID-19, will discover that their jobs have been automated.

4.1 Recession and Jobless Recoveries

Jaimovich and Siu (2018) investigated the interplay between job polarisation and jobless recoveries, and obtained extremely crucial findings. Jobless recovery is a phenomenon revolving recessions wherein recovery of the economy from a slump does not result in a recovery in aggregate employment levels. In other words, although the economy as a whole recovered to pre-recession levels, there is no corresponding recovery in the number of jobs lost to the recession.

The authors found that over the last three recessions in the USA, a shocking 88% of jobs lost comprised routine tasks, indicating that recessions primarily result in the deletion of routine-based jobs. They also concluded that jobless recoveries are intrinsically linked to job polarisation, since automation of routine mid-skill jobs results in, if not an increase in the relative demand for high- and low-skill labour, a hollowing out of mid-skill workers.

4.2 Jobless Recovery and Growth in India

4.2.1 Pre-COVID-19 crisis

The situation in the Indian landscape is not any better. First, India's developmental trajectory has been inundated by *jobless growth*. Employment elasticity during 1970–80s was approximately 0.5 − a GDP growth of 3% – 4% increased employment levels by 2% (Azim Premji University, 2018). In the last two decades, especially during the 2000s, while GDP grew at roughly 7%, aggregate employment only witnessed an increase of ≤1% (ibid.). Presently, employment elasticity stands at <0.1, requiring GDP to grow at an enormous

10% for employment to grow by 1% (ibid.). The relevance of this development to the research at hand is as follows: during this period, while capital has ostensibly boosted the economy, it has also demanded a higher share in the income generated. The tussle between automation and labour is, in fact, a continuous battle against capital's propensity to substitute labour.

Figure 1: Capital– Labour Ratio in Income Share (%)
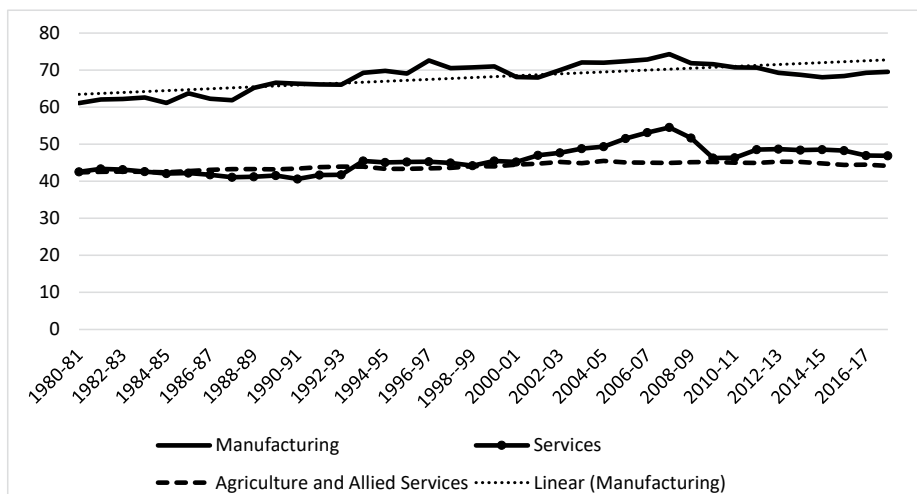
Source: (RBI, 2020)

The capital–labour ratio (in income share and unit-wise addition) has been steadily increasing since the 1980s (Figure 1 and Table 2). While this does not necessarily indicate increased automation, it does highlight Indian industries'tendency of attaching greater importance to capital than to labour. If such a model is not tempered and allowed to be pursued relentlessly, firms would automate processes without any heed to increasing overall productivity, thereby neglecting efficiency gains that have the potential to generate new employment opportunities.

Table 2: Growth in Capital Stock and Employment

Sector ↓	Growth from 1980–2017 →	Growth in capital stock	Growth in number of people employed
Manufacturing		14.6 times	1.8 times
Services		8.6 times	3.2 times
Agriculture and Allied services		3.7 times	0.99 times

Source: RBI, 2020.

Second, jobless recovery after recession can be observed in the Indian context. The following figures exhibit that while industrial activity (in terms of Index of Industrial Production (IIP)) picked up again after the globally induced

2008 recession in India (Figure 2), unemployment levels did not cease to rise (Figure 3).

Figure 2: IIP 2008-2013

Figure 3: Unemployment Rate 2008-2013
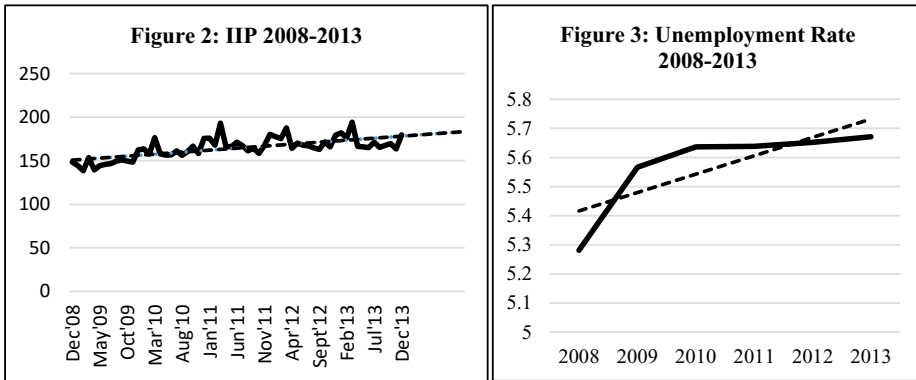
Source: IIP –(MOSPI, n.d.); Unemployment – (World Bank, n.d.).

4.2.2 Jobless recovery during COVID-19

Jobless recovery of the economy can also be observed in the ongoing pandemic in quantity and especially in quality. Imposition of stringent lockdowns resulted in a mind-boggling loss of 122 million jobs in April 2020 (Vyas, 2020a). In the following months, approximately 110 million jobs were restored (Figure 4). In other words, while industrial activity regained its pace, about 12 million Indians were still out of the workforce.

Figure 4: Unemployment and Industrial Production during COVID-19
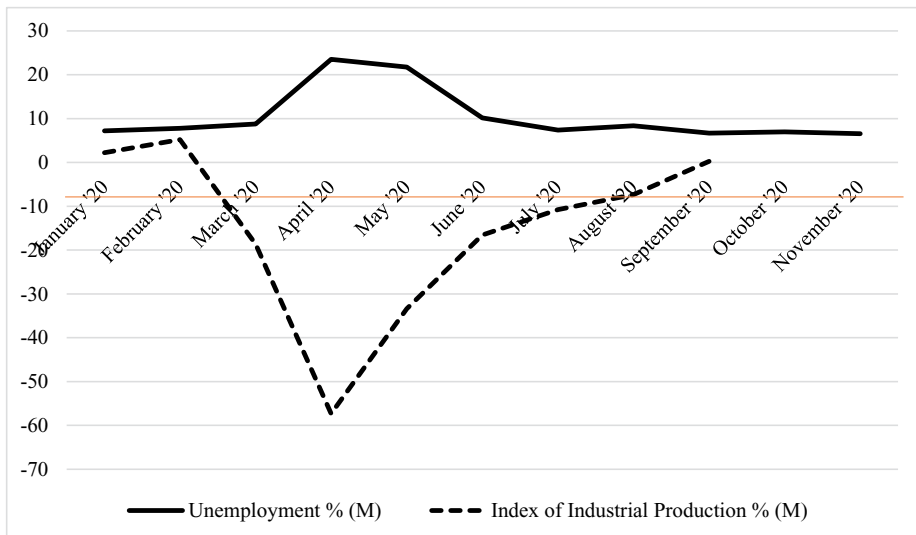
Glossary: M–Monthly; Q–Quarterly

Source: IIP–(MOSPI, n.d.); Unemployment rate–(CMIE, n.d.).

As per data from CMIE, aggregate employment in India has roughly returned to normalcy, and a *mere* 10% loss in jobs might not be as detrimental as it seems. What this does not reveal, however, is the mass migration of people from urban cities to rural areas and into agriculture and informal jobs. While jobs on a whole according to RBI and CMIE may have restored, the quality or 'health' of overall employment is strikingly worse. Recovery has largely happened in informal jobs, with salaried and other jobs within the formal economy having suffered the most (Vyas,2020b). While this may not per se be a jobless recovery, this is a classic case of job polarisation during economic downturns, wherein desirable jobs in the formal structure are replaced with low-skill jobs in the informal sector.

Corporate hiring practices along with the presence of significant pro-labour laws in India make losing salaried jobs in formal employment relatively difficult; however, once lost, these jobs are excruciatingly tough to regain. Such employees must now find different avenues for re-entering the labour force, and as stated, due to immense difficulty in regaining similarly situated jobs, such employees are often forced to opt for jobs in the informal economy.

Moreover, analysis of a jobless recovery requires context setting, that is, a jobless recovery of the economy depends on the type of job in consideration. If we limit our analysis to salaried jobs in the formal economy, we can confidently state that the situation is one of jobless recovery.

Lastly, the RBI (2020) noted that in the future, or in the event of a second wave, the 'precipitous plunge' in aggregate economic activity will not recur, as '…[firms] are quickly adapting to a virtual normal'. Who or which groups of people would be the ones virtually employed is the question to be raised? Only 2.3% of India's workforce is formally trained (Wheebox, 2020), and a substantial number of job loss has been observed among low- to mid-skill workers. The ongoing pandemic has raised poverty to the highest level in the last three decades (Saini, 2020). The few industries that have 'gained' from this pandemic, such as the pharmaceutical industry, have also been gearing up to automate various processes and job profiles (Vijay, 2020). Behemoths such as Reliance, which had reported over a 100% increase in profits until September 2020, have reduced staff costs by close to 15% (The Wire, 2020). While this may not necessarily imply a job loss, it does highlight two unnerving, interrelated trends: diminishing concern for labour and a proclivity to opt for profit over wages. The fear of job losers being unable to re-enter the workforce owing to lack of jobs or due to their job profiles being automated hence looms large. In the absence of a deliberate approach re-integrating workers back into the workforce en masse, inequalities are bound to further concretise.

4.3 COVID-19's Unique Impact on Automation

The COVID-19 pandemic is projected to only increase the rate of automation globally (Muro, 2020) and in India (Majumdar, 2020; Lakshmanan, 2020). The health crisis has given rise to varied incentives and motivations to opt for automation, and the market sentiment is aptly captured by the President of Volva Group India when he says that 'We need to ensure that our dependence on manual labour is gradually reduced. Our next level of investments would be more on automation than anything else'(quoted in Das, 2020). The following are some key developments that will catalyse automation –

1. Business prerogatives; adjusting business operations amidst lockdowns

    o   Before the crisis, the benefit of automation was valued against labour cost, but in the current crisis, automation demand is based on survival imperatives of firms.

2. Changes in attitudes and socio cultural norms regarding human contact and physical distance may induce employers to opt for automation.

3. Health concerns over sanitation and physical distancing from workers and customers

4. Volatility of labour supply in India, which has conventionally been considered strictly inelastic.

According to NASSCOM's report (2020) titled *COVID-19: The Tipping Point for Automation*, global and domestic economy has to take unprecedented efforts to recover from this crisis, and on this path, it will adopt wide-scale automation at 'highest-ever rates'. These predictions are in consonance with the findings of Jaimovich and Siu (2018) and state that many labour-intensive industries, which have laid-off workers due to acute shortage in demand, will on the path to recovery opt for automation of their labour needs instead of labour engagement.

What is most concerning is that afterthe health crisis, substitution of labour and replacement of humans with atuomation technology will in itself be a valid ground. In this case, the productivity effect,which is responsible for generating new jobs,is no longer a concern.

5. Policy Implications

Automation-induced job polarisation falls within the textbook definition of a wicked problem (Rittel & Webber, 1973). Definitively describing the policy problem in its entirety is nearly impossible, consensus on what approach is considered equitable is lacking, and labelling any interventions as optimal is impractical.

Yet, something must be done. The foregoing discussion clarifies that automation can exert an adverse impact on labour. If substitution of labour for the sake of replacement gains momentum, the effects can be catastrophic. The failure of these technologies to substantially increase productivity will result in technological unemployment of an unprecedented scale.

5.1 Principle-based approach

This signal towards the need for pre-emptive safety nets or protective mechanisms. Analysing effects as they unfold and devising policies is not only next to impossible but also a foolish strategy. We can adopt a principle-based approach, wherein we know that the outcome must conform to the agreed principles. The following two guiding principles are selected:

I.   Refrain from hampering automation.

Automation can substantially improve the aggregate quality of life and work opportunities. The quest for realising such technology must not be thwarted by restrictive policies stemming from Luddite paranoia.

II. Facilitate reinstatement.

Work is essential to humans and provides benefits that transcend the individual it originally concerned. A situation wherein nobody needs to work as technology has taken care of the 'economic problem'—as Keynes (1930) predicted 2030 would be—might not be the most desirable outcome.

W. J. Wilson stated that 'the consequences of high neighbourhood joblessness are more devastating than those of high neighbourhood poverty' (quoted in Brynjolfsson and McAfee, 2016).

Accordingly, policy and policymakers must allow automation, but at the same time ensure that the hollowing out of mid-skill jobs (and jobs in general) does not violate labour's right to decent work. This can be achieved by skilling and facilitating mobility, incentivising labour engagement, and having a social protection system in place.

Imperative 1: Skilling and Labour Mobility

One of the reasons for rigidity in upward mobility of mid- and low-skill workers is that skilling and other aspects, which are characteristics of high-skill workers, are acquired from a young age. As the government has recognised the need to impart skills to place workers in a better position in an increasingly competitive market,[2] Ministry of Skill Development and Entrepreneurship has launched various schemes in this direction. Pradhan Mantri Kaushal Vikas Yojana

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2   The role of information dissemination with respect to various skilling schemes necessitates greater importance. For example, only 60% of students are aware of the National Apprenticeship Scheme (Wheebox 2020).

(PMKVY), a flagship scheme of the government, aims at skilling the youth in industry-demanded skills (MSDE a). Skills Acquisition and Knowledge Awareness for Livelihood Promotion also has similar aspirations (MSDE b). However, past projects[3] have indicated that attempts at scaling up skilling of the workforce have not been met with an increase in labour demand/job creation as expected.

These, and other well-intentioned efforts of the government, are not steps in the right direction. Workers in the coming years would need to be able to undertake cognitive tasks. Although routine tasks in general would get automated, routine manual tasks are usually worse affected than their cognitive counterpart (Kuriakose and Iyer, 2018; Vashisht and Dubey, 2018). Therefore, if skilling is largely based on Industrial Training Institutes (ITIs) and jobs comprising of routine manual tasks, individuals are being skilled for certain failure.

Empirical evidence supporting this claim exists. In 2018, a market labour demand survey showed that machine operators and technical staff (both routine manual jobs) were part of the top 10 jobs in demand by the industry (Manpower Group, 2020). By 2019, the top 10 jobs demanded by the industries comprised cognitive tasks. The fall out of routine tasks from 2018 to 2019, according to the report, reflected the rise in automation. Additionally, industry demand for skills has changed in India, with a greater emphasis on high-skill domains at the expense of conventional tech- and science-related jobs (Figure 5).

Figure 5: Changing Demand for Skill Domain
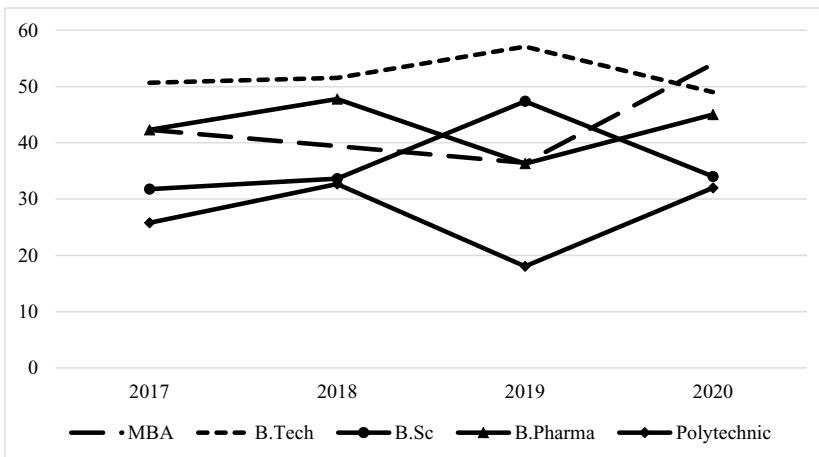
Source: (Wheebox, 2020)

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3 In Rajasthan, nearly 2 lakh candidates were trained under the PMKVY scheme for Short-Term and Special Projects from 2016 to 2020, but only 44% and 18% candidates were employed, respectively (Wheebox, 2020).
   Youth training and employment programmes trained over 18 lakh individuals in 2015. However, only 12.4% or 2.23 lakh trainees were placed in jobs (Tandem Research).

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The way ahead: Supply side

To right this wrong, we need to stop treating education and skills training as they have conventionally been understood. In all spheres, workers will have to keep re- and up-skilling throughout their careers as and when disruptive technology keeps emerging. Labour cannot be allowed to compete solely on the privilege of good education received in childhood, individuals must develop competencies that go beyond specific tasks. While a detailed effort is required to modernise school curriculums and thus increase employability of the incoming youth, young adults need to acquire skills with multifarious applicability.

Start-ups such as *White Hat Jr*—notwithstanding its business model—embody the need of the hour. Coding is akin to learning a language, and as the digital sphere is increasingly intermingling with various aspects of the world, increasing 'literacy' in coding is crucial. Similar to how acquisition of soft skills such as proficiency in English helps an individual's employability across a wide array of sectors, proficiency in coding languages facilitates employment in various job profiles.

In the context of the present pandemic, the importance of skilling interventions cannot be stressed enough, but what must be borne in mind is that the focus should not exclusively be on upskilling. Reskilling is important—workers need to be able to work in varied fields and not possess skills (to whichever degree) that limit them to the occupation at hand, since labour guarantee is absent in the modern economy.

The way ahead: Demand side

After the pandemic, state-led interventions will assume great significance. Focusing on the development of public infrastructure (such as roads, schools, and hospitals) will be key since this would facilitate attainment of two major goals: employment and holistic development. India has two diametrically opposite sides to her, and much of the rural or 'other' side lacks basic public services. As noted in the aforementioned sections, a strict dichotomy exists between labour-intensive and income-generating industries in India, and while industries in the former category may not be the highest earners when it comes to national economy, the immediate focus should be on absorbing employable workers as against parochially stimulating income-generating industries. Despite advocating for lesser government control and greater privatisation, empirical evidence shows how governments in advanced economies are one of the greatest employers, since as countries move from low-medium-high income levels, the size of government grows (Jagannathan, 2018). A mix of government spending on Keynesian grounds along with an increase in corporate and marginal personal tax on high-income earners will help generate employment and create social or unemployment insurance.

Imperative 2: Social Security

The COVID-19 economic crisis has revealed the deplorable state of social security to shield workers from sudden, mass unemployment. This state affects not only individuals but also the economy at large because a drop in disposable income culls aggregate demand. Two aspects underscore the necessity of social security: first, many mid-skill workers have been displaced from formal employment structures wherein they received social security benefits; second, the wage polarising effect reduces the dispensable income available to workers, which could reduce income utilised for health or other purposes.

While a universal basic pay is undoubtedly the right way to go (Frey, 2020), a more actionable and immediate step is to create portable social security funds to which the government, employer, and employee contributes.

Such an instrument would require a worker to receive social security from all employers whoever engages them. To avoid confusion and unneeded complications, employers would make contributions based on a task or set of tasks performed, instead of continuous periodic payments. Social security must be delinked from fixed hours of work or days.

A portable social security instrument will be able to adjust to the trends observed in labour. First, it will help combat the growing ills of rampant contractualisation of work in India, which leaves hundreds of millions without access to employment-related social security. Second, as is evident, workers have been diversifying employment opportunities, and in the process, do not receive social security from any employer.

The role of the state in financing this fund is important as the funding aspect must not overwhelm industries. Industries considering the costs for engaging labour substantial would catalyse automation. The Niti Aayog has recognised this responsibility and stated that in developed economies, social security should be extensively provided by the State (Livemint, 2017). Areas for generating funding of this instrument can explored, such as giving individuals the right to monetise their data on online platforms. These would require a legal–economic exploration.

Imperative 3: Labour's Competitive Edge over Automation

The last implication draws on the inability of the market to deliver socially desirable automation technologies. Government policies can aim at provide labour a competitive edge over automation in industries where automation is intended to merely substitute labour with capital.

First, we can increase the relative cost of capital, thereby disincentivising automation. Explicit examples include implementation of 'robot taxes', which was repeatedly promoted by Bill Gates(Quartz, 2017). However, this is against

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the first principle of allowing automation flow freely.

The second approach focuses on incentivising labour engagement. According to Niti Aayog, we must dispense with capital subsidies and focus on labour subsidies (Livemint, 2017). Such subsidies reduce the labour cost directly, while protecting wages from dropping below a statutory level.

Other Concerns

First, even when automation leads to a strong reinstatement effect, jobs created are observed to be menial in nature (ILO, 2018c). Gamst (2015) noted that deskilling is a Marxian mode of societal control, wherein jobs are divided into discrete minute tasks that are to be repeatedly performed and do not require any cognitive skills.

Second, the oncoming digital wave will mostly reflect existing social hierarchies, with socio cultural forces shaping the capability of individuals to reap the benefits of technological advancements. This ranges from restriction of good formal education to upper echelons of the society to patriarchal forces restricting women to sell their labour online.[4]

Third, automation has become a tool for subverting democratic progress. Strikes in 2011–13 by workers at a Maruti plant in Gurgaon was quickly followed by accelerated automation at the plant (ILO, 2018a). This highlights a clear impetus for automation of jobs to reduce the bargaining strength of labour, surely a perverse incentive. The period revolving these strikes witnessed a 27% increase in purchase of industrial robots by the automobile industry (ibid.).

6. Conclusion

Although automation can increase efficiency and productivity, its effect on labour can be polarising. Automation can hollow out mid-skill jobs, and because moving up the ladder is extremely difficult for mid-skill workers, they are overwhelmingly pushed into low-skill jobs, which can consequently widen socioeconomic inequalities.

In the ongoing health crisis, the demand for automation has increased and millions of Indians who lost their jobs will potentially be unable to re-enter at pre-crisis job positions.

These two considerations make state intervention essential. However, such an intervention must respect the rights of the two key stakeholders involved, that is, firms and workers. Firms should have the freedom to automate as they

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4   At present, despite women being more employable than men (47% and 46%), the respective labour force participation rate is 23% and 77% (Wheebox, 2020). Due to factors revolving around access to technology, job conditions, and social and cultural stereotypes, emerging technologies have the potential to further cement such inequalities.

deem fit, while workers should be empowered to take their rightfully deserved share of the economic pie. The state must take cognisance and implement three simultaneous systems. First, labour's mobility should be increased by focusing on developing competencies that do not revolve around context-specific tasks. This requires the attention of policymakers because current skilling interventions focus on developing skills concerning routine tasks. Second, employment will have a dynamic nature, with increasing contractualisation and digital platforms wherein workers can sell their labour to multiple employers. Such a situation calls for developing a social security mechanism that is detached not only from any specific employment but also the number of hours. At last, policymakers must disincentivise firms adopting automation technology that is aimed at substituting labour with capital.

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