

Impact of AI and Automation on China's Labor Market

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Abstract. This essay analyzes how automation and artificial intelligence affect China's labor market, focusing on the differences between different sectors, skill levels, and groups of the population. The study has shown that although AI improves the competitiveness of industries and productivity, income inequality and job polarization were worsened, based on legislative documents, secondary data, and an analysis of Foxconn's production automation case study. High-skilled jobs benefit due to an increase in wage levels and demand, while low-skilled and repetitive work in manufacturing is most replaceable. The result in the service sector is diversified, as AI improves certain jobs, the values of others are weakened. Other than that, China's objectives of social justice and shared prosperity are also threatened due to unequal distribution of rewards, as capital owners and urban elites benefit more. To decrease negative effects and ensure a fair transformation to a tech-driven economy, this essay promotes positive labor and welfare policies, including retraining of skills, inclusive social insurance, and equal regional development strategies.

Keywords: Artificial Intelligence; Automation; China; Labor Market; Inequality; Foxconn; Skill Polarization; Social Policy.

1. Introduction

China is slowly promoting Artificial Intelligence (AI) and automation as the foundation of its economic strategy. The State Council's New Generation AI Development Plan (2017) has designated Artificial Intelligence as the "core driving force" of sector transformation, setting a significant goal of leading the global development of the AI industry. [1] In parallel, programs such as "Made in China 2025" aimed to upgrade industries by promoting robotic technologies and advanced manufacturing, with local governments subsidising to encourage automation that caused a robot revolution on factory floors. Since 2013, China has become one of the biggest markets for industrial robots, accounting for over 50% of new global robot installations since 2023, and its robot stock has exceeded 1.8 million units, the largest in the world. [2] Rising labor costs and an aging population have forced firms to automate repetitive work. For example, electronic manufacturers report replacing hundreds of thousands of assembly line jobs with machines. [3, 4] Those trends have all highlighted the potential of the revolution in AI and automation in China's labor market, but also foreshadow an important disruption.

Recent studies show the labor impacts of AI are highly uneven. Economists have discussed how technologies affect the labor market, especially on skill-biased technological change (SBTC). SBTC theory suggests that new technology can replace regular low-skilled jobs while increasing demand for high-skilled labor, which could be a main reason for job polarization, that is, the sacrifice of middle-skilled jobs [5]. For example, studies in developed countries have shown that computerization and robotics have reduced job opportunities and the level of wages of regular workers. [3] But developing countries may face stricter situations: the World Bank warned that 1.8 billion jobs in developing countries are vulnerable to automation [6], while the International Labor Organization is concerned about the young workers and women in emerging markets being disproportionately at risk. According to research by OECD, jobs requiring lower education and involving routine work are facing the highest risk due to automation. McKinsey Global Institute (2017) predicted that there may be more than 800 million people who are facing unemployment due to automation in 2030, with

developing economies having significant impacts. [7] These are also shown in China's case as automation led to a "hollowing out" of the middle of the job market while improving high-tech jobs.

In China's context, vulnerable groups are hit hardest. Wang, Crowley, Doran, and O'Connor (2025) have found that the risk of job displacement varies significantly between individuals, especially for young workers, women, and low-educated people, as they face higher risks of unemployment due to automation. [8] It is also noticeable that this research pointed out the risk that workers in urban areas face may be higher than rural workers. This counterintuitive discovery may reflect that cities in China are centered on secondary and tertiary sector businesses that do manufacturing and the provision of services, while having jobs in rural areas, such as the extraction of natural resources or informal work, are not yet disposed to advanced automatic technologies. AI and automation can also affect the distribution of income. Giuntella, Lu, and Wang (2022) said that a one-standard-deviation increase in robot penetration is related to a 7.5% drop in employment and a 9% drop in wages among Chinese workers exposed to those robots. [9] This shows that early automation trends mainly affect young workers who are young and lack experience, while slowly affecting elderly, low-skilled labor that cannot be retrained. Therefore, AI and automation can lower the demand for low-skilled labor while improving high-end income and returns to capital, further worsening income inequality in China.

Due to these development trends, this essay will research how AI and automation change China's labor market and income distribution. Through case study and secondary data analysis, I will try to determine what kinds of labor and industries will benefit or be disadvantaged by AI and automation. This paper will use automation in Foxconn as the case to highlight the specific influence on manufacturing and service, to provide evidence for making policies that will not abandon workers who are at risk while directing the transition process.

2. Overview of the Case

I will use the case of automation in Foxconn to indicate those dynamics. Foxconn is a Taiwanese contract electronics company that assembles products like the iPhone in large factories in China, especially in Zhengzhou and Shenzhen. In the mid-2010s, Foxconn started an aggressive automation plan that aimed to achieve automation in 30% of its factories, specifically replacing human labor with automatic assembly lines and robotic techniques. [3] There were over 400,000 factory jobs that were replaced by robotics from 2012 to 2016. [3, 4] This case clearly shows how the large scale of robotic applications can significantly lower the demand for labor in manufacturing. So I will deeply analyse the effects on practices of industries, wage levels, and labor rights using this case.

3. Analysis

The impact of AI and automation in China is highly sector-specific, particularly in manufacturing and the automotive sector. In manufacturing, automation has had a disruptive impact on job opportunities and wages. For example, Foxconn, which is a leading electronics contract manufacturer, has announced that it has replaced over 400,000 assembly-line jobs with robots between 2012 and 2016. [10] This can show how fast the speed of AI of replacing human labor in factories. China has initiated a so-called "robot revolution" on factory floors through policy-led investments and massive investments in industrial robots. [7] Repetitive assembly and processing tasks that used to be done by low-skilled workers are now slowly getting replaced by machines. Research has found that in those regions in China that have a relatively high robot exposure rate, job opportunities in manufacturing have had a significant decrease. [6] Giuntella, Lu, and Wang (2022) said that a one-standard-deviation increase in robot penetration is related to a 7.5% drop in employment and a 9% drop in wages among Chinese workers exposed to those robots. [9] Those job losses are mainly centered in fields that are regulated and codifiable, for instance, assembly line workers, machine operators, and electronics assemblers. Moreover, a lot of replaced workers in manufacturing find it hard to have an equivalent new job and will even quit the labor market or turn to informal jobs. [6] This has proved the concept

of “premature deindustrialization”, where developing countries like China are facing the risk of losing manufacturing jobs more easily than in past transitions, due to automation. [7]

The negative impact on wages in manufacturing is also obvious. Foxconn itself noted that its robots would replace “repetitive tasks previously done by employees” so workers could focus on “higher value-added” work, such as R&D and quality control. [11] However, in the past, Chinese factories maintained low wage levels due to an abundance of labor, while robots further suppressed the demand for labor that resulting in downward pressure on wages. Studies have observed declining wages and the labor share of income in automated industries, leading to a sustained decrease in the share of GDP received by workers. [12] In fact, as capital (robots) slowly replaces workers, labor income’s share in certain manufacturing industries decreases even though some technological workers and engineers’ wages increase. This kind of substitution effect is not distributed equally, as low-skill workers are damaged the most, but job opportunities for robot maintenance technicians and engineers rise. The upgrade of skills within manufacturing industries has benefited technological expertise, but those regular workers, usually from rural areas, are facing unstable job security or even layoffs.

In contrast, the encounter of service and AI is more complicated. Part of China’s service industry is starting to automate regular service tasks. For example, banks and retail stores increasingly use kiosks or facial-recognition payment, which reduces job opportunities like cashiers and clerks. Call centers and customer service roles are also being replaced or augmented by AI chatbots. [13] These trends not only reduce regular job opportunities, but also form a downward pressure on wages for related jobs, because AI can handle a portion of those tasks, employers may value human labor on those tasks less. Whereas automation in service areas often works alongside human by enhancing their output. For instance, in the medical field, AI diagnostic tools assist doctors in making decisions rather than replacing them, and in logistics, algorithms help optimize better routes for delivery drivers, which boosts their productivity. Overall, AI by now has a positive net effect on service sector employment in China’s case. [13] Lu & Gui (2025) pointed out that the improvement in productivity and new jobs that AI brought may exceed the displacement of certain roles in service sectors. [13] Such as the expansion in e-commerce and fintech, which are both tech-driven services, has generated huge employment demand (for delivery people, online merchants, etc.), although traditional retail jobs stagnate.

Another factor is that many service jobs require social skills, creativity, or complex cognitive skills, whereas AI cannot yet fully replicate those skills. Tasks like management, care work, and creative strategy still highly rely on human force and are relatively safe from being replaced by automation. [14] So, mid- to high-end service professionals (managers, educators, healthcare workers) do not suffer a large range of substitution as factory workers have. In fact, in the background of China’s growing economy, the wage level of service sectors in urban areas has seen a rising trend, although the income gap between skilled workers and lower service workers is still significant.

So this tech-driven growth in China is now posing significant challenges to the development of the social welfare system and inclusivity. One of the main problems is that the income gap may increase, pressuring the social safety net. As mentioned before, although automation can improve productivity and overall GDP, its welfare is not distributed equally, favoring highly educated workers and capital owners. During recent years, China’s Gini coefficient (a measure of inequality) has remained relatively high, and the spread of AI may further push up that index if the government lets this alone. This situation may be more severe in urban areas when top technology talents’ and managers’ income surges, while more laborers’ income stagnates or falls. If rural workers cannot find equally paid work in cities, the gap between urban and rural areas may also increase. This went opposite to the political goal of “common prosperity” in China, highlighting the conflict between quick tech adoption and equal growth.

Another challenge is that automation may cause misallocation in the labor market and unemployment that policies cannot fully handle. China’s workforce is huge (over 750 million), which means that even if only 10% of workers face displacement in the next decade, that’s tens of millions of workers

who will need assistance. The coverage of unemployment insurance in China is also limited, especially for migrant and informal workers, and the retraining system is still developing. This resulted in many laid-off workers eventually ending up having informal jobs that are welfare-free, potentially increasing structural unemployment (joblessness due to skills no longer being needed). So the transition of jobs needs to be more frequent and robust as AI becomes more common, which is extra hard for older workers, as many of them lack the educational background to accept high-tech retraining. In fact, evidence has proven that China's robotic application has caused a portion of older workers to quit the labor market and retire earlier, causing pressure on pension systems (as people retire with possibly insufficient savings) and on families (as some may need to care for those without work). [7]

As the social insurance system in China (covering pensions, medical insurance, unemployment insurance, etc.) is highly related to being formally employed and being a local resident, many workers who are negatively affected by automation may not be able to have complete social welfare. For example, migrant workers may experience barriers in transitioning social insurance between provinces or fall through the cracks of the safety net due to a loss of a job in urban areas. The difference in social welfare between regions can also make poorer provinces have a weaker ability to support unemployed workers.

Finally, the possibility of social unrest cannot be ignored. History has shown that a technological revolution without proper social protection can lead to worker protests or instability in society. Giuntella & Wang (2019) have also proved that strikes and protests due to layoffs have increased in regions that have relatively high unemployment rates due to robotics in China. [6] So to ensure social cohesion, the negative emotions of the left-behind communities should be addressed properly.

In summary, this discussion has shown that AI and automation are not only improving the efficiency of China's economy and creating new wealth but also challenging present employment structures and accelerating inequality. Manufacturing workers and other regulated workers are facing pressure from both the risk of unemployment and decreasing wage levels, while skilled professionals and firms enjoy most of the gains. These can deepen socio-economic divides and pressure China's welfare system if lack of government intervention.

4. Suggestions

China must apply diverse solutions, firstly aiming at social stability and inclusivity, to solve issues in the labor market due to automation and AI. Improving education and retraining is also important, due to their ability to provide skills that labor requires from the automation industries. Moreover, the range of training of professional skills should be expanded, focusing on weak work groups such as women, young workers, and low-educated workers, helping them to transition to emerging industries. This will require the cooperation of firms, government, and education systems, especially in adjusting course setting, aiming at the cultivation of robotic technology, AI, and digital ability.

The government can decrease the income shock and economic vulnerability of the unemployed population by investing in labor rights protection and a welfare system that is more inclusive. The Chinese government should also broaden the coverage and generosity of unemployment insurance, healthcare, and pensions as automation replaces part of the workers, especially migrant workers and informal workers. In addition, improving the ability of welfare transition between provinces can ensure workers still have their rights when changing their jobs or locations.

Promoting a gradual and comprehensive plan of automation is also essential. The government should support the slow application of robotics and AI instead of allowing them to be applied too fast. The link between the retraining of affected employees and the reduction of taxation or subsidies can also help to reduce the negative effects of unexpected unemployment. Additionally, the development of emerging labor-centered sectors, such as green technology, personal services, can maintain employment levels by absorbing unemployed workers.

In addition, fair regional development is important to the distribution of the results of technological improvement. The share of the benefit automation can be achieved through investing in rural areas, such as smart agriculture and countryside e-commerce. In order to make sure the rural population will not be abandoned by sectoral upgrade, the government can build up a more inclusive urban-rural social insurance system. This can not only reduce the pressure on population migration, but also narrow the gap between social benefits.

Last but not least, effective policy-making needs regular monitoring and adjustment. The government should watch the wage trends and employment models in different regions and industries closely. If automation has caused the gap to increase, a targeted reallocation strategy should be applied. For instance, progressive taxation on robot-intensive capital or increased public spending on healthcare and education. Furthermore, encouraging workers to take part in decision-making for automation can help decrease protests and earn broader support for the technological revolution.

5. Conclusion

In conclusion, AI and automation are reshaping the contours of China's labor market. Although these technologies are capable of improving productivity, promoting industrial upgrade, and enhancing global competitiveness, their impact in different sectors, skill levels, and regions varies a lot. Factories in manufacturing, especially large ones like Foxconn, have seen a rapid automation that replaced hundreds of thousands of low-skilled jobs, causing wage stagnation and deepening inequality. Although the service sector is more resistant due to its reliance on social and cognitive skills, some of the regular jobs are also facing increasing threats.

Moreover, the distribution effect is benefiting capital, high-skill, and urban areas, and further threatening China's goal of inclusive growth and "common prosperity." If we let this trend alone, the urban-rural divide may be widened, the social safety net may be strained, and social unrest may occur, especially among vulnerable worker groups such as older employees, women, and less educated workers.

Therefore, China must post coordinated and inclusive policies to meet this transition. Expanding retraining programs, enhancing social protection systems, and encouraging fair regional development are all important for ensuring that no group is left behind in the wave of automation. Only through positive and responsive labor policies can China maintain social fairness and economic stability while fully embracing the benefits of AI and automation.

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