Gender Perspectives on the Future of Work in China

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Foreword

Despite economic growth and declining poverty levels across Asia, inequality continues to grow, with large groups of society remaining marginalized in economic and social terms.

Women in Asia continue to experience massive structural disadvantages, from early childhood education through their retirement from work – if they wanted and were allowed to work – and into their older age. It is mainly women who are exploited as cheap labour in Asia's export industries and low-skill sectors, especially agriculture, textiles and the footwear and electronic industries. They are paid subsistence wages and experience increasing precariousness of their working as well as living conditions.

On the heels of all the economic progress now comes rapid technological transformation that is altering the present and future nature of work in ways that offer a multitude of opportunities but also add new levels of risks for social groups across the Global South. Women are particularly vulnerable and disproportionally affected by these changes, both in the context of the Fourth Industrial Revolution and in the ever-expanding care work across the formal and informal sectors. Unfortunately, the predicted productivity gains through automation and digitalization in many sectors possibly will not give women much hope for fundamental improvements of their prospects.

Through our regional networks, Friedrich-Ebert-Stiftung (FES) brings together diverse voices from social movements, civil society organizations, trade unions, political parties and academia to work together in developing progressive ideas and narratives for advancing social justice. Among the most innovative platforms is the newly established FES Asia project Women's Perspectives on the Future of Work. With insights from distinguished researchers in nine Asian countries, FES and its partners aim to further promote gender equality in the world of work, with emphasis on enhancing women's participation in public and political life and promoting decent work for all along with gender-just and human-centric economic models.

The following study assesses the present situation of women in the Chinese labour market and provides an outlook on China's future industrial development and its prospective impact on women in the world of work.

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We hope that this paper contributes to a fruitful discussion and provides valuable insights for future initiatives.

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Introduction

In a November 2018 conversation with the new leadership of the All-China Women's Federation (ACWF), Chinese General Secretary Xi Jinping stressed adherence to the national policy of gender equality and women's equal participation in China's socioeconomic development.[1] China's experience with gender equality has shown how promoting the participation of women in socioeconomic activities improves their personal status as well as the country's overall social productivity and economic vitality.[2] Data also indicates, however, that the market's record on advancing gender equality has diluted the previous impact of the government-driven approach to fostering it.

According to findings from China's Sixth National Census (2010), the portion of women agricultural workers exceeds that of men, at 52.4 per cent.[3] In the industrial sector, however, female employees remain far fewer than men. For example, they are 51.6 per cent fewer women than men in the extractive industry, 20.6 per cent fewer in manufacturing, 38.8 per cent fewer in the production and supply of electricity, gas and water, and 68 per cent fewer than men in construction. In the services sector, however, there are only 6 per cent fewer women than men. This is in line with the *Report on Major Results of the Third Wave Survey on the Social Status of Women in China*, released in 2011 by the ACWF and the National Bureau of Statistics. The report shows that the proportion of female employees overall increased significantly during this period.

Statistical monitoring reveals that by the end of 2017, women will constitute 43.5 per cent of China's employed population, exceeding the target of 40 per cent set for 2020.[4] The data also show that the proportion of women working in public-owned enterprises and institutions reached 48.6 per cent in 2017. The number of women in middle and senior professional and technical positions stood at slightly more than 6.6 million that same year. The number of female entrepreneurs is growing, accounting for about a quarter of the total, while among internet entrepreneurs, they constitute 55 per cent.

The future trend for China's economic development will center on industrial transformation and upgrading. Today, the presence of women in certain sectors relevant to that trend outnumbers that of men by 13.2 per cent in wholesale and retail and a similar figure in services, 21.4 per cent in finance, 32.6 per cent in education, and 60.8 per cent in health and social security.[5]

Future of Work and Development for Chinese Women

The decline of China's population demographic dividend—driven by an ageing population and low birth rate—and ensuing rising labour shortage threatens to curb economic growth. China's long-standing one-child policy and corresponding shifts in socioeconomic norms have shaped the country's fertility pattern and are now widely viewed as being responsible for a worrying low birth rate. From the one-child policy initiated in 1979 to the current two-child policy, adopted in 2015, people's response to the question of whether they want a second child has changed from "Yes, but I shouldn't" to "Yes, but I can't."

Reproductive costs for women

The willingness of women to have a second child is generally less than that of men,[6] a phenomenon attributed to several issues, including concerns about employment and professional careers. Inadequate work experience, decline in human capital value as a result of intermittent, part-time employment and temporary withdrawal from the labour market in general lessen women's ability to earn income. Tensions between work and family are another concern. Although the immediate requirements of childbirth on women usually span the first 22 months after delivery, the ensuing conflict between work and family responsibilities endures much longer. Many women are forced to switch to lower-paid but more mother-friendly occupations.

An additional factor concerns social roles surrounding work and family. Women with better educations and of higher socioeconomic status are more likely to have a strong desire to pursue self-development, which often leads to additional conflicts in reconciling motherhood and careers. A related matter is apprehension about job burnout, which some mothers experience as a result of higher levels of emotional exhaustion. In short, giving birth and childrearing have the potential to lower a working mother's career goals.

These obstacles follow on top of restrictions based on traditional cultural norms that promote focus on the home and family as part of women's role in society. Such stereotypes also increase bias against women in the labour market.

The gender income gap

After the founding of the People's Republic of China in 1949, the government established gender equality as a political goal enshrined in the constitution and in a series of constitutional documents thereby laying a solid social foundation for the reduction of gender-based wage divergence. With the deepening of market-oriented reforms and economic opening in the late 1970s, the mechanisms for promoting gender equality in Chinese society began shifting from the government's hands to the market, resulting in a significant gender gap in wages.

In 1988, women annually earned 84 per cent of what men received. This figure declined to 80 per cent in 1995, to 79 per cent in 2002, and to 78.3 per cent in 2018.[7] The most immediate impact of this development has been the shift in women's power and status in various economic sectors, with women as a group increasingly becoming more vulnerable.[8]

From a policy perspective, marketization weakened government policies promoting women, and the competition between women and men worked to the disadvantage of women in the supposedly equalizing realm of the market. The marketplace remains an area of gender inequality even though many women are equally or even better qualified and better performing than men. At the enterprise level, women still confront a glass ceiling.[9]

Conflicting theories have been posited to explain the correlation between the gender pay gap and marketization. One theory maintains that the gender income gap tends to be greater in the context of deepening marketization, while another takes the opposite view. The data indicate a substantial and progressively widening gap between 1995 and 2007 and then a slight narrowing of 0.7 per cent between 2012 and 2018.[10] According to China Daily, a

survey published in early March 2018 by Zhaopin.com, one of China's major online recruitment platforms, recorded the average monthly income for women as 6,589 RMB (about 1,040 US dollars) and for men as 8,006 RMB (about 1,265 US dollars).[11] Regardless of which explanation is more relevant to the actual situation, marketization as a factor in China over the past decades has undoubtedly been critical in driving the gender income gap, a trend that is likely to continue.[12]

Impact of automation on women in export industries

China has entered a period of industrialization characterized by the export of advanced mechanical and electronic products that exceed the total exports in all other commodities. In 2017 exports of mechanical and electrical products totaled more than 8.9 trillion RMB, an increase of 12.1 per cent and accounting for 58.4 per cent of China's total exports.[13] Among the goods produced, automobile exports increased by 27.2 per cent, computer exports by 16.6 per cent, and mobile phone exports by 11.3 per cent compared to 2016.[14] Over the past five years, labour costs have increased by more than 40 per cent, resulting in an average rise in disposable income per individual worker.

Prior to 2017, one would have expected that if labour and other costs rose, low-end industries would shift to countries with lower production and labour costs. According to export data, however, the proportion of these industries churning out export products in China has remained relatively stable, holding steady at about 20 per cent—for instance 20.4 per cent in 2012 and 20.1 per cent in 2017. This suggests that the smart manufacturing industries are moving towards a high degree of clustering and automation.[15] The reason behind this is that smart manufacturing and automation have kept these industries profitable by lowering labour costs. In the garment sector, a major part of China's export industry, the utilization rate of automation equipment stands at 80 per cent, which means the complete automation of garment production has almost been realized.[16]

Significant improvements in automation in smart manufacturing and female-intensive export industries have enabled Chinese exporters to remain globally competitive. Take for example Suzhou Tianyuan Clothing Co., one of the biggest clothing suppliers in China, producing Adidas, Reebok, and Armani brands. Suzhou Tianyuan signed an agreement in 2016 for a $20 million investment in its factory, which mainly produces T-shirts. "We will install 21 fully automatic manufacturing lines," Tang Xinhong,the company's chairman, told reporters in July 2017. "When running at full capacity, the system can produce one T-shirt in 22 seconds, which means we can produce 80,000 T-shirts a day for Adidas. I'm really excited about the fact that even the cheapest market in the world can't compete with us. China's industrialization may be just in time."[17] Because the factory uses a large number of robots for sewing and production, the cost per T-shirt was 33 US cents, or about 2 RMB.

China's export industries involving the production of clothing, footwear, and small commodities employ female-dominated workforces. The increase in automation in smart manufacturing and female-intensive export industries has raised the employment threshold for women and reduced the number of women employed.[18] It has also increased the income and improved the treatment of women who continue to work in these industries.[19] As an overall result, automation has led to layoffs that disproportionately affect women.[20]

In short, greater automation appears to disadvantage women's employment, but every coin has two sides. In another respect, greater automation, the rise of "smart devices" and Artifical Intelligence (AI) has provided more opportunities for women's employment and improved their social status.[21]

Digitalisation and AI from a Gender Perspective

AI development in China began later than it did in the developed world. Once doubted and criticized, Chinese AI research has since took off, successfully attracting increased attention. In most government reports, the integrated use of AI technology involves the application of robot technology, use of big data and promotion of automation, all factors that impact the structure of the labour force. The main approach to AI research focuses on combining it with other technologies, mainly automation, robots, digitalization, the Internet of Things, big data, cloud computing and intelligent technology.[22]

Workforce impact of Made in China 2025

In 2015 the Chinese government launched the economic plan Made in China 2025, with a vision of making China a powerhouse of smart industrial production within the first decade of implementation. The strategy requires accelerating the integration of a new generation of information and production technologies and making intelligent manufacturing the main direction of this process. China's manufacturing industry still needs to improve the level of intelligent production.[23]

Since issuing Made in China 2025, the government has made AI research a top priority on the national agenda. In July 2015, China's State Council issued "Guiding Opinions on Actively Promoting the Action of 'Internet Plus,'"[24] which aspires to leverage the Internet platform to provide AI-enabled public innovation services, accelerate core technology breakthroughs of AI and promote the further integration of innovative Internet research achievements into economic and social development. For China, the key to handling the opportunities and challenges fostered by the AI revolution involves quickly improving the overall skill level of the labour force, making the best use of existing labour resources.

A 2015 report by the Chinese Academy of Sciences noted that China's labour productivity lagged far behind that of developed countries.[25] In 2012, labour productivity in China had been one-twelfth the rate in the United States, one-eleventh that in Japan and even less than that in India.[26] With the rapid increase in labour costs and the development of new technologies, the only way to catch up with the global industrial revolution was to improve the automation level of industries in research and development, manufacturing, management and services and to accelerate the shift from labour-intensive to smart and intelligent manufacturing.

In accordance with Made in China 2025 , increased use of automation, 5G cellular technology, artificial intelligence and information technology, such as big data, were to shift manufacturing into the smart manufacturing of goods. This would lead to the disappearance of traditional assembly line work and the retraining of surplus labour in other industries.[27] Women made redundant due to removal from the assembly line, especially those with relatively little education and no professional skills, could for example transfer to the service industry.

The strategic tasks and priorities proposed in Made in China 2025 reflect the current overall low skill level and unbalanced structure of Chinese human resources in various industries.[28] Churning out highly skilled personnel and improving the overall skill level of the labour force has become a matter of urgency for transforming and upgrading China's manufacturing industry.

Impact of AI and automation on the export industry labour force

Kai-Fu Lee, one of the most prominent figures in the Chinese internet sector as founding director of Microsoft Research Asia and president of Google China, predicts that in the next five years, AI technology will improve the efficiency of most sectors in China: by 82 per cent in education, 71 per cent in retailing, 64 per cent in manufacturing and 58 per cent in finance.[29] He also predicts that based on the current pace of technology development, AI and automation will replace 40 to 50 per cent of jobs in 15 years.[30]

Better AI technology will reduce the amount of repetitive or dangerous working processes but it will also introduce unprecedented challenges to individual well-being as increasing numbers of people are (or worry about) being replaced by robots in the workplace.

As forecast by the Education Examination Center of the Ministry of Industry and Information Technology, the demand for labour in the field of AI will increase to five million workers in the coming years. Overall, the labour force will gradually move towards technology and knowledge-intensive industries, service-oriented industries and high-tech.

The average age of AI enterprises in China is currently five and a half years. The application technology of Chinese AI enterprises focuses largely on vision and speech functions, with a relatively small share of research in basic hardware. As AI becomes more deeply integrated into manufacturing processes, it will be necessary to explore developing employment patterns that are compatible with the technological revolution.

Automation in export industries

The export industry is increasingly automating with new equipment and the introduction of big data and the cloud system. This phenomenon has mainly manifested in reductions in labour costs, less staff training time and precise control of manufacturing processes. In Guangdong Province, for example, the Municipal Government of Dongguan has been allocating funds annually to push smart manufacturing enterprises to implement "machine replacement" projects. The strategy, initiated in 2014, has thus far led to the reduced employment of 70,000 people since 2014.[31]

The expansion of e-commerce has accelerated the development of automation in the export industry. The large-scale transformation and upgrading of traditional production plants to "smart factories" are transforming the export industry from "Made in China" to "Mind in China."

Research, development and production of 5G cellular technology, robots, digitalization, automatization and artificial intelligence

Under the new technological revolution encompassing 5G cellular technology, robotics, digitization and automation, changes to the labour force and production processes increase, and the impact on the structure of the labour force has become increasingly intense, but difficult to accurately measured. Jing Cao and Yalin Zhou have estimated that China's gross domestic product could grow by 10 per cent with the help of automation.[32] Low-skilled workers may find their jobs changing or disappearing or their wages falling.

Influence of the development of digital technology on social equality

The rapid progress of digital technology has raised ideological issues. In line with the Chinese government's goal of social equality, digital and AI technology is supposed to benefit as many people as possible, bringing welfare and convenience to the majority of the population. Yet, there are many people who still cannot access the internet; for example, computers are not widely used in the impoverished mountainous areas of central and western China. In the era of artificial intelligence, such people are characterized as "marginal."[33] The more sophisticated AI technology becomes, the wider the information divide grows, and the harder it will be for so-called marginal people to enjoy the convenience and increasingly the necessity of intelligent information services and related social resources.

AI technology thus brings with it new implications for social stratification and mobility. In China, many people already regard AI and automatization as threats as a threat, recognizing that they are destined to replace a large number of jobs by making many workers' jobs redundant or lead to demotions. A follow-on to this is the solidification of social status by hindering social mobility, or in the case of elites, consolidating or even perpetuating their privileged position.

Challenges of AI technology for women

Leading researchers on women's issues in China as well as in other countries have examined how the gender bias prevailing in conventional workplaces has already spread to the domain of AI technology.[34]

First, judging by how AI development has been unfolding, more than half of all jobs in the labour market will probably be eliminated.[35] Although new technologies are creating new jobs, even for women, a majority of the women now engaged in simple and repetitive physical labour will be the first to be affected. For example, waitresses, production line workers, data processors and collectors and shop assistants will all face unemployment threats.

Second, as gender biases find their way into programming, algorithms and the design of robots, the conventional inequitable gender division of labour will extend to the AI domain as well. The gender bias of male dominance is already being exhibited in robots.[36] For example, Microsoft's AI assistant is called Jane, and even virtual assistants without speech functions are given feminized names conveying female gendering. On the other hand, the IBM AI lawyer is named John, and the IBM high-end AI system is designed as a man. Technology can be a double-edged sword, and pervasive gender-based discrimination is being replicated and reproduced in AI technology.

Third, the new challenge that AI presents to women is partly due to the lack of inclusion of women in the industry. In July 2016 at an artificial intelligence seminar jointly organized by President Barack Obama's administration and the Information Law Institute of New York University's School of Law,[37] the small proportion of women and ethnic minorities in the AI sector in the United States and the entire computer science industry was cited as one reason for the observable gender bias and lack of inclusiveness of AI technology. The lack of inclusiveness highlighted in the United States may be the same as that in China as well.

Challenge of AI for China

Platforms that stimulate the economy, such as the outsourcing of business processes, crowd and click work and the use of IT in finance, need closer examination. Many emerging economies have already improved with the help of information technology, such as the Internet, big data and 5G cellular technology and have created new models for China's economic development. Educated women have jumped on the high-speed train of China's platform for economic development and become one of the main beneficiaries of the economic impact. In the era of artificial intelligence, humans will be liberated from hard, manual labour, which stands to benefit women because physical strength will be of less importance. Although the challenges for women are emphasized in many debates, there is also a more optimistic outlook that suggests women will benefit from automation and technology.[38]

China is gradually replacing cash transactions with mobile telephone payments, dramatically changing the working patterns of people in the financial services and retail sectors. The overall objective is to reduce work intensity because the physical and mental work of cash transactions, for which employees are personally accountable, is now done by automatic machines, computers, mobile phones and other information equipment, with greatly improved efficiency. At the same time, automation reduces the need for expertise. Women constitute the majority of workers in financial services and retail, and this change brought about by new technology is tantamount to lowering barriers in the competition for jobs. That said, the new technology is also reducing the need for some jobs. For instance, mobile telephone payments now mean only one cashier might be employed whereas in the past several were needed.

Future research

How to improve gender sensitivity in various fields is an important issue in the research on AI and other hi-tech issues affecting human development. The *2017 Guidelines for Developing Manufacturing Talents*, published as part of Made in China 2025,[39] forecasts keenly felt shortages of the professionals needed by the top 10 manufacturing sectors: the new IT industry, 9.5 million professionals; electric equipment, 9.09 million; high-end computer numerical control machine and robot production, 4.5 million; new materials production, 4 million; and energy-saving and new energy vehicle production, 1.03 million persons.

How to reduce the impact of AI technology on female-dominated occupations is already an important research topic that merits pursuit.[40] The current main areas of new technology and AI application in which women are more often employed are transportation, health care, education, low-resource communities, public safety and security and entertainment.[41] Expanded use of AI technology in these areas may well dent women's employment.

How to effectively use technological progress to liberate women from the constraints imposed by child care and other work in the home to increase their participation rate in the labour market is another area in need of additional research. To achieve gender equality in the labour market, it is important to increase the flexibility of working hours so that even childbearing women can leverage the technological means to work flexible schedules and remain in the labour market.

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