PREPARING FOR AUTOMATION: THE CASE OF BANGLADESH[1]

Around 60 percent of the labor force in Bangladesh is employed in industries at a high risk of automation. Furthermore, automation in advanced economies will lead to the "onshoring" of manufacturing activities that were offshored to other countries. This is a critical time for Bangladesh, and every effort must be made to upgrade the RMG sector and keep it competitive. This includes increasing the technology used in factories, upgrading the skills of workers, and improving logistics, including transportation. Efforts to increase skills are complementary to policies needed in response to automation which center on upgrading the skills of labor through education and training.

1.   The fear of machines replacing humans has existed for arguably 500 years. Queen Elizabeth I denied a patent for an automated knitting machine for fear that it would replace the jobs of women.[2] The fundamental dilemma remains relevant to this day: if machines can replace people, what would be left for people to do?

2.   The heightened concern about automation's impact on employment has picked up in recent years. A confluence of factors is responsible for this: a decline in the labor share of income and an increase in the concentration of wealth; the hollowing out of the middle class; and the offshoring of manufacturing jobs. Also, between 2013 and 2018 the stock of industrial robots increased by more than 80 percent and projections suggest that the stock will increase a further 60 percent by 2022 (IRF, 2019).[3] Manufacturing jobs are not the only jobs at risk of automation. Artificial Intelligence (AI) and computer programs have been automating mental tasks, and advances in these technologies are expected to reach jobs previously thought to be immune to automation (for example, driverless cars).
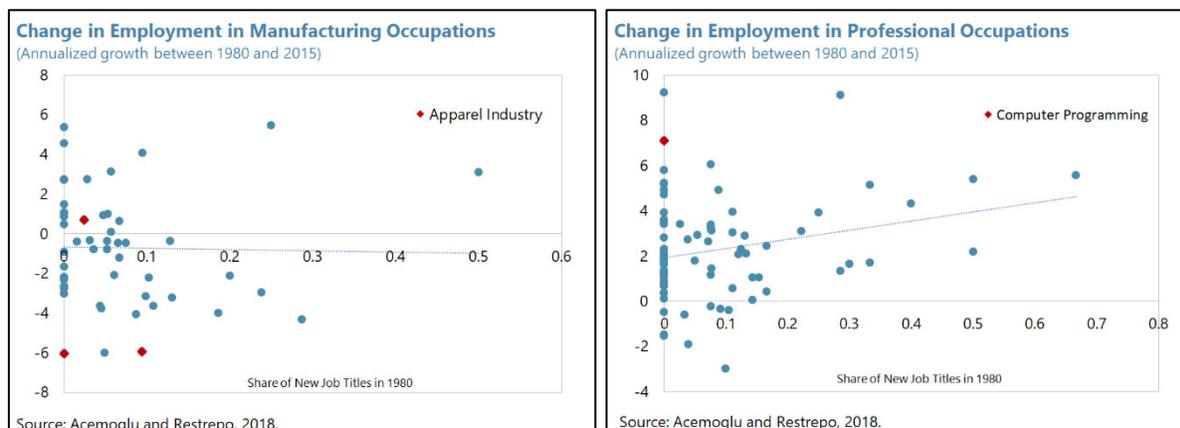
3.   History has shown that along with automation comes innovation and new jobs. Since the industrial revolution, new industries and new jobs were born alongside the disappearance of some. Acemoglu and Restrepo (2018) study automation in a theoretical setting where tasks carried out by labor can be automated, and new tasks in which labor has a comparative advantage can arise. They describe the conditions under which a balanced path where both automation and the emergence of new tasks co-exist. Using data from the United States they find that occupations with a higher proportion of new titles, which proxy new tasks, have growth in employment going forward. Of course, this means that workers' skills will have to keep up with learning new skills and moving to new jobs. In the case where new tasks are performed by high skilled labor, both automation and the emergence of new tasks would increase inequality unless low-skilled workers can learn the new tasks. Between 1980 and 2015, employment growth in manufacturing has been shrinking with occupations in the apparel industry among those contracting the most. Conversely,

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[1] Prepared by Racha Moussa (APD).

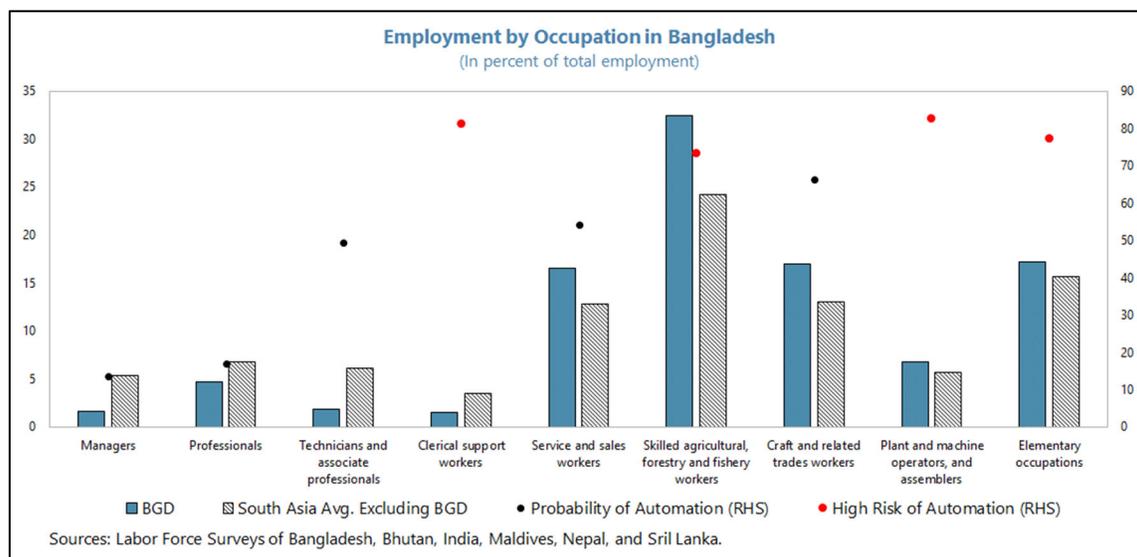[2] https://qz.com/1019145/weve-been-worrying-about-the-end-of-work-for-500-years/

[3] https://ifr.org/downloads/press2018/IFR%20World%20Robotics%20Presentation%20-%2018%20Sept%202019.pdf

professional occupations such as engineers, scientists, teachers, and healthcare professionals have seen growth in employment during the same time.
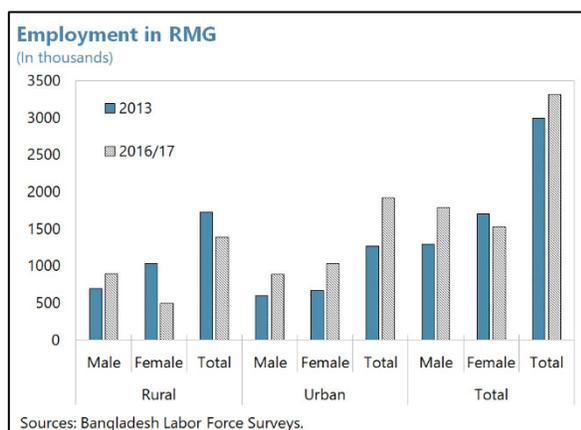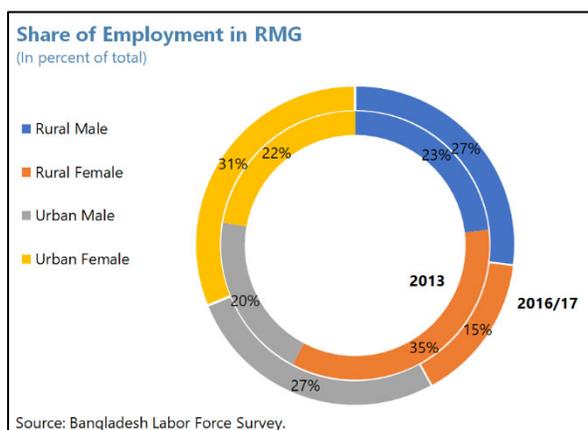

Change in Employment in Manufacturing Occupations
(Annualized growth between 1980 and 2015)

Share of New Job Titles in 1980

Source: Acemoglu and Restrepo, 2018.

Change in Employment in Professional Occupations
(Annualized growth between 1980 and 2015)

Share of New Job Titles in 1980

Source: Acemoglu and Restrepo, 2018.

4.   Around 60 percent of the labor force in Bangladesh are employed in industries that are at a high risk of automation (above 70 percent). This estimate is obtained by using the probabilities of automation estimated in Frey and Osborne (2013) and applying them to the occupational categories in Bangladesh. As the data on employment from the 2016/17 labor force survey (LFS) is only available for single digit occupations, the calculation uses average over the probabilities of automation in Frey and Osborne (2013) which are estimated by 4-digit occupation codes. It's important to highlight that occupations in the RMG industry vary in their risk of being automated, with weaving and knitting machine operators having higher risk of automation than patternmakers.[4] Bangladesh is more vulnerable to automation than other south Asian economies given the greater role manufacturing plays in the economy.

Employment by Occupation in Bangladesh
(In percent of total employment)

Sources: Labor Force Surveys of Bangladesh, Bhutan, India, Maldives, Nepal, and Sril Lanka.

[4] The LFS of 2016/17 does not provide data on employment in these specific occupations.

5.   **Understanding the impact of automation on the manufacturing industry and the ready-made garment (RMG) industry more specifically is critical to understanding prospects of employment and production in Bangladesh.** For the past two decades, manufacturing has been an important driver of growth in Bangladesh has had the largest contribution to growth. In the last 5 years, manufacturing contributed to more than one third of GDP growth. Within manufacturing, the RMG industry is an important component and makes up more than 90 percent of the value of exports.

6.   **Employment in the garment industry in Bangladesh has increased by 10 percent between the last two labor force surveys, 2013 and 2016/17.** This increase is driven by a 40 percent increase in male employment in the industry contrasted with a ten percent decline in female employment. The decline in female employment is explained by the decline in employment for females in rural areas—female employment in rural areas declined by 50 percent between 2013 and 2016/17 LFS. Females in rural areas comprised 15 percent of the RMG labor force in 2016/17 compared to 35 percent in 2013. Employment in RMG from labor in urban areas increased to 58 in 2016/17 compared with 42 percent in 2013. This trend could be caused by an increase in salary from working in RMG. In November 2013 the minimum wage was increased from Tk 3000 to Tk 5300, which was further increased to Tk 8000 in September 2018. However, the impact of this increase on employment in the RMG sector could be studied only after the next LFS. An increase in automation is cited as one of the major reasons for the decline in female employment in the RMG industry. Women tend to have lower skills and cannot operate various types of machines (CPD, 2019). It is critically important to ensure that workers in RMG continue to improve their skills so that they will be able to operate more sophisticated machinery which will increase productivity.
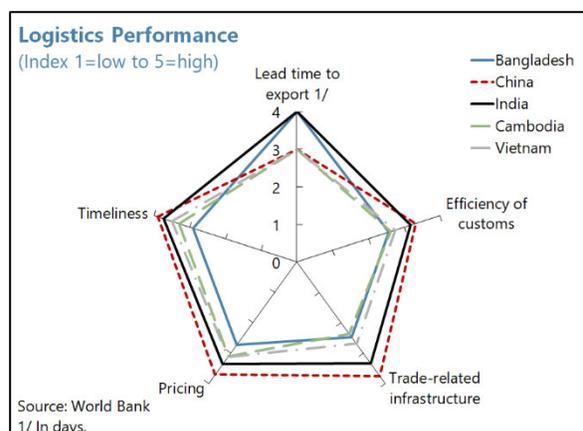

Share of Employment in RMG (In percent of total). Source: Bangladesh Labor Force Survey.

Employment in RMG (In thousands). Sources: Bangladesh Labor Force Surveys.

7.   The RMG industry in Bangladesh will need to be competitive without reliance on low

wages. Minimum wages in Bangladesh are no
longer below peers. The strategy to maintain
competitiveness must rely on improvements in
productivity and increasing the quality of
products. This will require improving the skill of
labor and moving into the production of higher
value-added goods. Continued emphasis on
diversifying the exports in Bangladesh remains a
key policy issue. In addition to this, increasing the
competitiveness of the RMG sector in Bangladesh
is important in the transition, as the sector is
currently an important driver of the economy.

Minimum Wage
(In US dollars)

Source: International Labor Organization.
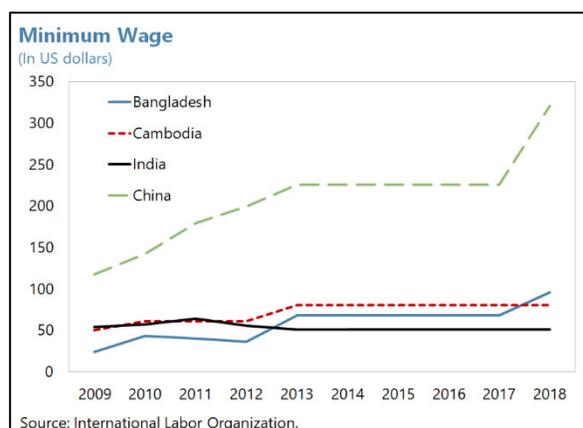
**8.   RMG in Bangladesh is largely centered on the production of low-value added cotton
garments sold to fast fashion retailers.** This makes the sector particularly vulnerable to two
emerging risks. First, the increase in onshoring in advanced economies, such as the US, which will
start to occur at the lower end of the value-added chain first. Onshoring efforts in the United States
have begun.[5,6] A factory in Arkansas is planned to test production relying on "Sewbots" which
perform the entire task of making an item of clothing from cutting the fabric to assembly to
finishing, in the second quarter of 2020. This includes t-shirts which is a major export from
Bangladesh.[7] This type of complete automation is at the experimental stage and by some estimates

about a decade away from being mainstreamed
(Nikkei, 2019).[8] Humans are still needed in the
process, but they are becoming more tasked with
technical things related to the operation of
machinery or finishing details that require human
nimbleness and skill. To remain competitive, it is
imperative that Bangladesh improve the quality of
the goods in the RMG sector, move further into
producing higher value-added goods which
require more skills to make, such as knits and
clothing made from synthetic fabrics. This will
require making sure that factories have updated

Logistics Performance
(Index 1=low to 5=high)

Source: World Bank
1/ In days.

technologies and that workers have the skills required to produce higher value-added goods.
Second, the changing nature of the Fast Fashion industry which has become more demanding of
faster delivery times to supply trends on-demand (Nikkei, 2019). For Bangladesh to remain

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[5] Onshoring refers to the domestic return of activities that were previously outsourced to other countries.

[6] https://www.trtworld.com/magazine/will-robots-completely-replace-humans-from-textile-factory-floors--14930

[7] https://www.just-style.com/news/tian-yuan-garments-invests-another-10m-in-us-facility_id136381.aspx

[8] https://asia.nikkei.com/Spotlight/Cover-Story/How-the-death-of-fast-fashion-is-transforming-Asia-s-garment-industry

competitive, logistics postproduction should be at par with the competition. Currently Bangladesh underperforms main competitors in the region.

9.   Automation will inevitably decrease the intensity of labor in the RMG sector if the sector remains globally competitive. Estimates by the ILO suggest that around 60 percent of Jobs in the RMG sector may be lost by 2041 (ILO, 2019). This is a critical time for Bangladesh, before onshoring in advanced economies picks up, and every effort must be made to upgrade the RMG sector and keep it competitive. This includes increasing the technology used in factories, upgrading the skills of workers, and improving logistics, including transportation. Efforts to increase skills are complementary to policies needed in response to automation which center on upgrading the skills of labor through education and training.

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