

## Box 2.6:

# Gen AI: Augmenting or Displacing Jobs in ASEAN+3?

Gmyrek, Berg, and Bescond (2023) from the International Labour Organisation (ILO) analyzed the potential exposure of various occupations and tasks to Gen AI. They specifically looked at large language models (LLMs), and how this exposure might affect employment.<sup>1</sup> In the study, an occupation is classified as having automation potential if most of its tasks can be automated.<sup>2</sup> On the other hand, a job has augmentation potential if some tasks are difficult to automate while others can be automated more easily. Overall, the study, along with others, finds that LLMs are more likely to augment jobs than automate them. Further, the impact is more pronounced in high- and upper middle-income economies—where occupations with clerical tasks make up a relatively higher proportion of employment—than in low- and lower-middle-income economies. The effects of LLMs are also highly gender-biased, with a larger proportion of women’s jobs facing both automation and augmentation potentials compared to men.

AMRO staff, using estimates by the authors, have approximated the potential effects of LLM exposure on jobs in the ASEAN+3 region.<sup>3</sup> The intent is not to have precise estimates of LLM’s effects on employment, but to provide broad insights of the direction and distributional impacts of possible changes. Overall, a higher proportion of jobs across ASEAN+3 have potential to be augmented by Gen AI rather than automated (Figure 2.6.1).<sup>4</sup> This suggests that LLMs are more likely to enhance jobs than replace them. However, Japan stands out: given the structural composition of its employment, which has relatively higher proportion of clerical tasks, the economy

could be more affected by job automation than job augmentation.<sup>5</sup>

The results vary when employment effects are classified according to ASEAN+3 economies’ income group and job skill levels.<sup>6</sup> Across all income groups, a greater proportion of high-skilled jobs than medium-skilled jobs have the potential to be augmented, with lower-income economies benefiting more. High-skilled workers in lower-middle-income economies are likely to benefit the most from augmentation (Figure 2.6.2). On the other hand, a greater share of medium-skilled jobs could be exposed to automation potential than high-skilled jobs, especially in higher-income economies. Meanwhile, LLM technology is unlikely to affect low-skilled jobs, which involve tasks that require considerable physical effort such as cleaning and manual labor.

Disaggregating the results by gender also reveals different impacts on employment. The share of women’s jobs that could be affected by LLM technology—both in automation and augmentation—is higher than for jobs held by men and increases with economies’ income levels (Figure 2.6.3). This disparity is most evident in high-income economies, where the proportion of women’s occupations exposed to automation are more than double that of men. Nonetheless, while women may be disproportionately affected by job automation, they also stand to benefit more from job augmentation.

This box was written by Megan Wen Xi Chong.

<sup>1/</sup> LLMs refer to AI algorithms designed to understand, interpret, and generate human language based on extensive training data. These models, such as the GPT series developed by OpenAI, are characterized by their vast number of parameters and deep learning techniques, allowing them to generate coherent and contextually relevant text. LLMs are utilized in a variety of applications, including language translation, content creation, and conversation simulations, demonstrating significant advancements in natural language processing and AI research.

<sup>2/</sup> Using the GPT-4 model, a score of exposure to GPT technology is generated for each task defined according to the International Standard Classification of Occupations (ISCO-08). Considering occupations as a collection of tasks with different exposures, jobs are then classified as having automation or augmentation potential based on the mean and standard deviation of task scores generated.

<sup>3/</sup> The authors have provided data on augmentation and automation potential for jobs at the ISCO-08 4-digit level. Since employment data for most economies are only available at the 2-digit level, AMRO staff calculated the proportion of occupations in each 2-digit category that are classified as having automation or augmentation potential. The share of occupations with automation or augmentation potential are then applied to country-level employment data to estimate the potential employment effects. For economies with data at only the 1-digit level, a weighted mean is calculated based on the economy’s income level classification.

<sup>4/</sup> AMRO staff use the most recent data available for employment by ISCO category; however, for some economies, these are still quite dated (e.g., China and Indonesia). Interpretation of economy-specific estimates warrant some degree of caution, especially if employment trends or structure have changed over time.

<sup>5/</sup> Among ASEAN+3 economies, Japan has the highest proportion of employment that fall under the ISCO category of Clerical Support Workers at 20 percent. For the rest of the region, the proportion of jobs in this category range from 1 percent to 12 percent.

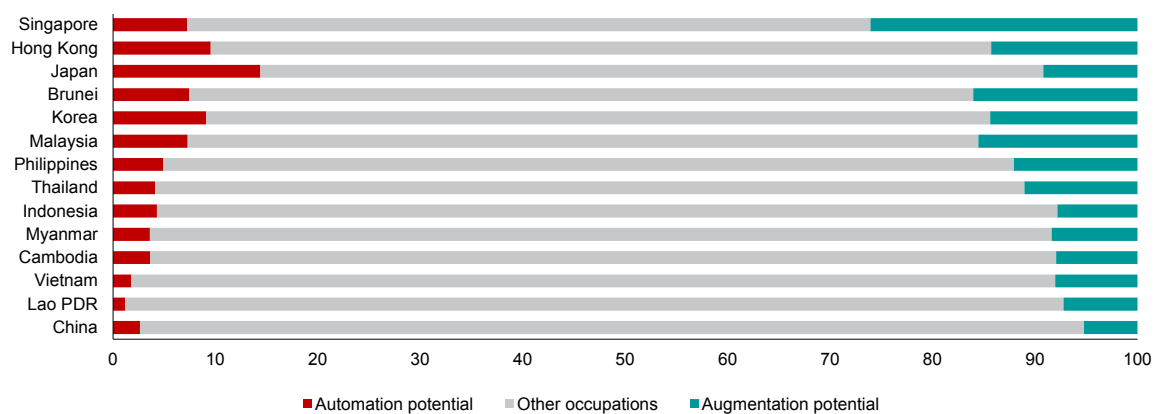
<sup>6/</sup> Income groups are defined per the World Bank’s income group classification. Skill levels are defined according to the International Labour Organization and based on the ISCO-08 classification.

It is important to stress that these results are not meant to be taken as precise estimates. In addition, this exercise only covers the effects of LLM-based technology, and not broader AI technology. Nevertheless, it provides insights regarding the potential impacts of Gen AI technology on the region's employment. First, more jobs in the ASEAN+3 are likely to be augmented rather than automated, providing a more positive outlook about the use and application of Gen AI technology. However, the distributional impact on employment varies with skills and gender. Medium-skilled jobs face a higher risk of automation, especially those with a larger share of clerical tasks, while high-skilled jobs could benefit more from Gen AI's augmentation potential. Meanwhile, given the types of

occupation that women are more involved in compared to men, they could be more disproportionately exposed to both augmentation and automation potentials.<sup>7</sup>

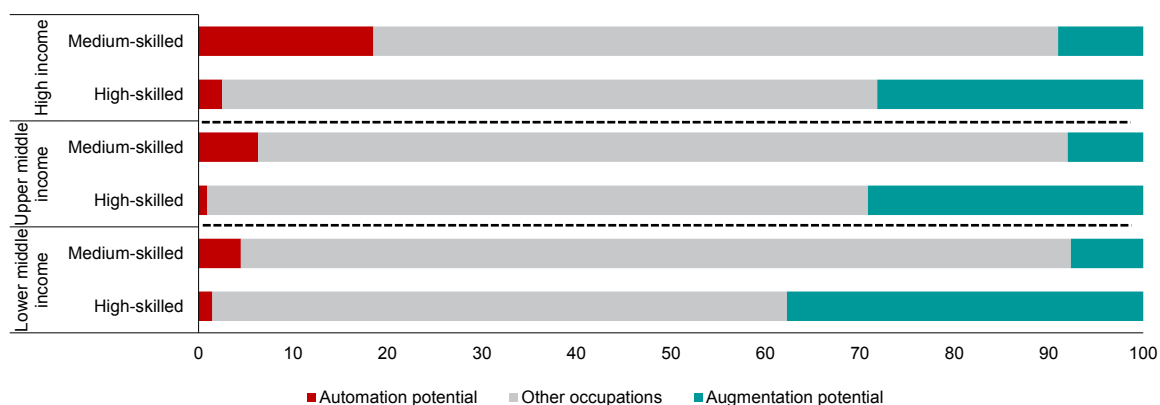
These preliminary findings suggest that the effect of Gen AI on ASEAN+3 employment will likely be uneven. The general-purpose nature of this particular technology is likely to have broad effects across many industries and jobs, bringing both opportunities and challenges. To deal with job displacement concerns, policies can be shaped to create a supportive environment for retraining and upskilling workers likely to be most affected. This way, the ASEAN+3 workforce will be prepared to make the most of Gen AI's capabilities—and while ensuring that no sector, group, or economy gets left behind.

**Figure 2.6.1. ASEAN+3: Share of Employment with Automation and Augmentation Potential**  
(Percent)



Source: Gmyrek, Berg, and Bescond (2023); AMRO staff calculations.  
Note: Data refer to the proportion of jobs with automation and augmentation potential as a share of total employment within each economy. Data are as of 2022 (Hong Kong, Korea, Singapore, Thailand, Vietnam), 2021 (Brunei, Cambodia, the Philippines), 2020 (Japan, Myanmar, Malaysia), 2017 (Lao PDR), 2010 (Indonesia), and 2005 (China).

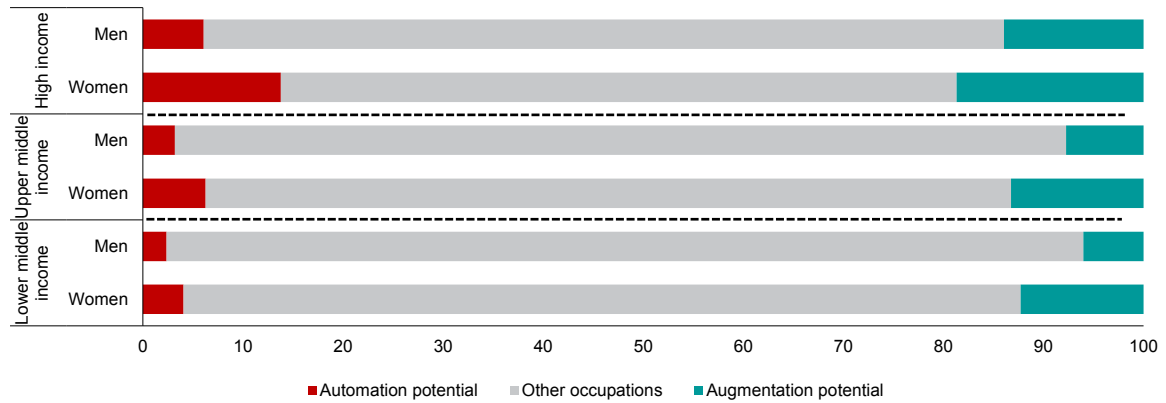
**Figure 2.6.2. ASEAN+3: Share of Employment with Augmentation and Automation Potential, by Income Group and Skill Level**  
(Percent of jobs within each skill category)



Source: Gmyrek, Berg, and Bescond (2023); ILO Labour Force Statistics; AMRO staff calculations.  
Note: High-skilled jobs include categories 1 to 3 of the ISCO-08; medium-skilled jobs include categories 4 to 8. The high income group includes Hong Kong, Japan, Korea, Brunei, and Singapore; the upper-middle-income group includes China, Indonesia, Malaysia, and Thailand; the lower-middle income group includes Cambodia, Lao PDR, Myanmar, the Philippines, and Vietnam.

<sup>7</sup> Job categories that have a higher percentage of women than men include professional services, as well as service and sales workers.

**Figure 2.6.3. ASEAN+3: Share of Occupations with Automation and Augmentation Potential, by Income Group and Gender**  
*(Percent of jobs within each gender)*



Source: Gmyrek, Berg, and Bescond (2023); ILO Labour Force Statistics; AMRO staff calculations.  
 Note: Data refer to percent of total employment within each sex. The high income group includes Hong Kong, Japan, Korea, Brunei, and Singapore; the upper-middle income group includes China, Indonesia, Malaysia, and Thailand; the lower-middle income group includes Cambodia, Lao PDR, Myanmar, the Philippines, and Vietnam.