BOK Issue Note

Rapid Adoption of Artificial Intelligence and Its Productivity Effects: The Case of Korea

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① We conduct a household survey using a representative sample that reflects the occupational distribution of the general population. The data obtained from this survey are then analyzed to assess the adoption of artificial intelligence (AI) technologies among Korean workers and its effects on productivity.

② 63.5% of all surveyed workers report using generative AI in some capacity. Even when only work-related uses of AI are considered, the usage rate is 51.8%. This is nearly double the adoption rate in the U.S., as well as eight times the rate of internet adoption at its commercial debut in the early 1990s. With the average duration of use measured at 5-7 hours per week, AI use intensity is also substantially higher among Korean workers compared to their U.S. counterparts. However, the survey finds a significant degree of variation in the usage of AI according to demographic and occupational characteristics. The usage rate of AI is generally higher among men, young adults, highly educated individuals, and professional and managerial workers than in the rest of the population.

③ The use of generative AI tools reduces work hours by 3.8% on average (1.5 hours weekly, based on a 40-hour work week). The resulting increase in potential productivity is estimated at 1.0%. Time savings are more sizable for less-experienced workers, suggesting that the use of AI may have an equalizing effect of narrowing the gap in skills and experience between workers.

④ About 11% of workers are currently exposed to physical AI, in the form of collaboration with autonomous robots. This figure is expected to rise to as high as 27% in the future. While AI technologies are mainly impacting intellectual labor for the moment via generative AI tools, they are likely to also bring about a major transformation in the way physical labor is performed through physical AI.

⑤ 48.6% of workers feel that AI would have a positive impact on society, far exceeding the percentage of those who believe that its impact would be negative (17.5%). Moreover, a considerable number of workers indicate that they are considering retraining or upskilling (33.4%) or a job change (31.1%) in response to AI-driven job displacement and shifting skills demands. Finally, 32.3% of workers express a willingness to contribute to an AI development fund. When estimated based on the percentage of those surveyed to be willing to donate to an AI fund, such a fund could raise about KRW 38 trillion over the next five years.

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■ Any remaining errors in the paper are attributable to the authors.

한국은행

I. Introduction

Artificial intelligence (AI) technology has emerged as the most transformative force of our time. Since the unveiling of ChatGPT, a large language model (LLM)-based generative AI, in November 2022, the number of its weekly active users has rapidly increased to reach an estimated 700 million in July 2025. ChatGPT was soon followed by other various generative AI systems, such as Gemini, CLOVA Note, Perplexity, and Claude, whose user bases are also quickly growing.

Recent studies have demonstrated the positive effects of generative AI on productivity (Oh et al. 2025; Brynjolfsson et al. 2025; Cui et al. 2024), with some of them predicting a substantial economic impact from its adoption (Chui et al. 2023; Filippucci et al. 2024). However, other studies estimated that the economic impact of generative AI could be rather limited (Acemoglu 2024). Expert predictions are, therefore, mixed at best, regarding both AI's impact on economic growth and its impact on the labor market. Uncertainty surrounding the future outlook of AI is in part due to the lack of comprehensive data on its usage among workers.

In this study, in order to provide crucial data for AI policy formulation, we assessed the usage of AI tools among Korean workers and analyzed its impact on productivity based on the results of a household survey. The survey was designed as a nationally representative survey that reflects the occupational distribution of the overall population and was conducted online. The sample consisted of close to 5,500 individuals. The survey asked respondents about whether they used AI, how their productivity changed as a result, how their task performance was impacted by physical AI, how they perceived AI technology, and whether they supported government policies including the establishment of an AI fund.

Some of the key findings of the survey were as follows. First, 63.5% of workers used generative AI to some degree, and even when only its work-related uses were considered, the rate of usage remained a hefty 51.8%. This is about double the corresponding adoption rate in the U.S. (26.5% for work) (Bick et al. 2025) and far outstrips the adoption rate of the internet during its early commercial phase. Korea has also surpassed the U.S. in terms of use intensity, with the average weekly duration of use among those reporting to use generative AI amounting to 5-7 hours. Meanwhile, AI usage showed significant variations according to demographic and occupational attributes. AI usage tended to be higher among men, young adults, highly-educated individuals, and professional and managerial workers.

Second, the use of generative AI reduced the time workers spend on the job by an average of 3.8% (1.5 fewer hours, based on a 40-hour work week), which is estimated to have boosted potential productivity (based on a production function model) by 1.0%. The generative AI-induced reduction in work hours was more pronounced among less-experienced workers, suggesting that generative AI may have an equalizing effect on the quality of work by narrowing the performance gap between less-experienced and highly-skilled workers. However, as many as 54.1% of workers experienced no reduction in working hours despite using generative AI. This appears to be due either to an insufficient AI proficiency or to additional time taken to review AI-generated content. As more workers learn to efficiently use generative AI, its positive impact on productivity will likely grow in the future.

Third, 11% of workers were exposed to physical AI in their jobs, in the form of collaboration with autonomous robots, so-called "cobots." With further advances in AI technology, this figure is projected to rise to as high as 27% in the future. However, workers exposed to physical AI exhibited different occupational characteristics from those exposed to generative AI. This is because unlike generative AI, which is mainly used for cognitive tasks, physical AI is employed to perform tasks that involve interaction with the real world.

Finally, a substantial number of workers expressed a positive perception of AI and showed strong support for pro-AI policies. It was found that 48.6% of workers, or nearly half of all respondents, believed that AI would have a favorable impact on society, far exceeding the percentage of those who felt that its impact would be detrimental (17.5%). Furthermore, 32.3% of workers indicated a willingness to contribute to an AI fund. When estimated based on the percentage of respondents willing to donate to an AI fund, such a fund, if created, could raise some KRW 38 trillion over the next five years.

The rest of this paper is organized as follows. Section II describes the survey design. Section III examines the current usage of generative AI. In Section IV, the productivity-enhancing effect of generative AI is estimated. In Section V, the impact of physical AI is investigated. Section VI analyzes the policy preferences of respondents, including their support for the establishment of an AI fund. Finally, Section VII summarizes the findings and offers concluding

remarks.

II. Survey Design and Data Collection

1. Target Population and Survey Method

Employed individuals aged 15-64 were selected as the target population. The sample was drawn using Hankook Research's Web Panel as the sampling frame. The survey was administered online through a computer-aided web interview (CAWI) between May 19 and June 17, 2025.

2. Sampling

The sample was created by stratifying the raw employment data for the first half of 2024 released by Statistics Korea, which were organized by geography. Minor occupational groups, age groups, and gender were used as the stratification variables. To ensure the validity and representativeness of the sample, proportionate quota sampling was employed.

- **Sample Size:** an effective sample of 5,512 subjects
- **Sampling Error:** ±1.32%p at a 95% confidence level

After sampling, post-stratification was used to align the sample with the target population by assigning weights to the data. The weights were adjusted so that the sample accurately reflects population demographics, including major occupational groups, age groups, and gender.[1]

3. Key Survey Items

The survey questions were organized into the following five dimensions.

1. Current occupation and perceived working conditions

- Average hours worked per day, work motivation, job responsibilities and their relative importance, time spent on core duties, job satisfaction, etc.

2. Use of generative AI

- Awareness of AI, use of AI for work and outside of work, purposes of use, frequently used AI tools, duration of use, tasks for which AI tools are more frequently used, etc.

3. Change in work performance brought about by the use of AI

- Changes in weekly hours worked, workload and job satisfaction experienced since the adoption of generative AI, reasons for the changes, etc.

4. Use of robots

- Degree of physical demand required by the job, experience collaborating with a robot, types of robots used, evaluation of the job performance of autonomous robots, collaboration methods, etc.

5. Perception of AI and policy preferences

[1] For more information about the sampling method, see Box 1. Sampling Method and Sample Characteristics.

• Likelihood of the job being automated, resulting risk of job loss, social impact of advancements in AI technology, upskilling, reskilling, or career change plans, areas to which the government needs to prioritize budget allocation, willingness to contribute to an AI fund, need to expand the social safety net, etc.

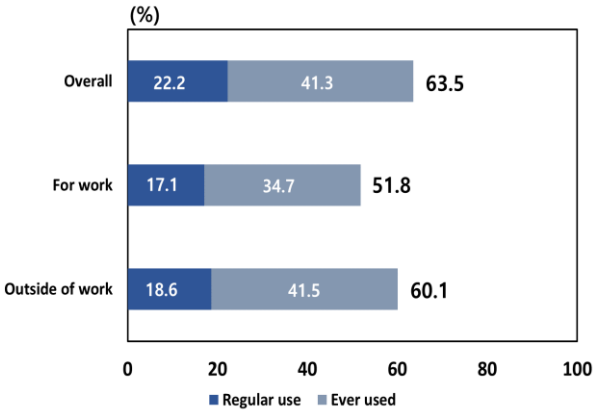
III. Usage of Generative AI

1. How Many Use It?

It was found that 63.5% of domestic workers reported having used generative AI tools at least once (Figure 1). Survey results showed that 22.2% of them identified themselves as "regular users" of generative AI, while the remaining 41.3% said that they had used it in some capacity, although they did not use it regularly. Such an elevated usage rate implies that generative AI is no longer a niche technology for early adopters, but is gaining widespread adoption across all sectors of the labor market.

Even when only work-related purposes were considered, more than half of all respondents (51.8%) reported that they had experience with generative AI. Exactly 17.1% indicated that they regularly used generative AI for their work, and 34.7% said that they experimented with some tools to try them for work. Although this is lower than the rate of using AI outside of work (60.1%), the result is nevertheless significant in that more than one in two workers are already using generative AI to enhance productivity.[2]

Figure 1. Generative AI Adoption



An international comparison and a comparison with past innovations both reveal that the adoption of generative AI in the domestic labor market is taking place at a remarkably fast rate. Figure 2 compares the results of the survey conducted for this study with the U.S. data quoted in Bick et al. (2025).[3] The use of generative AI for work purposes in Korea, measured at 51.8%, is nearly double the rate in the U.S. (26.5%).[4] The gap is similarly wide in terms of AI usage outside of work (Korea 60.1%, U.S. 33.7%) and overall usage (Korea 63.5%, U.S. 39.6%), suggesting that domestic workers are adopting AI technologies at a vastly faster pace than their U.S. counterparts.

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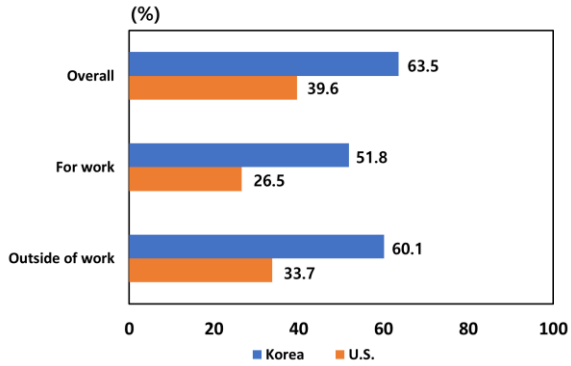
[2] According to the Survey of Business Activities, only 6.2% of companies have officially adopted AI in their business (as of 2023). This means that the vast majority of company employees who are using AI for their work are doing so on their own initiative.

[3] At this current point in time, the U.S. is nearly the only country where systematic research has been conducted into the use of generative AI using a representative sample, allowing a meaningful comparison with Korean data. In this study, to ensure comparability of the Korean and U.S. data, the questionnaire was designed by drawing on Bick et al. (2025).

[4] The survey period in Bick et al. (2025) was from August to November 2024.

Figure 2. Generative AI Adoption in Korea and the U.S.

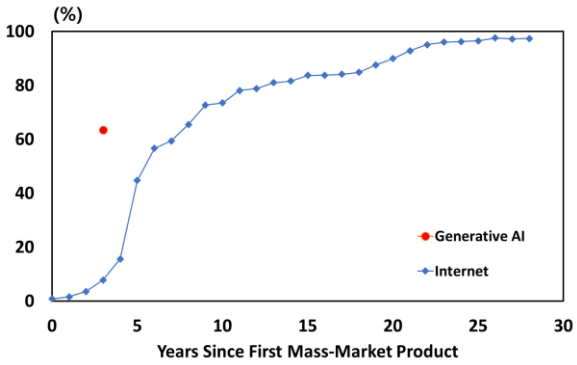


Source: U.S. data as cited in Bick et al. (2025).

The adoption rate of generative AI in Korea is also unprecedented when compared to the internet in its early days. As can be seen in Figure 3, during the first three years following the commercial debut of the internet, its usage rate was a mere 7.8%. In comparison, the usage of generative AI reached 63.5%, more than eight times the latter rate, even before the third anniversary of its commercial release.[5]

Two factors appear to be at play in this explosive adoption rate of generative AI. First, unlike in the infancy years of the internet, well-developed digital infrastructure is already in place today, facilitating the use of generative AI. The penetration rates of the internet, personal computers, as well as cell phones are currently extremely high across Korea. Second, generative AI has broad applications across diverse fields. According to Eloundou et al. (2024), language models, a subset of generative AI, are applicable to about half of all types of activity performed by workers in an economy. If video, image, and sound generation tools are added to language models, this further expands the scope of applications for generative AI.

Figure 3. The Trajectory of Generative AI [1)] and Internet[2)] Adoption



Notes: 1) ChatGPT was first released in 2022, so that year was selected as the year of the commercial debut of generative AI.

2) The year 1995 was chosen as the inception year for the commercial internet.

Source: Internet Usage Survey.

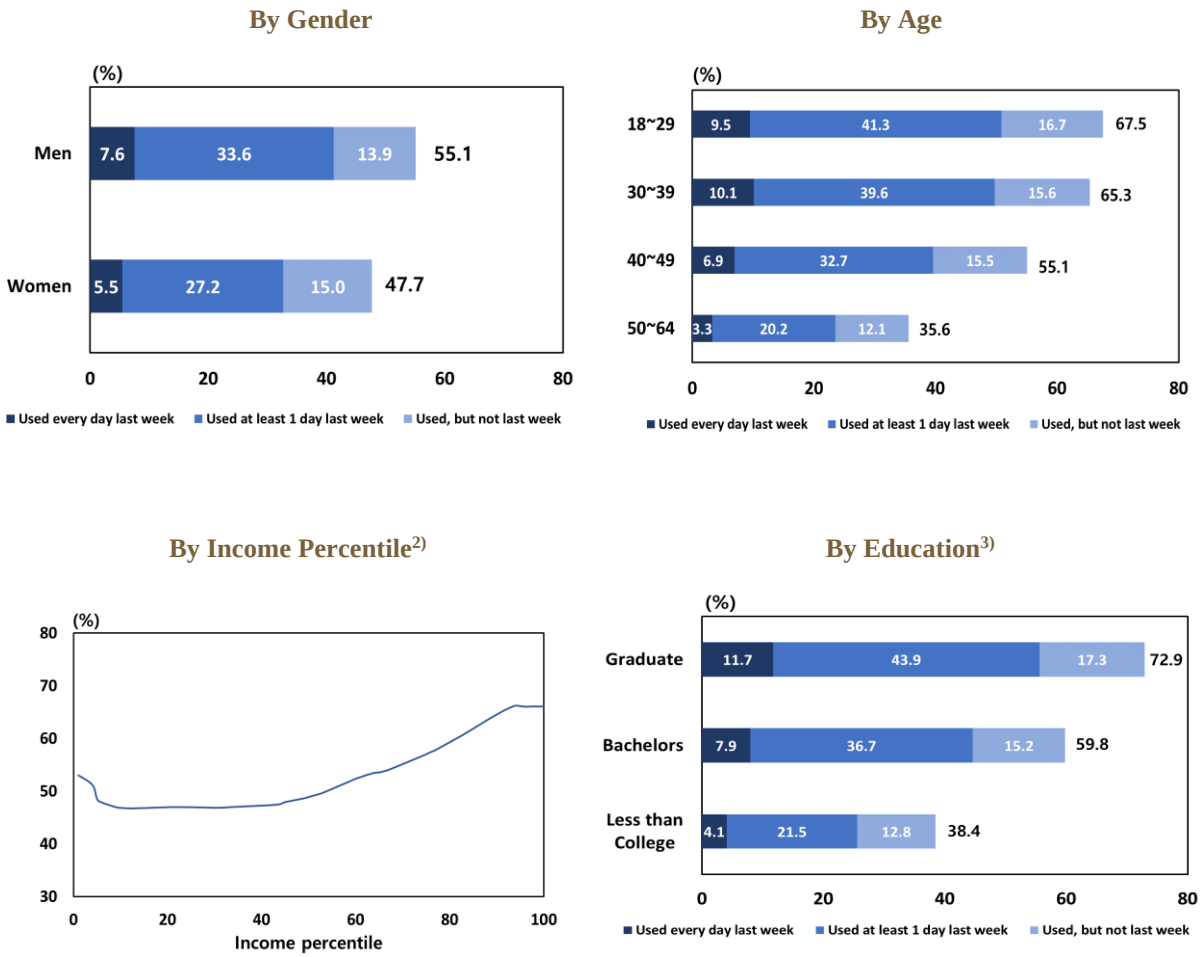
[5] Bick et al. (2025) reports that generative AI is spreading at an unprecedented pace, even compared to personal computers, as well as evenly across all professions and industries.

2. Who Mainly Uses It?

As was said earlier, although generative AI is gaining rapid and widespread adoption, its usage rate varies significantly according to demographic and occupational characteristics. As shown in Figure 4, the rate of AI usage is higher among men, young adults, high-income individuals, and highly-educated individuals. Moreover, the frequency of AI use was higher in groups with a high usage rate.

- **By gender**, men (55.1%) were found to use generative AI slightly more than women (47.7%).
- **By age group,** the usage rate was the highest among young adults (18-29), at 67.5%. With advancing age, the AI usage rate gradually decreased to stand at 35.6% in the age group 50-64.
- **By income level,** although there was a broad pattern in which the higher the income, the higher the AI usage, the usage rate dropped slightly in the highest income bracket.
- **By education level,** the higher the educational attainment, the higher the AI usage was. While the usage rate of AI among people with a postgraduate degree was 72.9%, the corresponding rate among individuals with a high school diploma or less was a mere 38.4%.

Figure 4. Generative AI Adoption by Demographic Group[1)]



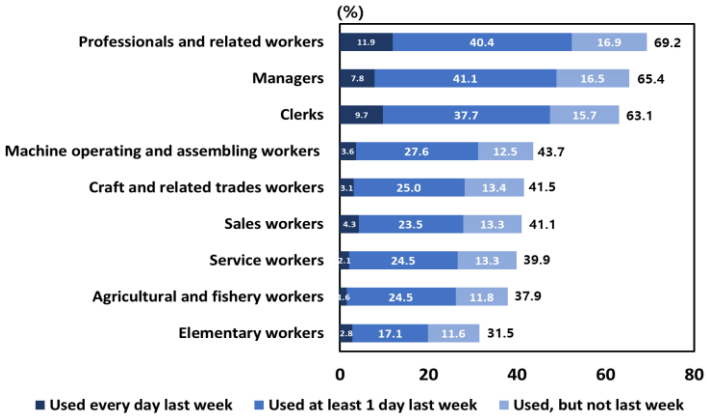
Notes: 1) Based on the use of AI for work.

2) Locally weighted smoothing regression (bandwidth 0.8).

3) Those who graduated from a two- or three-year college (vocational college) were classified as "less than college degree."

By occupational group, the usage rate of AI tended to be high among professional, managerial, and clerical workers (Figure 5).[6] This finding highlights that the use of AI is importantly influenced by task characteristics. Even in occupational groups with a comparatively low usage rate, over 30% of workers appeared to use AI, attesting to its widespread adoption across all segments of the labor market.

Figure 5. AI Adoption by Occupational Group[1) 2)]

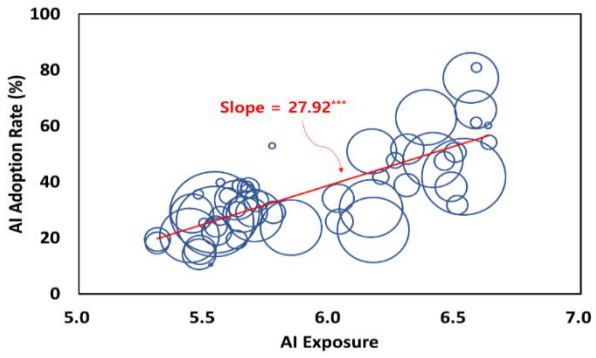


Notes: 1) Based on the use of AI for work.

2) Based on nine major occupational groups.

Meanwhile, the usage of AI in an occupational group was closely related to the degree of exposure to AI technology. When the AI occupation exposure index developed by Felten et al. (2021)[7] was compared to the actual AI usage rates measured in this study, a clear positive correlation could be observed between the two, as shown in Figure 6. This can be interpreted to mean that AI is most actively used in occupational groups that are most exposed to AI. This finding corroborates the thesis advanced by prior research (Han & Oh 2023) that occupational AI exposure is a valid predictor of the usage and impact of AI.

Figure 6. Occupational AI Exposure and Adoption[1) 2) 3)]



Notes: 1) AI exposure as proposed by Felten et al. (2021).

2) The size of the circle indicates the number of workers in each occupational group.

3) Statistical significance levels: ***p<0.01, **p<0.05, *p<0.1.

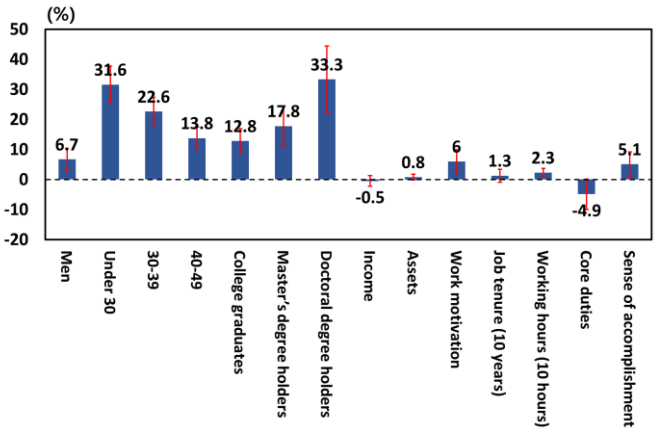
[6] For AI usage rates by minor occupational group, see Box 3.

[7] AI occupational exposure quantifies how many tasks within an occupation are susceptible to automation or augmentation by AI (job replacement by AI) by matching task characteristics and AI's functional capabilities.

Figure 7 visualizes the results of a regression analysis performed to precisely determine factors influencing the use of generative AI. The usage rates of AI by gender, age, and education were mostly similar to the rates that were measured earlier in this study, according to demographic attributes. All other conditions being equal, the probability of using generative AI was estimated to be 6.7%p higher for men than for women and 22.6%p higher for individuals in their 30s than for individuals in their 50s. The probability of using AI was also higher for college graduates, master's degree holders, and doctoral degree holders than for high school graduates by 12.8%p, 17.8%p, and 33.3%p, respectively. On the other hand, when other factors were controlled for, income level showed no statistically significant influence on the probability of AI use.

Aside from demographic attributes, factors such as working hours, work motivation, and role perception also showed a statistically significant influence on the use of generative AI. Concretely, the longer the working hours, the stronger the work motivation,[8] and the more intense the sense of accomplishment from work,[9] the higher the probability for a worker to use generative AI appeared to be.

Figure 7. Results of Regression Analysis on AI Use[1)]



Notes: 1) Red lines represent the 95% confidence interval.

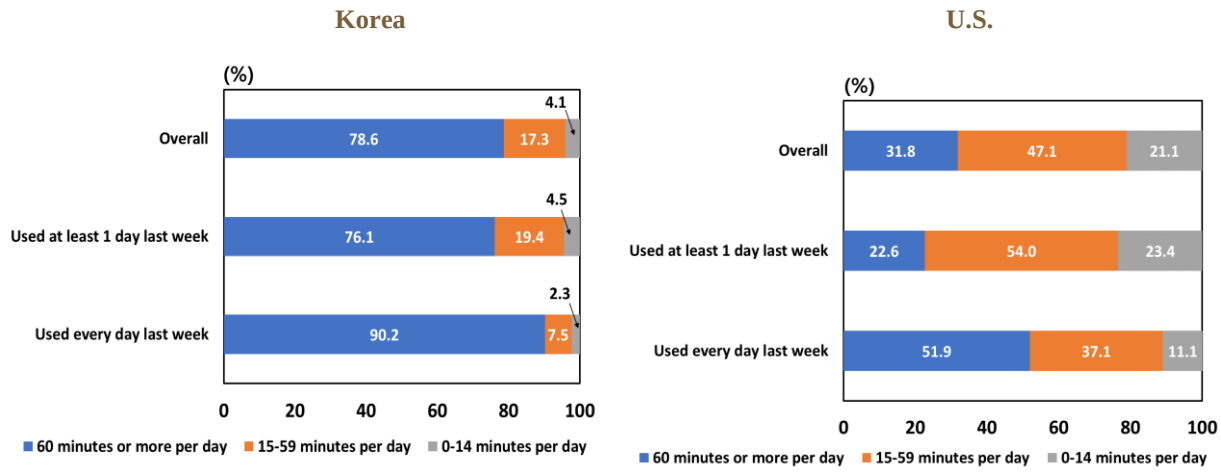
3. How Much Time Is Spent on AI?

Those who use generative AI for work were found to spend 5-7 hours weekly interacting with AI systems (Figure 8),[10] which corresponds to 12.1%-16.6% of total hours worked based on a 40-hour work week. This constitutes quite a high level of use intensity, especially compared to the U.S. (1.3%-5.4%, or 0.5-2.2 hours weekly),[11] suggesting that generative AI is quickly becoming a core element of work processes beyond a mere assistive tool.

Moreover, heavy users who use AI for an hour or more daily made up 78.6% of all users, while the corresponding share is only 31.8% in the U.S. (Figure 8). Also worth noting is the fact that 90.2% of Korean workers who reported using AI on a daily basis were heavy users who interacted with it for 60 minutes or more every day.

[8] The work motivation variable was measured based on the respondents' answers to questions about labor supply elasticity.
[9] The survey investigated specific tasks that were actually performed by the respondents. The variable was constructed based on survey results on their perceived sense of accomplishment experienced from each of the tasks.
[10] Due to the survey structure, for respondents who said that they used generative AI on two or more days during the past week, but not every day, while two was assigned as the minimum number of days of use, the total number of days worked during the past week minus one day was used as the maximum number of days of use. This gives an average weekly duration of use of at least 5.0 hours, up to 6.9 hours. Although this is similar to the estimation method used in Bick et al. (2025), our study derived a more accurate estimate range of weekly durations of AI use by formulating detailed survey questions about daily durations of use.
[11] Estimated by authors based on a 40-hour work week.

Figure 8. AI Use Intensity



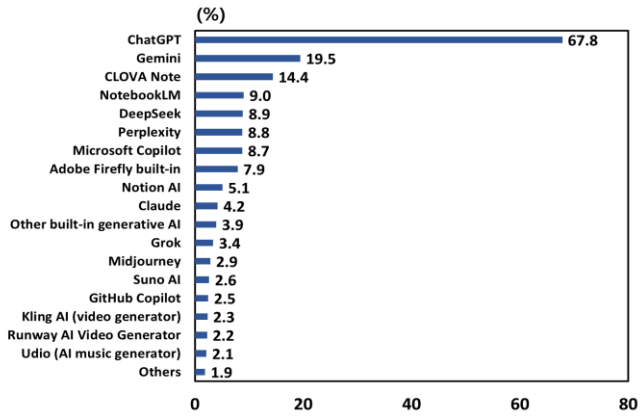
Source: U.S. data as cited in Bick et al. (2025).

4. What Tools Are Used for What Tasks?

ChatGPT currently holds the dominant share in the generative AI market. As can be seen in Figure 9, 67.8% of AI users reported using ChatGPT, with Gemini and CLOVA Note coming in as distant seconds and thirds, at 19.5% and 14.4%. There are also a variety of other tools, such as NotebookLM, DeepSeek AI, and Perplexity AI, vying for market share.

The most common application of generative AI[12] in a work setting was "information search and summarization" (62.2%), an activity fundamental to all knowledge work (Figure 10). The next most common application was "document drafting and editing" (38.6%), followed by "idea generation and development, brainstorming" (25.3%) and "data analysis and visualization" (24.0%). Noteworthy is the fact that creative and analytical tasks, such as idea generation and data analysis, make up a significant portion of AI use cases in Korea.[13] This implies that the reach of generative AI may soon extend to creative thinking, which has been, until now, considered unique to humans.

Figure 9. AI User Share by Platform[1)]

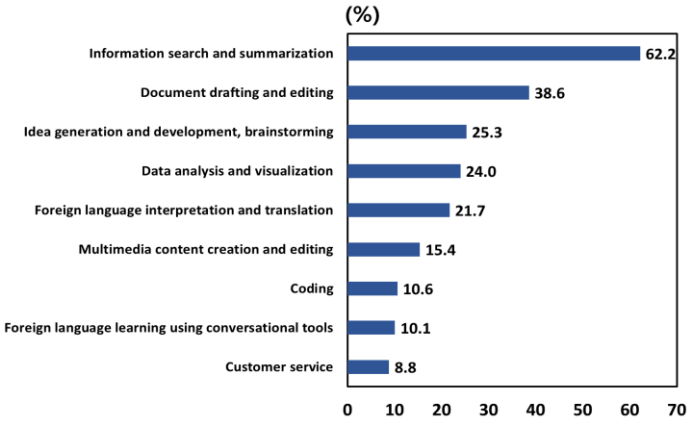


Notes: 1) Based on all AI users, including both those using AI for work and outside of work.

[12] The respondents selected all tasks they have performed using AI and then ranked them from those that were most facilitated by the use of AI to those that were least facilitated by it. The scores shown in the figure are the sums of the percentages of respondents who ranked each task first and second.

[13] Yuval Noah Harari has remarked that AI is the first technology that can make decisions by itself and invent new ideas by itself.

Figure 10. Tasks Facilitated by the Use of AI[1)]



Notes: 1) Based on those who used AI for work during the week before the survey.

IV. Productivity Effects of Generative AI

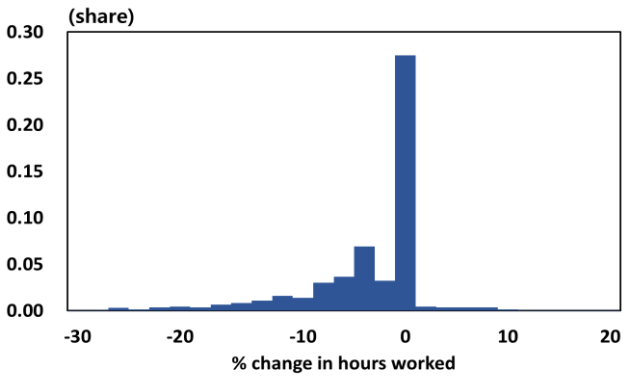
In this section, we analyze how generative AI contributes to reducing working hours and we use the results to quantitatively estimate the resulting productivity gain across the economy as a whole.

1. Reduction of Working Time

Completing the same task in less time is one of the most direct indicators of productivity growth. The survey found that average weekly hours worked among workers that use generative AI were reduced by an average of 3.8%. Based on a 40-hour workweek, this is equivalent to about 1.5 fewer hours spent on the job each week. Although significant, this is not as substantial as the size of AI-induced reduction in work hours observed in the U.S. (5.4%) (Bick et al. 2025).

In order to obtain relevant responses, the respondents were asked to report only the change in work hours experienced during the week before the survey. Exactly 37.4% of surveyed workers indicated that they used AI for work during the week immediately before the survey. If the average reduction in time spent on work activities is calculated for the workforce as a whole by reflecting this share, the result would be 1.4%.

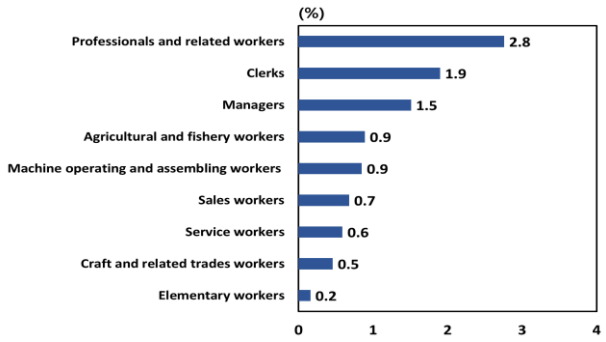
Figure 11. Change in Working Hours Since the Adoption of AI



The reduction in work hours was not evenly observed across all workers. Figure 11 shows the distribution of rates of change in weekly working hours since the adoption of AI. The distribution is concentrated around 0%, indicating that many workers have noticed no measurable change in working time. Meanwhile, the long left tail suggests that a substantial number of them have experienced a reduction. Finally, there are also rare instances in which hours worked have increased rather than decreased.

Furthermore, there existed wide disparities according to occupation groups. In Figure 12, the magnitude of the reduction in work hours is shown to be the largest among managerial and professional workers (1.5%-2.8%). On the other hand, the AI-attributable decrease in time spent on work was comparably negligible in other occupational groups, such as in craft & trades and in elementary workers, whose work revolves around physical labor and manual tasks.[14] This finding is most probably due to the fact that generative AI at its current stage of development is better optimized to assist with language-based intellectual tasks.

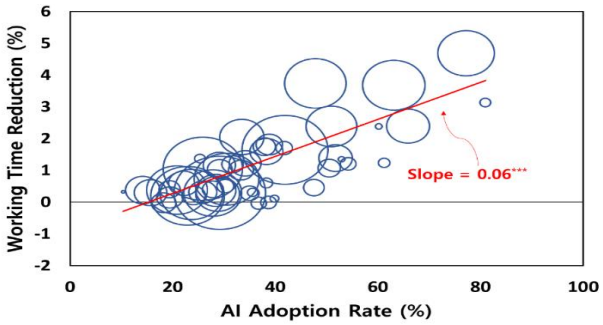
Figure 12. Reduction in Work Hours by Occupation[1)]



Notes: 1) Based on nine major occupational groups.

Moreover, working time savings exhibited a strong positive correlation with the rate of AI usage rate and exposure. Figure 13 is a scatter plot visualizing the relationship between AI usage and time savings in different occupational groups. The scatter plot shows that the higher the rate of AI usage in an occupation, the larger the reduction in work hours. This means that occupational groups in which AI technologies are actively leveraged are reaping more benefits from it, with tangible productivity gains experienced from reduced work hours.

Figure 13. AI Adoption Rates and Time Savings, by Occupational Group[1) 2) 3)]



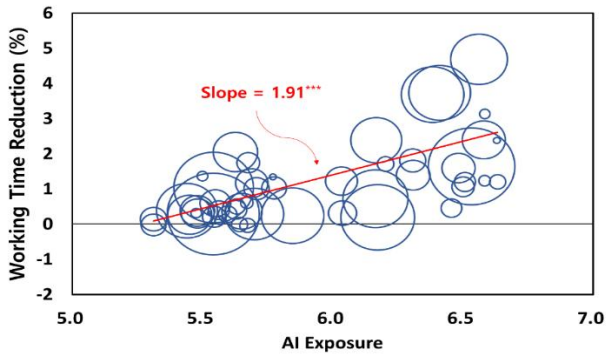
Notes: 1) AI exposure as proposed by Felten et al. (2021).

2) The size of the circle indicates the number of workers in each occupational group.

3) Statistical significance levels: ***p<0.01, **p<0.05, *p<0.1.

[14] For the reduction in working hours seen by smaller occupation groups, see Box 3.

Figure 14. AI Exposure and Time Savings, by Occupational Group[1) 2) 3)]



Notes: 1) AI exposure as proposed by Felten et al. (2021).

2) The size of the circle indicates the number of workers in each occupational group.

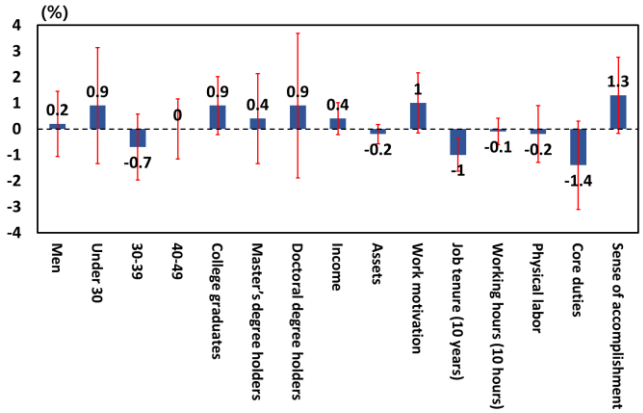
3) Statistical significance levels: ***p<0.01, **p<0.05, *p<0.1.

Likewise, the magnitude of working time savings was greater in occupation groups with high AI exposure (Figure 14). In other words, time savings effects were more substantial in occupational groups that are more susceptible to AI disruption.

Figure 15 provides the results of a regression analysis on working time savings effects performed by controlling for other variables. One interesting finding is that variables that have a statistically significant influence on the decision to adopt AI have no measurable effect on working time savings. In other words, attributes that played an important role in the adoption of AI did not guarantee that its actual use would lead to a reduction in time spent on work.

On the other hand, job tenure was found to have a statistically significant influence on the reduction of time spent on work tasks. The shorter an employee's tenure in a job, the larger the reduction in work hours induced by the use of generative AI. This can be interpreted to mean that generative AI has an equalizing effect on skills by partially substituting for the tacit knowledge of skilled workers and narrowing the gap in hours required to complete a task between highly-experienced and less-experienced workers.[15]

Figure 15. Regression Analysis of AI-Induced Working Time Reduction[1)]



Notes: 1) Red lines represent the 95% confidence interval.

[15] The results of this regression analysis are consistent with prior research that demonstrated that generative AI narrowed the gap in productivity between workers (Brynjolfsson et al. 2025; Dell'Acqua et al. 2023; Cui et al. 2024; Hoffmann et al. 2024). Such an equalizing effect could become more pronounced in the future as the capabilities of AI improve and as its application is broadened to more diverse fields (Suh 2023).

2. Productivity Gains

In this study, productivity gains were quantitatively estimated using the wage and working hours data collected from the survey by drawing on the methodology proposed by Bick et al. (2025). The estimation method used is as follows.

1. **Production Function:** The total output of an economy (Y) can be expressed as the Cobb-Douglass production function $Y=AK^{\alpha}L^{1-\alpha}$ where it is a function of capital (K) and labor (L) inputs. Here, A is total factor productivity and α is capital income share.

2. **Working Time Savings:** Let us suppose that worker i saves s_i hours of working time per week by using generative AI. Let us furthermore suppose that the time saved is not spent on leisure activities, but is instead put into additional productive activities. In this case, worker i's effective labor time increases from ℓ_i to $\ell_i + s_i$.

3. **Approximation of GDP Growth:** The effect of the increase in an individual worker's effective labor time on the total output of an economy can be approximated using the following equation,

$$\frac{\Delta Y}{Y} \approx (1-\alpha)\frac{\Delta L}{L} = (1-\alpha)\frac{\Sigma_i s_i w_i}{\Sigma_i \ell_i w_i},$$

where s_i is the working time savings, ℓ_i is the labor time, and w_i is the hourly wage.

Here, the numerator $\sum_i s_i w_i$ is the sum of total time savings from the use of AI of all workers multiplied by their respective hourly wages (proxy for productivity), which represents the total labor value-added in an economy. The denominator $\sum_i \ell_i w_i$ is total labor cost. The productivity increase induced from AI is therefore estimated by multiplying the result of dividing total labor value-added by total labor cost by labor income share (1-α).[16]

When the survey data were applied to the above equation, the estimated potential productivity gain attributable to the use of AI was 1.0%.[17] This result is similar to the estimate of 1.1% obtained by Bick et al. (2025) in their study using U.S. data,[18] while it exceeds somewhat the 0.7% projected in Acemoglu (2024)[19] (Figure 16).[20]

Meanwhile, as can be seen in Figure 17, 50.9% of surveyed workers who use generative AI reported experiencing no change in time spent on work, with 3.2% reporting an increase. This could be explained by the fact that since most workers are still insufficiently familiar with using generative AI, they tend to spend a significant amount of time reviewing and correcting AI-generated content. Therefore, as, over time, more workers learn to efficiently use generative AI, the productivity gain is likely to increase further. The more proficient a worker is with the use of

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[16] Here, the increase in labor productivity was estimated at 1.8%. For the labor income share (1-α), like Bick et al. (2025), we used 0.57, following Acemoglu (2024). This value is obtained by adjusting the regular labor income share in a manner to reflect the share of AI-exposed tasks.

[17] For example, during the period from Q4 2022 (the release of ChatGPT) to Q2 2025, Korean GDP grew by 3.9%. Theoretically, 1.0%p of this growth can be considered the portion corresponding to the potential contribution by the introduction of AI. However, this value was calculated assuming that workers did not spend the time saved from the use of AI on leisure activities and put it instead into other productive activities. Therefore, if workers used some of the time saved for leisure activities, the actual gain in productivity could be lower.

[18] Although the rate of AI usage is higher in Korea than in the U.S., the reduction in working time attributable to AI is less significant (Korea 3.8%, U.S. 5.4%). Because of this, the estimated AI-induced productivity gain is roughly the same in the two countries. Working time savings are less substantial in Korea, in part, due to the fact that, unlike in Bick et al. (2025), the survey conducted for this study accounted for the eventuality that the use of AI would cause working time to increase rather than decrease (Figure 17). Another major difference is that while Bick et al. (2025) only considered weekly hours worked, our survey also gathered data on the time spent on individual tasks and calculated their total, as a further way to validate the changes in weekly hours reported by the respondents.

[19] The low estimate provided in Acemoglu (2024) is in large part due to the assumption of a conservative productivity gain, which was smaller than the value used in this study.

[20] It should also be noted that unlike in this study and in Bick et al. (2025), the result reported in Acemoglu (2024) is the productivity gain that is projected to occur over the next 10 years. This is one reason why the estimates by this study and by Bick et al. (2025), both based on actual usage data, are statistically significantly higher than the estimate by Acemoglu (2024).

generative AI, the less time it should take to review the AI-generated content, with usage know-how building up eventually. Future advancements in AI, reducing hallucinations and producing more reliable results, can also strengthen this trend.

Figure 16. Productivity Gains

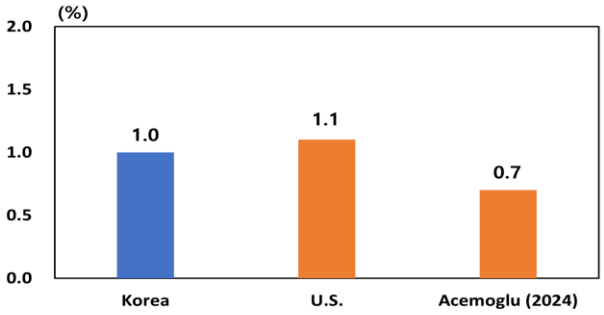
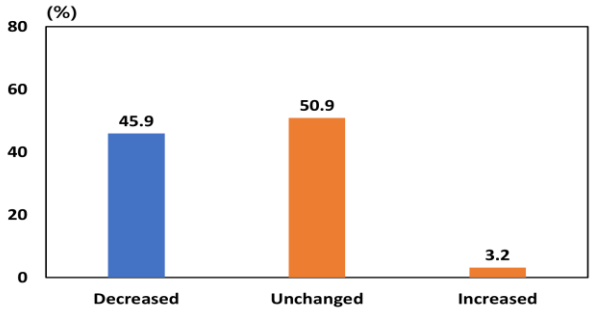


Figure 17. Change in Work Hours Due to AI Use[1) 2)]



Notes: 1) Based on those who used AI for work during the week before the survey.

2) Percentage shares were derived by adding changes in working time reported by all respondents and calculating weighted sums of each population group based on the change status (decrease, no change, increase).

V. Impacts of Physical AI

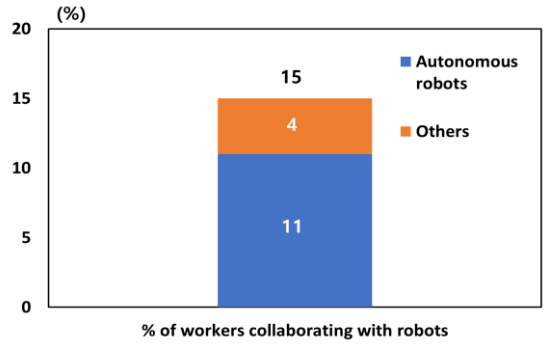
In this section, we shift our focus from generative AI to physical AI, another area of AI that has gained attention in recent years, and discuss its current state and future outlook. Physical AI enables systems to interact with physical environments and perform real-world tasks through the integration of AI with robotics and other hardware technologies. Unlike traditional robots that perform repetitive tasks according to pre-programmed instructions, modern AI-powered robots are able to operate autonomously as they can learn from their environments, adapt to new situations, and make decisions.[21]

[21] Surgical robots, automated soldering robots, agricultural drones, service robots, and humanoid robots are some of the examples of physical AI that have already been deployed in various industrial sites and everyday environments, whose use and range of applications are rapidly growing.

1. Use of Autonomous Robots and Human-Robot Collaboration

It was found that 15% of domestic workers collaborate with robots in their workplace, with 11% of them working with autonomous robots (Figure 18).[22] Here, autonomy is a function of task complexity, responsiveness, and the range of operation.

Figure 18. Share of Workers Collaborating with Robots



Collaboration with autonomous robots tends to occur far more frequently in certain occupational groups than in others. Figure 19 shows shares of workers collaborating with robots by occupational group.[23] The rate of human-robot collaboration is the highest among "equipment and machine operating and assembling workers" that directly operate machines. In comparison, this rate is rather low among sales, service, and professional workers, indicating that the adoption of physical AI is concentrated in manufacturing industries and in jobs that involve physical labor and the use of certain types of technologies.

Figure 19. Share of Workers Collaborating with Autonomous Robots, by Occupation[1)]

Notes: 1) Based on nine major occupational groups.

Interestingly, the analysis revealed a weak negative correlation between exposure to LLM-based AI and the rate of human-robot collaboration (Figure 20). This is because these two areas of AI are optimized for different types of tasks. The finding also underscores the fact that human-robot collaboration is a phenomenon that is unique to "physical tasks that are susceptible to automation," which is not captured by existing AI exposure indicators.

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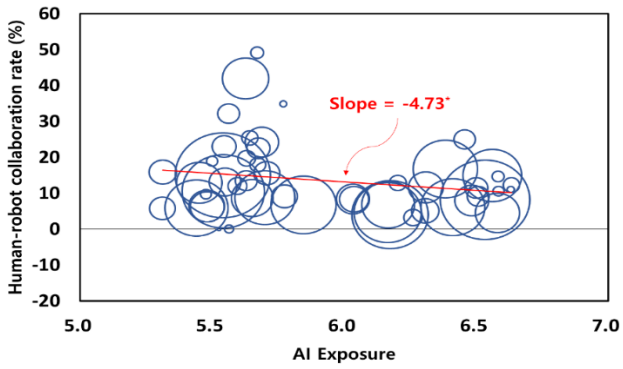
[22] In the survey conducted for this study, collaborating with robots was broadly defined to include all working arrangements in which human workers co-exist with robots in a shared work space, even if they do directly deal with collaborative robots, so-called "cobots," which are widely used in industrial settings.

[23] For the rate of human-robot collaboration by minor occupation group, see Box 3.

Figure 20. AI Exposure and Human-Robot Collaboration, by Occupational Group[1) 2) 3)]



Notes: 1) AI exposure as proposed by Felten et al. (2021).

2) The size of the circle indicates the number of workers in each occupational group.

3) Statistical significance levels: ***p<0.01, **p<0.05, *p<0.1.

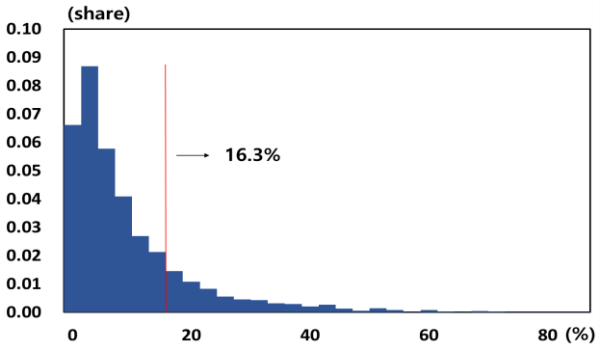
2. Likelihood of an Increase in Workers Collaborating with Robots

Advancements in software development and the declining cost of hardware are expected to accelerate the pace of the adoption of autonomous robots. In this study, based on the characteristics of workers that are currently collaborating with autonomous robots, a simulation was performed to estimate the probability of workers that are not currently collaborating with them doing so in the future.[24]

Figure 21 provides the distribution of probabilities of collaborating with autonomous robots among those who are not currently collaborating with them. Assuming that human-robot collaboration is gradually introduced, first in groups with the highest probability and later in other groups, our analysis suggests that an additional 16.3% of the total workforce could be assigned to collaborate with robots in the future, raising the total percentage to 27%.

This points to the possibility of a sweeping and profound reshaping of the labor market by AI, not confined to knowledge work, but across all types of labor, including physical labor and manual tasks. It is therefore urgent for policy makers to prepare for this eventuality by redesigning and reimagining work, retraining the workforce, and strengthening the social safety net.

Figure 21. Probability of Collaborating with Autonomous Robots



[24] We began by estimating the relationship between individual characteristics of workers and whether or not they will collaborate with robots. We then calculated the probability of collaboration based on the characteristics of those that are already collaborating with a robot. Next, we derived the median value of the distribution of probabilities among workers that are currently collaborating with robots and calculated the percentage of those that are not currently collaborating with robots, whose probability to collaborate with them in the future exceeds this median.

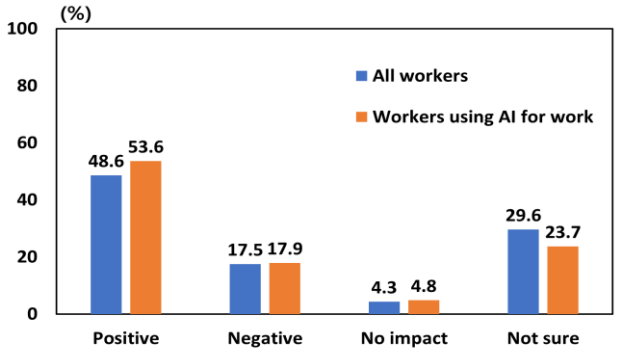
VI. Perception of AI and Policy Preferences

1. Perception of the Social Impacts of AI

A far greater number of surveyed workers (48.6%) felt that AI technology would have a positive impact on Korean society than the number that expressed a negative perception of its impact (17.5%) (Figure 22). When only the current users of AI were considered, the share of respondents with a positive perception rose further (53.6%).

The perception of AI among domestic workers appears to be more positive compared to workers in other countries. According to IPSOS AI Monitor 2024, as many as 73% of Korean workers positively perceive AI-powered products and services, which is well above the corresponding global average of 53%. In the U.S., a majority of surveyed workers believed that AI would have a negative impact on society.[25] Such disparities are important to recognize as the public's perception of a technology can influence policy and regulation.

Figure 22. Social Impacts of AI Technology



2. AI Automation and Job Displacement

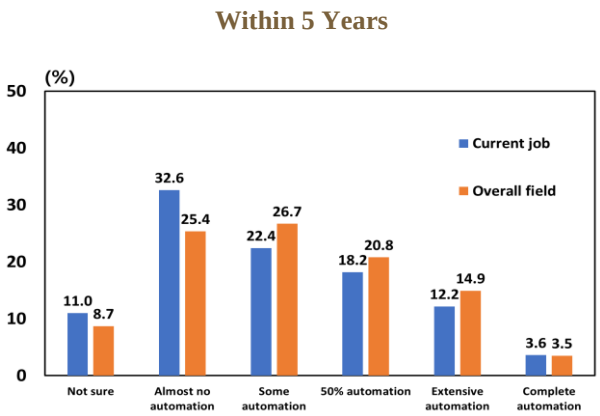
Next, the respondents' perceptions of the future level of job automation and the resulting likelihood of job displacement were examined over two different time horizons, the next five years and the next 10 years. The respondents were, furthermore, asked to provide their projections separately for their current job and for their overall occupational field.

Figure 23 visualizes the outlook for job automation based on the survey responses. Here, two characteristics emerge prominently. First, the respondents tend to underestimate the susceptibility of their own job to automation, while they see a much higher likelihood of automation for their overall occupational field. Second, the perceived likelihood of automation tends to be higher for the 10-year horizon than for the five-year horizon. Concretely, 50.4% of all respondents answered that over half of all their tasks would be automated within the next 10 years.

Figure 24 shows the perceived likelihood of job displacement from automation. Similar to the outlook for automation, the respondents exhibit a tendency to underestimate their own likelihood of losing a job. The perceived likelihood of job displacement is also likewise higher for the 10-year horizon than on the five-year horizon. It was found that 48.3% of respondents believed that there was a high likelihood that they would lose their job within the next 10 years.

[25] For details about this survey, see McClain et al. (2025).

Figure 23. Job Automation Outlook



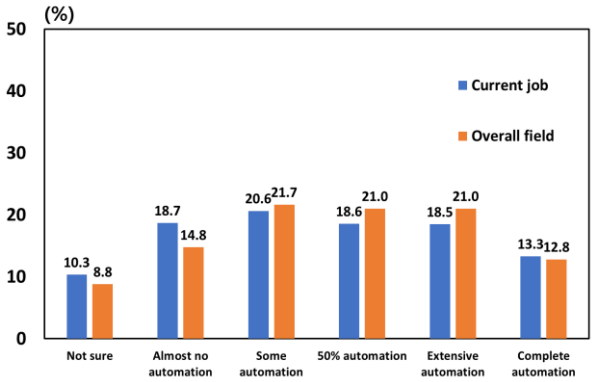
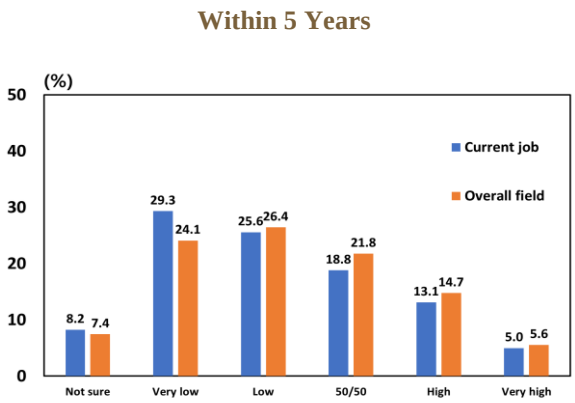
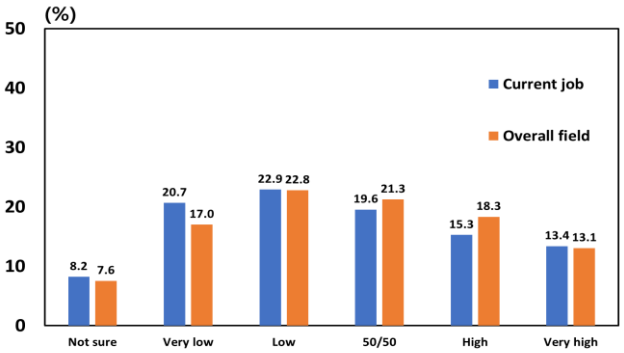


Figure 24. Likelihood of Job Displacement

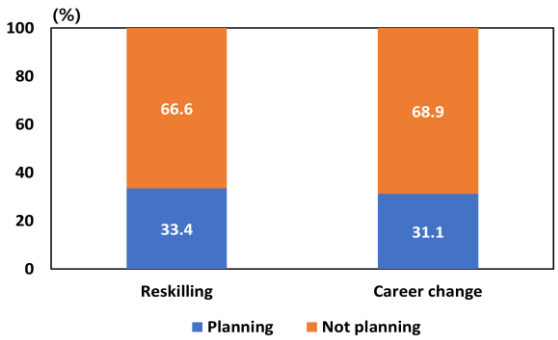




3. Preparing for the AI Revolution

Technological change prompts workers to reskill or upskill, or to attempt a career change. The survey found that a significant number of workers were considering taking steps to adapt to AI-induced job market changes. As can be seen in Figure 25, 33.4% of them reported that they were planning to complete a retraining program and 31.1% were preparing for a career change.

Figure 25. Reskilling and Career Change Plans to Adapt to AI-Induced Job Market Changes[1)]



Notes: 1) Those that are currently attending a reskilling program to navigate changes in the job market were also included among workers planning to complete a reskilling program.

Meanwhile, the intention to reskill or seek a career change was strongly correlated with certain occupational factors. Figure 26 shows the results of a regression analysis on whether or not a worker will plan to reskill or switch careers. Our estimation found that the probability of a worker planning to reskill or change career was statistically significantly higher for those who have experience with generative AI, those who are currently collaborating with robots, and those who feel that their jobs are highly susceptible to automation. Furthermore, the probability of an AI user planning to reskill or change career paths was markedly higher than that of a non-user, by 15.0%p and 10.7%p, respectively. This implies that exposure to AI technology is a key factor influencing how acutely a worker is aware of future changes in the job market and how inclined they are to take steps to prepare for anticipated changes. On the other hand, the tendency to prepare for AI-induced disruption was reduced in a statistically significant manner among workers with longer job tenures, suggesting that there could be disparities in the adaptation to job market changes according to the length of service.

4. AI Technology Development Fund: Willingness to Contribute to Societal Investment in AI

Government funding alone is insufficient to cover the financial requirements for the development of AI technology. As an alternative source of funding, the survey proposed a hypothetical AI technology development fund and asked the respondents whether they would be willing to contribute to it and how much they would contribute.

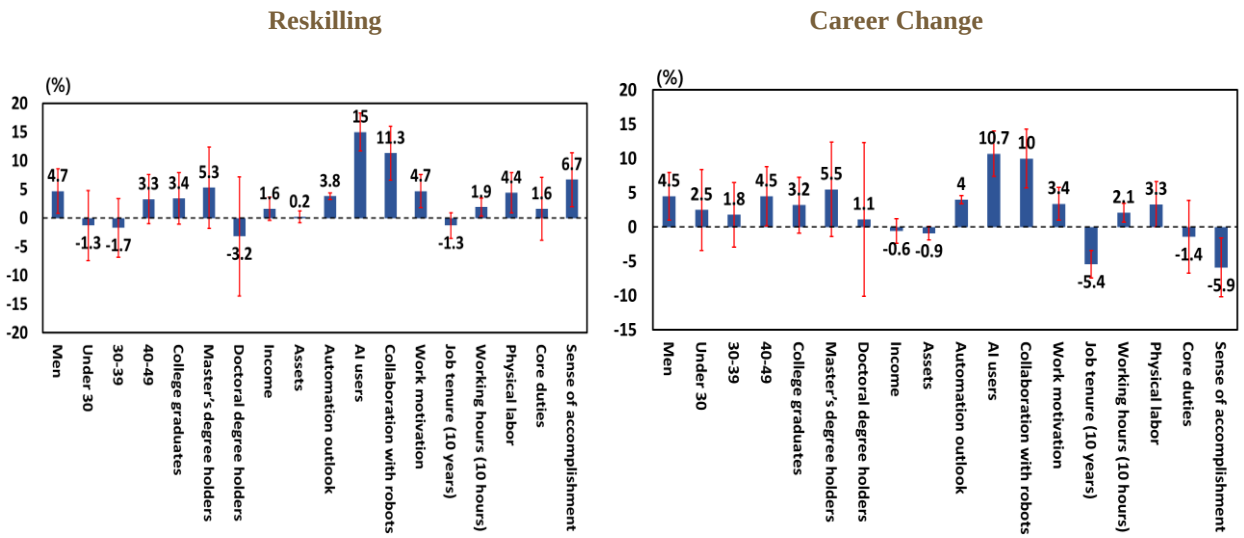
4.1. Description of the Fund

Respondents were provided with the following description of a hypothetical AI technology development fund, which included its purpose and role.

- **Financial Support:** Financial support for AI startups and other firms in AI-related fields.
- **Infrastructure Development:** Establishment of a national AI computing center based on a public-private partnership to provide low-cost computing resources to research organizations and companies.
- **Development of Public AGI:** Leading the development of non-profit artificial general intelligence (AGI) to serve the public interest, with related initiatives financed from public contributions to the fund, which will correspond to a certain percentage of monthly income, levied like a tax over the next five years.[26]

[26] Respondents were asked, “Would you be willing to contribute a certain portion of your monthly income to an AI development fund over the next five years in the form of a temporary tax?” Those that answered yes were then asked to indicate the amount they would be willing to contribute as a percentage of their monthly income.

Figure 26. Results of a Regression Analysis on Reskilling and Career Change Plans[1)]

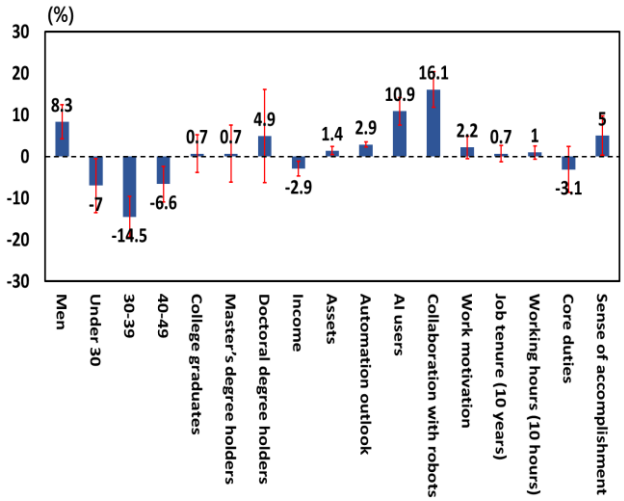


Notes: 1) Red lines represent the 95% confidence interval.

4.2. Willingness to Contribute to the Fund and Determinants

To the question asking about the willingness to contribute to a hypothetical AI development fund, 32.3% of all surveyed workers responded positively. A regression analysis was performed to identify factors that may have influenced the respondents' willingness to contribute to the fund, whose results are shown in Figure 27. Workers that are currently collaborating with robots, those that have used or reported using generative AI, and those that feel that their occupations are highly susceptible to automation were statistically significantly more willing to contribute to the fund.

Figure 27. Results of a Regression Analysis on Willingness to Support an AI Fund[1)]



Notes: 1) Red lines represent the 95% confidence interval.

Notably, the analysis found that the probability of supporting an AI fund was higher among workers who have been exposed to generative AI or to physical AI than among those that have not, by 10.9%p and 16.1%p, respectively. This finding may be interpreted to mean that workers who understand AI's formidable potential through direct experience

realize the need to invest in its development more acutely and are more open to the idea of collective AI investment. Moreover, the probability of supporting an AI fund was higher among workers who believed that their occupations were highly likely to be automated in the future (top 25%) than among those who felt that this outcome was only moderately likely, by 5.3%p.[27] On the other hand, the level of support for an AI fund was low among workers under the age of 40, revealing the existence of differences according to age group.

4.3. Size of Any Potential AI Fund

When respondents who were receptive to the idea of an AI fund were asked about how much they would be willing to contribute to the fund, the amount averaged to about 0.5% of their monthly income over the next five years. Based on this result, the size of an AI fund that could be created from workers' contributions was estimated as follows.

- **Annual Contribution Per Capita:** KRW 259,000 per year based on the willingness to pay of surveyed workers (0.5% of income).
- **Total Annual Amount Raised for the Fund:** Multiplying it by the total number of employed workers of about 29 million gives close to KRW 7.5 trillion.
- **Size of the Fund in Five Years:** In five years, the fund would theoretically have raised KRW 38 trillion in cumulative resources.

This has important implications for the AI policy of the government, which has recently announced a plan to heavily invest in this field. The establishment of an AI fund contributed to by individual citizens, as envisioned in this study, could generate an extra KRW 38 trillion over five years, in addition to government funding and corporate investment. This is one of the many avenues that could be explored in order to create an investment model that is based on a public-private partnership by leveraging the broad public support for AI development initiatives.

VII. Conclusion

The economic impact of AI is determined by how widely and intensively AI tools are used by workers and how many productivity gains are experienced as a result. In order to empirically assess the adoption of AI and its effects on productivity, a national first-ever survey was conducted of a representative sample of Korean workers.

In May and June 2025, 51.8% of workers were using AI for work, in some capacity, which is over twice the corresponding share currently seen in the U.S. and eight times the adoption rate of the commercial internet in its early days (early to mid-1990s). This widespread adoption of AI appears to have reduced the time workers spend on the job and brought about an estimated productivity gain of about 1%. With further advancements in AI, its working time savings effects are expected to further increase in the future. As for how to use these AI-induced time savings to achieve even more productivity gains, this is a question that companies and workers must ponder together.

While currently the AI-driven reshaping of work is affecting primarily intellectual labor amid the accelerated penetration of generative AI, going forward we are likely to also see a major transformation in physical labor as more workplaces adopt physical AI systems, i.e., robots. According to our survey, 11% of domestic workers are already collaborating with autonomous robots in their workplaces. This percentage is expected to rise to as high as 27% in the future.

The survey also found that a substantial number of workers had a positive perception of AI (48.6%) and many were considering reskilling (33.4%) or a career change (31.1%) in response to the AI disruption of the job market and shifting skills demands. Furthermore, surveyed workers showed strong support for pro-AI policy initiatives by the

[27] This regression coefficient means that each 10%p increase in the perceived likelihood of automation increases the probability of support for the fund by 2.9%p.

government. It was found that 32.3% of workers expressed a willingness to contribute to an AI technology development fund. Based on the willingness to pay of workers, such a fund, if created, could theoretically raise close to KRW 38 trillion over the next five years.

This study is significant in that, beyond assessing the current state of AI adoption, it provides early indicators of its impact on the Korean economy. It will be important for future research to expand on this study by accumulating further AI usage data and by elucidating the economic implications of AI.

Box 1.

Sampling Method and Sample Characteristics

Sample Design and Weights

The sample was selected based on the raw region-specific employment data for the first half of 2024 published by Statistics Korea, by stratifying the population by minor occupational group, age group, and gender. To ensure the confidence and representativeness of the sample, proportionate quota sampling was employed. A quota was first set for each major occupational group and next for each minor occupational group, using the square root proportional allocation method. Finally, during the last and third stage, a quota was assigned for each age group within a minor occupation group through proportional allocation.

Furthermore, in order to align the sample with the population's known demographic distribution, weights were calculated using post-stratification. The weights were appropriately adjusted so that the sample accurately reflects the major occupational group, age, and gender distributions of the population.

Sample Characteristics

The recruitment of the sample yielded an effective sample size of 5,512 individuals. The margin of sampling error was ±1.32%p at the 95% confidence level. The demographic characteristics of the respondents that were retained for the final analysis were as follows.

- By gender, 3,083 (55.9%) respondents were male and 2,429 (44.1%) female.
- By age, 842 (15.3%) were aged 15-29, 1,208 (21.9%) aged 30-39, 1,377 (25.0%) aged 40-49, 1,485 (26.9%) aged 50-59, and 601 (10.9%) aged 60-64.
- By educational attainment, 1,324 (24.0%) were high school graduates or less, 3,689 (66.9%) college graduates, and 500 (9.1%) post-graduate degree holders.
- By employment type, 3,563 (64.6%) were permanent employees, representing the largest share of wage workers. It was found that 848 (15.4%) were temporary workers and day laborers, and 1,101 (20.0%) were non-wage workers.
- By occupational distribution, the sample was a representation of diverse groups, consisting of 1,355 (24.6%) professionals and related workers, 1,090 (19.8%) clerical workers, 688 (12.5%) service workers, 506 (9.2%) sales workers, 598 (10.8%) equipment and machine operating and assembling workers, and 575 (10.4%) elementary workers.

Box 2.

Comparison of Survey-Based Macro-Productivity Estimate and Experiment-Based Micro-Estimates

The productivity gain estimated in Section IV is a macro-estimate based on survey responses about the use of generative AI and the resulting change in work hours, corresponding to productivity growth in the economy as a whole. Below, we compare this macro-estimate with experiment-derived micro-estimates (hourly productivity gains) reported in recent studies.

For this comparison, we created the following equation where the change in work hours is a linear function of the duration of use of generative AI,

$$\Delta L = \sum_i (\ell_i + \gamma u_i) e_i ,$$

where u_i is the duration of use of generative AI, γ is the rate of change in hourly productivity attributable to its use, and e_i is the labor productivity. From this equation, we can derive the following expression for macro-labor productivity growth,

$$\frac{\Delta L}{L} = \frac{\gamma \sum_i u_i w_i}{\sum_i \ell_i w_i} .$$

Since the macro-productivity gain estimated in Section IV is 1.8%, we can rewrite the above equation as follows to solve γ using inverse operations:

$$\gamma = 1.8\% \cdot \frac{\sum_i \ell_i w_i}{\sum_i u_i w_i} .$$

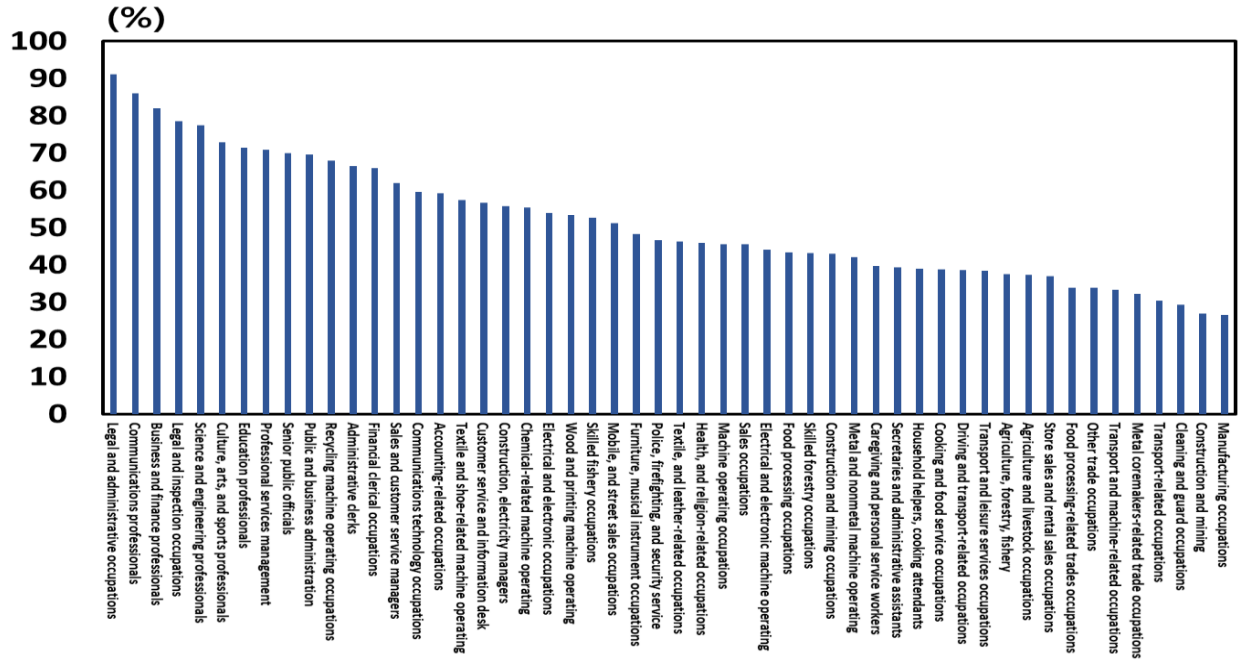
The weekly duration of use of generative AI was surveyed as ranges. The average duration was obtained by calculating a weighted average using the median values of each range. The result was 5.5% of total work hours. The substitution of this value into the above equation yielded an hourly productive gain (γ) of 0.33 (33%) from the use of generative AI. This result is broadly consistent with 27%, the average micro-estimate reported in prior studies (Cui et al. 2024; Dell'Acqua et al. 2023; Noy and Zhang 2023; Peng et al. 2023), produced from random experiments.

It is worth noting that Acemoglu (2024), where the wage-weighted share of AI-applied work was set to 4.6% and the hourly productivity gain to 27%, which is the average value assumed in the existing literature, arrived at an overall productivity growth of 0.7%, which is lower than the estimate in this study (1.0%).

Box 3.

Survey Results, by Minor Occupational Group

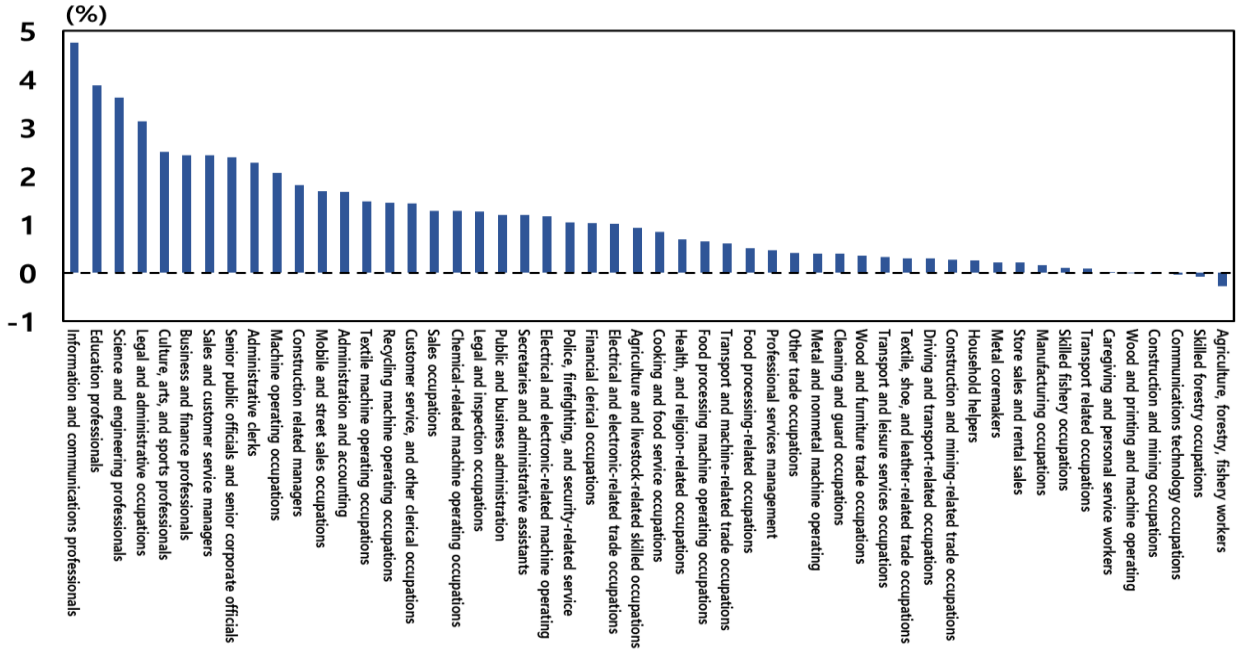
Figure 3-1. AI Adoption Rate, by Minor Occupational Group[1) 2)]



Notes: 1) Based on the use of AI for work purposes.

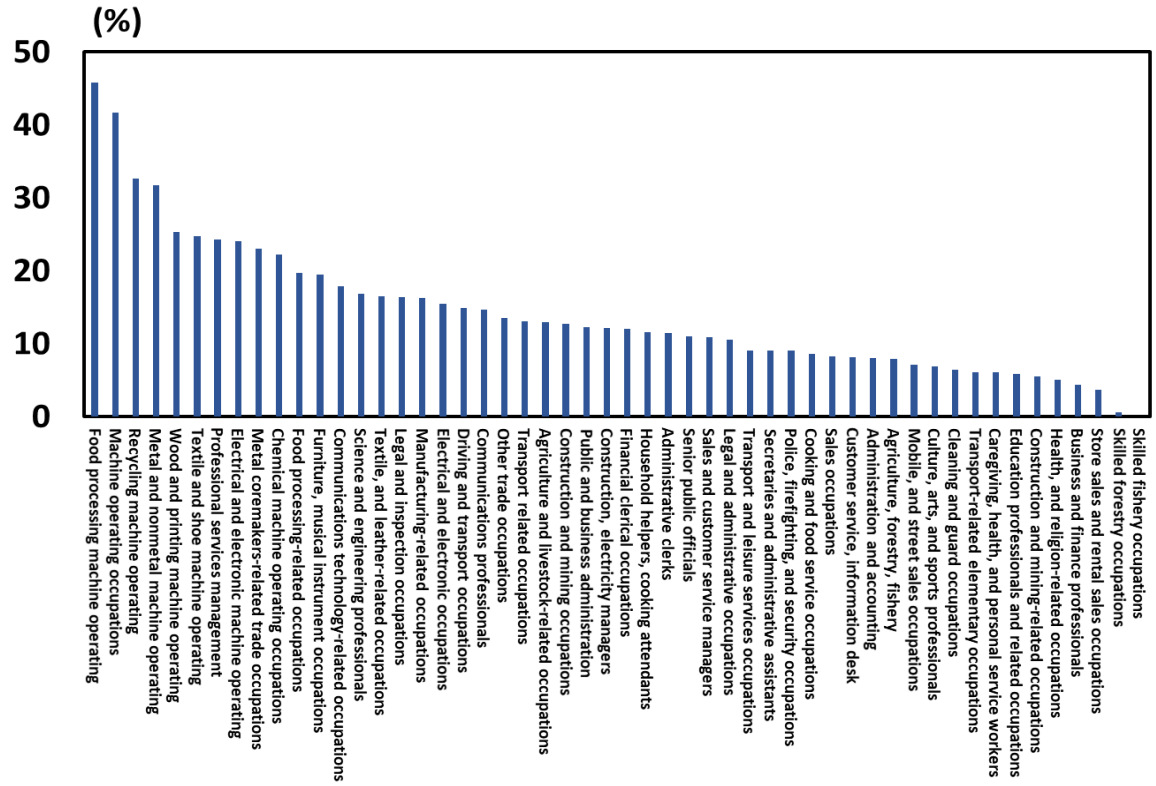
2) Based on 52 minor occupational groups.

Figure 3-2. Time Savings due to Generative AI, by Minor Occupational Group[1)]



Notes: 1) Based on 52 minor occupational groups.

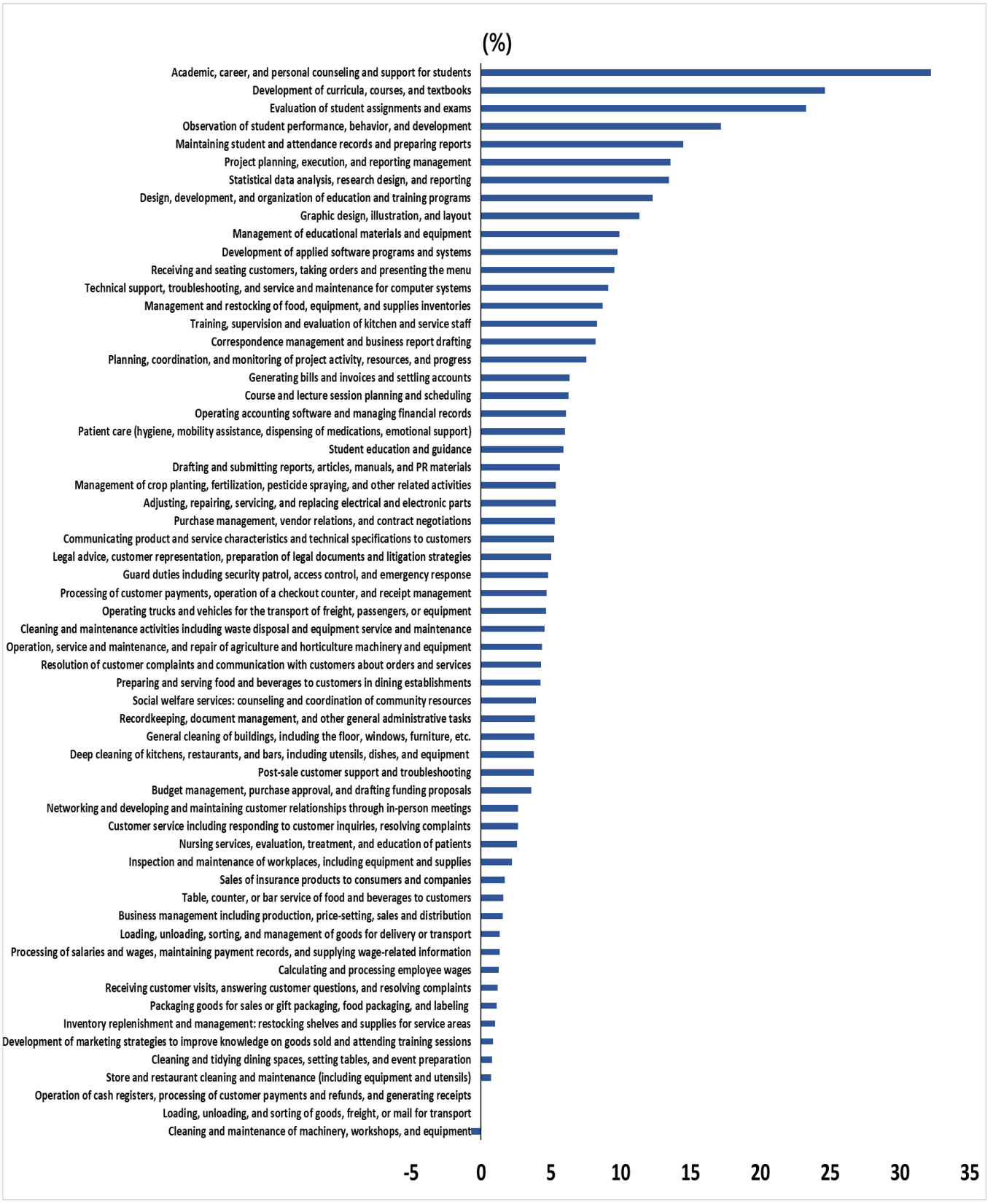
Figure 3-3. Share of Workers Who Collaborate With Autonomous Robots, by Minor Occupational Group[1)]



Notes: 1) Based on 52 minor occupational groups.

Box 4.

Working Time Savings, by Task Type[1)]



Notes: 1) Tasks selected by fewer than 50 respondents were excluded from the list.

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