Japan's AI Opportunity.
How AI can support Japan's economic and social revitalisation

Methodology Note

Polling

Polling claims derived from a survey of **1,025** online adults based in Japan in February 2025, conducted in English and Japanese. All results are weighted using Iterative Proportional Fitting, or 'Raking'. The results are weighted by age group, gender, education level, and region to nationally representative proportions.

We used a range of different panel providers who contacted respondents on our behalf; in return for their participation in our survey, respondents were provided with a financial incentive.

Like all polling data, market research is susceptible to poor memory or consumers not answering truthfully. In order to reduce the risk of this, we completed a number of standard quality checks on the polling data to help ensure that respondents are paying attention:

- Excluding respondents who take too long to answer;
- Excluding respondents who 'straight-line', eg. always picking the top or left most option to every question;
- Excluding respondents who fail an attention check, eg in the middle of a longer question, we ask them to pick a particular option if they are reading;
- Excluding respondents whose answers all perfectly match another;
- Excluding respondents whose open text answers are incoherent or look like they have been generated by a computer bot.

Potential economic impact of gen AI

Our headline estimate for the potential impact of AI is based on the Goldman Sachs methodology for calculating the growth and productivity impact of AI.

In order to estimate the economic impact of AI, we:

- Draw on the US O*Net occupation database, which contains information on 51 different types of work activity for around ~800 types of occupations
- Based upon Goldman Sachs' identification of the types of tasks exposed to automation by generative AI, classify the proportions of tasks in each occupation that are susceptible to automation.

- Aggregate this into broader economic categories based on their overall share of US employment and average wage bill, and then create our own crosswalk to convert the results from each occupation to the corresponding occupation in ISCO-08.
- Aggregate by wagebill, occupation and sector to produce an estimate of the total possible improvement in labour productivity.
- Assume capital intensity remains constant, and convert this labour productivity improvement into an overall improvement in GVA.

Per our estimates of GVA improvements by sector, we note that at least half of these gains will be distributed outside Tokyo.

Proportion of workers likely to be augmented by, insulated from or at risk of displacement from AI

Based on our model for the potential economic impact of AI, we look at the modelled automability of each occupation and categorise them into one of three groups:

- **Augmented roles** are occupations which exceed a threshold level of automatability, and for which workers are likely to see significant productivity improvements from AI. However, automatability is not so high that AI is likely to be able to take over the whole role in the short to medium term.
- **Insulated roles** fall below our threshold for significant automatability, and are unlikely to be affected by AI in either a positive or negative manner.
- **Risk of displacement roles** exceed our higher threshold for automatability, and are at potential risk of complete replacement by AI. (Even here, however, this is just a measure of technical possibility, rather than a prediction that this will in practice take place.)

Potential from AI to save time in administrative tasks

We use our polling data to identify the number of hours the average worker spends on administrative tasks that could be automated by AI, calibrating the results against time use surveys of the labour force conducted in the APAC region and elsewhere.

We then apply to this an assumption of overall time that can be saved, based on a combination of our core AI model and a literature review of estimated potential time savings that have been found so far.

Potential from AI to boost worker productivity and wages

This is based on:

- Our overall estimate of average automability or labour productivity increases across the economy.
- Adjusting for average labour income share.

Potential from AI to boost worker skills

We estimate the potential impact of AI driven upskilling on human capital by combining:

- Data from the literature on AI's relative impact on worker productivity across the skills distribution.
- Our estimate of the human capital contribution to the growth gap between each country and the frontier leader, here taken as Singapore. We draw on data from Penn World Table (10.01) to perform our own growth accounting exercise, applying an augmented Cobb-Douglas framework to decompose output per worker difference

Impact of not overcoming AI divide

To quantify the economic impact of not overcoming the AI adoption divide we:

- **Quantify Adoption Differentials:** We leverage our polling data to estimate gender- and age-specific self-reported AI adoption rates within the workforce. These differentials represent the "adoption gap."

- **National Adoption Gap Estimation:** The identified adoption gaps are then applied to ILO statistics on national employment, disaggregated by gender and age cohorts. This allows for the calculation of an aggregate national reduction in AI adoption attributable to these demographic disparities.

- **Modeling GVA Impact under Differential Adoption Scenarios:** We employ a dynamic model projecting the trajectory of generative AI (gen AI) adoption in the workplace. This adoption model is integrated with our headline AI impact model, which quantifies the relationship between AI adoption and Gross Value Added (GVA). This integrated framework allows us to simulate two GVA trajectories:

    - A baseline scenario reflecting projected GVA uplift assuming the persistence of current gender and age-specific adoption gaps.

    - A counterfactual scenario projecting GVA uplift assuming the elimination of these adoption gaps (i.e., uniform adoption rates across demographic groups).

Potential impact of AI on cybersecurity

We estimate the cost savings from AI through:

- **Estimating total cost of data breaches:** We calculate the total cost of data breaches by country using existing third party cost-per-breach estimates, such as the Surfshark dataset on recorded breaches.

- **Faster responses to data fraud:** We then apply IBM's reported 33% cost reduction from AI-driven rapid response yields potential savings, adjusting for each country's cybersecurity readiness and AI adoption levels.

- **Preventing phishing:** We estimate national phishing costs using country-specific reports (e.g., Singapore's 2024 Cybercrime Brief) or, where unavailable, DMARC phishing data combined with regional averages. AI's effectiveness (95–99.5% accuracy versus 96% human accuracy) informs estimated savings from reduced phishing success rates. Results are adjusted by country-specific AI adoption and cybersecurity readiness.

Economic Impact of Google Products

Our headline estimate is the sum of our estimates for:

- **Google Ads:** We use third-party data to estimate the total size of the Google Ads market in each country, taking the most conservative estimate of the paid search advertising market from PWC's Global Entertainment, Media & Telecoms Outlook, Statista and eMarketer, and combining this with Statcounter's estimate of Google Search's market share per country. Following the methodology of the US Google Economic Impact Report, we then scale this revenue by an assumed Return on Investment (ROI) factor of 8.

- **AdSense:** Global AdSense revenue is estimated using Google's published Network Revenue, with an assumption for the proportion of Traffic Acquisition Costs going to publishers based on historical data. This is then apportioned to different markets based on each country's overall share of the global display advertising market.

- **Play:** The Android app economy's impact is estimated using total app revenue data from SensorTower.

- **YouTube:** Total YouTube ad spend is estimated by applying the country's share of global video display spending to YouTube's published global ad revenue. This is then adjusted based on an assumed revenue share going to creators.

- **Google Cloud:** The total economic activity is estimated by multiplying Google's cloud market share by the total public cloud market size in each country, drawing on data from Statista.

We then convert this into an equivalent number of jobs supported by dividing our estimate by GVA per worker per country.

Consumer Surplus (Search, Maps, Docs, Sheets, Slides, YouTube, Android)

Following the methodology of Brynjolfsson et al (2019), we used a "willingness to accept" framing to model the current default hypothetical consumers face. As part of our polling, we asked participants a single discrete binary choice question of "Would you prefer to keep access to [product] or go without access to [product] for one month and get paid [Price]" with the price offered randomised between set levels per country.

We regressed the results of this poll to derive a demand curve and used this to calculate total consumer surplus per user. In order to reduce noise, we regressed our country estimates against GDP per capita, and used this to produce our final smoothed per country estimate. Finally, we scaled this estimate by third party estimates of Internet prevalence and polling information on product usage by country.

Potential impact of gen AI to offset labour shortages

We estimate AI's role in offsetting labour shortages caused by an ageing workforce by combining:

- **Predicted fall in labour supply.** We use official age cohort data to estimate the proportion of the workforce reaching retirement age over the next ten years. The exit

fraction by age cohort is derived from the number of workers leaving versus entering each cohort, and total exits are aggregated across all cohorts.

- **Potential improvement in labour productivity enabled by AI.** We draw on our core AI model to estimate potential productivity improvements by sector and age cohort.

Potential impact of AI on public sector efficiency

We calculate the overall potential impact of AI on public sector efficiency by aggregating:

- **Automating repetitive tasks:** We use our polling to identify the number of hours the average worker spends on tasks which could be automated by AI, normalising the results against official time use surveys.
- **Reducing waste:** We construct a regression model to estimate the relationship between public sector efficiency and levels of non-transparencies in governance.
- **Supporting the private sector and individuals in meeting compliance needs:** We estimate additional tax revenue that could be recovered using AI drawing on World Bank on the estimated size of the un-taxed legal economy as a proportion of GDP, assuming AI can achieve similar improvements to previous digitalisation reforms.

Translation tools helping Creators to expand their reach

Here, we estimate the impact of AI for opening up Japanese-language content to new global audiences who do not speak Japanese by first calculating the global size of the market for content creators and then subtracting from this the size of the presently accessible, Japanese-speaking market.

We estimate the global size of the total addressable market for digital content consumers now and in the future by adjusting national populations using Internet and social media penetration rates as well as population growth rates. We manually account for political restrictions on access to the Internet and social media.

We then calculate the size of the current market for Japanese content by considering the native population as well as expatriate native speakers and applying similar adjustments for Internet and social media access.

Potential reduction in time for drug discovery

We review a range of studies and pharmaceutical trials on the percentage reduction in drug discovery time driven by AI and take an average across estimates.