# The impact of AI on the workplace: Main findings from the OECD AI surveys of employers and workers

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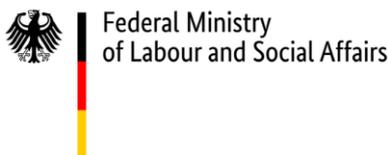
# The impact of AI on the workplace: Main findings from the OECD AI surveys of employers and workers

# Acknowledgments

# Abstract

New OECD surveys of employers and workers in the manufacturing and finance sectors of seven countries shed new light on the impact that Artificial Intelligence has on the workplace—an under-researched area to date due to lack of data. The findings suggest that both workers and their employers are generally very positive about the impact of AI on performance and working conditions. However, there are also concerns, including about job loss—an issue that should be closely monitored. The surveys also indicate that, while many workers trust their employers when it comes to the implementation of AI in the workplace, more can be done to improve trust. In particular, the surveys show that both training and worker consultation are associated with better outcomes for workers.

# Résumé

La récente enquête de l'OCDE auprès des employeurs et des salariés du secteur financier et de l'industrie manufacturière apporte un nouvel éclairage sur l'impact de l'Intelligence Artificielle au sein des entreprises – une question encore peu étudiée du fait du manque de données. Les résultats suggèrent que les salariés comme leurs employeurs ont une vision globalement très positive de l'impact de l'IA sur les performances et les conditions de travail. Néanmoins, l'IA suscite aussi certaines inquiétudes, notamment sur la stabilité des emplois – un aspect qui doit être suivi de près. L'enquête suggère également que même si nombre de salariés font confiance à leur employeur sur l'utilisation de l'IA au sein de l'entreprise, il reste une marge de progrès dans ce domaine. En particulier, l'enquête montre que la formation et la consultation des employés vont de pair avec une vision positive de l'IA parmi les travailleurs.

# Übersicht

Aktuelle OECD-Erhebungen bei Arbeitgebern und Beschäftigten im Verarbeitenden Gewerbe und im Finanzsektor von sieben Ländern werfen ein neues Licht auf die Auswirkungen der künstlichen Intelligenz auf den Arbeitsplatz – ein Bereich, der aufgrund fehlender Daten bislang wenig erforscht wurde. Die Ergebnisse deuten darauf hin, dass sowohl Beschäftigte als auch Arbeitgeber die Auswirkungen der KI auf die Leistung und die Arbeitsbedingungen generell sehr positiv einschätzen. Es gibt jedoch auch Bedenken, u. a. in Bezug auf den Verlust von Arbeitsplätzen – eine Entwicklung, die genau beobachtet werden sollte. Die Erhebungen lassen auch darauf schließen, dass trotz des Vertrauens, das viele Arbeitskräfte ihrem Arbeitgeber bei der Einführung von KI am Arbeitsplatz entgegen-bringen, noch mehr getan werden könnte, um das Vertrauen zu stärken. Die Befragung zeigt insbesondere, dass berufliche Weiterbildung und die Konsultation der Beschäftigten mit besseren Ergebnissen für die Arbeits-kräfte assoziiert sind.

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# Executive summary

While there is a growing body of research on the likely impact of Artificial Intelligence (AI) on the world of work, there has been little analysis to date examining what actually happens in organisations and to workers when AI is introduced. Wishing to capture workers' and employers' own perceptions of the current and future impact of AI on their workplaces, the OECD surveyed a total of 5 334 workers and 2 053 firms in the manufacturing and financial sectors in Austria, Canada, France, Germany, Ireland, the United Kingdom and the United States. As a pair, the OECD surveys of employers and workers offer a complete picture: the employer survey is a valuable source of information about how and why AI is being implemented, while the worker survey captures the first-person experience of using AI and responding to the changes it brings about.

**The surveys reveal that workers and employers in finance and manufacturing tend to be very positive about the impact of AI on worker productivity and working conditions.** Around 80% of AI users said that AI had improved their performance at work, compared to 8% who said that AI had worsened it. Across all indicators of working conditions considered (job satisfaction, physical health, mental health, fairness in management), AI users were more than four times as likely to say that AI had improved working conditions as to say that AI had worsened them. This indicates that AI, if used correctly, could contribute to higher productivity and better job quality.

**Nevertheless, workers express some concerns about the impact of AI on job stability and wages.** In companies that had adopted AI, 20% of workers in finance and 15% in manufacturing said that they knew of someone in the company who had lost their job as a result of AI. Looking ahead, 19% of workers in finance and 14% in manufacturing said that they were very or extremely worried about job loss in the next ten years, while 46% and 50% were not worried at all. AI users were more likely to express worries than non-users. While most employers reported no change in employment in their companies due to AI, the number that reported employment had decreased exceeded the number that reported an increase. Workers and employers appeared to signal consistently that jobs and job stability in finance faced more risk than in manufacturing. In both sectors, many workers expected AI to put downward pressure on wages, with twice as many workers expecting AI to decrease wages in their sector in the next 10 years as to increase them. Given the potential for much greater adoption of AI in the workplace in years to come, these are issues that deserve to be monitored closely, including keeping an eye on sectoral differences.

**AI is already transforming the nature of work.** AI results in a high degree of task reorganisation, with 66% and 72% of employers in finance and manufacturing, respectively, reporting that AI had automated tasks that workers used to do, while around half of employers in each sector reported that AI had created tasks that were not previously done by workers. Employers were twice as likely to say that AI had automated repetitive and dangerous tasks as had created them, which may explain why AI users were so positive about the impact of AI on performance and working conditions. Three-quarters of AI users said that AI had increased the pace at which they perform their tasks. While this could be related to increased worker productivity, it could also indicate increased work intensity. Most AI users reported that AI had assisted them with decision-making, which workers appeared to appreciate. These findings indicate that workers will need support in managing these changes successfully.

**The adoption of AI results in significant skill changes, which employers are addressing primarily through training.** More employers reported that they had addressed changing skill needs by retraining or upskilling internal talent (64% and 71% in finance and manufacturing, respectively) or by buying services from external companies (53% and 53%) than by attrition or redundancies (17% and 14%). More than half of workers who use AI said that their company had provided or funded training so that they could work with AI, and these workers were significantly more likely to report positive outcomes of AI on their working conditions. Although the majority of workers who use AI did not consider themselves to have specialised AI skills, more than 70% said that they were enthusiastic to learn more about AI. While employers say that AI has increased the importance of specialised AI skills, they suggest that it has increased the importance of human skills and the need for highly educated workers even more so. This suggests that a broad range of skills will be needed as AI becomes more pervasive within the economy.

**Consultation regarding the adoption of new technologies appears to be associated with better outcomes.** The workplaces in which workers or worker representatives are consulted regarding new technologies are the same workplaces where the most positive impacts on worker productivity and working conditions are reported. This is consistent with previous OECD research that found that direct dialogue between workers and managers (either alone or combined with representative workers' voice) was associated with a higher quality working environment. In finance and manufacturing, respectively, 43% and 45% of employers that have adopted AI said that they consulted workers or worker representatives regarding the use of new technologies in their workplace. The most commonly discussed topic in these consultations was skills and training.

**Most workers trust their employers to make the right decisions regarding AI, but not all, suggesting that more can be done in this area.** 57% of workers said that they supported banning AI that would decide which workers were dismissed, while 40% supported banning AI that would decide which workers were hired. 49% of workers in finance and 39% in manufacturing said that their company's application of AI collected data on them as individuals or how they do their work. Most of these workers expressed some related worries, such as feeling increased pressure to perform at work due to data collection (62%/56% in finance/manufacturing) and feeling that too much of their data was being collected (58%/54%). Employers saw workers with disabilities as a group that could benefit from AI in the workplace, whereas other groups such older and low skilled workers were seen as facing more harm.

**Employers say that cost and a lack of skills are currently greater barriers to AI adoption than government regulation.** 25% of employers in finance and 19% in manufacturing said that government regulation was a barrier, compared to 53% and 58% that said that high costs of the technology were a barrier, and 41% and 43% that said that lack of relevant skills was a barrier.

This study has been conducted in parallel with case studies of AI implementation (Milanez, 2023[1]). The surveys can be seen as an accompaniment to the case studies, in providing structured, representative and quantitative evidence regarding AI in the workplace to complement the rich and detailed qualitative picture offered by the case studies. The overall, combined picture is surprisingly aligned, reflecting the same patterns through both quantitative and qualitative evidence.

# Principaux résultats

Les travaux de recherche sur l'impact potentiel de l'intelligence artificielle (IA) sur l'emploi et le travail se multiplient. Néanmoins, il n'existe aujourd'hui que très peu d'études examinant les implications concrètes de l'IA pour les entreprises et les travailleurs qui utilisent effectivement cette technologie. Afin de saisir comment les salariés et les employeurs perçoivent l'impact que l'IA a aujourd'hui, et pourrait avoir dans le futur, sur l'emploi et le travail, l'OCDE a interrogé 5 334 salariés travaillant dans 2 053 entreprises du secteur manufacturier et du secteur financier. L'enquête couvre différents pays : l'Autriche, le Canada, la France, l'Allemagne, l'Irlande, le Royaume-Uni et les États-Unis. En interrogeant à la fois les salariés et leurs employeurs, cette enquête de l'OCDE offre un éclairage approfondi sur l'IA : l'enquête employeurs renseigne sur la façon dont l'IA a été mobilisée et les motivations sous-jacentes ; l'enquête employés permet d'appréhender l'expérience des utilisateurs directs et la façon dont ils ont répondu aux changements que l'IA a pu entrainer.

**L'enquête suggère que les salariés et les entreprises des secteurs manufacturier et financier ont une vision très positive de l'impact de l'IA sur la productivité et les conditions de travail.** Environ 80% des utilisateurs directs indiquent que l'IA a amélioré leurs performances au travail, contre seulement 8% déclarant l'effet inverse. En considérant l'ensemble des indicateurs portant sur les conditions de travail (satisfaction au travail, santé physique, santé mentale, intégrité des pratiques de management), les utilisateurs de l'IA sont quatre fois plus nombreux que les autres salariés à rapporter que l'IA a amélioré leurs conditions de travail. Ces observations indiquent que l'IA, lorsqu'il en fait bon usage, pourrait contribuer à accroitre à la fois la productivité des travailleurs et la qualité de l'emploi.

**Néanmoins, les salariés expriment certaines inquiétudes quant à l'impact de l'IA sur la stabilité de leur emploi et de leur salaire**. Dans les entreprises ayant adopté l'IA, 20% des salariés du secteur financier et 15% de ceux du l'industrie manufacturière affirment connaître une personne qui a perdu son emploi à cause de l'IA. Dans une perspective de plus long terme, 19% des salariés du secteur financier et 14% de ceux du secteur manufacturier déclarent être très inquiets, voir extrêmement inquiets, de perdre leur emploi dans les dix ans à venir, tandis 46% and 50% se montrent très sereins. L'inquiétude est plus marquée parmi les utilisateurs de l'IA que pour les autres salariés. Dans leur majorité, les employeurs ne font état d'aucune variation des effectifs due à l'IA dans leur entreprise. Néanmoins, ceux qui indiquent une baisse de l'emploi sont plus nombreux que ceux rapportant une augmentation. Salariés comme employeurs tendent à déclarer que les emplois et leur stabilité seraient plus menacés dans le secteur de la finance que dans l'industrie manufacturière. Dans les deux cas, de nombreux salariés pensent que l'IA pourrait exercer une pression à la baisse sur les salaires dans les 10 ans à venir : les personnes craignant que l'IA réduise les salaires dans leur secteur sont deux fois plus nombreuses que celles misant sur une augmentation. Étant donné le fort potentiel de croissance de l'utilisation l'IA, ces questions sont à surveiller de près, notamment les différences entre secteurs.

**L'IA tend à transformer la nature du travail**. L'IA a entrainé d'importantes réorganisations des tâches : 66% et 72% des entreprises de la finance et du secteur manufacturier déclarent respectivement que l'IA a automatisé des tâches auparavant effectuées par les employés, et dans les deux secteurs, la moitié des employeurs indiquent que l'IA a généré de nouvelles tâches à exécuter. Deux fois plus d'entreprises

déclarent que l'IA a automatisé des tâches répétitives et dangereuses plutôt que d'en générer, ce qui peut expliquer pourquoi les utilisateurs de l'IA se montrent très positifs quant à son impact sur leurs performances et leurs conditions de travail. Trois quarts des utilisateurs déclarent que l'IA a accéléré leur cadence de travail. Bien que cela puisse refléter une hausse de leur productivité, cela peut également être le fait d'une intensification du travail. La plupart des utilisateurs déclarent que l'IA est pour eux un outil d'aide à la décision, ce qu'ils semblent apprécier. Dans l'ensemble, ces constats suggèrent que les travailleurs vont devoir être accompagnés pour gérer au mieux les différents changements engendrés par l'adoption de l'IA.

**L'adoption de l'IA a entrainé un changement significatif des compétences requises, auquel les entreprises ont majoritairement répondu en proposant des formations à leurs employés**. La plupart des employeurs affirment avoir fait face à l'évolution des besoins de compétences via des actions de requalification ou de progression en interne (64% et 71% dans la finance et l'industrie manufacturière, respectivement), ou en sous-traitant des services (53% dans les deux cas). Peu d'employeurs déclarent avoir miser sur l'attrition des effectifs ou avoir procédé à des licenciements (17% et 14% dans la finance et l'industrie manufacturière, respectivement). Plus de la moitié des salariés utilisateurs de l'IA rapportent que leur employeur leur a fourni ou financé une formation idoine, et ces derniers sont également bien plus enclins à considérer que l'IA a amélioré leurs conditions de travail. Bien que la majorité des utilisateurs ne se disent pas dotés de compétences spécifiques à l'IA, plus de 70% d'entre eux se montrent enthousiastes à l'idée d'en apprendre plus dans ce domaine. Les employeurs déclarent que l'IA a accrue l'importance des compétences spécifiques à cette technologie, mais ils soulignent que l'IA a davantage amplifiée l'importance des compétences humaines et le besoin de personnel très qualifié. Dans l'ensemble, ces constats suggèrent que des compétences très variées seront recherchées à mesure que l'IA s'imposera dans l'économie.

**La consultation des employés au sujet des nouvelles technologies semble faciliter la réussite de leur adoption.** Les entreprises au sein desquelles les salariés ou leurs représentants ont été consultés sur ce sujet sont également celles pour lesquelles on observe les effets les plus favorables sur la productivité des employés et leurs conditions de travail. Ce constat s'accorde avec de précédents travaux de l'OCDE, selon lesquels le dialogue direct entre les travailleurs et les responsables (seul ou conjugué avec la représentation des travailleurs) va de pair avec un environnement professionnel de meilleure qualité. Dans le secteur financier et l'industrie manufacturière, 43% et 45% respectivement des employeurs ayant adopté l'IA affirment avoir consulté leurs employés ou leurs représentants au sujet de l'utilisation de nouvelles technologies au sein de l'entreprise. Le sujet le plus souvent abordé lors des consultations est celui des compétences et de la formation.

**La plupart des travailleurs font confiance à leur employeur quant aux décisions prises sur l'IA, mais ce n'est pas toujours le cas. Cela suggère qu'il reste des progrès à faire dans ce domaine.** 57% de salariés se déclarent favorables à l'interdiction d'utiliser l'IA dans le cadre de décisions relatives à des licenciements, et 40% expriment la même opinion s'agissant des recrutements. 49% des salariés du secteur financier et 39% de ceux de l'industrie manufacturière affirment que les applications IA utilisées dans leur entreprise collectent des informations sur eux, en tant qu'individu, ou sur la façon dont ils travaillent. Nombre de ces salariés expriment une certaine inquiétude à ce sujet, et peuvent par exemple ressentir une pression accrue sur leurs performances du fait de cette collecte de données (62% et 56% dans la finance et l'industrie manufacturière, respectivement), ou avoir le sentiment que trop de données les concernant sont collectées (58% et 54%). Par ailleurs, les employeurs suggèrent que l'IA pourrait aider les personnes souffrant d'un handicap, alors qu'elle pourrait être dommageable à d'autres groupes tels que les travailleurs âgés ou très peu qualifiés.

**Les entreprises affirment que le coût et le manque de compétences sont aujourd'hui les principales barrières à l'adoption de l'IA, plutôt que les réglementions mises en place par les gouvernements.** Seulement 25% des entreprises du secteur financier et 19% de celles de l'industrie manufacturière indiquent que les règlementations constituent un frein, alors que 53% et 58% d'entre elles considèrent le

coût élevé de la technologie comme une barrière importante, le manque de compétences adéquates étant quant à lui évoqué dans 41% et 43% des cas.

Cette étude a été conduite en parallèle avec des études de cas sur l'utilisation de l'IA au sein des entreprises (Milanez, 2023[1]). Les enquêtes employés et employeurs peuvent être considérées comme complémentaires aux études de cas, car elles fournissent des informations quantitatives, structurées et représentatives, sur les enjeux posés par l'IA. Les études de cas offrent quant à elles un examen qualitatif, riche et détaillé, de cette question. Globalement, les principaux constats se rejoignent, qu'ils émergent de l'étude quantitative ou des examens qualitatifs, se renforçant ainsi mutuellement.

# Zusammenfassung

Die wahrscheinlichen Auswirkungen der künstlichen Intelligenz (KI) auf die Arbeitswelt werden zunehmend untersucht, es gibt bisher jedoch nur wenige Studien zu der Frage, wie sich die Einführung von KI konkret auf Organisationen und Beschäftigte auswirkt. Um zu erfahren, wie die Beschäftigten und Arbeitgeber selbst die aktuellen und zukünftigen Auswirkungen von KI am Arbeitsplatz beurteilen, hat die OECD insgesamt 5 334 Arbeitskräfte und 2 053 Unternehmen im Verarbeitenden Gewerbe und im Finanzsektor in Deutschland, Frankreich, Irland, Kanada, Österreich, dem Vereinigten Königreich und den Vereinigten Staaten befragt. Da die OECD-Umfragen Arbeitgeber und Beschäftigte erfassen, bieten sie ein umfassendes Bild: Die Arbeitgeberumfrage ist eine wertvolle Quelle für Informationen darüber, wie und warum KI eingeführt wird, und die Beschäftigtenumfrage erfasst die direkten Erfahrungen der Betroffenen beim Einsatz von KI und ihre Reaktionen auf die damit verbundenen Veränderungen.

**Die Erhebungen zeigen, dass die Beschäftigten und Arbeitgeber im Finanzsektor und im Verarbeitenden Gewerbe die Auswirkungen von KI auf die Produktivität der Beschäftigten und die Arbeitsbedingungen sehr positiv einschätzen.** Rund 80 % der KI-Nutzer*innen sagten, dass sich ihre Leistung am Arbeitsplatz durch KI verbessert hat, gegenüber 8 %, bei denen das Gegenteil der Fall war. Bei allen im Hinblick auf die Arbeitsbedingungen erfassten Indikatoren (Arbeitszufriedenheit, körperliche Gesundheit, psychische Gesundheit, faire Behandlung durch Vorgesetzte) war die Zahl der KI-Nutzer*innen, die angaben, dass ihre Arbeitsbedingungen durch KI verbessert wurden, mehr als viermal so hoch wie die Zahl derjenigen, die eine Verschlechterung feststellten. Dies lässt darauf schließen, dass KI – wenn sie richtig eingesetzt wird – zu höherer Produktivität der Beschäftigten und einer größeren Beschäftigungsqualität beitragen könnte.

**Die Beschäftigten äußern jedoch auch Bedenken über die Auswirkungen von KI auf die Beschäftigungsstabilität und die Löhne.** In Unternehmen, die KI eingeführt hatten, sagten im Finanzsektor 20 % und im Verarbeitenden Gewerbe 15 % der Beschäftigten, dass sie eine Person kennen, die ihren Arbeitsplatz in ihrem Unternehmen aufgrund von KI verloren hat. Mit Blick in die Zukunft sagten 19 % der Beschäftigten im Finanzsektor und 14 % im Verarbeitenden Gewerbe, dass sie sich große oder sehr große Sorgen machen, in den nächsten zehn Jahren ihren Arbeitsplatz zu verlieren; 46 % bzw. 50 % waren nicht besorgt. KI-Nutzer*innen äußerten häufiger Bedenken als Personen, die KI nicht nutzten. Die meisten Arbeitgeber gaben an, dass sich die Beschäftigung in ihren Unternehmen aufgrund von KI nicht verändert hat. Allerdings meldeten mehr Arbeitgeber einen Beschäftigungsrückgang als einen Anstieg. Im Finanzsektor sahen Beschäftigte und Arbeitgeber die Arbeitsplätze und die Beschäftigungsstabilität durchweg stärker bedroht als im Verarbeitenden Gewerbe. In beiden Sektoren erwarteten viele Beschäftigte, dass die Löhne durch KI unter Druck geraten; die Zahl der Beschäftigten, die in den nächsten zehn Jahren in ihrem Sektor infolge von KI einen Lohnrückgang erwarten, ist doppelt so hoch wie die Zahl derjenigen, die einen Lohnanstieg erwarten. Da der Einsatz von KI am Arbeitsplatz in den kommenden Jahren wahrscheinlich stark zunehmen wird, sollten diese Entwicklungen sorgfältig beobachtet werden, u. a. im Hinblick auf sektorspezifische Unterschiede.

**Die Arbeitswelt wird durch KI bereits verändert.** KI führt zu einer Neuorganisation der Aufgaben; 66 % der Arbeitgeber im Finanzsektor und 72 % im Verarbeitenden Gewerbe gaben an, dass KI Aufgaben

automatisiert hat, die vorher von Beschäftigten ausgeübt wurden, und etwa die Hälfte der Arbeitgeber in beiden Sektoren gab an, dass KI neue Aufgaben geschaffen hat, die vorher nicht von Beschäftigten ausgeübt wurden. Die Arbeitgeber berichteten mit einer doppelt so hohen Wahrscheinlichkeit, dass repetitive und gefährliche Aufgaben durch KI automatisiert wurden, als dass sie durch KI geschaffen wurden. Das kann erklären, weshalb die KI-Nutzer\*innen sich so positiv über die Auswirkungen von KI auf ihre Leistung und die Arbeitsbedingungen äußerten. Drei Viertel der KI-Nutzer\*innen sagten, dass das Tempo, in dem sie ihre Aufgaben erledigen, durch KI beschleunigt wurde. Dies könnte mit der gestiegenen Produktivität der Beschäftigten zusammenhängen, es könnte jedoch auch auf eine steigende Arbeitsintensität hindeuten. Die meisten KI-Nutzer\*innen gaben an, dass ihnen KI hilft, Entscheidungen zu treffen, was sie offensichtlich positiv einschätzten. Diese Ergebnisse deuten darauf hin, dass die Beschäftigten unterstützt werden müssen, um diesen Wandel erfolgreich zu bewältigen.

**Der durch den Einsatz von KI veränderte Kompetenzbedarf wird hauptsächlich über berufliche Weiterbildung gedeckt.** Die meisten Arbeitgeber adressieren den sich ändernden Kompetenzbedarf durch die Umschulung oder Höherqualifizierung der Beschäftigten (64 % im Finanzsektor und 71 % im Verarbeitenden Gewerbe) oder externe Dienstleister (jeweils 53 %), und weniger durch Arbeitskräfteabgänge oder Entlassungen (17 % bzw. 14 %). Mehr als die Hälfte der Beschäftigten, die KI nutzen, gaben an, dass ihr Unternehmen Schulungen für die Arbeit mit KI angeboten oder finanziert hat, und diese Beschäftigten gaben auch wesentlich häufiger an, dass KI ihre Arbeitsbedingungen positiv beeinflusst. Die meisten Beschäftigten, die KI nutzen, hatten Eigenangaben zufolge keine spezialisierten KI-Kompetenzen, mehr als 70 % zeigten jedoch großes Interesse, mehr über KI zu lernen. Die Arbeitgeber gaben zwar an, dass spezialisierte KI-Kompetenzen wichtiger geworden sind, sie verwiesen jedoch auch darauf, dass die Bedeutung menschlicher Kompetenzen und der Bedarf an hochqualifizierten Arbeitskräften durch KI noch stärker gestiegen sind. Dies deutet darauf hin, dass die Verbreitung von KI in immer mehr Branchen einen breiten Fächer von Kompetenzen erfordert.

**Ein konsultativer Ansatz bei der Einführung neuer Technologien scheint mit besseren Ergebnissen assoziiert zu sein.** Die Unternehmen, in denen die Arbeitskräfte oder Arbeitnehmervertreter\*innen in Bezug auf neue Technologien konsultiert werden, melden die positivsten Auswirkungen auf die Produktivität der Beschäftigten und die Arbeitsbedingungen. Dies steht im Einklang mit früheren OECD-Studien, in denen festgestellt wurde, dass der direkte Dialog zwischen Belegschaft und Geschäftsführung (individuell oder über Arbeitnehmervertretungen) mit einem besseren Arbeitsumfeld verbunden ist. Im Finanzsektor und im Verarbeitenden Gewerbe sagten 43 % bzw. 45 % der Arbeitgeber, die KI eingeführt haben, dass sie die Beschäftigten oder Arbeitnehmervertreter\*innen in Bezug auf den Einsatz neuer Technologien an ihrem Arbeitsplatz konsultiert haben. Die häufigsten Themen bei diesen Konsultationen waren Kompetenzen und berufliche Weiterbildung.

**Da nicht alle Beschäftigten darauf vertrauen, dass ihr Arbeitgeber in Bezug auf KI die richtigen Entscheidungen trifft, besteht in dieser Hinsicht noch Verbesserungspotenzial.** 57 % der Beschäftigten sprachen sich für ein Verbot von KI bei Entscheidungen über Entlassungen aus, 40 % waren für ein Verbot von KI bei Entscheidungen über Einstellungen. 49 % der Beschäftigten im Finanzsektor und 39 % im Verarbeitenden Gewerbe sagten, dass in ihrem Unternehmen durch KI-Anwendungen personen- oder leistungsbezogene Daten gesammelt werden. Die meisten dieser Beschäftigten äußerten sich besorgt, dass der Leistungsdruck durch die Datenerhebung steigt (62 % im Finanzsektor und 56 % im Verarbeitenden Gewerbe), und hatten den Eindruck, dass zu viele Daten gesammelt werden (58 % bzw. 54 %). Die Arbeitgeber waren der Auffassung, dass Arbeitskräfte mit Behinderungen von KI am Arbeitsplatz profitieren könnten. Für andere Gruppen, wie ältere und geringqualifizierte Arbeitskräfte, werden dagegen größere Herausforderungen erwartet.

**Den Arbeitgebern zufolge sind Kosten und fehlende Kompetenzen derzeit größere Hindernisse für die Einführung von KI als die staatliche Regulierung.** 25 % der Arbeitgeber im Finanzsektor und 19 % im Verarbeitenden Gewerbe gaben an, dass die staatliche Regulierung ein Hindernis darstellt. Im

Vergleich dazu verwiesen 53 % bzw. 58 % auf die hohen Kosten der Technologie und 41 % bzw. 43 % auf Kompetenzdefizite.

Die Umfragen, auf denen die vorliegende Studie beruht, wurden ergänzend zu Fallstudien durchgeführt, die sich mit der Umsetzung von KI befassen (Milanez, 2023[1]). Die OECD-Umfragen liefern strukturierte, repräsentative und quantitative Daten über KI am Arbeitsplatz, die das detaillierte qualitative Bild der Fallstudien ergänzen. Das Gesamtbild ist erstaunlich einheitlich und bestätigt sich durch ähnliche Muster in der quantitativen und qualitativen Analyse.

# 1 Introduction

Wishing to capture workers' and employers' perceptions of the current and future impact of AI on the workplace, the OECD surveyed a total of 5 334 workers and 2 053 firms in the manufacturing and financial sectors in Austria, Canada, France, Germany, Ireland, the United Kingdom and the United States.

The surveys examine how and why AI is being implemented in the workplace, its impact on management, working conditions and skill needs; its impact on worker productivity, wages and employment; what measures are being putting in place to manage transitions; and concerns and attitudes surrounding AI.

The decision to focus the survey on two sectors (finance and manufacturing) was driven by a desire to limit the scope of the research to the specific AI-related technologies used in those sectors and thereby avoid the generalities underpinning much public discourse on AI. In reality, AI can take many forms and can be combined with many technologies, meaning that its impact on workers is not uniform. The advantages of selecting finance and manufacturing in particular are that these sectors offer a higher prevalence of AI compared to other sectors, as well as heterogeneity between the two sectors in terms of worker profile. For instance, the larger proportion of university-educated workers in the financial sector compared to the manufacturing sector lends an interesting angle to between-sector comparisons.

The surveys are a key component of the OECD programme on AI in Work, Innovation, Productivity and Skills (AI-WIPS). The design of the questionnaires was heavily influenced by other AI-WIPS research, including the literature review (Lane and Saint-Martin, 2021[2]) and the classification toolkit (Lane and Williams, 2023[3]). The surveys can also be seen as an accompaniment to the case studies (Milanez, 2023[1]), in providing structured, representative and quantitative evidence regarding AI in the workplace to complement the rich and detailed qualitative picture offered by the case studies.

This report is structured as follows, with a chapter devoted to each major topic of the survey questionnaires. Chapter 2 provides some background information, including a description of the survey methodology, descriptive statistics relating to the sample and an assessment of respondents' relationship with AI. Chapter 3 examines the impact of AI on worker productivity and working conditions, as reported by respondents to the worker and employer surveys, while Chapter 4 focuses on the impact on employment, job stability and wages. Chapter 5 explores some of the main mechanisms driving these changes: how AI changes the nature of work, which tasks it automates and which tasks it creates. Chapter 6 addresses the question of how AI has changed skills needs. Chapter 7 examines the possibility that worker consultation can improve outcomes, while Chapter 8 asks whether AI is being implemented in a trustworthy and inclusive manner.

# 2 Who responded to the survey and what is their relationship with AI?

This chapter provides some background information, intended to assist with interpreting the results presented in this report. This includes a description of the survey methodology, descriptive statistics relating to the sample, as well as an assessment of respondents' relationship with AI.

## Survey methodology

The OECD commissioned Kantar Public to undertake two surveys: an employer survey and a worker survey.

- The employer survey was conducted as a telephone survey (CATI = Computer Assisted Telephone Interviewing) among representatives of the management of companies with 20 or more employees[1] in the sectors "Manufacturing (NACE C)" and "Finance and Insurance (NACE K)". The sampling frames for the employer survey were predominantly provided by Dun & Bradstreet, which claims to have the largest business databank worldwide, commonly used for many national and international surveys, including the European Commission's Eurobarometer business surveys.

- The worker survey was implemented as an online survey using access panels, databases of individuals who have indicated a willingness to participate in future online surveys for compensation. One advantage of these panels is that they typically hold demographic information such as age, gender and education, which allows groups with low response rates to be targeted during fieldwork, ultimately leading to a more representative sample. One disadvantage of these panels, which may undermine representativeness, is that they exclude individuals without internet access.

The main fieldwork phase for both surveys was between mid-January and mid-February 2022. The surveys were conducted in English, French and German.

Particular attention was paid to the framing and definition of AI within the survey. In both surveys, individuals within the financial and manufacturing industries were invited to participate in the survey, regardless of whether they used AI themselves or whether their companies used AI. It was thus important to establish a basic definition of AI so that respondents with no or little familiarity with AI could provide meaningful responses to the survey and so that those with more familiarity would be oriented towards this shared definition.

Respondents were asked to keep the following definition in mind when answering the survey questions, regardless of their familiarity with AI: "Artificial intelligence – or 'AI' in short – is what enables smart computer programs and machines to carry out tasks that would typically require human intelligence". To

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[1] Given the focus of the survey on the impact of AI on the workplace, companies with fewer than 20 employees were because they were less likely to have adopted AI (OECD, 2021[4]). Furthermore, although companies with fewer than 20 employees make up a substantial share of all companies within any economy, they naturally account for a smaller share of all employees.

reinforce the definition, respondents were then provided with examples of where AI might be found in everyday life: Siri, Alexa and other smart assistants, Netflix or YouTube recommendations, and self-driving cars. They were also provided with examples of where AI might be found in their own sector: robo-advisors, chatbots used for customer service, and fraud detection software, for respondents in the financial sector; and robots that use cameras to check items for flaws, software used to predict prices and demand and technology that predicts when machines should be serviced, for respondents in the manufacturing sector.

Initial communications with prospective respondents purposefully omitted the terms "Artificial intelligence" and "AI" when describing the survey, to avoid biasing participation towards workers who use AI and employers that have adopted AI. Instead, initial communications referred to a survey on the topic of "advanced technologies". In the employer survey fieldwork, interviewers followed a protocol to find the individual within each company most knowledgeable about this topic.[2]

Over 5 000 workers and 2 000 firms were surveyed in the manufacturing and financial sectors in Austria, Canada, France, Germany, Ireland, the United Kingdom and the United States. Table 2.1 and Figure 2.2 provide a breakdown of the worker and employer survey samples (raw numbers and weighted percentages) by country and by the characteristics used to weight the samples: age, gender and education for the worker survey; firm size for the employer survey. Throughout this report, data were weighted in order to ensure that the analysis was representative of the underlying population of employers and workers in the sectors studied, in terms of these characteristics, as reflected in official statistics.

### Table 2.1. Descriptive statistics: worker survey

|  | Number of observations | | | % of total (weighted) | | |
|---|---|---|---|---|---|---|
|  | Finance | Manufacturing | Total | Finance | Manufacturing | Total |
| *Country* |  |  |  |  |  |  |
| Austria | 326 | 421 | 747 | 12.7 | 15.2 | 14.0 |
| Canada | 412 | 425 | 837 | 16.1 | 15.3 | 15.7 |
| France | 393 | 412 | 805 | 15.3 | 14.9 | 15.1 |
| Germany | 418 | 428 | 846 | 16.3 | 15.4 | 15.9 |
| Ireland | 208 | 234 | 442 | 8.1 | 8.4 | 8.3 |
| United Kingdom | 402 | 426 | 828 | 15.7 | 15.4 | 15.5 |
| United States | 403 | 426 | 829 | 15.7 | 15.4 | 15.5 |
| *Age* |  |  |  |  |  |  |
| 16-24 | 348 | 251 | 599 | 9.6 | 8.7 | 9.1 |
| 25-34 | 718 | 628 | 1,346 | 21.1 | 22.4 | 21.8 |
| 35-49 | 979 | 1,183 | 2,162 | 38.9 | 35.6 | 37.2 |
| 50-64 | 475 | 667 | 1,142 | 28.0 | 31.3 | 29.7 |
| 65+ | 42 | 43 | 85 | 2.4 | 2.0 | 2.2 |
| *Gender* |  |  |  |  |  |  |
| Male | 1,228 | 1,818 | 3,046 | 48.2 | 71.8 | 60.5 |
| Female | 1,320 | 945 | 2,265 | 51.3 | 27.9 | 39.1 |
| Other | 14 | 9 | 23 | 0.5 | 0.3 | 0.4 |
| *Education* |  |  |  |  |  |  |
| University degree or above | 1,673 | 1,137 | 2,810 | 47.4 | 22.9 | 34.7 |
| No university degree | 861 | 1,595 | 2,456 | 51.4 | 75.4 | 63.8 |
| No answer | 28 | 40 | 68 | 1.2 | 1.8 | 1.5 |
| **Total** | **2,562** | **2,772** | **5,334** | **100.0** | **100.0** | **100.0** |

Source: OECD worker survey on the impact of AI on the workplace (2022).

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[2] In firms with fewer than 250 employees, the interviewer asked to speak to the owner or manager of the company or a specific manager for technology. In larger firms, the interviewer asked to speak to the managing director of the company or the head of technology (or head of production, in the manufacturing sector only).

**Table 2.2. Descriptive statistics: employer survey**

| | Number of observations | | | % of total (weighted) | | |
|---|---|---|---|---|---|---|
| | Finance | Manufacturing | Total | Finance | Manufacturing | Total |
| *Country* | | | | | | |
| Austria | 100 | 200 | 300 | 15.3 | 14.3 | 14.6 |
| Canada | 100 | 200 | 300 | 15.3 | 14.3 | 14.6 |
| France | 100 | 200 | 300 | 15.3 | 14.3 | 14.6 |
| Germany | 100 | 200 | 300 | 15.3 | 14.3 | 12.3 |
| Ireland | 53 | 200 | 253 | 8.1 | 14.3 | 14.6 |
| United Kingdom | 100 | 200 | 300 | 15.3 | 14.3 | 14.6 |
| United States | 100 | 200 | 300 | 15.3 | 14.3 | 14.6 |
| *Size* | | | | | | |
| 20 to 49 workers | 247 | 529 | 776 | 46.9 | 53.6 | 51.5 |
| 50 to 249 workers | 239 | 545 | 784 | 36.3 | 36.7 | 36.5 |
| 250 to 499 workers | 92 | 164 | 256 | 9.5 | 5.1 | 6.5 |
| 500 or more workers | 75 | 162 | 237 | 7.3 | 4.6 | 5.5 |
| **Total** | 653 | 1,400 | 2,053 | **100.0** | **100.0** | **100.0** |

Source: OECD employer survey on the impact of AI on the workplace (2022).

The results in this report are presented as follows. Where a difference between two independent groups (e.g. men vs. women, small vs. large employers) is indicated as statistically significant (or not), this is the result of a z-test with a significance level of 5%. When testing differences in the employer survey, sample sizes are adjusted to account for the effects of weighting and stratification, using Stata's *svy* suite of commands for complex survey analysis. Sample sizes for the worker survey are adjusted by the Kish Approximation to account for the effect of the weighting in significance tests.

In a few instances, statistical significance has been assessed on the basis of weighted linear regression (where there is a need to control for the effect of other variables), chi-squared tests (for testing the association between two categorical variables) and t-tests (for comparing two dependent/overlapping groups). In these cases, the *svy* adjustments are also applied for the employer survey.

It should be noted that, due to the lower sample size associated with the employer survey, fewer of the statistical tests show significant results, compared to the worker survey.

More information on the sampling approach, the development of the questionnaire, fieldwork, data cleaning and weighting is provided in the technical report available on the OECD website. The full questionnaires in English are available in Annexes A and B. Error tolerance tables for the two surveys are shown in Annex D.

## Respondents' relationship with AI

This section examines the relationship between the survey respondents and AI, in terms of whether their companies use AI, whether the respondents themselves have any interaction with AI at work, and the attributes of the workers who use AI and of the technology used. The information presented here serves as useful context for the chapters that follow, which explore the impact of AI on workers and on the workplace.

### *Larger employers are more likely to say that they use AI*

42% of employers surveyed in the financial sector and 29% in the manufacturing sector said that they used AI. In both sectors, larger firms were more likely to say that they used AI compared to smaller firms

(Figure 2.1). This is consistent with existing literature showing that smaller size often acts as a barrier to adoption of new technologies, due to lower internal resources and awareness, skills gaps and costs (OECD, 2021[4]).

**Figure 2.1. Larger employers are more likely to say they use AI**

% of all employers, by size
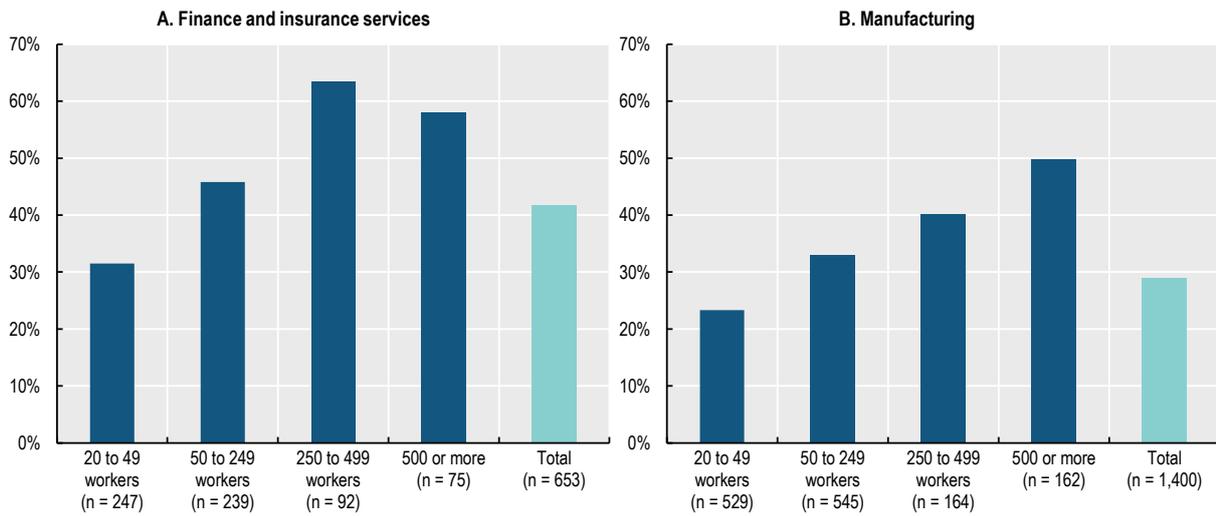


Note: Employers were asked: "To the best of your knowledge, does your company use artificial intelligence? Please think of all areas within your company in [country], not just the area you work in."
Source: OECD employer survey on the impact of AI on the workplace (2022).

Note that these estimates should not be interpreted as adoption rates, since the purpose of the survey was not to estimate adoption, nor was it designed to do so. However, it is worth noting that these estimates, although larger than those obtained in national statistical agencies' surveys, are within the ranges produced by other business surveys on the topic of AI, as discussed in Box 2.1.

## Box 2.1. How do the estimates of AI use reported in these surveys compare to estimates from other surveys?

**What do other surveys say?**

Surveys vary widely in their estimates of AI use among companies, but generally national statistical agencies surveys tend to produce lower estimates than surveys undertaken by non-official sources, such as consultancies, survey firms and academic researchers.

The estimates produced by the employer survey (42% and 29% in the financial and manufacturing sectors, respectively) are closer to the estimates produced by non-official sources. For instance, an EU-wide survey of companies suggested that 42% of companies were using at least one AI technology (European Commission, 2020[5]). One third of IT professionals surveyed in IBM's Global AI Adoption Index 2022, said that their business was using AI (2022[6]). The McKinsey Global Survey on AI indicated a figure of 57%, based on a proprietary panel of executives and managers (McKinsey, 2021[7]).

By contrast, estimates by national statistical agencies tend to be lower. Table 2.3 presents some recent estimates produced by national statistical agencies in the countries included in the OECD AI surveys. It is evident from the table that AI use increases with firm size with nearly a third of the largest companies reporting that they use AI. Where the same statistical agencies publish estimates by sector, manufacturing is consistently associated with a higher-than-average prevalence of AI. Finance too is associated with higher prevalence, although this comparison is only possible in Canada.

### Table 2.3. Percentage of businesses using AI technologies, national statistical agencies

| | | Austria[1] | Canada[2] | France[1] | Germany[1] | Ireland[1] | US[3] |
|---|---|---|---|---|---|---|---|
| | Year | 2021 | 2021 | 2021 | 2021 | 2021 | 2019 |
| Firm size | 1+ | | | | | | <9%* |
| | 10+ | 9% | | 7% | 11% | 8% | |
| | 10-49 | 7% | | 5% | 9% | 6% | |
| | 20-99 | | 6% | | | | |
| | 50-249 | 15% | | 13% | 15% | 13% | |
| | 100+ | | 20% | | | | |
| | 250+ | 32% | | 31% | 31% | 31% | |

Note: Figures for Austria, France, Germany and Ireland are based on all sectors, except finance and insurance. *The United States estimate refers to a selection of advanced technologies, some of which are related to AI.
Source: [1] (Eurostat, 2021[8]), [2] (Statistics Canada, 2021[9]), [3] (Beede D et al., 2020[10]), (OECD, 2021[11]).

**Why are estimates of AI use higher in this survey than in national statistical agencies' surveys?**

A 2021 OECD working paper ([11]) discusses the choices that researchers must make when measuring AI use, such as how to define AI as well as choices regarding the scope, design and coverage of the survey tool, which ultimately influence the results and drive differences between countries and researchers. The following three factors could explain why the rates estimated through the OECD employer survey are higher than those estimated by national statistical agencies:

- This survey focuses on two sectors, finance and manufacturing, which are generally associated with higher AI use;
- The employer survey only includes companies with 20 or more employees and larger companies are generally associated with higher use;

> • Many national business surveys are mandatory to complete, whereas participation in this survey was voluntary; while the invitation informed potential participants that this survey concerned "advanced technologies" (rather than specifically mentioning "AI"), this may still have disproportionally attracted responses from more tech-forward employers, more likely to use AI.

### *The most common uses for AI in finance and manufacturing, respectively, are in data analytics and production processes*

Amongst employers that said that they used AI, it was most commonly used in data analytics (52%) and fraud detection (50%) in the finance sector, while in manufacturing it was most commonly used in production processes (60%) and maintenance tasks (40%) (Figure 2.2).[3] In most cases, employers reported multiple uses for AI, with just 26%/32% indicating that AI was limited to a single use within the company.

**Figure 2.2. The most common uses for AI in finance and manufacturing, respectively, are in data analytics and production processes**

% of employers that use AI
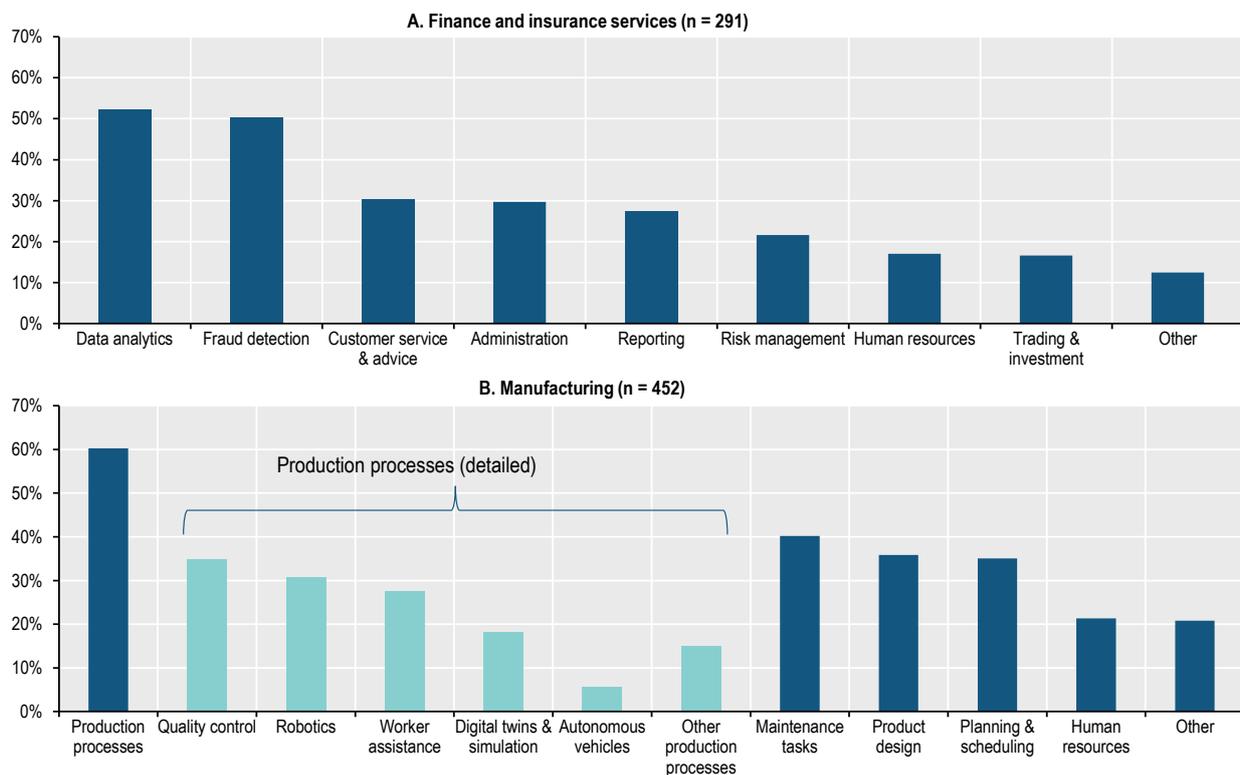


Note: Employers that use AI were asked: "I am going to list some possible uses of artificial intelligence in the finance and insurance/manufacturing sector. Please tell me whether or not your company uses AI for each of the following purposes." Employers could select multiple answers.
Source: OECD employer survey on the impact of AI on the workplace (2022).

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[3] The list of AI applications was informed by desk research (sources were predominantly industry reports and surveys on the topic of AI) and validated with industry representatives. Since production processes was perceived to cover many diverse and important uses, manufacturers that said they used AI in production processes were asked to select more detailed uses from a disaggregated list.

The most frequently reported use differed somewhat by country (Table 2.4). For instance, fraud detection was the most commonly reported use in the financial sector in Canada and Germany, while robotics was the most commonly reported use in the manufacturing sector in the United States and Germany.

**Table 2.4. The most frequently reported use differs by country**

| Country | Most frequently reported use in finance | Most frequently reported use in manufacturing |
|---|---|---|
| Austria | Data analytics | Production processes – Quality control |
| Canada | Fraud detection | Production processes – Worker assistance |
| France | Data analytics | Production processes – Quality control |
| Germany | Fraud detection | Production processes – Robotics |
| Ireland | Reporting | Production processes – Quality control |
| United Kingdom | Administration | Production processes – Quality control |
| United States | Data analytics | Production processes – Robotics |

Note: Employers that use AI were asked: "I am going to list some possible uses of artificial intelligence in the finance and insurance/manufacturing sector. Please tell me whether or not your company uses AI for each of the following purposes."
Source: OECD employer survey on the impact of AI on the workplace (2022).

### *The proportion of employers that say they use AI varies by country*

In both sectors, the proportions of employers in the survey that said that they used AI were highest in Canada and lowest in the United Kingdom (Figure 2.3). In the United Kingdom, the share of employers that said they used AI was particularly low (less than one third of other countries' rates) in the financial sector whereas in the manufacturing sector, the rate was not statistically significantly different from those in Austria and Germany. Box 2.2 explores some possible explanations for why AI use was lower in the United Kingdom sample. Due to compositional differences between sectors in each country and the fact that the survey was not designed to measure adoption, these results should be interpreted with caution.

**Figure 2.3. The proportion of the employer sample that say they use AI is highest in Canada**

% of all employers, by country
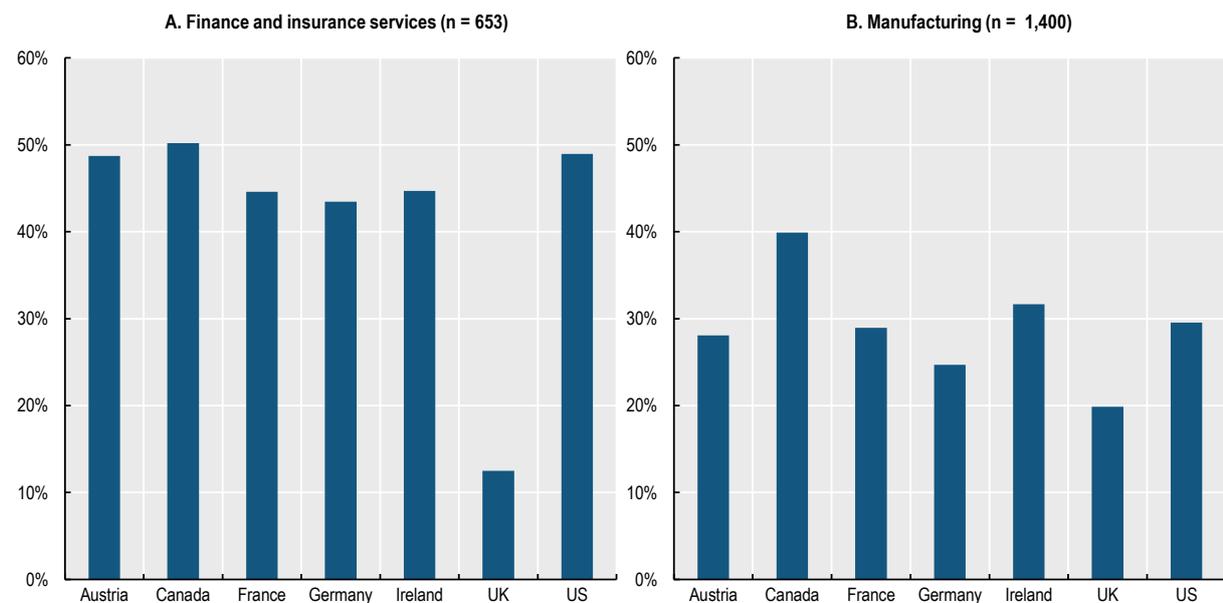


Note: Employers were asked: "To the best of your knowledge, does your company use artificial intelligence? Please think of all areas within your company in [country], not just the area you work in." Countries are ordered alphabetically.
Source: OECD employer survey on the impact of AI on the workplace (2022).

**Box 2.2. Why do so few employers in the United Kingdom sample say that they use AI, especially in the financial sector?**

The low share of employers that report using AI in the United Kingdom sample may seem surprising, particularly in the financial sector, in view of the importance of the banking sector in London, a global financial hub. It is suspected that, to some extent, differences in the composition of the financial sectors across countries are skewing the comparison. As one example, financial intermediation companies (e.g. trusts, funds) make up a much higher share of the Dun & Bradstreet sampling frame in the United Kingdom compared to other countries.[4] Companies in this subsector tend to be small and, according to the survey results, tend to have a lower AI use than companies in the other subsectors of the financial sector. However, this can only explain a portion of the lower AI use measured for the United Kingdom. If this subsector is excluded from the sample, the share of companies that say that they use AI in the United Kingdom financial sector is still roughly half of what companies in other countries report. Due to this compositional difference (and the possibility of other compositional differences, unobservable within the data), comparison between countries of reported use of AI is challenging and should not be interpreted as actual differences in adoption of AI across countries.

However, the lower AI use reported in the United Kingdom's manufacturing sector does not seem incongruous with existing evidence. For instance, in a European Commission survey (2020[5]), which covered all sectors of the economy, 34% of businesses surveyed in the United Kingdom said that they used at least one AI technology, marginally lower than in Ireland (35%) and France (36%), and much lower than in Germany (44%) and Austria (51%). The IBM Adoption Index (2022[6]) associated lower adoption rates with the United Kingdom (26%) and the United States (25%) than with Canada (28%), France (31%) and Germany (34%).

Note that the United Kingdom was not an outlier in terms of AI use in the financial sector according to the worker survey, as shown in Annex C. However, it was associated with the lowest proportion of AI users in the manufacturing sector.

***Considerable shares of the workforce in finance and manufacturing report using AI in one way or another***

Workers whose companies use AI were asked whether they interacted with AI in one of the following ways: working with AI; managing workers who use AI; developing/maintaining AI; being managed by AI; or interacting with AI in another way. Just under 35% of workers in each sector said that they worked with AI (Figure 2.4). Over 15% of workers said that they managed workers who worked with AI. It was less common for workers to say that they were being managed by AI or were developing/maintaining AI. A large proportion of respondents also said that they interacted with AI in "another way" at work, i.e. other than the options presented—however no further information was collected on what these other interactions might be.

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[4] This naturally raised the question of whether this could be a flaw within the database. Dun & Bradstreet (the database provider) has provided assurances that this is not the case, and that the database reflects the true size of this subsector in the United Kingdom. For a fuller account of the measures taken to investigate this result, see the technical report available on the OECD website.

% of workers in companies that use AI



**A. Finance and insurance services (n = 1,626)**

**B. Manufacturing (n = 1,301)**
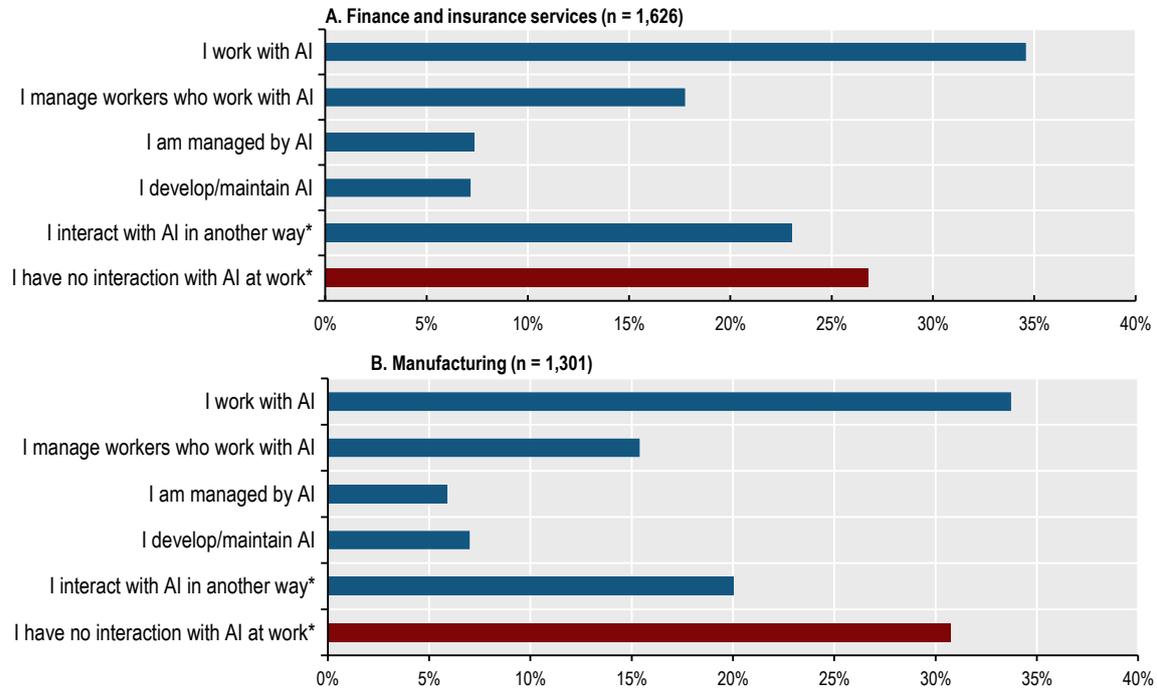
Note: Workers in companies that use AI were asked: "Which of these statements best describes your interaction with AI at work? I work with AI; I manage workers who work with AI; I develop/maintain AI; I am managed by AI; I interact with AI in another way; I have no interaction with AI at work; Don't know". "Don't know" responses are not included in the figure.
* Exclusive response options. Otherwise, respondents could select multiple answers.
Source: OECD worker survey on the impact of AI on the workplace (2022).

Combining all possible ways of interacting with AI, 42% of all workers surveyed in the financial sector and 29% in the manufacturing sector could be considered "AI users".[5] Focusing only on companies that have adopted AI, this is equivalent to 70% and 67%, respectively, of workers in these companies.

### AI users are more likely to be younger, male and more educated than non-users

In both sectors, AI users were more likely to be younger (aged under 50), male and more educated compared to non-users (Figure 2.5). The median AI user was male and aged 35 to 49. In the financial sector, the median AI user had a university degree, whereas that was not the case in the manufacturing sector. In both sectors, workers born in another country were more likely to be AI users. In the United States, where respondents could provide information on race and ethnicity, non-white workers were more likely to be AI users. There were no statistically significant differences by ethnicity.

Many of these findings are not unexpected. One global survey (Ipsos, 2022[12]) suggested that self-reported understanding of AI was higher among male, younger and more educated respondents, and that the same groups were generally more optimistic about the benefits of AI-based products and services. More generally, the OECD Survey of Adult Skills – conducted as part of the Programme for the International

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[5] From this point forward, employers that reported they used AI are described as having "adopted AI", in order to avoid confusion between this group of employers and the AI users (i.e. workers who interact with AI in one of the ways presented in Figure 2.4).

Assessment of Adult Competencies (PIAAC) – has shown that male, younger and more educated respondents have on average greater proficiency in problem solving in technology-rich environments and greater likelihood to report some experience with computers (OECD, 2015[13]).

## Figure 2.5. AI users are more likely to be younger, male and more educated than non-users

% of workers in companies that use AI, by age, gender and education
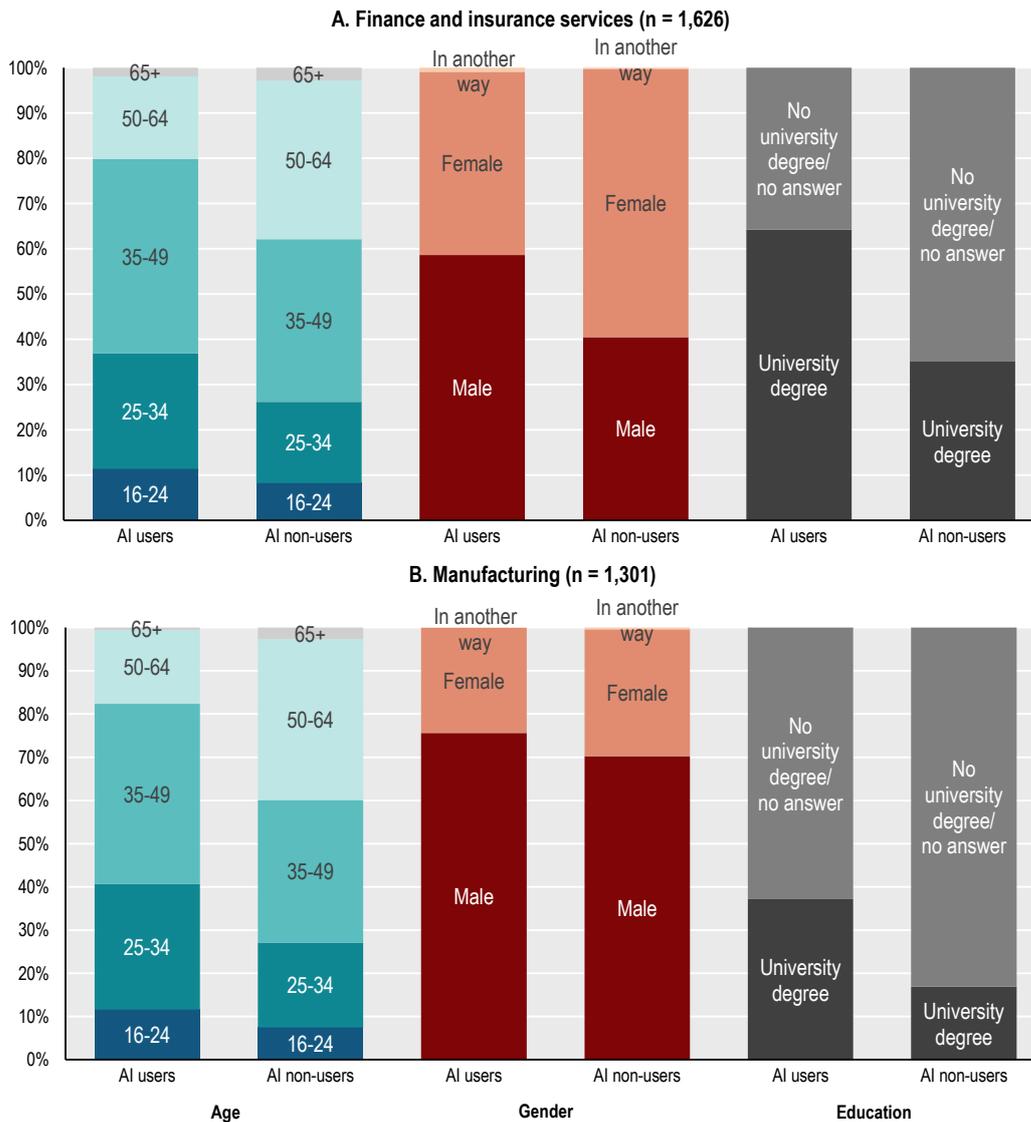


Note: Workers in companies that use AI were asked: "Which of these statements best describes your interaction with AI at work? I work with AI; I manage workers who work with AI; I develop/maintain AI; I am managed by AI; I interact with AI in another way; I have no interaction with AI at work; Don't know". Workers who selected "no interaction" or "Don't know" or who said that their companies did not use AI are described as "non-users", while the rest are described as "AI users".
Source: OECD worker survey on the impact of AI on the workplace (2022).

# 3 What is the impact of AI on worker productivity and working conditions?

This chapter presents the impact of AI on worker productivity and working conditions, as reported by respondents to the worker and employer surveys. The worker survey asked workers who use AI whether they felt that AI had improved or worsened their performance, enjoyment, mental health and well-being, physical health and safety, as well as how fairly they felt management treated them. The employer survey asked employers that had adopted AI similar questions about worker productivity, worker satisfaction, health and safety, and managers' ability to measure worker performance within the company.[6]

The indicators relating to working conditions were designed to reflect different elements of the OECD's framework for assessing quality of the working environment (OECD, 2017[14]). Their inclusion in the two surveys was envisaged as a novel and important addition to the existing research on the impact of AI, which tends to be more focused on employment and wages.

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[6] The two sets of indicators were chosen to allow comparison between the worker and employer survey, although the exact text of the questions differs slightly to account for the different audiences and survey modes.

## Main findings

- Employers saw improving worker performance and reducing staff costs as bigger motivations to adopt AI than addressing skill shortages and improving workers' health and safety. Approximately half of those that said that improving worker performance was a motivation also said that reducing staff costs was a motivation, reinforcing the idea that AI has the potential to complement labour and, at the same time, substitute it.

- Workers and employers alike were overwhelmingly positive about the impact of AI on performance and working conditions. For instance, 79% and 80% of AI users[7] in finance and manufacturing, respectively, said that AI had improved their own performance, compared to 8% in both sectors who said that AI had worsened it. Across all performance and working conditions indicators considered, workers who use AI were more than four times as likely to say that AI had improved their performance and working conditions as to say that it had worsened them.

- While still overwhelmingly positive, the workers who work with AI (and presumably have the most direct interaction with AI) were generally less positive about the impact of AI on their own performance and working conditions, than the managers of workers who work with AI. The workers who develop or maintain AI were the most positive group across all indicators in finance, although not in manufacturing where results were more mixed.

- Male AI users were more likely to report that AI had improved their performance and working conditions compared to female AI users, particularly in the financial sector. This gender gap is partly attributable to the fact that male workers are more likely to be in management and professional occupations, where views of AI tend to be more positive. Workers with a university degree were generally also more positive than those without.

- Individuals working in companies that had not adopted AI were also positive about the impact of AI on their sector in future, although less positive than AI users had been. Approximately half of workers in companies that had not adopted AI (50% and 49% in finance and manufacturing, respectively) said that AI would improve worker performance within the sector, compared to 22% and 16% who said that AI would worsen it.

### Employers say that improving worker performance and reducing staff costs are the main motivations for adopting AI

Before examining the impact of AI on worker productivity and working conditions, it is useful to consider why employers said they were adopting AI in the first place. Employers in both sectors saw improving worker performance and reducing staff costs as bigger motivations to adopt AI than addressing skill shortages and improving workers' health and safety (Figure 3.1)[8]. This reinforces the idea that AI has the

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[7] "AI users" have any of the following interactions with AI: they work with AI; they manage workers who work with AI; they develop/maintain AI; they are managed by AI; or they interact with AI in another way.

[8] This appears roughly in line with the results of another survey, the IBM Global AI Adoption Index 2022 (2022[6]), which suggested that 22% of companies were exploring or adopting AI because of labour or skills shortages, compared to 42% that cited a need to reduce costs and automate key processes. Other business survey have suggested that decisions to adopt AI are motivated more by the aim of complementing human capabilities than by the aim of substituting workers (Accenture, 2018[33]; Bessen et al., 2018[26]).

potential to complement labour and, at the same time, substitute it. Employers did not appear to see these motivations as mutually exclusive; approximately half of those that said that improving worker performance was a motivation also said that reducing staff costs was a motivation. Improving worker performance was the most commonly reported motivation in all countries surveyed, except Austria and the United States, where reducing staff costs was more commonly reported.

Improving workers' health and safety was a more important motivation in manufacturing than in finance, which is unsurprising given the higher risk of physical injury in this sector. This difference across sectors was statistically significant, as was the difference in shares that were motivated by improving worker performance (also higher in manufacturing).

**Figure 3.1. Employers say that improving worker performance and reducing staff costs are the main motivations for adopting AI**

% of employers that have adopted AI
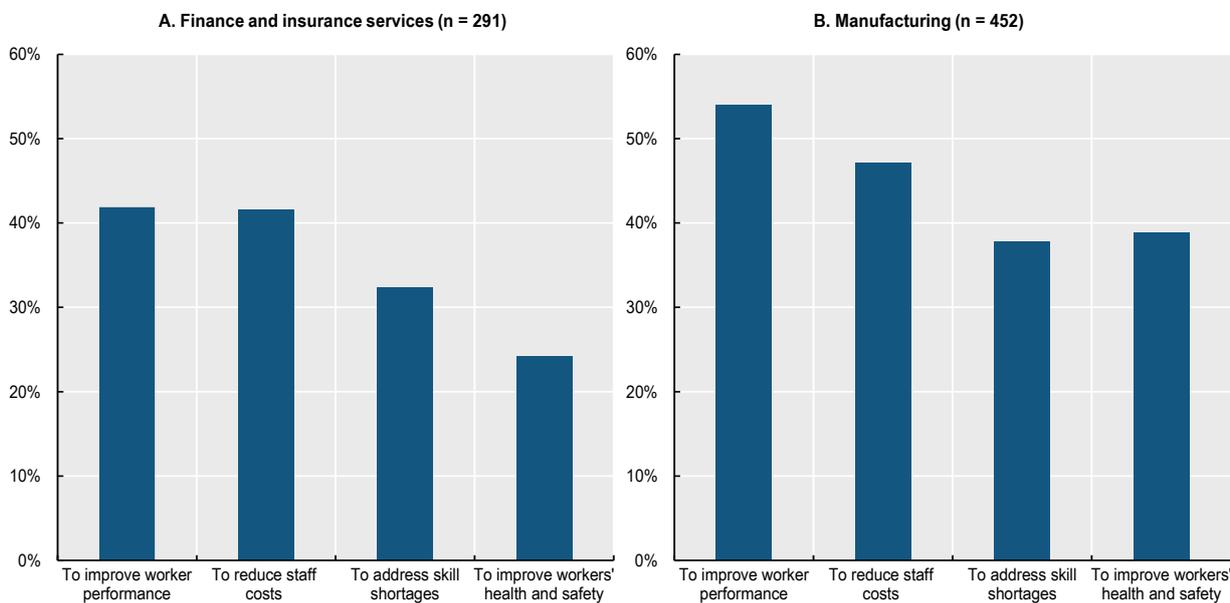


Note: Employers that have adopted AI were asked: "To the best of your knowledge, were any of the following motivations for your company adopting artificial intelligence?" Employers could select multiple answers.
Source: OECD employer survey on the impact of AI on the workplace (2022).

The set of options was intentionally limited to workforce-related motivations, given the survey's focus on the workplace impact of AI. However, employers may have other reasons to invest in AI. Indeed, 19% of respondents in the financial sector and 13% in manufacturing said that none of the options provided in the questionnaire were motivations for adopting AI. This suggests that while many decisions to adopt AI have been influenced by workforce-related motivations, other factors (e.g. improving products and processes,[9] expanding operations or keeping up with competitors) have also played an important role. The fact that

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[9] For instance, in the firm-level case studies carried out by the OECD in the finance and manufacturing sectors (Milanez, 2023[1]), improving product and service quality was the most frequently mentioned motivation in in-depth interviews.

each workforce-related motivation was associated with a higher share of employers in manufacturing than in finance, may also suggest that other motivations play a more important role in finance.

## Employers report a positive impact of AI on worker productivity and working conditions

In the employer survey, representatives of management within companies that had adopted AI were asked about the impact AI had on worker productivity, worker satisfaction, health and safety, and managers' ability to measure worker performance within the company. In both sectors, employers were far more likely to report a positive, rather than negative, impact on worker productivity and working conditions (Figure 3.2). Across all indicators of worker productivity and working conditions, employers in manufacturing were more positive than employers in finance, although the association was only statistically significant for health and safety. That so many in the manufacturing sector reported improvements in health and safety is potentially attributable to the higher risk of injury in this sector and to the higher prevalence of AI tools that seek to improve safety and collaboration between workers and machinery.

**Figure 3.2. Employers that have adopted AI are positive about its impact on worker productivity and working conditions**

% of employers that have adopted AI
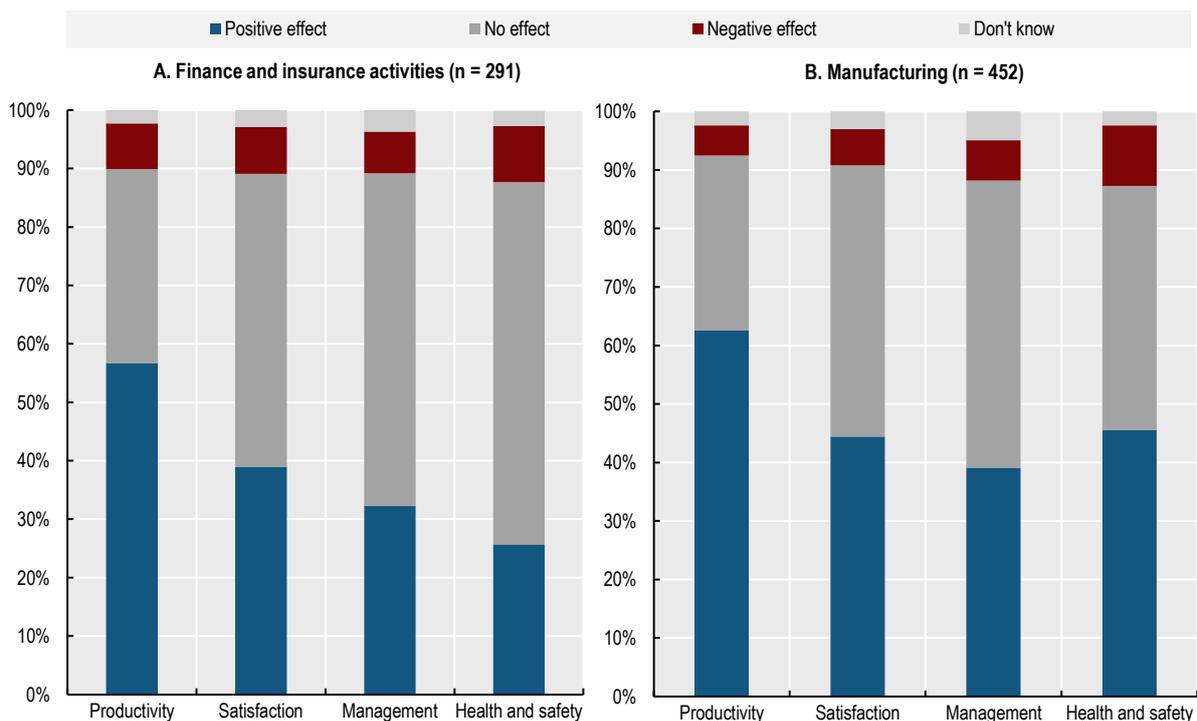


Note: Employers that have adopted AI were asked: "Has artificial intelligence had a positive effect, negative effect or had no effect on worker productivity/worker satisfaction/health and safety/managers' ability to measure worker performance in your company?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

Of all the indicators, employers were most positive about the impact of AI on worker productivity in their company. 57% in finance and 63% in manufacturing responded positively compared to 8% and 5% responding negatively. The positive reported impact on worker productivity is encouraging and perhaps unsurprising given that the most commonly reported motivation for adopting AI was to improve worker

performance. Indeed, employers that reported that improving worker performance was one of their motivations for adopting AI were even more likely to say that AI had increased worker productivity (81% in finance/87% in manufacturing). Similarly, employers that reported that improving health and safety was a motivation for adopting AI were more likely to report a positive effect on health and safety (61% in finance/80% in manufacturing). These results suggest that respondents felt that AI had achieved some of its promise regarding productivity and health and safety.[10],[11]

However, it is worth noting that, even though employers tended to be more positive than negative about the impact of AI on health and safety, this was the indicator that attracted the most negative responses. One in ten employers in both sectors said that AI had negatively affected health and safety.

Employers were generally positive about the impact that AI had on worker satisfaction. 39% and 44% of employers in finance and manufacturing that adopted AI suggested that the technology had increased worker satisfaction in their company, compared to 8% and 6% who reported a negative effect.

Employers were also positive about the impact of AI on managers' ability to measure worker performance. 32% and 39% of employers that adopted AI in finance and manufacturing said that the effect of AI on managers' ability to measure worker performance had been positive. These figures were higher (54% and 53%) among employers that said they used AI-enabled tools to collect worker data, and this difference was statistically significant.

## Workers also report a positive impact of AI on performance and working conditions

In the worker survey, questions about the impact of AI on individuals' performance and working conditions were asked only of workers who actually use AI, i.e. they interact with AI in any of the ways presented in Figure 2.4. Across all performance and working conditions indicators considered, AI users were more than four times as likely to say that AI had improved their performance and working conditions as to say that it had worsened them (Figure 3.3).

Across most indicators, the results were very similar in finance and manufacturing. In finance, more than half of AI users reported that AI had improved their performance (79%), enjoyment (63%) and mental health (54%), either by a little or by a lot. The corresponding figures in manufacturing were 80%, 63% and 55%, respectively. However, the difference between sectors was larger when it came to the impact on physical health and safety. In manufacturing, 65% reported that AI had improved their physical health and safety, compared to just under half of workers in finance.

Workers were least positive, although still considerably more positive than negative, when asked how AI had affected how fairly their manager or supervisor treated them. 45% and 43% of workers in finance and manufacturing, respectively, said that it had improved fairness in management, compared to 11% and 9% who said that AI had worsened it.

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[10] Reported impact of AI on productivity and working conditions did not display any clear relation with company size nor with length of time since the company had adopted AI.

[11] Other literature suggests that more digitally intensive firms are more productive, particularly where firms use in-house digital capabilities rather than purchasing them from external vendors (Coyle et al., 2022[36]).

## Figure 3.3. AI users report that AI improves their performance and working conditions
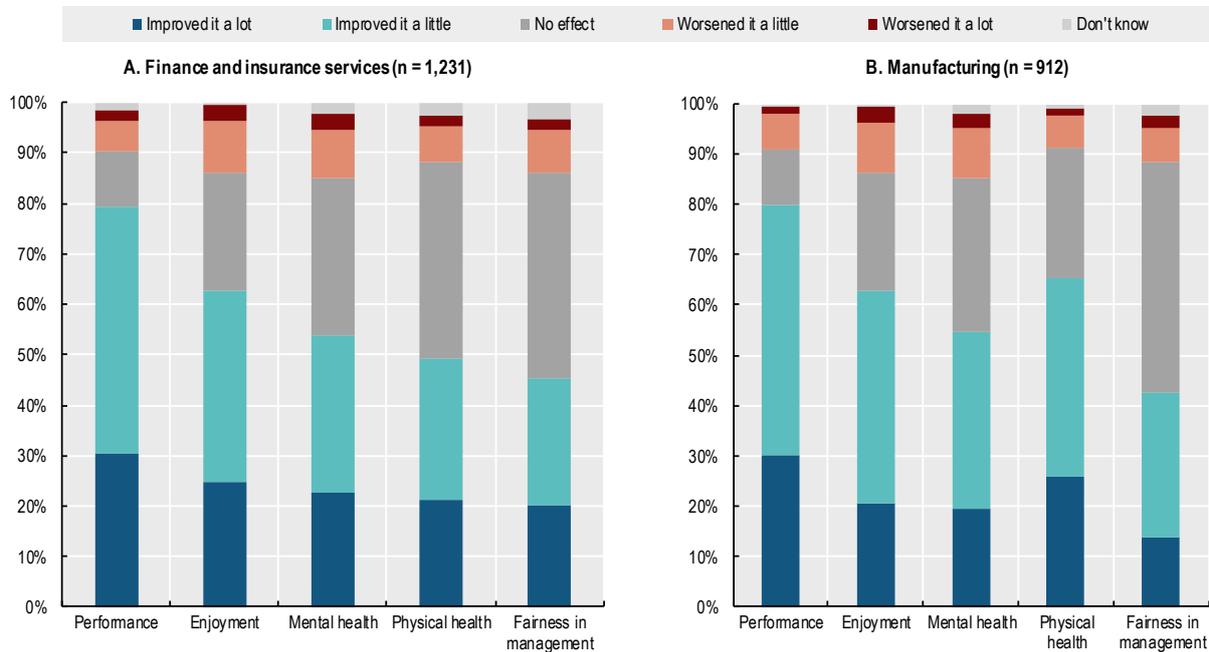
% of AI users



Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

Together with the results of the employer survey, these findings support the idea that AI, if used correctly, can contribute to higher productivity and better job quality. Improved worker productivity/performance appeared to be the main benefit according to both employers and workers. The findings also provide some early indications of how AI is already affecting the quality of the working environment, which has been an under-researched question to date. The main areas of improvement, according to the surveys, were in terms of worker satisfaction/enjoyment and, in the manufacturing sector, in terms of physical health/health and safety.

Another OECD working paper used a case study approach to look at the impact of AI in the manufacturing and finance sectors (Milanez, 2023[1]). This qualitative approach complements the survey results presented in this report by providing real-world examples of how AI can improve productivity, worker satisfaction and physical health and safety. A few specific examples taken from these case studies include:

- A visual inspection tool, which reduces the error rate in the manual assembly of medical devices, with the result that fewer devices need to be scrapped and workers produce more quality-assured devices per hour;

- A robotic process automation (RPA) system, which automates admin tasks related to mortgage underwriting and interest adjustments, with the result that workers' jobs become less tedious; and,

- AI software, which enables workers to monitor a machine that straightens steel rods from behind a barrier so that workers no longer need to straighten the rods themselves, with the result that accidents have reduced.

### *The impact on performance and working conditions depends on how workers interact with AI*

While the survey could capture workers' perceptions of AI's impact on performance and working conditions, it could not probe further into the mechanisms by which these changes had taken place. However, by comparing the answers of workers who use AI in different ways, it was possible to identify the types of interactions associated with the strongest impacts. As discussed in Chapter 2, workers may interact with AI in various ways, such as: working with AI themselves; managing workers who use AI; developing or maintaining AI; being managed by AI; and/or interacting with AI in another way.

Despite being overall positive about the impact of AI on their own performance and working conditions, workers who work with AI (and presumably have the most direct interaction with AI) were generally less positive about the impact of AI than those managing workers who work with AI (Figure 3.4). However, there were two notable exceptions in the manufacturing sector: (i) workers who work with AI were the most likely to say that AI had improved their physical health and safety; (ii) they were also second most likely to say that AI had improved their performance.

The positive responses of those who develop or maintain AI (in finance, particularly) may reflect greater enthusiasm among this group for AI and a greater capacity to use these technologies to their benefit.

### Figure 3.4. Workers working with AI do not appear to be the group benefiting most from AI

% of AI users, by interaction type



Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?" The figure shows the proportion of AI users who said that each of these outcomes were improved (a lot or a little) by AI. Workers who said that they interacted with AI in another way are not included in the figure.
Source: OECD worker survey on the impact of AI on the workplace (2022).

*While male AI users are more positive about the impact of AI on worker productivity and working conditions, this is partly attributable to differences in occupations held by men and women*

Male AI users were more likely to report that AI had improved their performance and working conditions compared to female AI users (Figure 3.5). The average gender difference across the indicators of performance and working conditions was larger in finance than in manufacturing (16 and 4 percentage points, respectively).[12]

**Figure 3.5. Male AI users are more likely to report that AI improved their performance and working conditions**

% of AI users, by gender
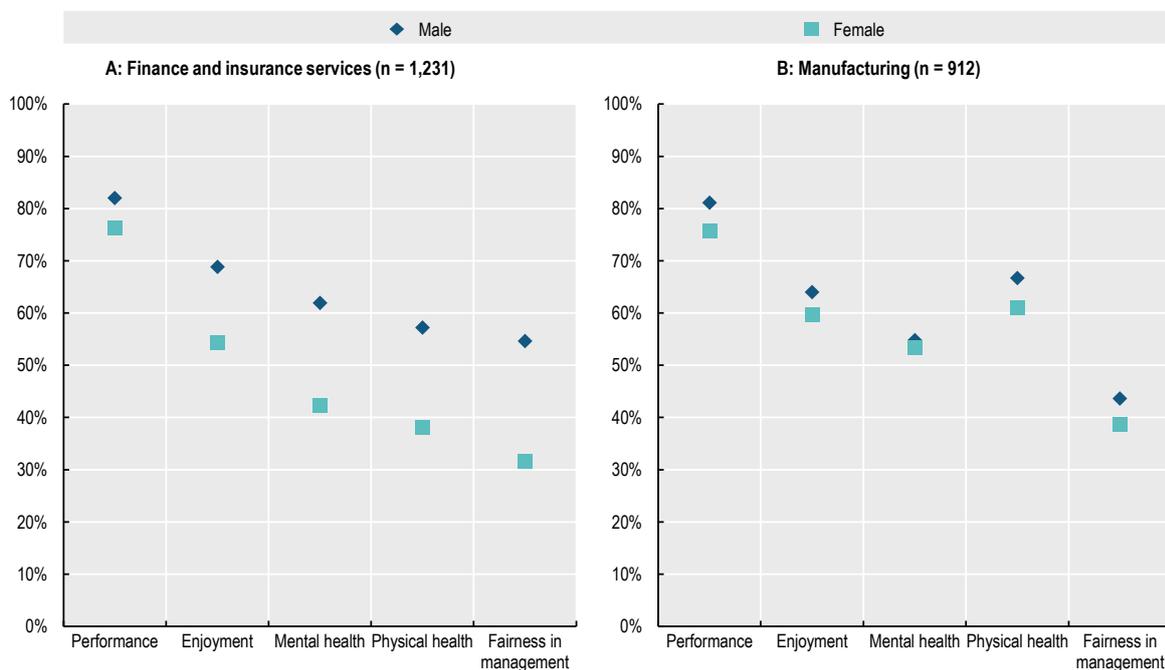


Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?" The figure shows the proportion of AI users who said that each of these outcomes were improved (a lot or a little) by AI.
Source: OECD worker survey on the impact of AI on the workplace (2022).

The gender gap can be partly attributed to the different occupations held by men and women who use AI. For instance, male AI users were more likely to be managers and professionals, while female AI users were more likely to be clerical support or service and sales workers. Since the views of those in management and professional positions were generally more positive than those in clerical support or service and sales positions, occupation explains some of the gender gap.[13] However, some gender effect

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[12] Gender differences in finance were statistically significant for all indicators except performance while no gender differences in manufacturing were statistically significant.

[13] The gender gap is reduced by roughly a quarter when occupation is controlled for, in a linear regression of an index comprising all performance and working conditions indicators.

remains above and beyond occupational differences. For instance, male managers and professionals were still more positive than female managers and professionals about the impact of AI on performance and working conditions.

This occupation effect is also the reason why the gender gap is larger in finance than in manufacturing. While men who use AI are more likely to occupy management and professional roles in both sectors, men also make up a higher proportion of plant and machine operators in the manufacturing sector. Since workers in these professions were less likely to express positive opinions, the gender gap is less pronounced in manufacturing.

### *AI users with a university degree are more positive than those without about the impact of AI on performance and working conditions*

AI users with a university degree were more likely to report that AI had improved their performance and working conditions, compared to AI users without a university degree (Figure 3.6).[14,15] This appears to be consistent with the literature, which suggests that workers with higher educational attainment may be more capable or better positioned to use AI to complement their own labour, boost their productivity and to share in the benefits of AI (Lane and Saint-Martin, 2021[2]). The findings thus raise questions about whether AI could leave certain workers behind, reinforcing existing inequalities between low- and high-educated workers.

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[14] The gap between workers with and without a university education was statistically significant across both sectors and all indicators.

[15] AI users born abroad were also more positive about the impact of AI on their performance and working conditions and this difference was statistically significant even when controlling for the fact that this group was also more likely to have a university degree. In the United States, where workers could provide information on race and ethnicity, there was no statistically significant difference between the responses of white and non-white workers nor between the responses of workers of Hispanic, Latino or Spanish origin and workers not of these origins.

% of AI users, by education
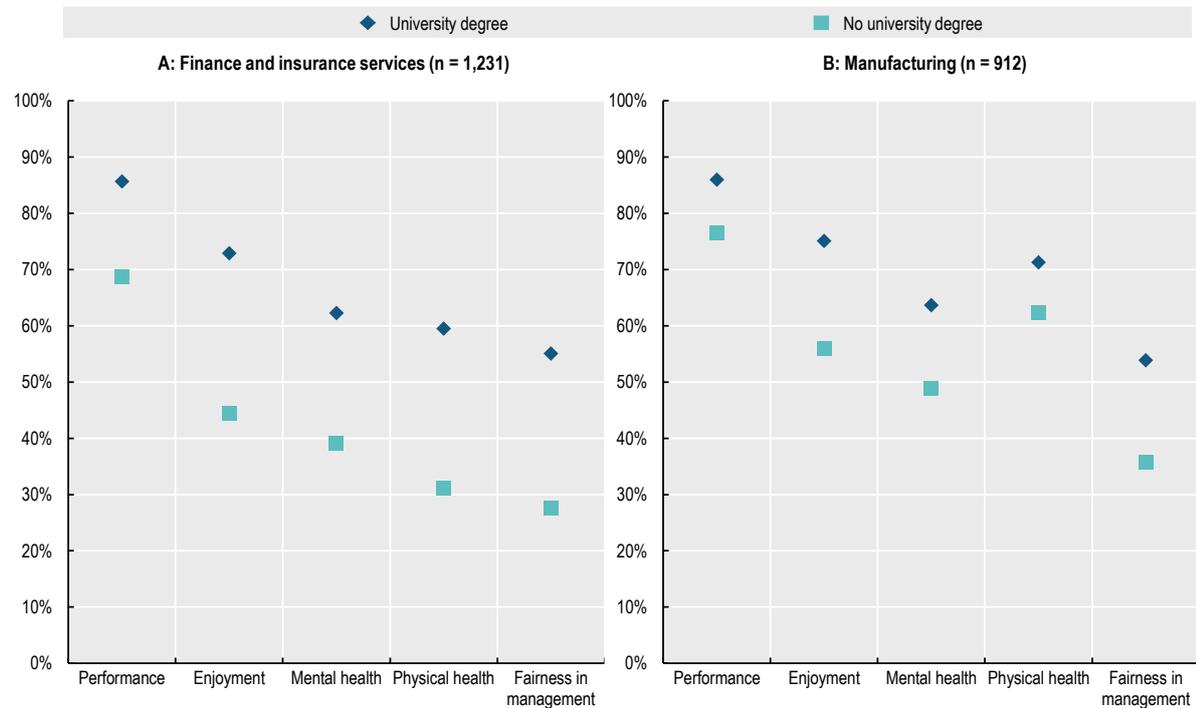


Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?" The figure shows the proportion of AI users who said that each of these outcomes were improved (a lot or a little) by AI.
Source: OECD worker survey on the impact of AI on the workplace (2022).

The education gaps were less pronounced in manufacturing than in finance, which may be in part attributable to the occupations held by individuals without a university degree. In finance, most of these individuals were in clerical support or service and sales positions, which were generally associated with more negative views on the impact of AI. In manufacturing, individuals without a university degree were more evenly spread across occupations.

## Workers and employers with no exposure to AI are also positive about the impact of AI on their sectors

Workers in companies that have not adopted AI were asked about the impact that AI would have on worker productivity and working conditions in their sector in the future. They were more likely to respond "Don't know" to this question, compared to the questions asked of workers who use AI. This likely indicates an honest lack of knowledge and familiarity regarding the technologies and their impacts on workers, and/or an unwillingness to speculate.

These workers were more likely to say that AI would improve worker performance and working conditions in the sector than to say that it would worsen them (Figure 3.7). Around half of these workers in both sectors reported that AI would improve performance (50%/47% in finance/manufacturing). In

manufacturing, respondents were particularly positive about the impact of AI on physical health and safety (53%) in the sector. Of all indicators, fairness in management was least likely to be associated with positive expectations among workers in firms without AI, mirroring the reported experiences of AI users.

**Figure 3.7. Workers in companies without AI are relatively optimistic about the impact of AI on their sector**

% of workers in companies that have not adopted AI
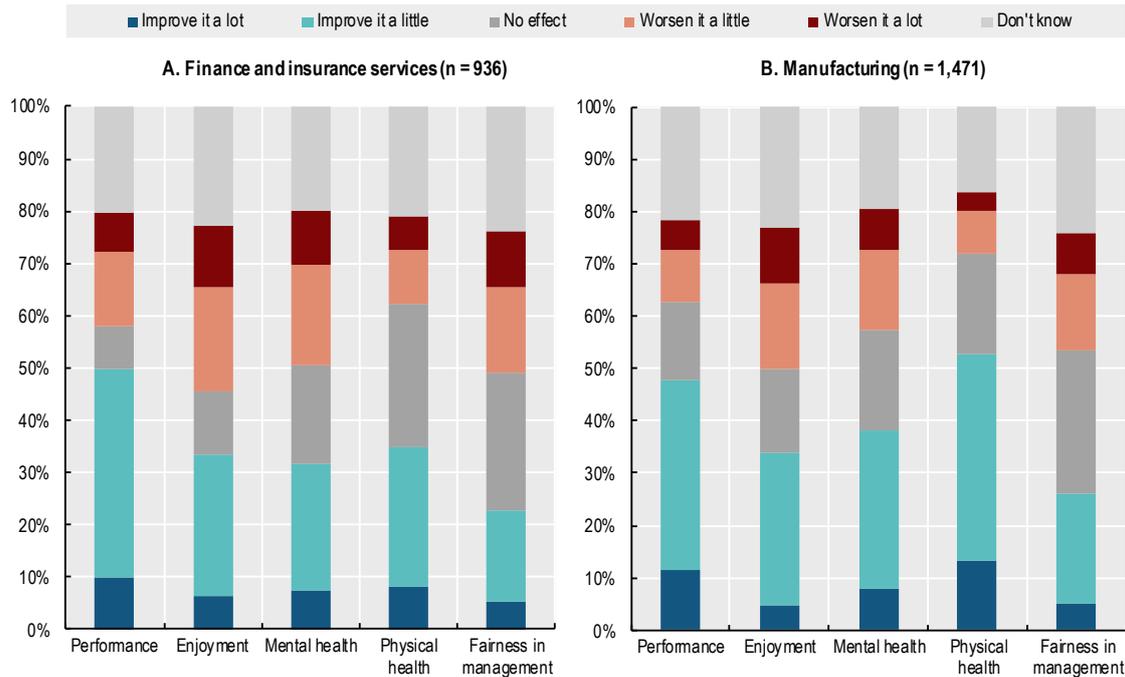


Note: Workers in companies that have not adopted AI were asked: "How do you think AI will change the job performance of workers in your sector (performance)?/how much workers in your sector enjoy their job (enjoyment)?/the physical health and safety of workers in your sector (physical health)?/the mental health and well-being of workers in your sector (mental health)?/how fairly managers or supervisor treats workers (management) in your sector?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

Employers that have not adopted AI were also asked about the impact that AI would have on worker productivity and health and safety in their sector in the next 10 years. The views of these employers were consistent with those shown in Figure 3.7, with most reporting that the impact of AI on worker productivity would be positive (57%/56% in finance/manufacturing). Most employers in manufacturing also said that health and safety in the sector would be positively affected by AI (60%).

# 4 What is the impact of AI on employment, job stability and wages?

This chapter examines the impact of AI on employment, job stability and wages, as reported by respondents to the worker and employer surveys.

As an automation technology, AI offers companies an opportunity to replace labour with cheaper capital. Chapter 2 showed that 42% and 47% of employers in finance and manufacturing, respectively, said that reducing staff costs was a motivation for using AI. While recent empirical studies have not shown evidence of net job loss in occupations exposed to AI, there are still concerns that AI could threaten the importance of humans in the workplace and undermine wages, particularly if expectations about job creation are not realised, if there is excessive automation, or if AI only benefits a narrow group of workers.

The surveys asked employers and workers about the impact on employment to date and also asked workers about their expectations for the future, in terms of job stability and wages.

## Main findings

- While most employers reported no change in employment in their companies due to AI, the number that reported employment had decreased exceeded the number that reported an increase. The reported decreases could signal that AI has automated more jobs than it has created, although the survey collected no evidence on the size of job losses and gains.
- In companies that had adopted AI, 20% of workers in finance and 15% of workers in manufacturing said that they knew of someone in the company who had lost their job as a result of AI. 29% and 24% said that they knew of someone who had changed their job as a result of AI.
- Looking ahead, 19% of workers in finance and 14% in manufacturing said that they were very or extremely worried about job loss in the next ten years, while 46% and 50% were not worried at all. AI users were more likely to say that they were very or extremely worried, as were younger workers, women and those with a university degree. One of the main explanations for why older workers were less worried about job loss is that they tend to be in more secure working arrangements; specifically, they are less likely to hold temporary or closed-ended contracts.
- In addition, many workers expected AI to put downward pressure on wages, with twice as many workers expecting AI to decrease wages in their sector in the next 10 years as to increase them.
- Given the potential for much greater adoption of AI in the workplace in years to come, these are issues that deserve to be monitored closely, including keeping an eye on sectoral differences. Workers and employers appeared to signal consistently that jobs and job stability in finance faced more risk than in manufacturing.

## Workers and employers report some AI-related job losses and reductions in employment

The two surveys utilised different methods to assess the impact of AI on employment. In the employer survey, representatives of companies that have already adopted AI were asked about the impact that AI has had on overall employment in their company to date. The worker survey asked workers whether they knew of anyone in their company or sector who had lost their job or changed jobs because of AI[16].

### *While most employers report no effect of AI on employment, more employers report a decrease than an increase*

Most employers that have adopted AI reported that there had been no effect of AI on overall employment in their company (55%/52% in finance/manufacturing) (Figure 4.1). Roughly one quarter of employers said that AI had decreased employment, which was more than the share reporting an increase, signalling that AI may have been automating more jobs than it has created—although the survey collected no evidence on the size of job losses and gains. The focus on overall employment could also obscure some underlying dynamics. For instance, qualitative research based on case studies at the firm-level (Milanez, 2023[1]) reveals that, even when AI makes a worker's role redundant, employers will often choose not to dismiss the worker, instead reallocating them to another role or business area, or waiting for them to resign or retire.

**Figure 4.1. While most employers report no effect of AI on employment, more employers report a decrease than an increase**

% of employers that have adopted AI
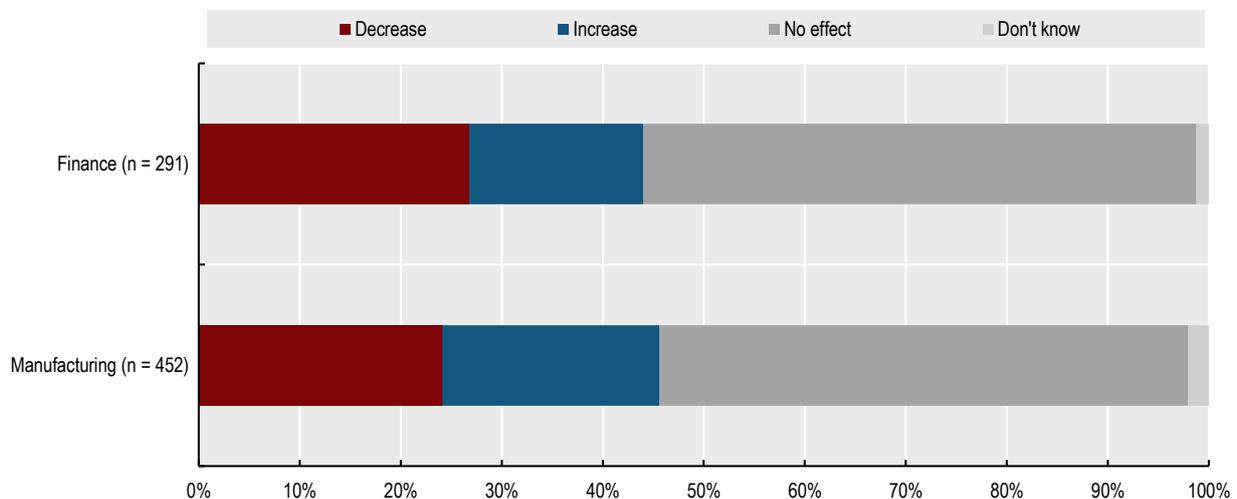


Note: Employers that have adopted AI were asked: "Has artificial intelligence increased, decreased or had no effect on overall employment in your company?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

Employers in finance were more likely, compared to employers in manufacturing, to report that AI had decreased employment in their company (27% vs. 24%) and less likely to report that AI had increased

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[16] To avoid survival bias, i.e. skewing the analysis through the omission from the sample of individuals who had experienced job loss and left the industry as a result.

employment (17% vs. 21%), although these differences were not statistically significant.[17] The results substantiate the worries expressed in the worker survey (presented later in this chapter), where workers in finance were more concerned than workers in manufacturing about the impact of AI on job stability.

The difference between sectors might seem surprising, given that the reported motivation to adopt AI to reduce staff costs was stronger in manufacturing than in finance (as seen in Chapter 3). However, it is difficult to compare the two because no information was collected about the salaries of those who lost their jobs, or those who were hired. As the question on employment effects focuses on overall change, no inference can be made about how the composition of jobs has changed within the company. For example, if a company lays off low-paid workers with skills easily replicated by AI and hires higher paid workers with technical AI skills, overall employment could decrease while staff costs increase.

In the manufacturing sectors of some countries (Austria, Germany, Ireland and the United Kingdom), more employers reported an increase than reported a decrease. There were no such exceptions in the financial sector.

### *Workers in finance are more likely than workers in manufacturing to know of somebody in their company who has lost or changed their job as a result of AI*

All workers in companies that have adopted AI were asked whether they knew of anybody in their company who had lost their job or changed their job because of AI. As shown in Figure 4.2, most workers were unaware of anybody who had lost their job due to AI (71%/78% in finance/manufacturing) and were unaware of any job changes (64%/69%).

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[17] The results were broken down by firm demographics to assess whether factors such as company size, time since adoption of AI and type of AI could be considered determinants of impact on employment. As with the similar analysis in Chapter 3, none of these factors had a statistically significant association with employment effects.

**Figure 4.2. Workers in finance are more likely than workers in manufacturing to know of individuals in their company who have lost or changed their job as a result of AI**

% of workers in companies that have adopted AI
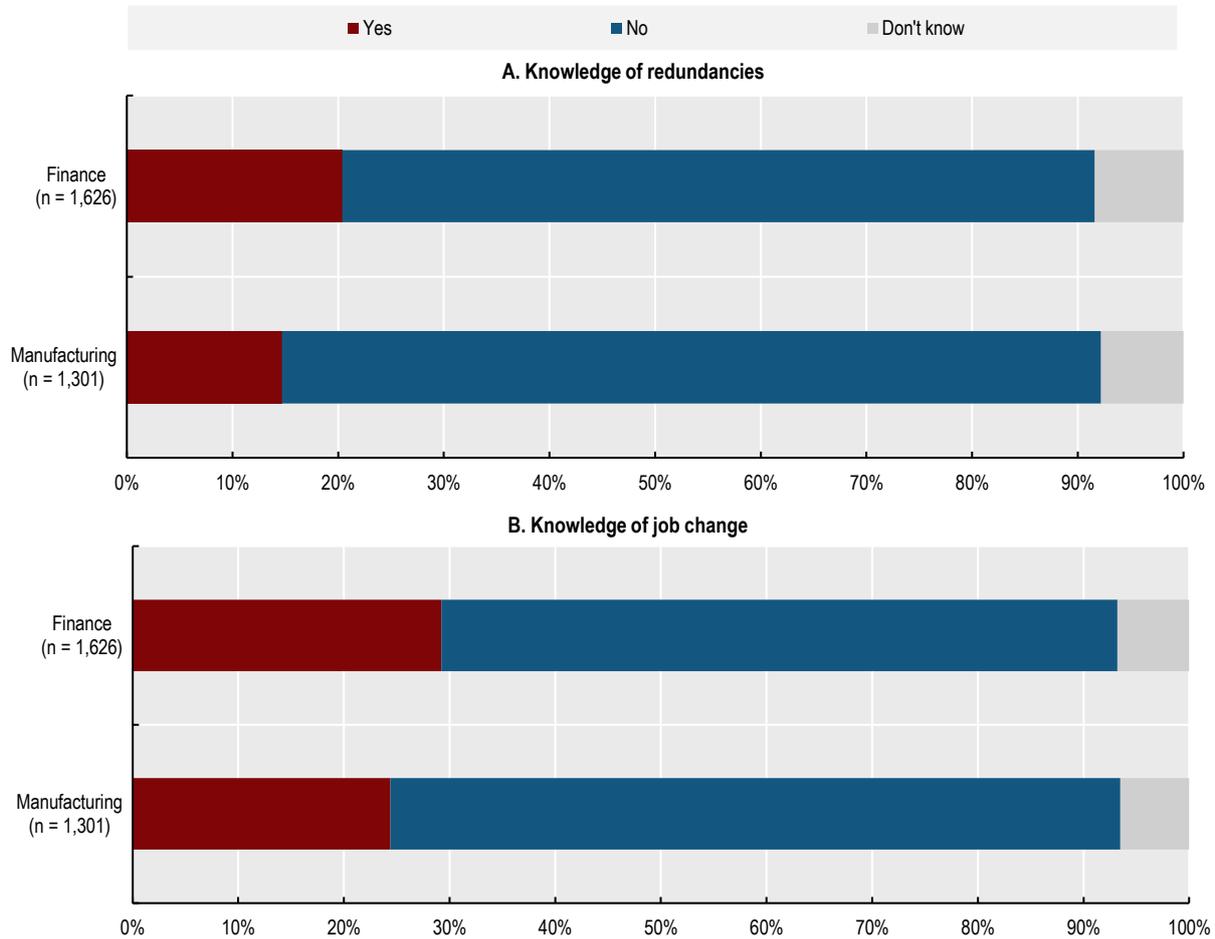


Note: Workers in companies that have adopted AI were asked: "Do you know of anyone in your company who has lost their job because of AI?" and "Do you know of anyone, including yourself, who has had to change jobs within your company because of AI?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

Workers in finance were more likely to say that they were aware of job loss (20% vs. 15%) and job change (29% vs. 24%) in their company, compared to workers in manufacturing – both differences were statistically significant. These findings appear consistent with the employer survey findings shown in Figure 4.1, where employers in finance were more likely to report a decrease in overall employment compared to employers in manufacturing. This could suggest that the AI technologies used in the financial sector are more labour displacing by nature.

## Workers express some worries about future job stability

In finance, 19% of workers said that they were extremely or very worried about losing their job due to AI in the next two years (Figure 4.3). A further 32% were slightly or moderately worried, while 46% were not worried at all. In manufacturing, 14% were extremely or very worried, while 31% were slightly or moderately worried, and 50% were not worried at all.

In both sectors, more respondents reported that they were worried about job loss over the next 10 years than over the next 2 years, as would be expected given the longer timeframe under consideration. 22% in finance and 19% in manufacturing said that they were extremely or very worried about job loss in the next 10 years, compared to 34% and 38% who were not worried at all. The rest of this section breaks down the ten-year results[18] by AI use, gender, age group and education level.

**Figure 4.3. Workers express some worries about losing their job due to AI in the next two and ten years**

% of all workers
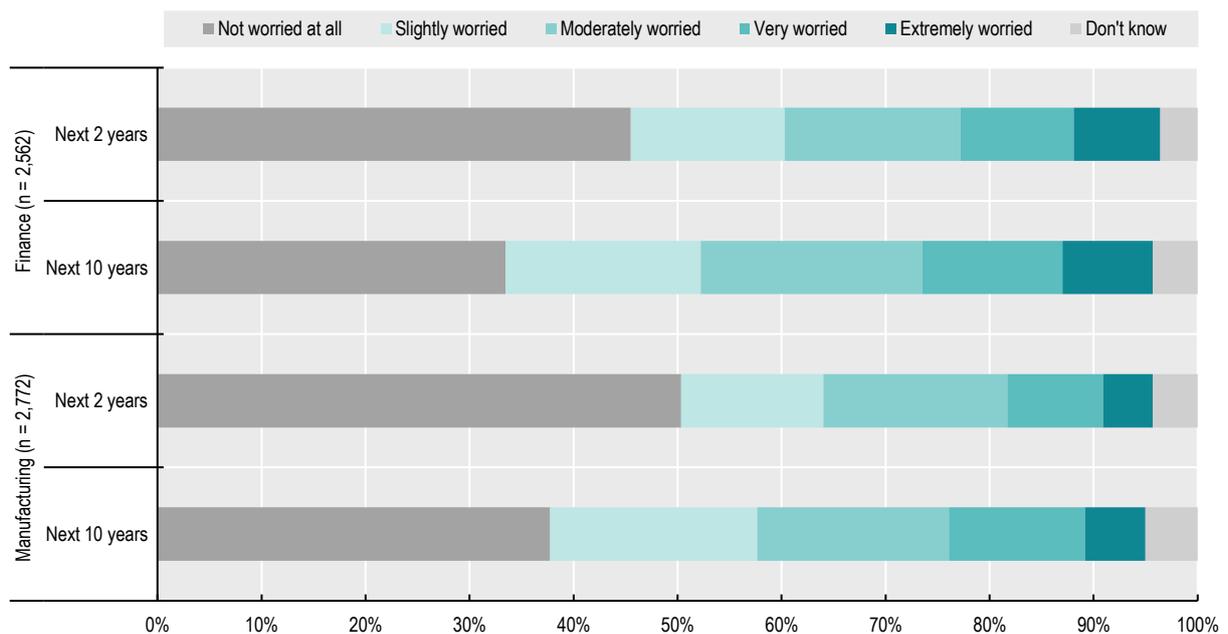


Note: Workers were asked: "How worried are you about losing your job as a result of AI in the next 2 years/in the next 10 years?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

***AI users are more worried than non-users about job stability***

In both sectors, AI users were more likely to say that they were very or extremely worried about losing their job in the next ten years compared to non-users. One possible explanation is that non-users expect that they will still not be using AI in ten years' time and will therefore be less exposed to its effects. Another is that AI users are more aware of the capabilities of AI and the potential for automation.

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[18] For simplicity, the section does not include the same breakdown of the two-year results. However, in general, the analyses of both questions exhibit similar trends.

## Figure 4.4. AI users are the most worried about losing their job due to AI in the next ten years

% of all workers, by whether they and their company use AI
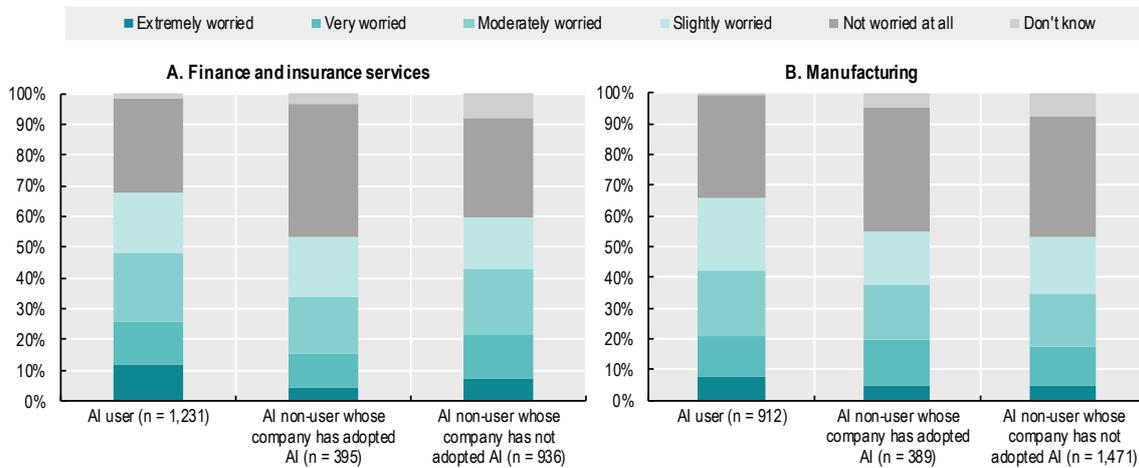


Note: Workers were asked: "How worried are you about losing your job as a result of AI in the next 10 years?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

### *Younger workers, women and those with a university degree are most worried about job stability*

Younger workers, women and those with a university degree were more likely to say that they were very or extremely worried about losing their jobs in the next 10 years. For instance, 26% of workers aged 18 to 24 expressed such worries, compared to 17% of workers aged 50 or over. 22% of female workers were very or extremely worried compared to 19% of men. 23% of workers with a university degree were very or extremely worried compared to 19% of workers without a university degree.

Regression analysis assists with the interpretation of these findings. It suggests that one of the main reasons why older workers are less worried about job loss is that they tend to be in more secure working arrangements; specifically, they are less likely to hold temporary or closed-ended contracts. [19] The greater worries among women are attributable in small part to the fact that male workers are more likely to hold management positions, where worries about job loss are less common. Nevertheless, most of the gender gap persists even after controlling for this and other factors.

That workers with a university degree are more likely to worry about job loss seems surprising, given that education is thought to enable workers to use AI to complement their own labour, boost their productivity and to share in the benefits of AI (Lane and Saint-Martin, 2021[2]). This finding is driven primarily by the fact that workers with a university degree are more likely to use AI and, as established previously, AI users are more worried about job stability. Other groups that were more likely to say that they were very or extremely worried about losing their jobs in the next 10 years included: workers who were born abroad;

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[19] Where regression analysis is used to control for exposure to AI (in terms of the three categories shown in Figure 4.4), education, gender, age, sector, whether the worker was born in another country, and whether the contract is temporary or permanent, the estimate associated with age is not statistically significant. This analysis only includes workers in Austria, France, Germany, Ireland and the United Kingdom, since the concept of temporary vs. permanent contracts is not applicable to the United States and Canada.

trade union members; and workers who did not describe themselves as white[20], including in particular Black or African American workers.

*Occupational differences in worries about job stability vary by sector*

In the financial sector, managers and professionals were the most likely to say that they were very or extremely worried about losing their jobs as a result of AI. While clerical support workers were among the least likely to say that they were very or extremely worried, they were among the most likely to say that they were slightly worried. In manufacturing, professionals, workers in service and sales occupations, and clerical support workers were most likely to report that they were very or extremely worried, while managers, craft and related trades workers, and plant and machine operators and assemblers were the least worried.[21]

## Workers expect AI to put downward pressure on wages

Twice as many workers expected AI to decrease wages in their sector in the next 10 years as to increase them (Figure 4.5).

**Figure 4.5. Twice as many workers expect AI to decrease wages as to increase them**

% of all workers
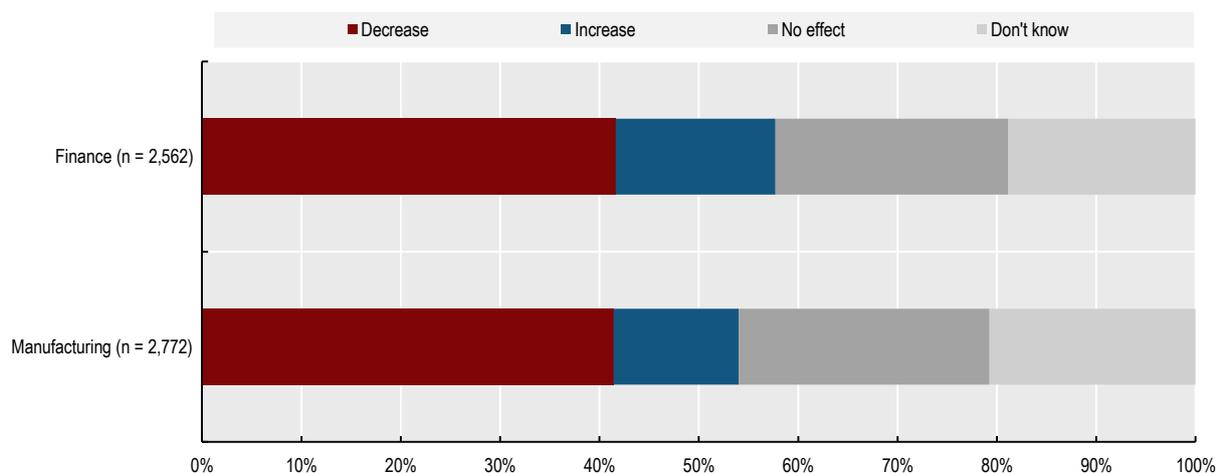


Note: Workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

In finance, 42% of all workers surveyed reported that AI would decrease wages in the sector. A further 23% expected that wages would remain the same and 16% expected wages to increase. In manufacturing, 41% of workers reported that AI would decrease wages, followed by 25% expecting that wages would remain the same and 13% expecting that wages would increase. The responses suggest that workers expect AI to put overall downward pressure on wages. The contrast between these downbeat wage

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[20] This question on race was only asked of workers in the United States. No differences by ethnicity were statistically significant.

[21] The findings were similar when the analysis was limited to AI users only.

expectations and the very positive reported impact of AI on performance (as shown in Chapter 3) is striking and suggests that respondents did not expect to see productivity improvements reflected in wages. Workers in France were least likely to expect wages to decrease due to AI (Figure 4.6).

It should also be noted that a relatively large proportion of respondents answered "Don't know" to this question (19% in finance and 21% in manufacturing), which may indicate uncertainty among respondents or indeed that the question was not appropriate for this group of respondents.

**Figure 4.6. Workers in France are least likely to expect wages to decrease due to AI**

% of all workers, by country
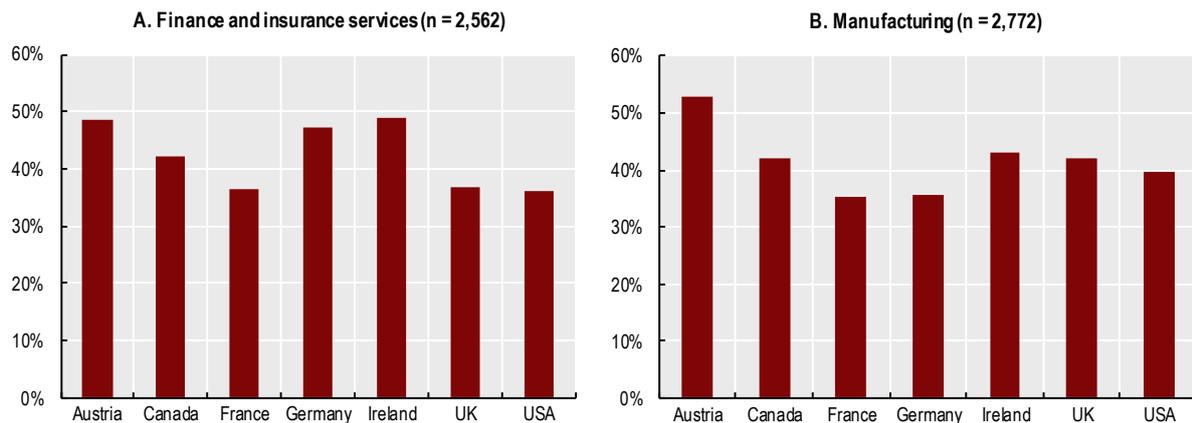


Note: Workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know". The figure shows the proportion of workers who said that wages would decrease.
Source: OECD worker survey on the impact of AI on the workplace (2022).

### *AI users are more likely than non-users to expect wages in their sector to increase due to AI*

AI users were more likely than non-users to report that they expected AI to increase wages in their sector in the next 10 years (Figure 4.7). The optimism among this group is difficult to reconcile with their worries regarding job stability. It could be that AI users expect that, while AI may lead to some job loss, those who remain will gain from the technology.

The AI users who say that they develop/maintain the AI were much more positive about the wage impact than AI users who interacted with AI in other ways. 50% and 47% of developers/maintainers in finance and manufacturing, respectively, said that wages in the sector would increase due to AI, compared to 18% and 29% who said that wages would decrease.[22]

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[22] The optimism among this group regarding wage expectations is consistent with a 2023 OECD study (Manca, 2023[39]), which demonstrates that job postings where AI skills are highly relevant advertise higher wages than the average even after accounting for other attributes of the job description, such as education and skill requirements and location.

**Figure 4.7. AI users are more likely than non-users to expect wages in their sector to increase due to AI**

% of all workers, by whether they and their company use AI
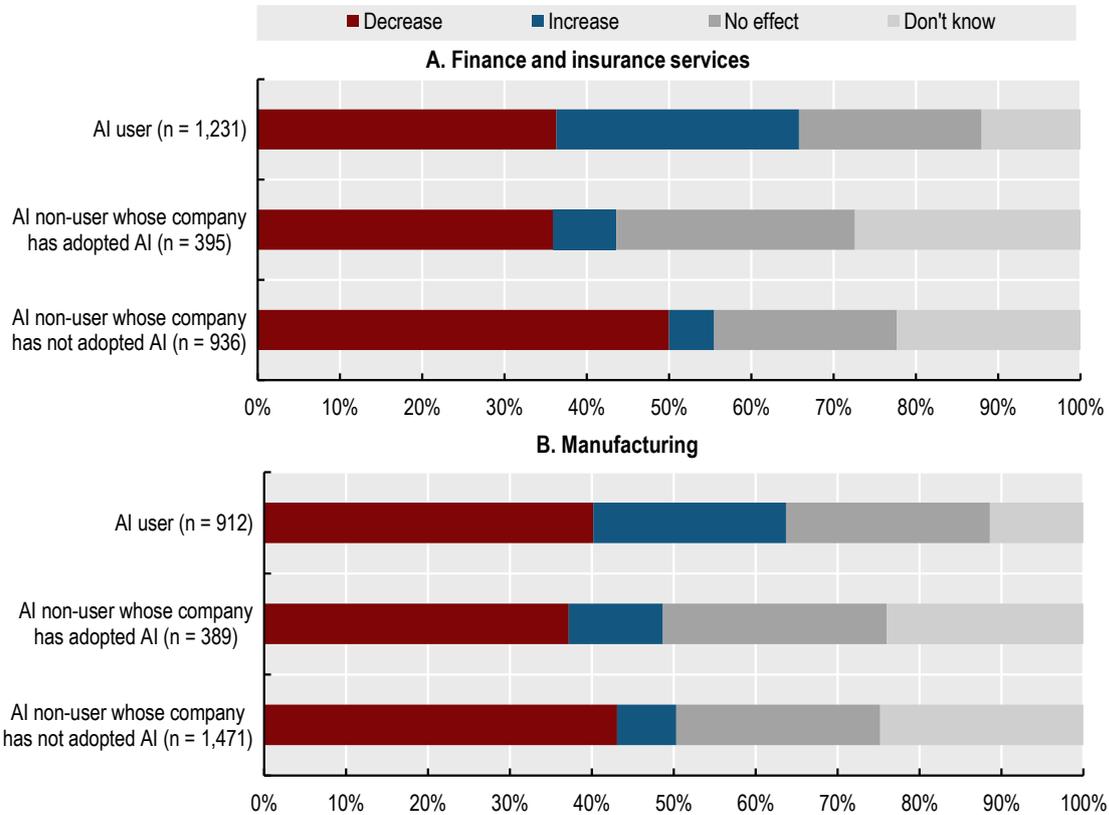


Note: Workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

### *Male workers with a university degree are more likely to expect wages to increase due to AI*

In finance and manufacturing, respectively, male workers were 15 and 4 percentage points more likely, compared to female workers, to expect that AI would increase wages in their sector in the next ten years. The gender difference was statistically significant in finance but not in manufacturing.

Workers with a university degree were, respectively, 19 and 13 percentage points more likely to suggest that AI would increase wages in the next 10 years, compared to workers without a university degree. Workers with a university degree were also less likely to report that AI would decrease wages.

In both sectors, workers aged under 35 were more likely to expect some kind of change in wages due to AI compared to older workers, but opinion was split on whether wages would increase or decrease (Figure 4.8).[23]

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[23] These patterns were similar when the analysis was limited to workers who use AI in their work.

**Figure 4.8. Male workers with a university degree are more likely to expect wages to increase due to AI**

% of all workers, by age, gender and education
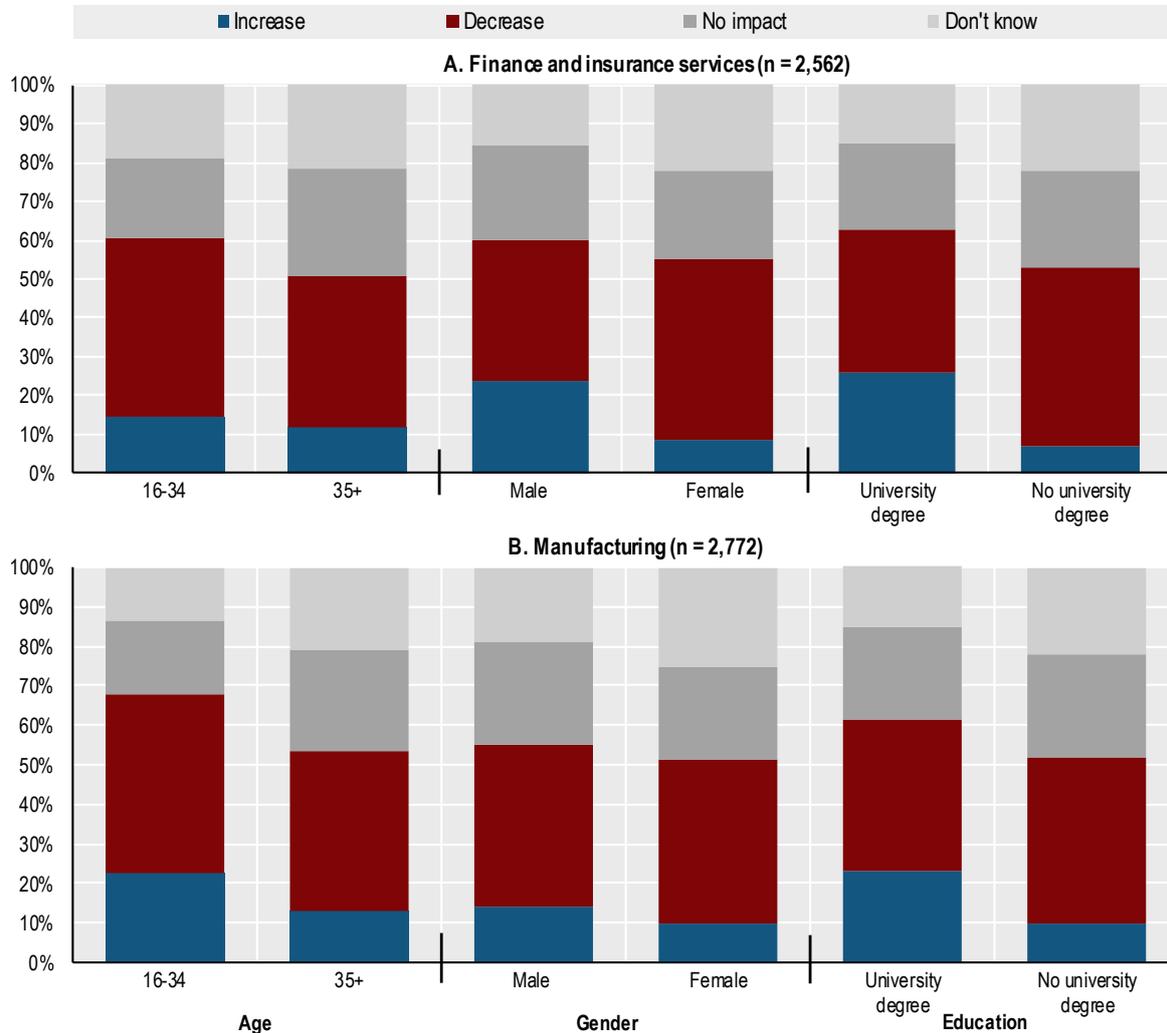


Note: Workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know". Workers who described their gender in another way and workers who did not say whether they had a university degree are not included in the figure.
Source: OECD worker survey on the impact of AI on the workplace (2022).

Of all occupations, managers were among the most likely to say that wages in the sector would increase. 28% and 23% in finance and manufacturing, respectively, reported this. They were also less likely than average to say that AI would decrease wages. Workers born in another country were more likely to expect wages to increase, although this difference was only statistically significant in finance.[24]

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[24] For workers in the United States, it was also possible to analyse responses by race and ethnicity. Workers who described themselves as Asian were less likely than the average to say that wages would increase and more likely to say that wages would be unchanged. Other racial groups answered either similarly to the average or were too small to support robust analysis. Workers of Hispanic, Latino or Spanish origin were more likely to expect wages to change as a result of AI, although views were divided on whether wages would increase or decrease.

# 5 How is AI changing the nature of work?

This chapter examines how AI changes the nature of work, by automating certain tasks but creating others for workers to do. Positive visions of the labour market impact of AI generally rely on the idea that the tasks created for workers are associated with higher productivity and are more fulfilling than the tasks automated.

Through the surveys, it was possible to ask employers and workers about not only the degree of task automation and task creation they had experienced, but also about the types of tasks most affected. The survey asked AI users how this had affected their pace of work, their level of autonomy and their decision-making processes.

In presenting these results, this chapter delves deeper into the mechanisms at task level, which may be driving the job loss and job change discussed in Chapter 4 as well as some of the changes in productivity and working conditions discussed in Chapter 3.

## Main findings

- AI results in a high degree of task reorganisation, with both employers and workers suggesting that AI was more likely to automate than create tasks. 66% and 72% of employers in finance and manufacturing, respectively, reported that AI had automated tasks that workers used to do, while around half of employers in each sector reported that AI had created tasks that were not previously done by workers. Additionally, approximately a third of employers in finance and manufacturing reported that AI had both automated and created tasks in their company, an indication of the complex and transformative impact that AI has on the organisation of work.

- Employers were twice as likely to say that AI had automated repetitive and dangerous tasks as created them. This may help explain why AI users were so positive about the impact of AI on performance and working conditions.

- Three-quarters of AI users said that AI had increased the pace at which they perform their tasks, which could indicate increased work intensity and/or increased worker productivity. More than half said that AI had increased the control they have over the sequence in which they perform their tasks, one element of worker autonomy which acts as a buffer against high-intensity work.

- Most AI users reported that AI had assisted them with decision-making, which workers appeared to appreciate. 84% and 83% of workers in finance and manufacturing agreed that they liked that AI assisted with decision-making, compared to 4% and 3% who disagreed.

## AI is changing how tasks are organised

The employer survey finds evidence of a high degree of task reorganisation in both sectors. 66% and 72% of employers in finance and manufacturing, respectively, reported that AI had automated tasks that workers used to do, while around half of employers in each sector reported that AI had created tasks that were not previously done by workers (49%/48% in finance/manufacturing) (Figure 5.1). Approximately a third of employers in finance and manufacturing reported that AI had both automated and created tasks in their company, an indication of the complex and transformative impact that AI has on the organisation of work, and of the support that workers will need in managing these changes successfully.

Employers were more likely to report that tasks had been automated than created by AI, and the differences were statistically significant in both sectors. However, it is not possible to conclude that the automation effect is stronger than the creation effect because the relative time and importance associated with each task remains unknown. For instance, an AI-enabled chatbot might address simple customer requests, while the time freed on the part of the employee is now spent monitoring the output of the software, maintaining and training it, as well as problem solving.

### Figure 5.1. Employers report task automation and creation due to AI

% of employers that have adopted AI
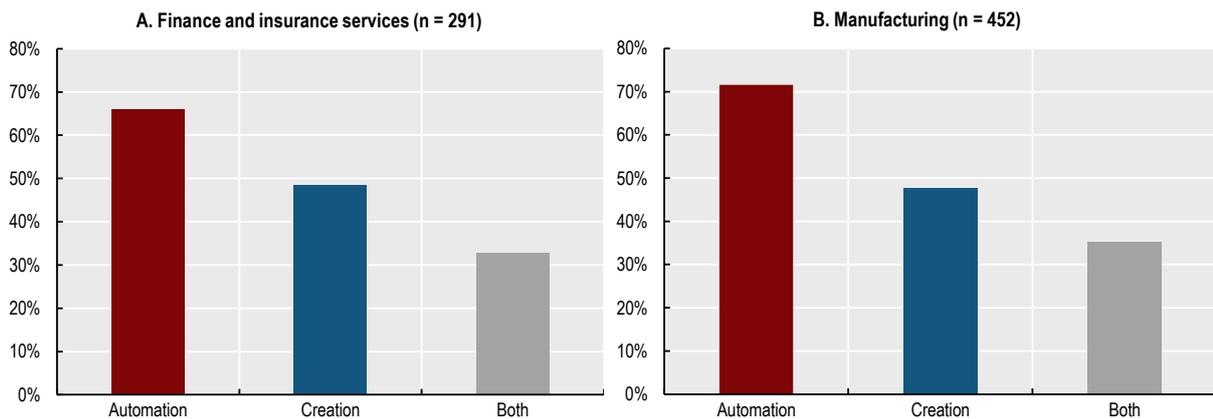


Note: Employers that have adopted AI were asked: "Thinking about your company, has artificial intelligence automated tasks that workers used to do?/created new tasks that workers did not do previously? Yes; No; Don't know".
Source: OECD employer survey on the impact of AI on the workplace (2022).

In finance, task automation was most frequently reported where AI was used for risk management, reporting and human resources (Figure 5.2), while it was least frequent where AI was used for trading and investment and for fraud detection. In manufacturing, there was little difference in task automation according to the use of the AI.

**Figure 5.2. In finance, certain uses of AI are more strongly associated with task automation**

% of employers that have adopted AI, by AI use



Note: Employers that have adopted AI were asked: "Thinking about your company, has artificial intelligence automated tasks that workers used to do?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

### Task automation does not necessarily mean lower employment

The relationship between task change and the impact on employment is not straightforward (Figure 5.5). On the one hand, employers that reported that AI had automated tasks in their company were 5 percentage points more likely to say that overall employment in their company had decreased as a result of AI (compared to those that reported that AI had not automated tasks). On the other hand, the same group was also more likely to say that AI had increased employment (by 3 percentage points in finance and by 10 percentage points in manufacturing). Task automation therefore appears to be related to changes in employment level, both positive and negative. Similarly, employment levels were more likely to change in companies where AI had created tasks.

**Figure 5.3. Employers that report task automation are more likely to say that employment has decreased, but also that it has increased**

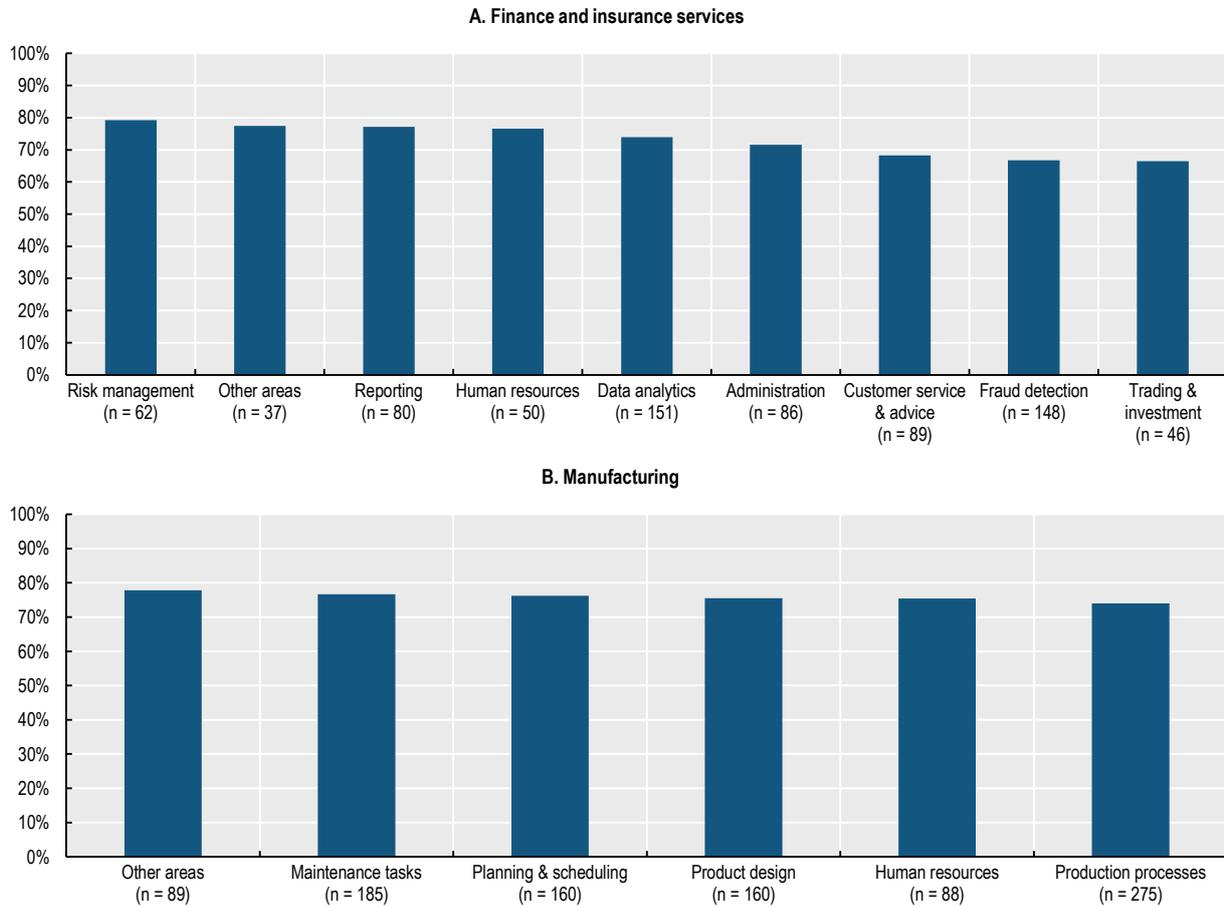% of employers that have adopted AI, by whether AI has automated tasks
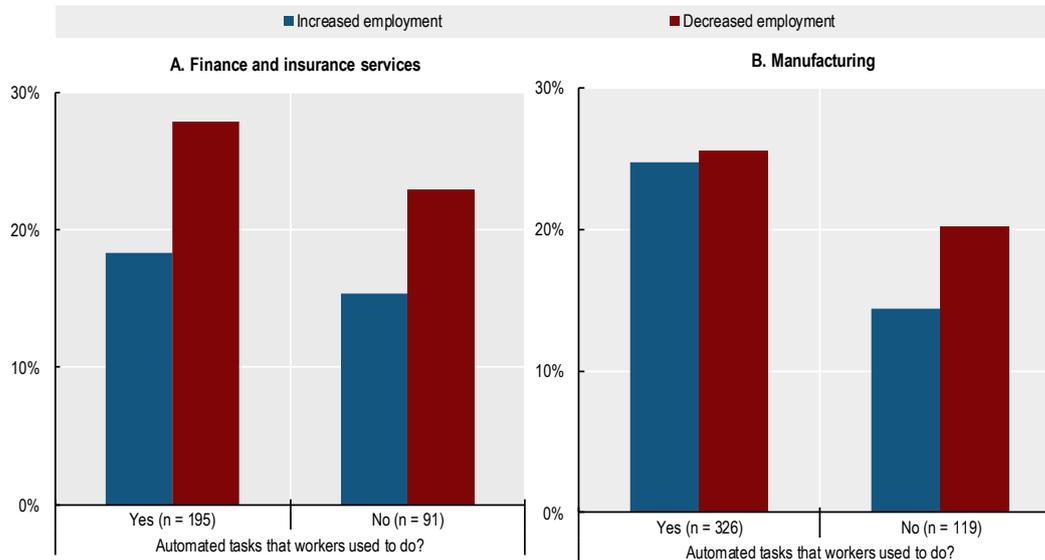


Note: Employers that have adopted AI were asked: "Thinking about your company, has artificial intelligence automated tasks that workers used to do?" They were also asked: "Has artificial intelligence increased, decreased or had no effect on overall employment in your company?" The figure does not include "Don't know" responses for either question.
Source: OECD employer survey on the impact of AI on the workplace (2022).

### *According to employers, AI is twice as likely to automate as to create repetitive and dangerous tasks*

The survey not only captured a high degree of task reorganisation resulting from AI, but also the types of tasks most affected. Specifically, employers were asked whether the types of tasks created or automated by AI in their company were repetitive, complex and/or dangerous. Workers who use AI were asked a similar question in the worker survey. The motivation for asking about these three task types was that: (i) previous automation technologies have primarily automated repetitive or routine tasks (Autor, Levy and Murnane, 2003[15]) and low-skilled tasks (Nedelkoska and Quintini, 2018[16]); (ii) while AI is expected to expand the range of tasks that can be automated to include more complex tasks (Aghion, Jones and Jones, 2017[17]); and, (iii) the automation of dangerous tasks could improve the working conditions for workers in the manufacturing sector, in particular.

Employers were more likely to report that AI had automated than had created the three types of tasks (Figure 5.4). In both sectors, repetitive and complex tasks were more affected by AI than dangerous ones. However, repetitive and dangerous tasks were the tasks with the highest ratio of automation to creation. In both sectors, roughly twice as many employers said that they had automated repetitive and dangerous tasks, as created them. These differences were all statistically significant. In another survey, the IBM Global AI Adoption Index 2022 (2022[6]), 65% of companies that reported that AI was helping them address labour and skills shortage said that it did so by automating repetitive tasks.

**Figure 5.4. According to employers, AI is twice as likely to automate as to create repetitive and dangerous tasks**

% of employers that have adopted AI

**A. Finance and insurance activities (n = 291)**



**B. Manufacturing (n = 452)**
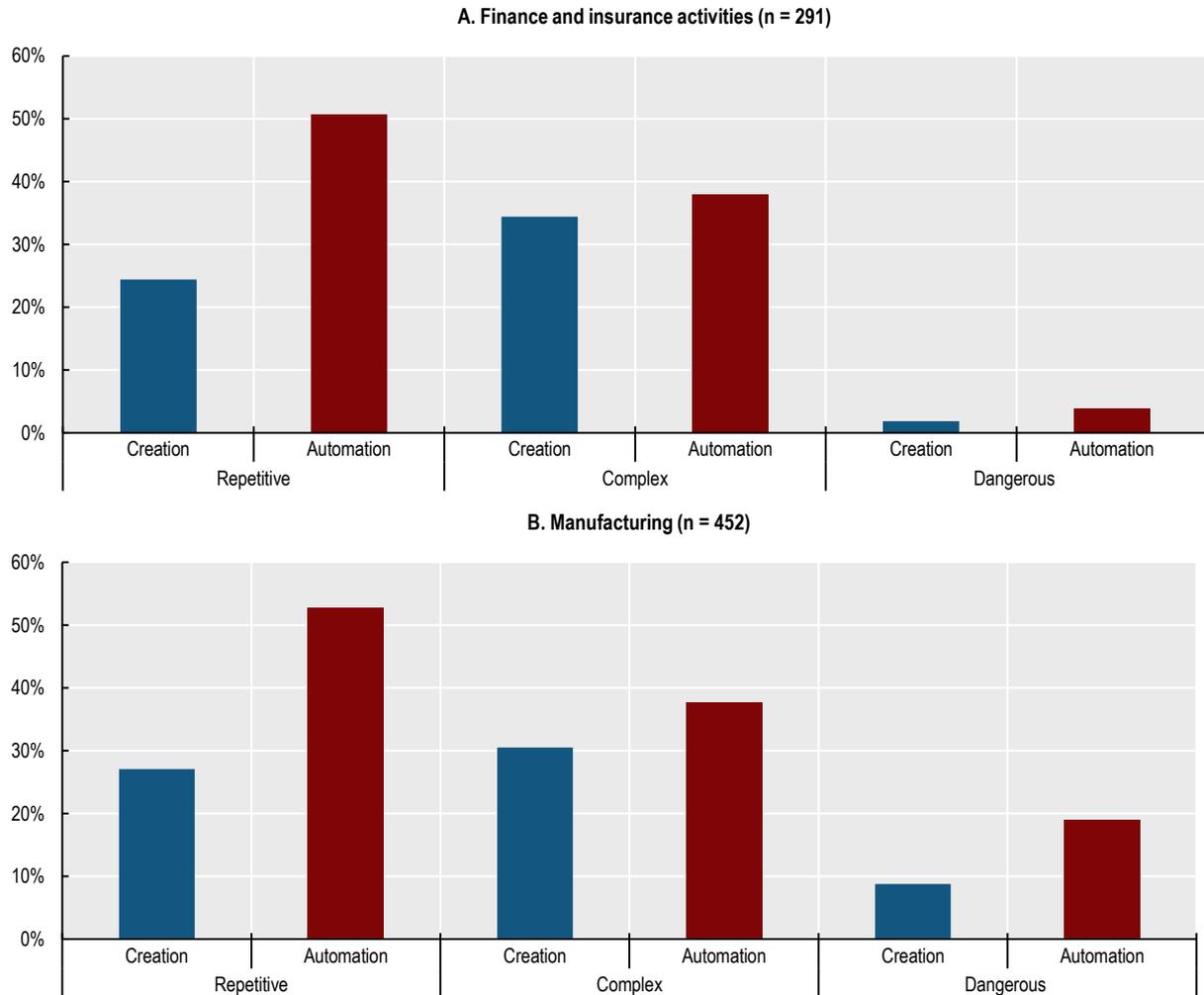


Note: Employers that said that artificial intelligence had automated/created tasks were asked: "Were most of these tasks repetitive?/complex?/dangerous? Yes; No; Don't know".
Source: OECD employer survey on the impact of AI on the workplace (2022).

In both sectors, complex tasks were the type of task most likely to be created according to employers (34%/31% in finance/manufacturing).[25] A considerable share also reported that AI had created repetitive tasks (24%/28% in finance/manufacturing).

Since employers and workers alike were so positive about the impact of AI on worker productivity and working conditions, it is worth reflecting on whether these positive impacts are driven by the reorganisation of tasks. For instance, workers who said that dangerous tasks had been automated were more likely to say that AI had improved health and safety. Additionally, the considerable share reporting creation of repetitive and complex tasks is a reminder that the workplace is not only changed by AI's capacity to

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[25] As before, the relative time associated with each task remains unknown, so it is not clear whether these complex tasks require more time to carry out.

automate, but also to create tasks – both aspects must be understood to build a full picture of the AI's impact on the workplace.

### Workers are also more likely to report that AI has automated tasks than created them

When asked about the type of tasks created or automated by AI in their job, the responses of workers who use AI follow a similar pattern to those of employers. Overall, 59% and 47% of workers in finance and manufacturing said that AI had created tasks, while 81% and 70% said that AI had automated them. For each type of task, workers were significantly more likely to report that AI had automated those tasks in their jobs than created them (Figure 5.5).

As with the employer results, workers reported that repetitive and complex tasks had been more affected by automation and creation than dangerous ones. Additionally, repetitive tasks were the tasks with the highest ratio of automation to creation.

### Figure 5.5. Workers are more likely to report that AI has automated than created tasks

% of AI users
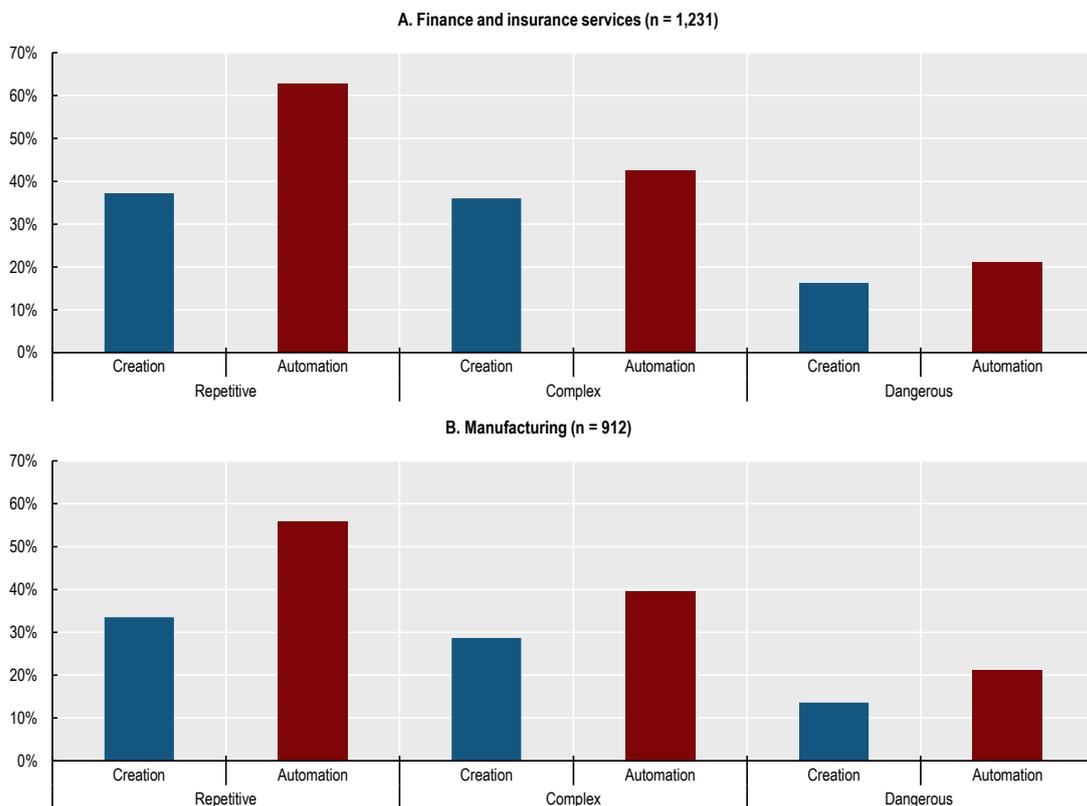


Note: AI users who said that AI had created or automated tasks in their jobs were asked: "Were most of these tasks repetitive? /complex?/dangerous?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

### Workers in different occupations experience task reorganisation differently

In finance, technicians and associate professionals, as well as clerical and support workers, were the professions most likely to report that AI had automated repetitive tasks (Table 5.1). These observations suggest that AI is used in finance to replace more repetitive, clerical work, such as data entry or credit

underwriting. Managers and professionals were the most likely to say that AI had created tasks, regardless of type.

In manufacturing, plant and machine operators were the most likely to say that AI had automated repetitive and dangerous tasks in their jobs, aligning with the idea that AI has the potential to improve safety and increase productivity among workers who use machinery. Craft and related trades workers, as well as managers, were among the most likely to report that AI had created complex tasks.

**Table 5.1. Top two occupations reporting that AI creates or automates each type of task**

% of AI users

| Type of tasks | Finance | Manufacturing |
|---|---|---|
| *Create* | | |
| Repetitive | Managers (41%), Professionals (37%) | Managers (39%), Plant and machine operators (35%) |
| Complex | Managers (41%), Professionals (37%) | Craft and related trades workers (34%), Managers (32%) |
| Dangerous | Professionals (19%), Managers (19%) | Manager (18%), Service and sales (14%) |
| *Automate* | | |
| Repetitive | Technician and associate professionals (66%), Clerical support workers (65%) | Plant and machine operators (67%), Managers (57%) |
| Complex | Managers (47%), Professionals (46%) | Managers (47%), Professionals (46%) |
| Dangerous | Technician and associate professionals (32%), Managers (25%) | Plant and machine operators (26%), Elementary occupations (24%) |

Note: AI users who said that AI had created or automated tasks in their jobs were asked: "Were most of these tasks repetitive?/complex?/dangerous?" Occupations with fewer than 10 respondents are not included in the table due to small sample size.
Source: OECD worker survey on the impact of AI on the workplace (2022).

A regression analyses suggest that there are some differences in the likelihood of experiencing task automation and creation by education level and country of birth, beyond what is attributable to gender, occupation, age and sector. AI users who have a university education were more likely to say that AI had created and automated tasks compared to those without a university education – and this was true in both sectors. AI users who were born abroad were more likely to say that AI had created tasks.[26]

## Workers say that AI has increased work pace

Workers who use AI were asked how AI had changed their work in terms of the pace at which they perform their tasks and the control over the sequence in which they perform their tasks. On the one hand, increases in worker pace may indicate beneficial aspects of AI, such as increased worker productivity. On the other hand, when worker pace is increased in such a way that it increases work intensity, it may induce psychosocial risks, such as increased stress and anxiety (Lane and Saint-Martin, 2021[2]). The question about control over the sequence in which workers perform their tasks was intended to capture one element of worker autonomy, which has been shown to be closely associated with workers' job satisfaction, physical

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[26] For AI users in the United States, it was also possible to analyse responses by race and ethnicity. Workers who described themselves as Asian were less likely than the average to say that AI had created tasks. Other racial groups answered either similarly to the average or were too small to support robust analysis. There were no statistically significant differences according to whether a worker reported that they were of Hispanic, Latino or Spanish origin.

and psychological well-being, and to act as a buffer against the damaging effect of high work intensity ( (OECD, 2017[14]) citing (Karasek, 1979[18]; Karasek and Theorell, 1990[19])).

Around three-quarters of workers who use AI reported that AI had increased the pace at which they performed their tasks (75%/77% in finance/manufacturing) (Figure 5.6). These workers were more than 5 times more likely to report that AI had increased pace than decreased it.

More than half of AI users said AI had increased the control they have over the sequence in which they perform their tasks (58%/59% in finance/manufacturing), compared to 20% and 21% of AI users who said that AI had decreased control.

**Figure 5.6. Workers report that AI has increased their pace and their control over the sequence in which they perform their tasks**

% of AI users
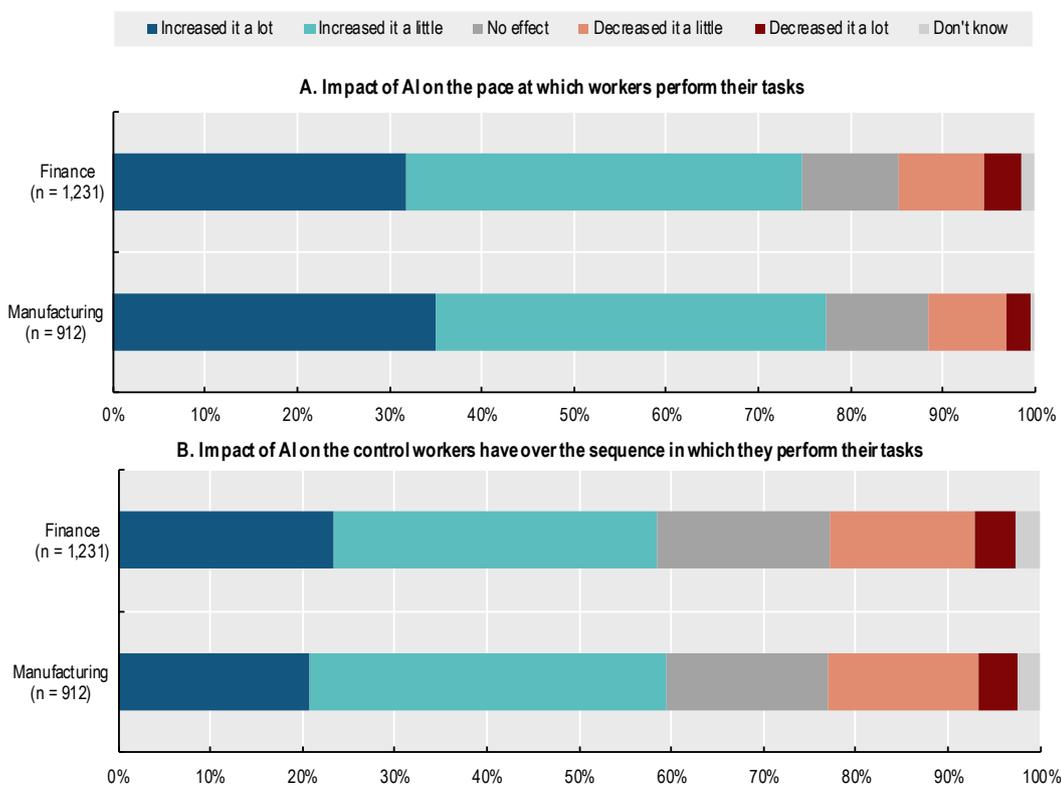


Note: AI users were asked: "How has AI changed how you work, in terms of the pace at which you perform your tasks?/the control you have over the sequence in which you perform your tasks?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

In both sectors, workers who develop and maintain AI were the most likely to report that AI had increased the pace at which they perform their tasks (89%/81% in finance/manufacturing) (Figure 5.7). If the use of AI for monitoring effort had detrimental effects on work intensity, it might be expected that workers who are managed by AI would overwhelmingly report that AI had increased their pace of work. In finance, this group was indeed the second most likely to report an increase in pace.

The survey did not probe how workers felt about the increased pace, whether this signalled an excessive workload and/or whether workers felt that this outweighed the reported positive impacts on working conditions (discussed in Chapter 3). However, it is notable that AI users who reported that pace had increased were more likely than the average AI user to report positive impacts on performance and working

conditions. Another survey of workers in Japan (Yamamoto, 2019[20]) suggests that these dynamics are complex. It found that AI adoption contributed both to greater job satisfaction and increased stress. The authors suggested that AI allowed workers to concentrate on more complex tasks, which intensified work-related stress but possibly also provided a greater sense of satisfaction once accomplished.

Control over the sequence in which workers perform their tasks appeared to be positively associated with performance and working conditions, in that AI users who reported diminished control were less likely than the average AI user to report positive impacts. Workers who are managed by AI were the most likely to say that AI had decreased their control over their tasks in manufacturing (31%) and the second most likely to report the same in finance (23%).[27] The findings suggest that, when workers are managed by AI, it may diminish their sense of autonomy over their work, which can have a negative impact on job quality.

**Figure 5.7. Workers who develop and maintain AI are the most likely to report that AI increases their pace of work**

% of AI users, by interaction with AI
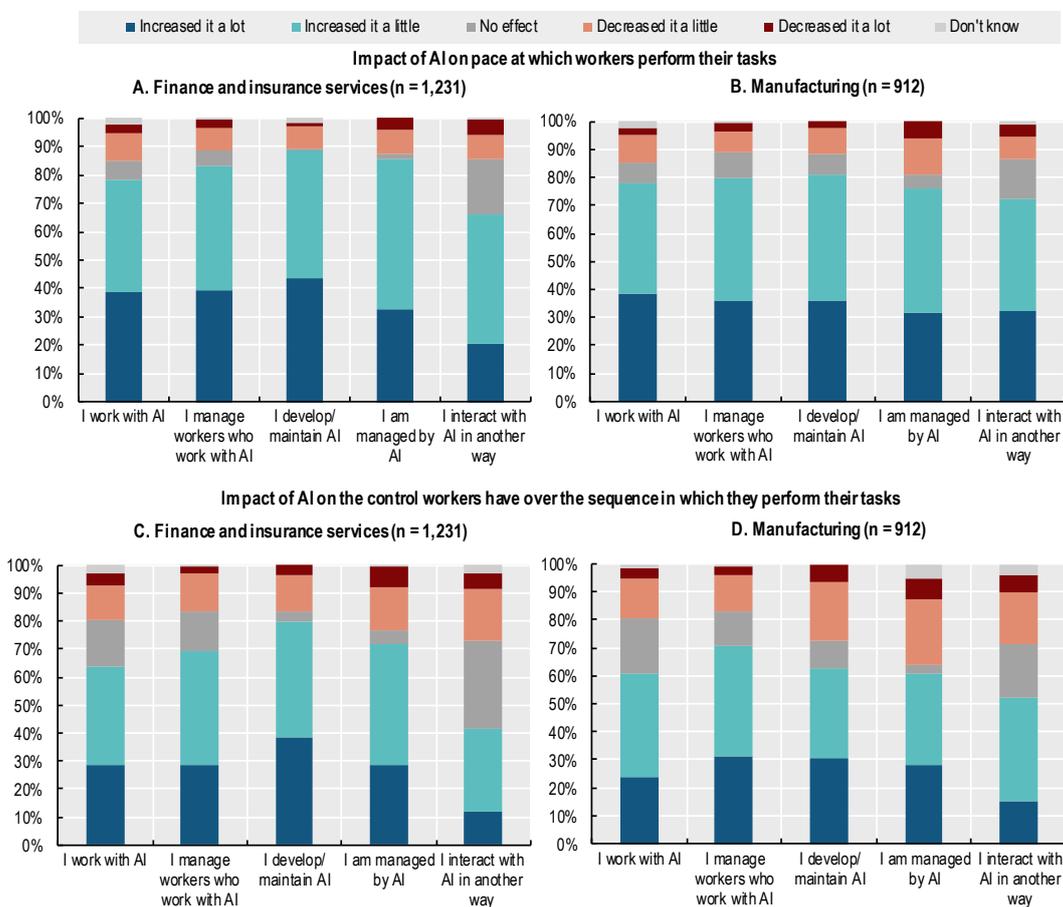


Note: AI users were asked: "How has AI changed how you work, in terms of the pace at which you perform your tasks?/the control you have over the sequence in which you perform your tasks?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

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[27] In finance, workers who develop and maintain AI were the most likely (80%) to report that AI had increased their control over the sequence in which they perform their tasks.

A simple breakdown of these results suggests that younger workers, male workers, workers with a university degree and workers born abroad were more likely to say that AI had increased the pace at which they perform their tasks. When regression analysis is used to control for exposure to AI, occupation and sector, the estimates associated with age and education remain statistically significant. It appears that the gender difference and the difference by country of birth are partly attributable to differences in occupations, while the associations between increased pace and age and education appear to persist even when controlling for factors. The differences by age, gender, education and country of birth were generally larger in finance than in manufacturing.

Differences were also larger in finance when considering whether AI was perceived to have decreased control over the sequence in which workers perform their tasks. In finance, female workers, those without a university degree and those not born abroad[28] were more likely to say that AI had decreased control. When examined through regression analysis, only the gender effect remained statistically significant. In other words, the gender difference in finance was not solely attributable to the different occupations held by men and women. There was no clear pattern with age in either sector and none of the associations between variables were statistically significant in manufacturing.

## Workers say that AI helps them with decision-making

AI's ability to collect and analyse large amounts of information makes it an attractive tool for producing more data-driven and/or faster inputs for decision-making. AI tools that assist workers with decision-making include AI-driven credit-underwriting software that ranks applications based on their level of risk, and software that that predicts when machines on the factory floor will require maintenance.

70% and 56% of AI users in finance and manufacturing, respectively, reported that AI assisted them with decision-making (Figure 5.8). AI users in finance were statistically significantly more likely to say that AI assisted them with decision-making compared to AI users in manufacturing. This can potentially be attributed to the different types of technologies used in each sector. When the answers to this question were analysed alongside the types of AI in use within workers' companies, the applications most strongly linked to decision-making were: in finance, using AI for risk management, trading and investment and human resources; and in manufacturing, using AI for product design and planning and scheduling. Examining the interactions that AI users have with AI, workers who say that they are managed by AI and managers of workers who use AI were most likely to say that AI assisted with decision-making.

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[28] For workers in the United States, disaggregation by race and ethnicity was possible. However, differences were either not statistically significant or based on a very small number of responses.

### Figure 5.8. Most AI users report that it assists with decision-making

% of AI users
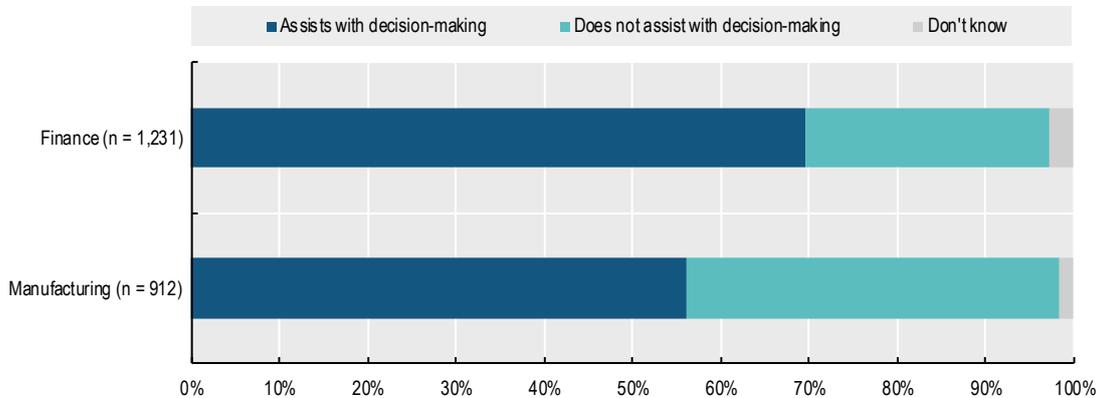


Note: AI users were asked: "Thinking about your job, does AI assist you with decision-making? Yes; No; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

In both sectors, AI users who have a university degree were significantly more likely than those who do not to report that AI assisted them with decision-making. In a regression analysis with controls for occupation, gender, age, country of birth and sector, the estimate associated with education retains its significance, suggesting that there is some link between the education of the worker and whether AI assists them with decision-making beyond any relationship with the control variables. While, in finance, the youngest workers (16-24 years old) were the most likely to be assisted by AI for decision-making (79%), the pattern was not as clear in manufacturing. In finance, men and workers born abroad were more likely to report that AI assisted them with decision-making but there was little difference in manufacturing.[29]

### *Workers assisted by AI in decision-making appreciate the assistance*

Given how common it appeared to be for AI to assist with decision-making, it was important to establish whether workers liked being assisted, whether they perceived that this enhanced their performance and working conditions, or instead undermined their knowledge and autonomy.

Respondents expressed overwhelmingly positive views of AI assisting in decision-making (Figure 5.9). 84% and 83% of workers in finance and manufacturing agreed that they liked that AI assisted with decision-making, compared to 4% and 3% who disagreed. The results were similarly positive when the same workers were asked whether AI helped them make better decisions and whether AI helped them make faster decisions. The positive result suggests that workers feel that AI is complementing their work when it assists with decision-making.

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[29] Among AI users in the United States, no differences by race or ethnicity were found.

## Figure 5.9. Workers are overwhelmingly positive about the use of AI to assist in decision-making

% of AI users who are assisted by AI in decision-making
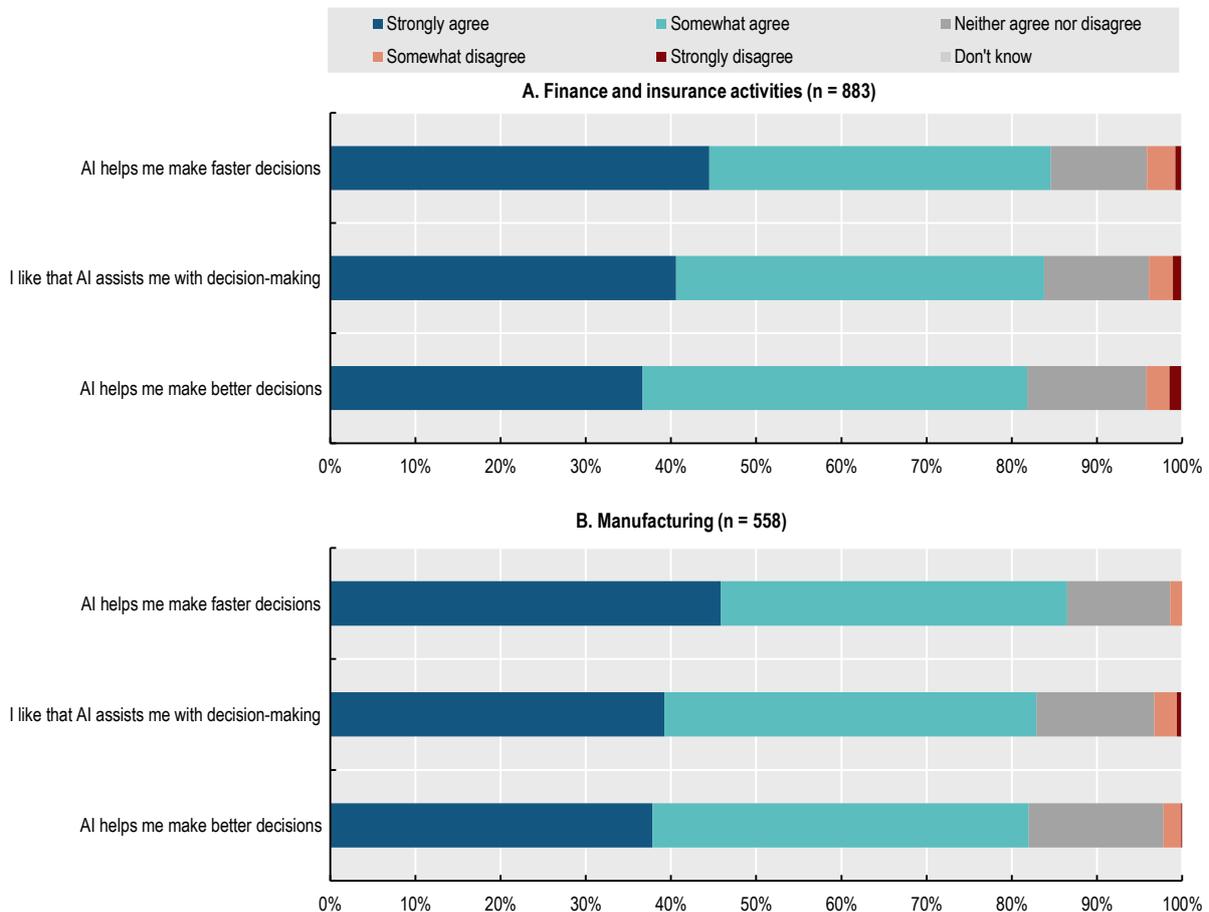


Note: AI users who said that they were assisted by AI in decision-making were asked: "To what extent do you agree or disagree with the following statements? AI helps me make faster decisions; AI helps me make better decisions; I like that AI assists me with decision-making".
Source: OECD worker survey on the impact of AI on the workplace (2022).

Firm-level case studies carried out by the OECD in the finance and manufacturing sectors (Milanez, 2023[1]), provide some insight on why workers might like AI's assistance in decision-making. In a couple of instances, workers expressed relief that AI had taken weighty decisions off their hands, especially where the consequences of a bad decision could result in blame for the decision-maker. For example, when one auto manufacturer used AI to monitor the stocks of materials along an assembly line, one assembler said that they no longer experienced the embarrassment of the production line stopping because of a mistake on their part. The idea that decision-making can be a source of stress in the workplace is one explanation for why workers may be quite willing to be assisted by AI in decision-making.

However, some workers interviewed as part of the case studies mentioned that AI's recommended decisions were sometimes unhelpful, e.g. producing an irrelevant customer service recommendation. While the workers did have the opportunity to tag responses as helpful/not helpful, in order to train the AI, they would have liked the ability to override decisions.

The survey did not probe why workers reported that AI helped them make better decisions, for instance whether worker based their opinion on: (i) the outputs of the decision-making process; (ii) a comprehensive understanding of how AI arrived at a recommendation; or (iii) trust in the AI without having a comprehensive

understanding of how AI arrived at a recommendation. Some literature on the explainability of AI highlights the challenge in getting this type of insight from certain complex machines and algorithms (L.H. et al., 2018[21]; Tjoa and Guan, 2021[22]).

# **6** How is AI changing skill needs?

This chapter addresses the question of how AI is changing skills needs. The task reorganisation evidenced in the preceding chapter may make certain skills more important and others less so. For workers, this may mean learning new skills in order to be able to work successfully with the AI. To respond to changing skill needs, employers may choose to train existing staff, to recruit staff with new skill profiles, and/or to lose others through attrition or redundancy.

The survey captures the views of employers on which skills have become more important as a result of AI and how they have responded to these changes. It also captures the opinions of workers regarding their own AI skills, their enthusiasm to learn more and whether they think AI complements their existing skills.

## **Main findings**

- While employers say that AI has increased the importance of specialised AI skills, they suggest that it has increased the importance of human skills and the need for highly educated workers even more so. Overall, this suggests the need for a broad range of skills as AI becomes more pervasive within the economy.

- Employers appear to be addressing AI-related changes in skill needs primarily through training. Most employers reported that they had addressed changing skill needs by retraining or upskilling internal talent and by buying services from external companies. A less common strategy was to hire new workers. Very few employers said that they had addressed changing skill needs through attrition or redundancies.

- Although most workers who use AI did not consider themselves to have specialised AI skills, more than 70% said that they were enthusiastic to learn more about AI. Broadly, the same groups of AI users who were more likely to already have specialised AI skills (male, university-educated, aged 16-24) were also more enthusiastic to learn more. Most AI users said that AI complemented their skills (70%/63% in finance/manufacturing). Approximately half said that AI had made some of their skills less valuable (51%/45%).

- More than half of workers who use AI said that their company had provided or funded training so that they could work with AI. These workers were more likely to report that AI had improved working conditions and more likely to say that AI had increased wages in the sector, compared to those who had not received training. However, they were also more likely to report AI-related worries regarding job stability. The survey does not indicate causality in either direction, but it could be that fears of job loss motivate workers to participate in training or that training raises workers' awareness of AI's capabilities.

AI primarily increases the importance of human skills within the company, as well as the need for highly educated workers

In order to understand how skill needs changed as a result of AI adoption, employers were asked if AI had made it more important to have: highly educated workers; human skills, such as creativity and communication; and specialised AI skills, such as those needed to maintain or develop artificial intelligence (Figure 6.1). In both sectors, specialised AI skills was the element associated with the lowest share of "yes" responses (42%/41% in finance/manufacturing). More than half of employers that have adopted AI reported that AI had increased the importance of having highly educated workers (55% in both sectors). 49% of employers in finance and 58% of employers in manufacturing said that AI had increased the importance of human skills.

While many employers felt that specialised AI skills had become more important as a result of AI, these results suggest that a broader range of skills may be required as AI becomes more pervasive. This is consistent with the literature, which suggests the adoption of AI requires not just AI expertise but also (or rather): skills in creative and social intelligence; reasoning skills; and critical thinking (OECD, 2019[23]; Samek, Squicciarini and Cammeraat, 2021[24]; Squicciarini and Nachtigall, 2021[25]).

**Figure 6.1. More employers say that AI has increased the importance of human skills than of specialised AI skills**

% of employers that have adopted AI
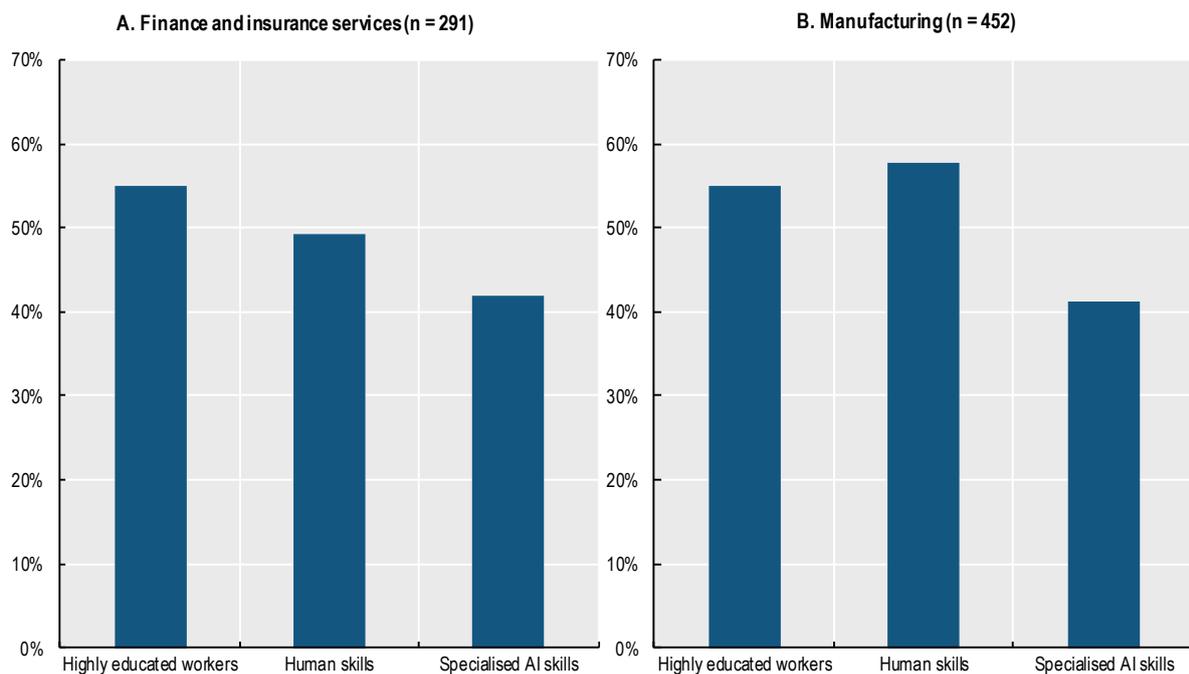


Note: Employers that have adopted AI were asked: "In your company, has artificial intelligence made it more important to have specialised artificial intelligence skills, such as those needed to maintain or develop artificial intelligence/human skills, such as creativity and communication/highly educated workers?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

## Employers mostly address changes in skill needs through retraining and upskilling

Employers who said that AI had changed skill needs in their company (43% and 52% of employers that have adopted AI in finance and manufacturing) were asked how they had addressed the change. In both sectors, the most common response was that they had addressed skill needs by retraining or upskilling internal workers (64%/71% in finance/manufacturing) (Figure 6.2). This was the most common response in all countries. The second most frequently reported action was to buy services from external companies (53% in both sectors), followed by hiring new workers (35%/48% in finance/manufacturing). Few employers (under 20% in both sectors) said that changing skills needs had been addressed through redundancies or attrition.

### Figure 6.2. Employers are most likely to address skill needs by retraining and upskilling internal workers

% of employers that reported that AI has changed skill needs in their company
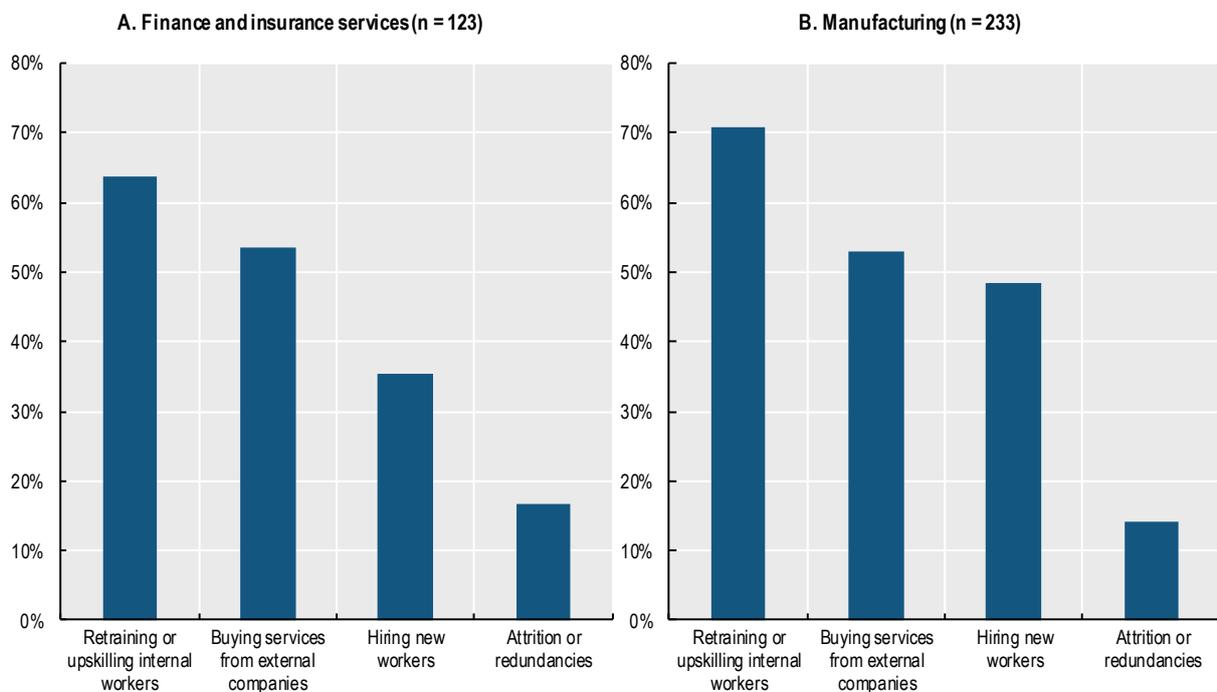


Note: Employers that reported that artificial intelligence had changed skill needs in their company were asked: "Has your company addressed these changing skill needs in any of the following ways? By retraining or upskilling internal workers?/By hiring new workers?/By buying services from external companies?/By attrition or redundancies?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

## AI users are generally positive about AI's impact on their skills

Workers who use AI were asked whether they agreed or disagreed with a series of statements regarding their level of technical AI skills, enthusiasm to learn more about AI, and the impact of AI on their skills (Figure 6.3).

## Figure 6.3. Workers who use AI are generally positive about AI's impact on their skills

% of AI users
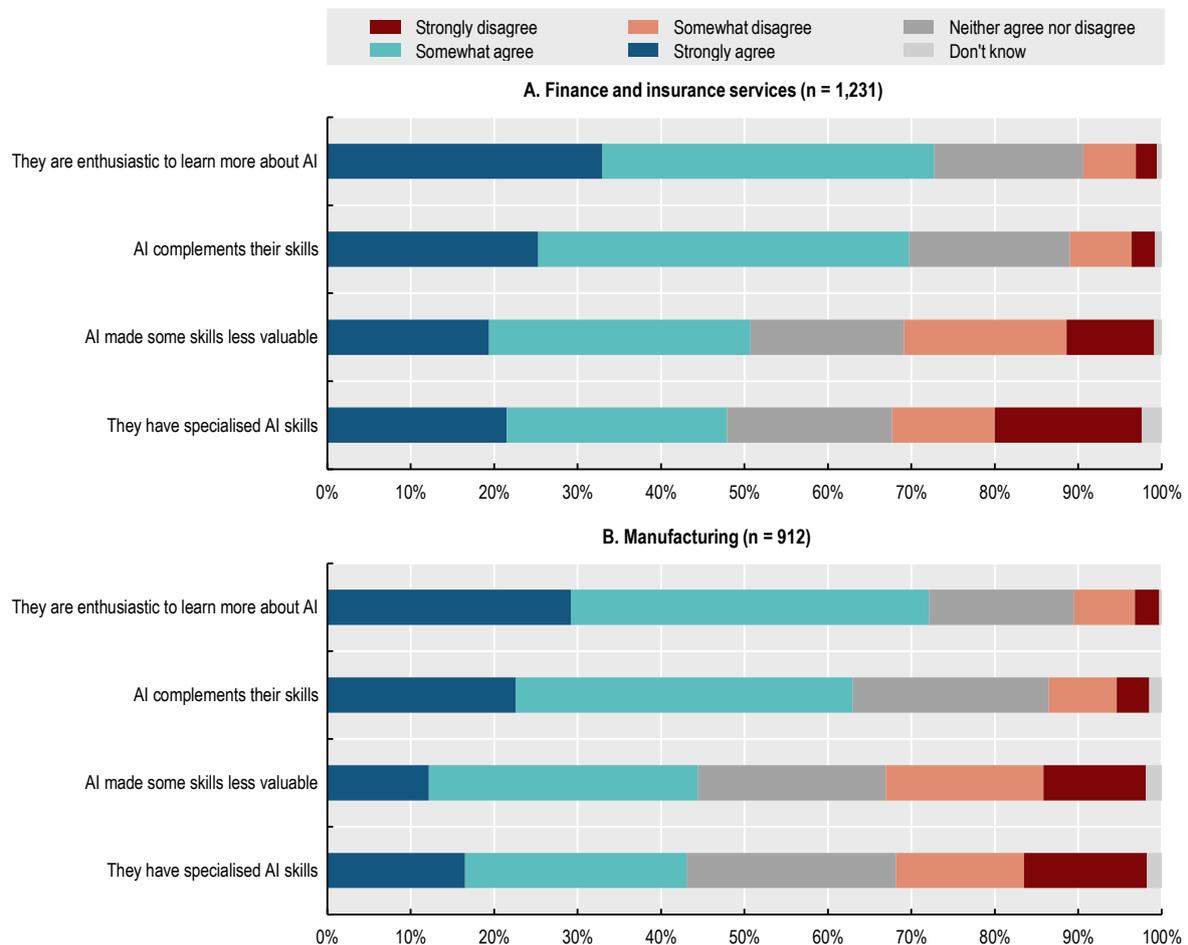


Note: AI users were asked: "Please think about the skills you need in your job. Do you agree or disagree with the following statements? AI has made some of my skills less valuable/AI complements my skills/I have specialised AI skills, such as those needed to maintain or develop AI/I am enthusiastic to learn more about AI".
Source: OECD worker survey on the impact of AI on the workplace (2022).

Just under half of AI users said that they had specialised AI skills (48%/43% in finance/manufacturing). Predictably, workers who develop and maintain AI were the group most likely to say that they had specialised AI skills (79%/75% in finance/manufacturing). Other groups that were more likely to say that they had specialised AI skills included workers with a university degree (57%/59% in finance/manufacturing), men in finance (57%), workers in finance aged 16 to 24 (55%), managers (58%/58% in finance/manufacturing) and workers born abroad (65%/49% in finance/manufacturing).[30,31]

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[30] Since the survey relied on self-reporting of skills, it should be noted that other studies comparing self-reported ICT skills with objective assessments have found evidence of over-reporting, and that the demographic groups most likely to possess ICT skills (younger individuals and men) are also most likely to over-report (Palczyńska and Rynko, 2021[37]). The authors attribute this to social desirability bias, which is likely also a factor in the OECD AI surveys.

[31] In the United States, differences between white and non-white workers and differences between those with Hispanic, Latino or Spanish origins and those without such origins were not statistically significant.

Although a minority of AI users said that they had specialised AI skills, nearly three-quarters of AI users said that they were enthusiastic to learn more (73%/72% in finance/manufacturing), signalling widespread interest in AI.[32] Broadly, the same types of AI users who were more likely to already have specialised AI skills were also more enthusiastic than average to learn more – this enthusiasm may have led them to learn the skills in the first place.

70% and 63% of AI users in finance and manufacturing, respectively, said that AI complemented their skills. In both sectors, male workers and workers with a university degree were more likely to say that AI had complemented their skills. In finance, workers aged under 35 were more likely to say that AI complemented their skills, whereas the relationship was the inverse in manufacturing.

At the same time, approximately half of AI users said that AI had made some of their skills less valuable (51%/45% in finance/manufacturing). These proportions were even higher among workers who reported that some of their tasks had been automated (56%/51%). In both sectors, younger workers and workers with a university degree were more likely to say that some of their skills had been made less valuable.

## AI-related training may be an important tool for improving worker outcomes

In companies that have adopted AI, AI-related training may be key to enabling workers to work more productively and safely with AI. Where AI has made some skills less valuable or even redundant, companies can upskill or reskill existing employees as an alternative to redundancies and/or hiring new staff. The worker survey attempted to capture the availability of training in the financial and manufacturing sectors and assess the impact that this may have on workers' working environment, worries regarding job stability and wage expectations.

### *Many companies have provided or funded training to help their workers to work with AI*

More than half of AI users said that their company had provided or funded training so that they could work with AI (Figure 6.4). AI users in finance were more likely than those in manufacturing to have received training (58% vs. 53%, though the difference was not statistically significant). The survey did not probe workers on what form this training took (e.g. whether it was formal or on-the-job training) or how extensive it was. In one survey (Bessen et al., 2018[26]), many AI start-ups suggested that their products required only general familiarity with computers, and that there was only a modest need for specialised computer skills or specific training among workers who would use the product.

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[32] For comparison, the OECD Survey of Adult Skills suggests that only half of all adults participate or want to participate in adult learning (OECD, 2019[35]). The difference could reflect novelty or hype surrounding AI within society and/or within the context of respondents filling in a questionnaire dedicated to the subject of AI. Another survey (Accenture, 2018[33]) of employers and workers suggests that employers tend to underestimate the willingness of employees to acquire the skills necessary to work with intelligent technologies. Similar to the OECD AI worker survey, most employees in the Accenture survey were positive about the impact of AI on their work (high-skilled employees were most positive) and considered it important to develop their own skills.

**Figure 6.4. More than half of AI users say that their company has provided or funded training so that they can work with AI**

% of AI users



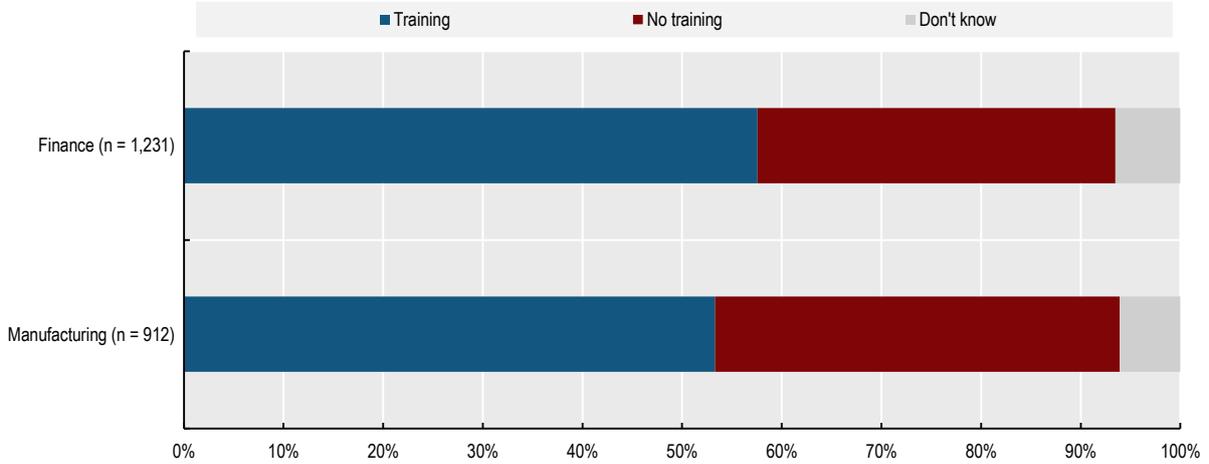Note: All workers were asked: "Has your company provided or funded training so that you can work with AI? Yes; No; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

AI users in Ireland and the United States were most likely to say that their company had provided or funded training (Figure 6.5).

**Figure 6.5. AI users in Ireland and the United States are most likely to say that their company has provided or funded training**

% of AI users
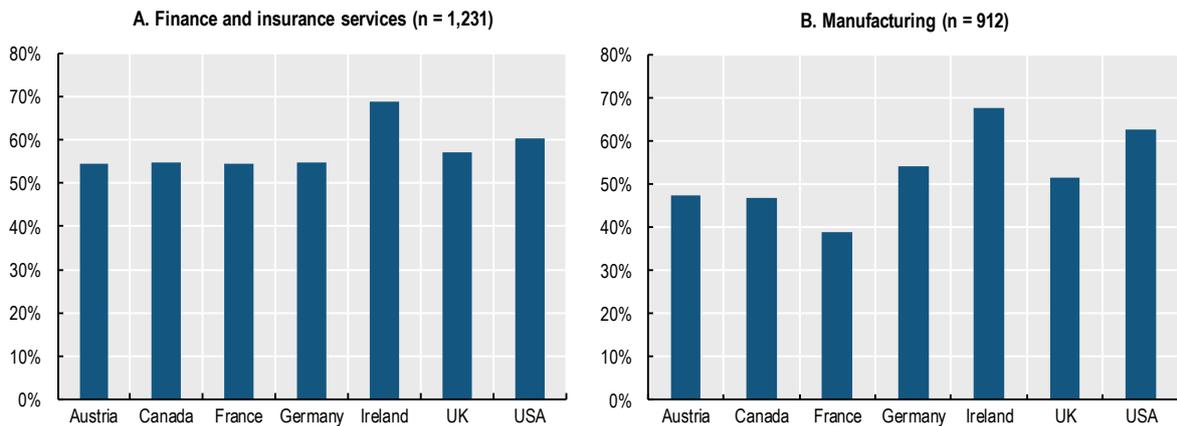


Note: AI users were asked: "Has your company provided or funded training so that you can work with AI? Yes; No; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

***Training is associated with AI-related improvements in performance and working conditions***

Across all indicators and in both sectors, workers who had received training were significantly more likely to report positive outcomes of AI on their working conditions. The gaps between trained and untrained

workers were larger in finance, particularly regarding mental health and well-being and physical health and safety, where the differences were 39 and 38 percentage points respectively. Although causality cannot be established in the analysis, the results suggest that providing and/or funding relevant training strengthens the benefits of AI in terms of performance and working conditions.[33]

**Figure 6.6. AI users who have received training are even more likely to report positive outcomes of AI on performance and working conditions**

% of AI users, by whether they received training



Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?" The figure shows the proportion of AI users who said that each of these outcomes were improved (a lot or a little) by AI.
Source: OECD worker survey on the impact of AI on the workplace (2022).
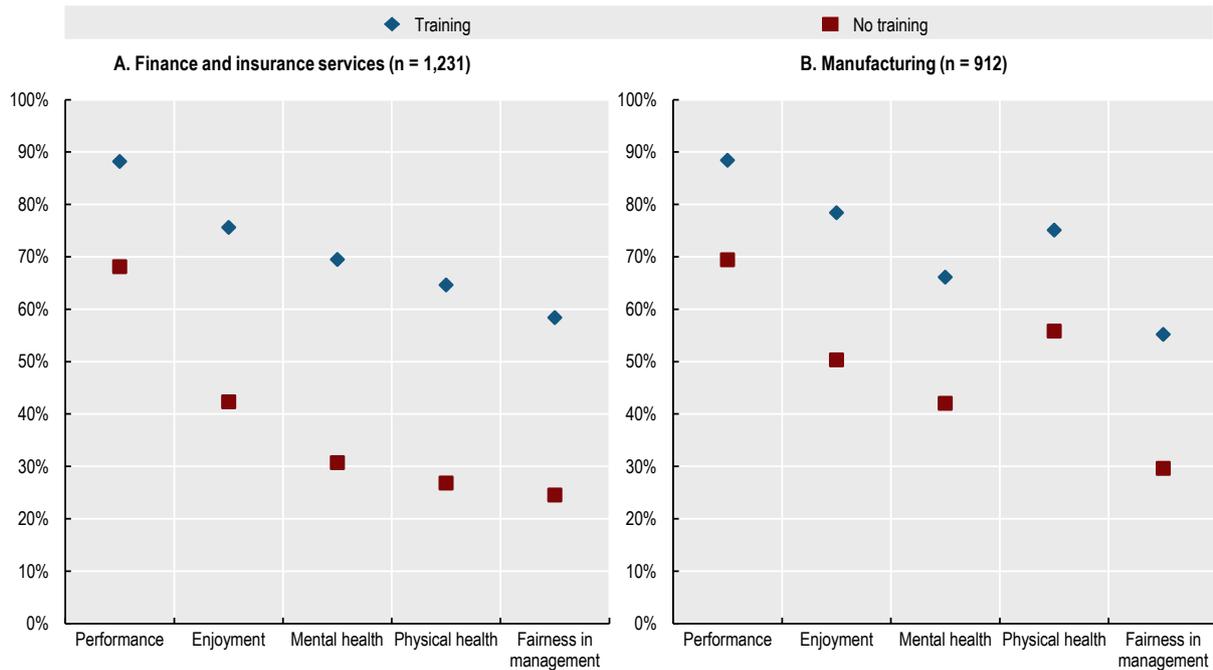
### *Training is associated with greater worries regarding job stability*

In both sectors, but in finance in particular, AI users who said that they had received training were more likely to report fears of job loss over the next 10 years, compared to those who had not (Figure 6.7). When analysed in a linear regression, the relationship is positive and statistically significant even when controlling for gender, age, education, occupation and sector.[34] The survey does not indicate causality in either direction, but it could be that fears of job loss motivate workers to participate in training or that training

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[33] In a series of regressions where each of the indicators included in Figure 6.6 is specified as the dependent variable and controls are added for gender, age, education, occupation and sector, the estimates associated with training remain statistically significant in all cases. In other words, the more positive outcomes experienced by those that have received training do not appear to be attributable to the fact that workers of a particular age, gender, occupation etc. are both more likely to participate in training and more likely to report positive outcomes.

[34] The relationship is also positive and statistically significant when controlling for whether the contract is permanent or temporary, but this analysis is limited to European countries only.

raises workers' awareness of AI's capabilities or that it convinces them that obtaining the necessary skills is harder than they thought.

**Figure 6.7. AI users who have received training are more likely to report worries about job stability**

% of AI users, by whether they received training
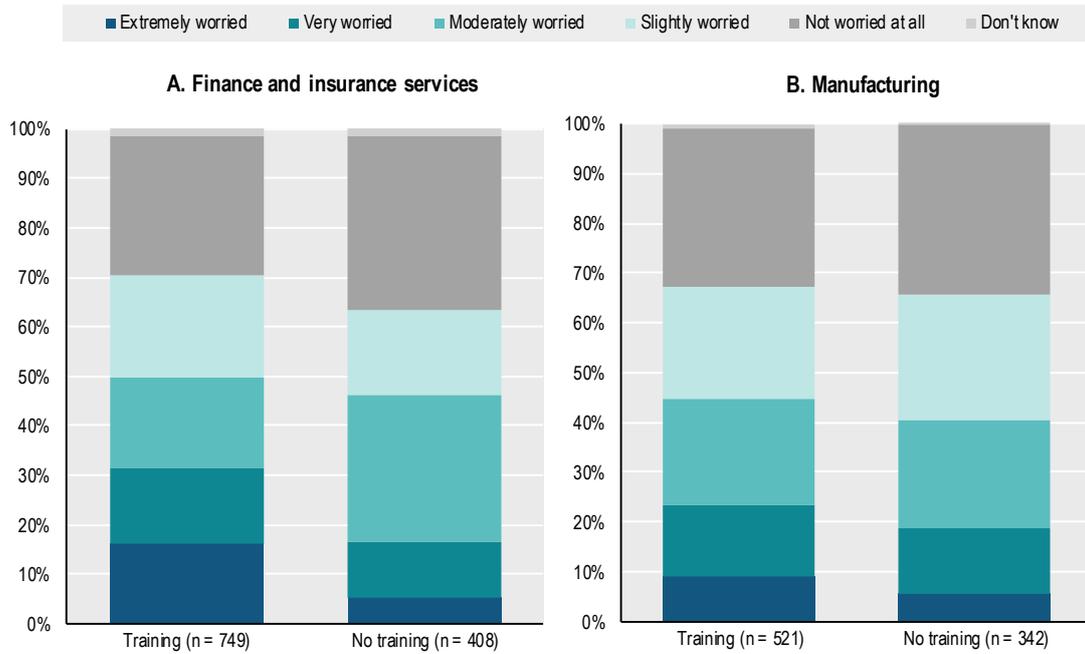


Note: All workers were asked: "How worried are you about losing your job as a result of AI in the next 10 years?" Workers who said that they did not know whether they had received training are not included in the figure.
Source: OECD worker survey on the impact of AI on the workplace (2022).

### *Training is associated with greater expectations of wage increases*

AI users who received training were more than twice as likely to say that they expected AI to increase wages in the sector, as AI users who had not received training (Figure 6.8). As before, a direction of causality cannot be established. It could be that workers participate in training because they are more optimistic about what AI may be able to offer in terms of performance and wage growth or it could be that training increases this optimism. It is also possible that workers expect their own wages to increase if training is provided or funded in conjunction with a forthcoming promotion, or that the propensity for employers to fund or provide training is related to the business's growth (and wage) expectations.

**Figure 6.8. AI users who have received training are more likely to say that AI will increase wages in the sector**

% of AI users, by whether they received training



Note: All workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know". The latter two responses are not included in the figure. Workers who said that they did not know whether they had received training are not included in the figure.
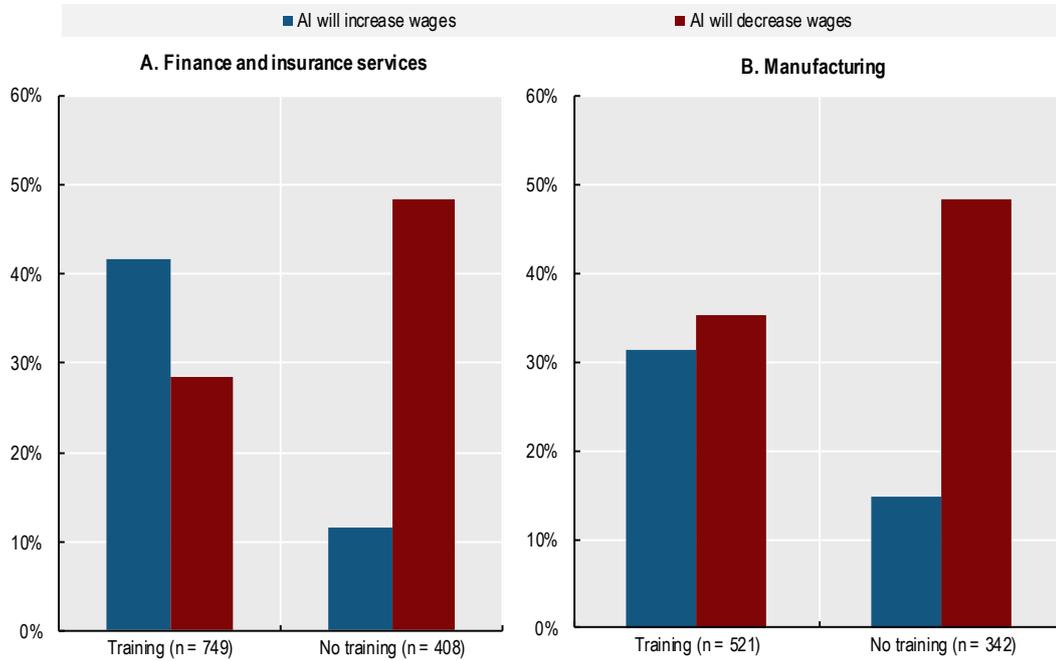Source: OECD worker survey on the impact of AI on the workplace (2022).

# 7 How does worker consultation shape outcomes?

This chapter explores the role of worker consultation in shaping the implementation of AI and determining its ultimate impact on the workplace. The underlying idea is that giving workers opportunities to voice questions, concerns and feedback regarding new technologies could ease transitions for employers and workers alike. Such consultation could ultimately improve the usability of the technology, mitigate risks and promote greater engagement and acceptance by allowing workers to provide input into the development and adoption process. Consultation with worker representatives could allow employers and workers to find flexible and pragmatic solutions where adjustments to wages, staff needs, work organisation and training may be needed. A recent OECD report provides a fuller discussion of how social dialogue can shape the AI transition in beneficial ways for both workers and firms (Kramer and Cazes, 2022[27]).

Both surveys sought to test whether consultation with workers or worker representatives was associated with better outcomes in the eyes of workers and employers. Workers who use AI and employers that have adopted AI were asked whether, in their company, workers or worker representatives were consulted regarding the use of new technologies in the workplace.[35] The reference to workers and to worker representatives means that respondents were reflecting on both representative worker voice and direct voice between workers and managers. Previous OECD research has found that direct voice is associated with a higher quality working environment, whether combined with representative worker voice or acting alone (OECD, 2019[28]).

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[35] The questionnaire referred to "new technologies" rather than AI specifically as the latter was seen as too narrow a topic for consultation.

# Main findings

- In finance and manufacturing, respectively, 43% and 45% of employers that have adopted AI said that they consulted workers or worker representatives regarding the use of new technologies in their workplace.

- In both sectors, consultation with workers or worker representatives regarding new technologies appears to be associated with more positive outcomes of AI in terms of performance and working conditions, according to workers and employers. Manufacturers that consult workers or worker representatives were also less likely to report that AI had decreased overall employment. However, there was no such difference in the financial sector.

- In both sectors, the most commonly discussed topic in consultations was skills and training. The next most commonly discussed topics varied by sector and appeared to depend on the most common AI applications in that sector. As an example, the use of data was the second most commonly discussed topic in finance, where applications of AI are often software-based. On the other hand, the impact of working conditions was the second most commonly discussed topic in manufacturing, where applications of AI are often imbedded in machinery. In both sectors, potential job loss and impact on wages were the topics least likely to be discussed.

- Most of these consultations (60% and 65% in finance and manufacturing) led to one or more of the following: changes to or the adoption of guidelines; changes to or the adoption of an AI strategy; and/or a collective agreement.

- Consultation with workers or worker representatives appeared to be associated with more positive outcomes of AI in terms of performance and working conditions, according to both workers and employers. This is consistent with previous OECD research that found that direct dialogue between workers and managers (either alone or combined with representative workers' voice) was associated with a higher quality working environment.

## The outcome and topic of consultation with workers or worker representatives vary between sectors

### *Less than half of employers that have adopted AI consult workers regarding new technologies*

43% and 45% of employers that have adopted AI in the finance and manufacturing sectors, respectively, said that they consulted workers or workers representatives regarding the use of new technologies in their workplace (Figure 7.1).

**Figure 7.1. Just under half of employers that have adopted AI consult workers or worker representatives regarding new technologies**

% of employers that have adopted AI
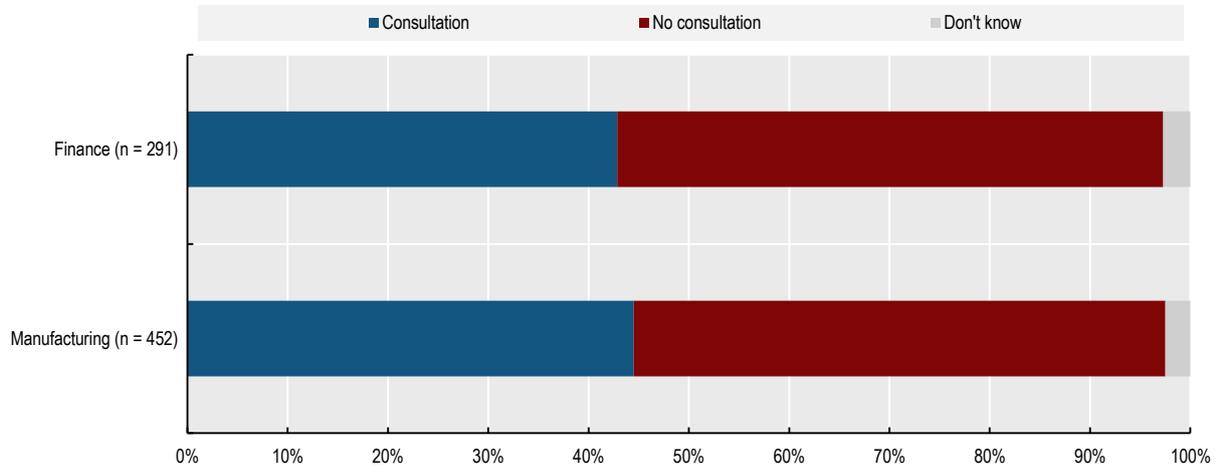


Note: Employers were asked: "Does your company consult workers or worker representatives regarding the use of new technologies in the workplace?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

A breakdown of these results by country suggests that consultation with workers or worker representatives is most prevalent in both sectors in the United Kingdom, Ireland and Germany. Box 7.1 discusses the difference between consultation with workers and consultation with worker representatives.

**Box 7.1. What is the difference between consultation with workers and consultation with worker representatives?**

The employer and worker questionnaires asked about consultation with either workers or worker representatives, and therefore combined two different types of "voice". OECD research (2019[28]) explains that voice is often mediated through representatives, such as local trade union representatives, works councils or workers representatives, while it can also include direct exchanges between workers and managers (e.g. via regular town hall meetings and/or direct channels of communication). A key difference between "direct" and "representative" forms of voice is the legal protections and rights attached to the status of workers' representatives, notably the protection against retaliation and firing, and information and consultation rights. In European countries, "mixed" voice, which combines both, is the most common arrangement.

**Figure 7.2. Consultation with workers or worker representatives appears most prevalent in the United Kingdom, Ireland and Germany**

% of employers that have adopted AI, by country



Note: Employers were asked: "Does your company consult workers or worker representatives regarding the use of new technologies in the workplace?"
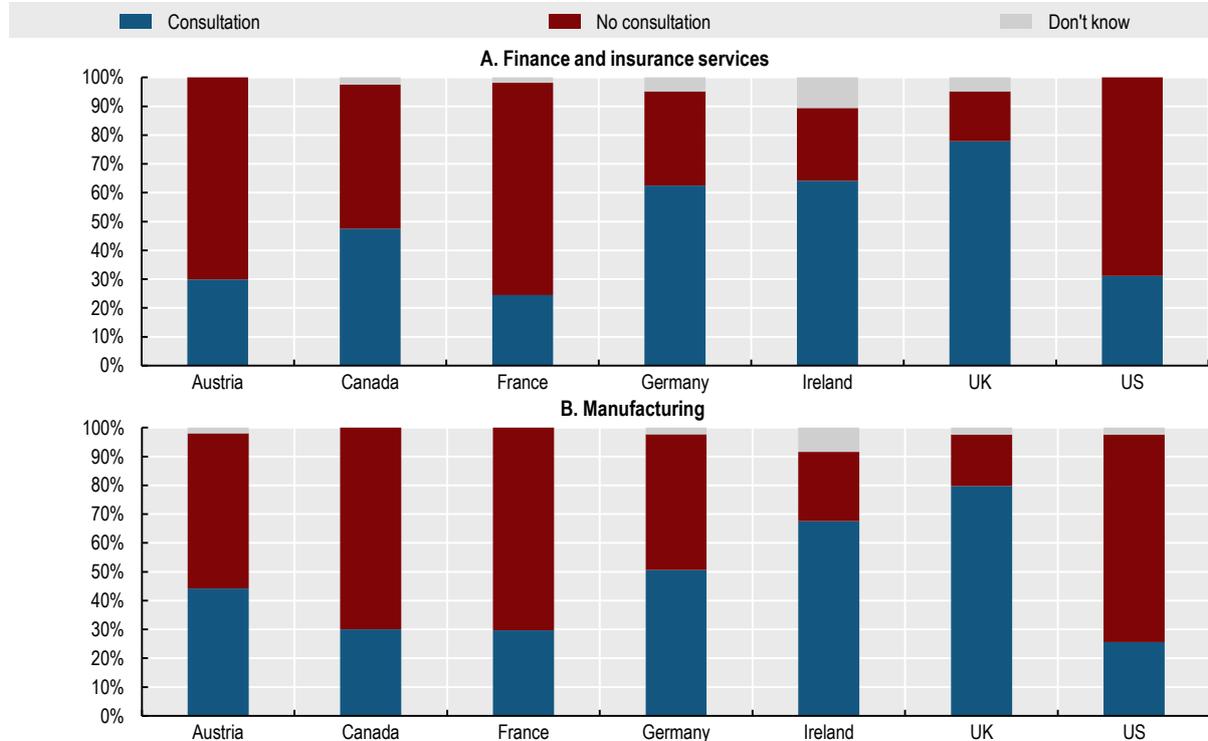Source: OECD employer survey on the impact of AI on the workplace (2022).

Employers with worker representation (i.e. through trade union representation, works councils or another form of worker representation) in their company were more likely (56%/57% in finance/manufacturing) to hold worker consultations compared to those without worker representation (36%/34%) and the difference was statistically significant.

The largest employers were the most likely to consult workers or worker representatives. In finance and manufacturing respectively, 46% and 61% of companies with 500 employees or more said that they consulted workers or worker representatives, compared to 43% and 41% of companies with 20 to 49 employees.

## Consultation is associated with better outcomes in terms of worker productivity and working conditions, as well as employment and wage expectations

### *Where consultation takes place, workers are even more likely to report positive impacts of AI on their performance and working conditions*

Workers using AI were more likely to report that AI improved their performance and working conditions if their companies consulted workers or worker representatives regarding the use of new technologies in the workplace (Figure 7.3). For example, workers in companies that consulted workers or worker

representatives were 18 percentage points (finance) and 19 percentage points (manufacturing) more likely to say that AI had improved performance, compared to workers in companies that did not consult workers or worker representatives.[36] However, the analysis cannot establish causality, so it is not possible to say definitively that consultation encourages employers to deploy AI in a more productive, fulfilling and safe manner. It could also be that the act of being consulted generates positive perceptions of the AI, even if little has changed.

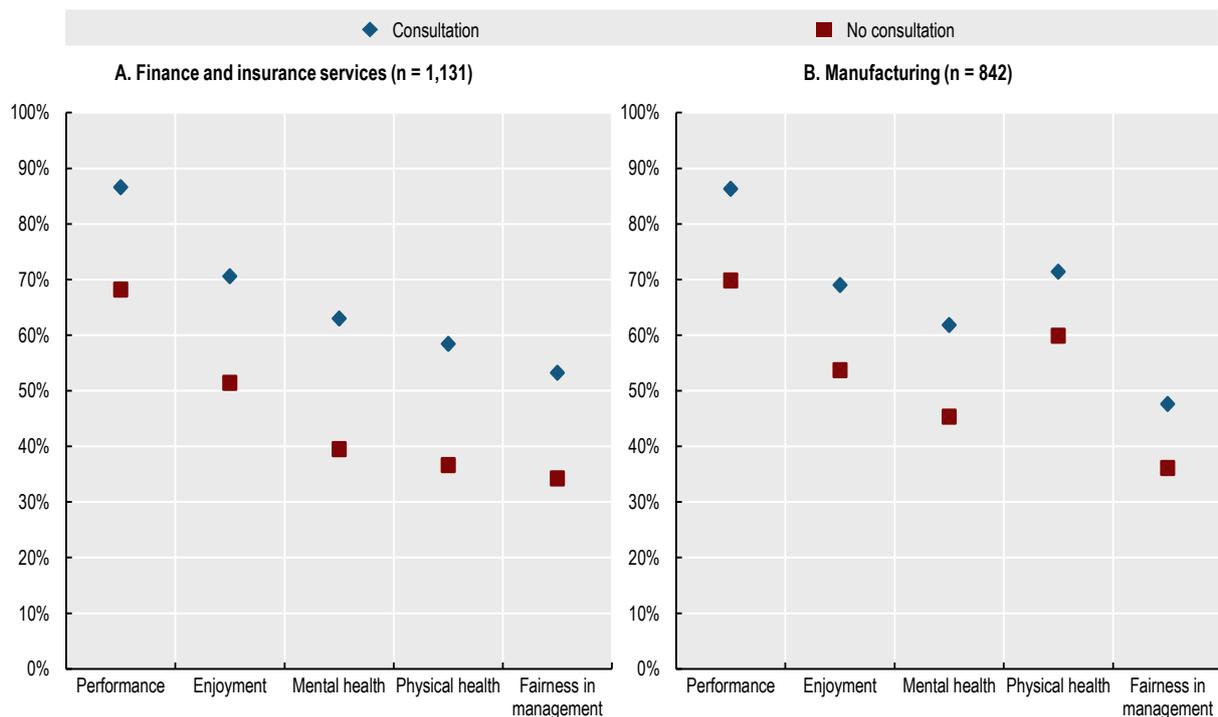## Figure 7.3 Where consultation takes place, workers are even more likely to report positive impacts of AI on performance and working conditions

% of AI users, by consultation



Note: AI users were asked: "How do you think AI has changed your own job performance (performance)/how much you enjoy your job (enjoyment)?/your physical health and safety in the workplace (physical health)?/your mental health and well-being in the workplace (mental health)?/how fairly your manager or supervisor treats you (fairness in management)?" The figure shows the proportion of AI users who said that each of these outcomes were improved (a lot or a little) by AI. Workers who said that they did not know whether consultation takes place are not included in the figure.
Source: OECD worker survey on the impact of AI on the workplace (2022).

### *Where consultation takes place, workers are more likely to expect AI to increase wages*

Workers were more likely to expect AI to increase wages in the sector in the next 10 years if their companies consulted workers or worker representatives regarding the use of new technologies in the workplace (Figure 7.4). Workers in companies that consulted workers were 17 percentage points (finance)

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[36] In a series of regressions where each of the indicators specified as the dependent variable and controls are added for gender, age, education, occupation and sector, the estimates associated with consultation remain statistically significant in all cases. In other words, the more positive outcomes reported by those who work in companies without worker consultation do not appear to be simply attributable to the age, gender, occupation and sector of the workers.

and 11 percentage points (manufacturing) more likely to say that AI would increase wages, compared to workers in companies that did not consult workers. While the higher wage expectations could reflect improvements to worker productivity, the analysis cannot take account of the full set of wage-setting mechanisms, such as the presence (in some countries) of sectoral wage agreements.

**Figure 7.4. Where consultation takes place, workers are even more likely to expect AI to increase wages**

% of all workers, by consultation
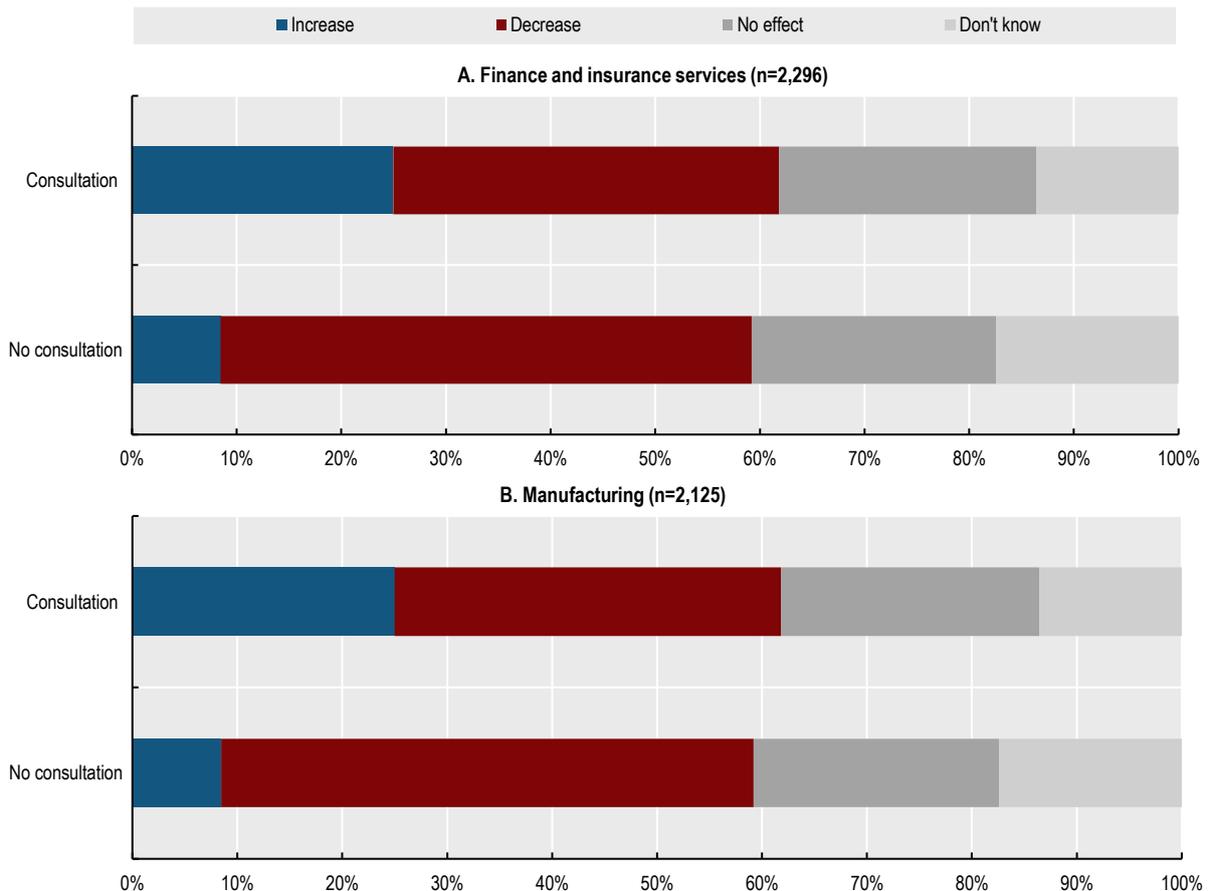


Note: Workers were asked: "Do you think that AI will have an impact on wages in your sector in the next 10 years? Yes, AI will increase wages; Yes, AI will decrease wages; No, AI will not impact wages; Don't know". Workers who said that they did not know whether consultation takes place are not included in the figure.
Source: OECD worker survey on the impact of AI on the workplace (2022).

***Employers that consult workers or worker representatives are also more likely to report positive impacts of AI on worker productivity and working conditions***

Results of the employer survey also suggested a positive association between consultation and impact on worker productivity and working conditions (Figure 7.5), but there was more variation between sectors than in the worker responses. In finance, employers that consulted workers and worker representatives were statistically significantly more likely to report that AI had improved worker productivity and that AI had improved worker satisfaction, but the differences were not significant for the other indicators. In manufacturing, the results were reversed: differences were only statistically significant for working conditions (worker satisfaction, ability to measure worker performance, and health and safety) and not

statistically significant for worker productivity. The sectoral difference may be attributable in part to the different topics discussed. As shown later, the impact on working conditions was more commonly discussed in manufacturing than in finance.
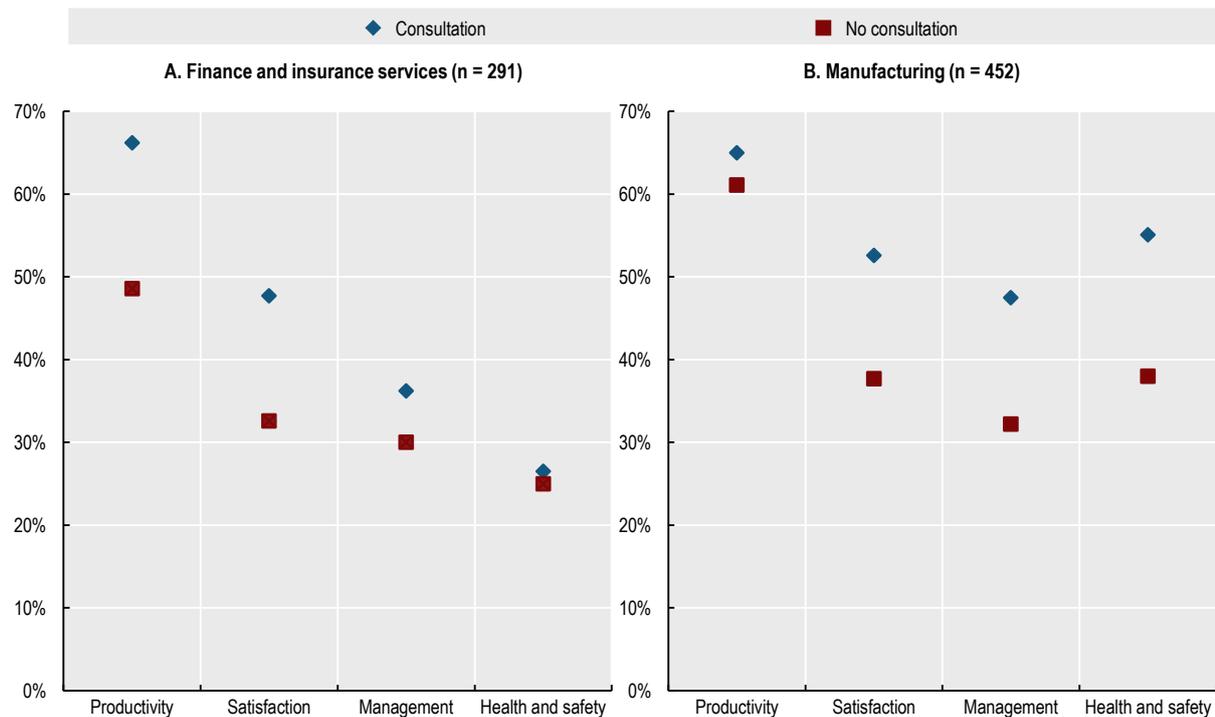
**Figure 7.5. Employers that consult workers or worker representatives are more likely to report positive impacts of AI on worker productivity and working conditions**

% of employers that have adopted AI, by consultation



Note: Employers that have adopted AI were "Has artificial intelligence had a positive effect, negative effect or had no effect on worker productivity/worker satisfaction/health and safety/managers' ability to measure worker performance in your company?" The figure shows the proportions that reported a positive effect.
Source: OECD employer survey on the impact of AI on the workplace (2022).

*Manufacturers that consult workers or worker representatives are less likely to report that AI has decreased overall employment*

In manufacturing, employers that had not consulted workers or worker representatives were nearly twice as likely (compared to those that did) to report that AI had decreased overall employment (Figure 7.6). This suggests that consultation could have a beneficial moderating effect on redundancies or that employers that intend to retain workers are more likely to consult them, although the survey cannot establish causality. Differences were not statistically significant in the financial sector.

**Figure 7.6. Consultation may avoid or minimise AI-related job loss in manufacturing**

% of employers that have adopted AI, by consultation
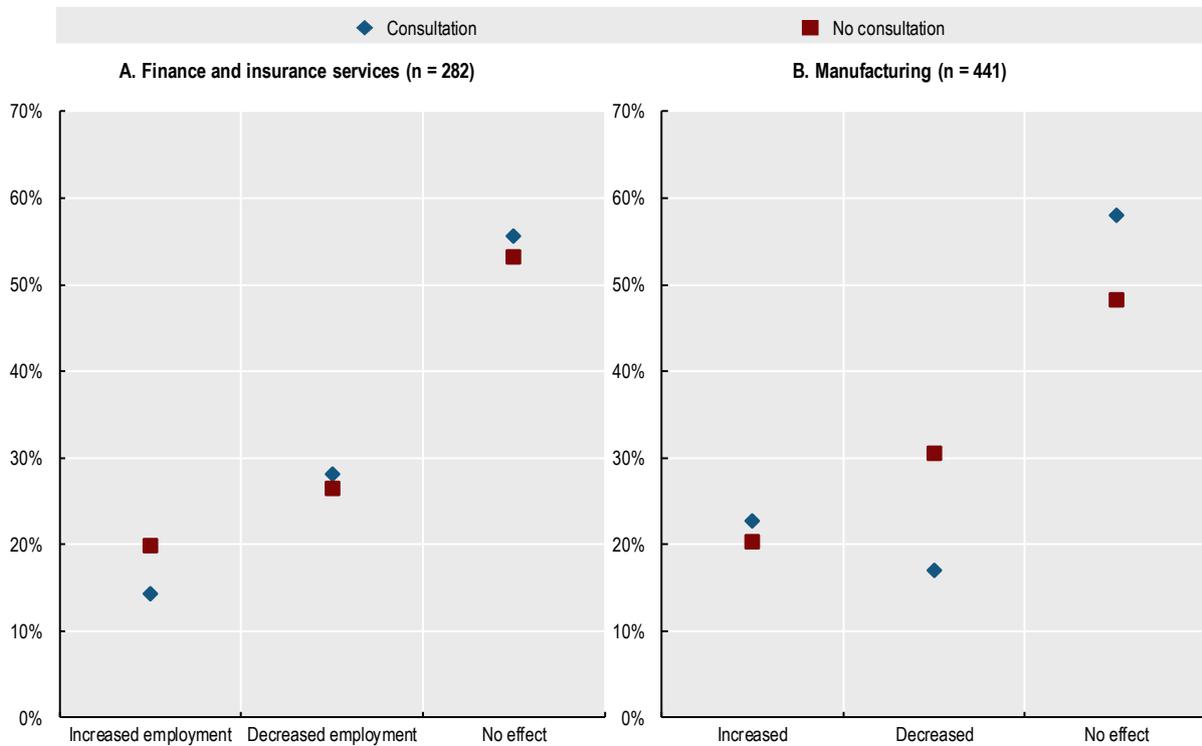


Note: Employers that have adopted AI were asked: "Has artificial intelligence increased, decreased or had no effect on overall employment in your company?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

### *The most commonly discussed topic in consultations is skills and training*

Employers that said they had consulted workers or worker representatives were asked what topics were discussed in these consultations. "Skills and training needs" was the most common topic discussed (73%/80% finance/manufacturing) (Figure 7.7). The next most commonly discussed topics vary by sector and appear to depend on the most common AI applications in that sector. As an example, the use of data was the second most commonly discussed topic in finance (67%), where applications of AI are often software-based. On the other hand, the impact of working conditions was the second most commonly discussed topic in manufacturing, where applications of AI are often imbedded in machinery. In both sectors, potential job loss (33%/31% finance/manufacturing) and impact on wages (26%/32% finance/manufacturing) were least likely to be discussed.

These results are roughly in line with a 2021 OECD survey (Kramer and Cazes, 2022[27]) which asked trade union confederations what they saw as the most important benefits and risks associated with AI technologies. It found that changing skill requirements and physical and mental health risks were among the main perceived risks (after the trustworthy use of AI), while job quality and the creation of new tasks and jobs were among the main perceived benefits.

Firm-level case studies carried out by the OECD in the finance and manufacturing sectors (Milanez, 2023[1]) provide one example of consultation on the topic of skills and training needs. In this case, an Austrian automotive contract manufacturer consulted their works council in the early stages of AI development. The works council not only provided input into worker training programmes, but also

encouraged workers to engage in training and provided guidance on the type of training each worker should do. The involvement of the works council also served to reassure workers of the firm's interest in maintaining job stability, even as certain tasks were being automated.

**Figure 7.7. The most commonly discussed topic in consultations is skills and training**

% of employers that consult workers or worker representatives
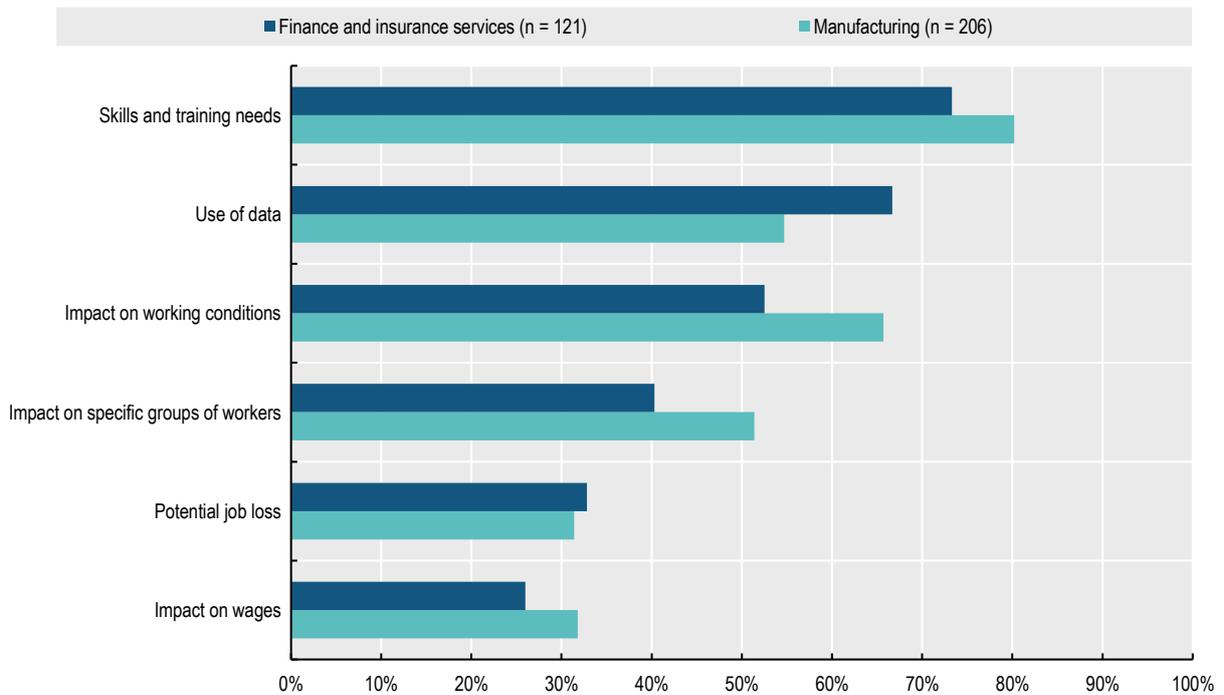


Note: Employers that reported that consultation took place were asked, "I'm going to list a few topics that might have been discussed in consultations regarding the use of new technologies in the workplace. For each of these topics, please tell me whether or not they were discussed."
Source: OECD employer survey on the impact of AI on the workplace (2022).

### *Consultation generally results in guidelines, strategies or agreements*

60% and 65% of employers that consult workers or worker representatives in finance and manufacturing, respectively, said that consultations resulted in at least one outcome (e.g. changes to or the adoption of guidelines, changes to or the adoption of an AI strategy, a collective agreement) (Figure 7.8).There were differences between the sectors in the outcomes from consultations. Employers in manufacturing were significantly more likely to report changes or the adoption of an AI strategy or guidelines compared to employers in finance.

### Figure 7.8. Over one-third of consultations result in a collective agreement

% of employers that consult workers
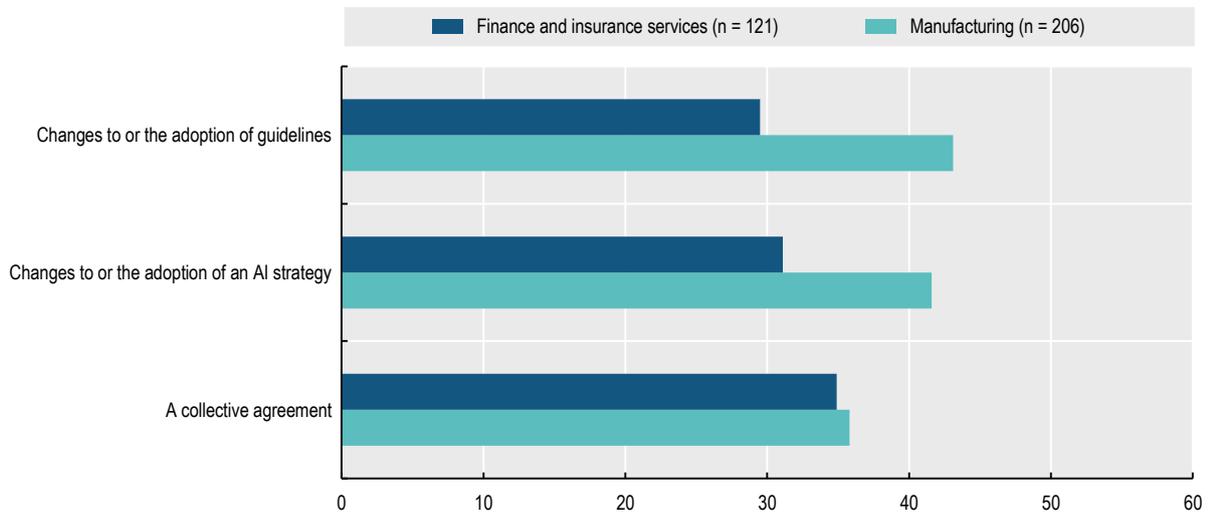


Note: Employers that reported that consultation took place were asked: "Have these consultations led to: a collective agreement which addresses the use of artificial intelligence?/changes to or the adoption of an artificial intelligence strategy?/changes to or the adoption of guidelines for the use of artificial intelligence?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

In both sectors, over one-third of employers said that consultations resulted in a collective agreement. This contrasts with other OECD research (Kramer and Cazes, 2022[27]), which suggested that collective agreements on digital technologies were generally scarce. However, a few examples exist which cover aspects of AI use and its implications for occupational health and safety, privacy, monitoring and evaluation of work performance, and hiring and firing decisions.

# **8** Are employers implementing AI in a trustworthy and inclusive manner?

If AI is to contribute to positive and sustainable global economic activity, to increase innovation and productivity, and to improve the welfare and well-being of people, it must be trustworthy and inclusive. The OECD AI Principles laid out in the Recommendation of the Council on Artificial Intelligence (OECD, 2019[29]) call on countries to use trustworthy AI to pursue inclusion of underrepresented populations and greater economic, social, gender and other equality, while a recent OECD working paper (Salvi del Pero, Wyckoff and Vourc'h, 2022[30]) applies these principles to the workplace, stating that trustworthy use of AI in the workplace means recognising and addressing risks regarding: human rights (including privacy, fairness, agency and dignity); transparency and explainability; robustness, safety and security; and accountability.

This chapter brings together elements of the employer and worker surveys which touch on issues related to implementing AI in a trustworthy and inclusive manner:

- AI-related data collection and implications for privacy;
- AI-enabled workplace monitoring and the intensification of work;
- The potential of AI to introduce, imbed or magnify bias;
- Employers' ability to implement AI in a way which benefits all workers;
- Government regulation, which may play a role in ensuring trustworthy use of AI in the workplace.

## Main findings

- Most workers trust their employers to make the right decisions regarding AI, but not all. Approximately a quarter of workers had complete trust in their companies to provide training for workers to work with AI and to only use safe and trustworthy AI, while just under half trusted their companies somewhat in these areas. However, under 20% said that they did not trust their companies very much in these areas while under 10% said that they did not trust their companies at all.

- Many workers support banning or restricting the use of AI in the firing, promotion and hiring of workers. 57% of workers in both sectors supported a ban on AI that would decide which workers were dismissed, and a further quarter of workers thought that this use of AI should be allowed, but with restrictions. 47% of workers in both sectors supported a ban on AI that would make promotion decisions while 40% of workers in finance and 41% in manufacturing supported a ban on AI that would make recruitment decisions.

- 49% of workers in finance and 39% in manufacturing said that their company's application of AI collected data on them as individuals or how they do their work. Most of these workers expressed some related worries, such as feeling increased pressure to perform at work due to data collection (62%/56% in finance/manufacturing) and feeling that too much of their data was being collected (58%/54%).

- Employers saw workers with disabilities as a group that could benefit from AI in the workplace, whereas other groups such older and low skilled workers were seen as facing more harm. Employers were more than 4 times as likely (46%/50% in finance/manufacturing) to say that AI would help workers with disabilities as to say that it would harm them (8%/12%). This could be because employers think that AI can supplement and complement their skills in the workplace and enable more such workers to enter the workforce.

- Employers say that cost and a lack of skills are currently greater barriers to AI adoption than government regulation. 25% of employers in finance and 19% in manufacturing said that government regulation was a barrier, compared to 53% and 58% that said that high costs of the technology were a barrier, and 41% and 43% that said that lack of relevant skills was a barrier.

### Most workers trust their employers to make the right decisions regarding AI, but not all

When workers were asked about their trust in their employers in a number of AI-related areas, including using AI in a way that benefits all workers and only using safe and trustworthy AI, a majority said that they trusted their employers, completely or somewhat (Figure 8.1).[37] Trust in one's employer is important given that distrust may raise uncertainty and suspicion surrounding the use of AI and may stifle further adoption and innovation, even if it is feasible for employers to address workers' concerns.

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[37] According to another business survey (IBM Watson, 2022[6]), a majority of organisations that have adopted AI have not taken key steps to ensure their AI is trustworthy and responsible, such as reducing unintended bias (74%), tracking performance variations and model drift (68%), and making sure they can explain AI-powered decisions (61%).

The areas where workers trusted employers most were to provide training for workers to work with AI and to only use safe and trustworthy AI. Approximately a quarter of workers had complete trust in their employers in these areas while just under half trusted their employers somewhat.

**Figure 8.1. Most workers trust their employers to make the right decisions regarding AI**

% of all workers
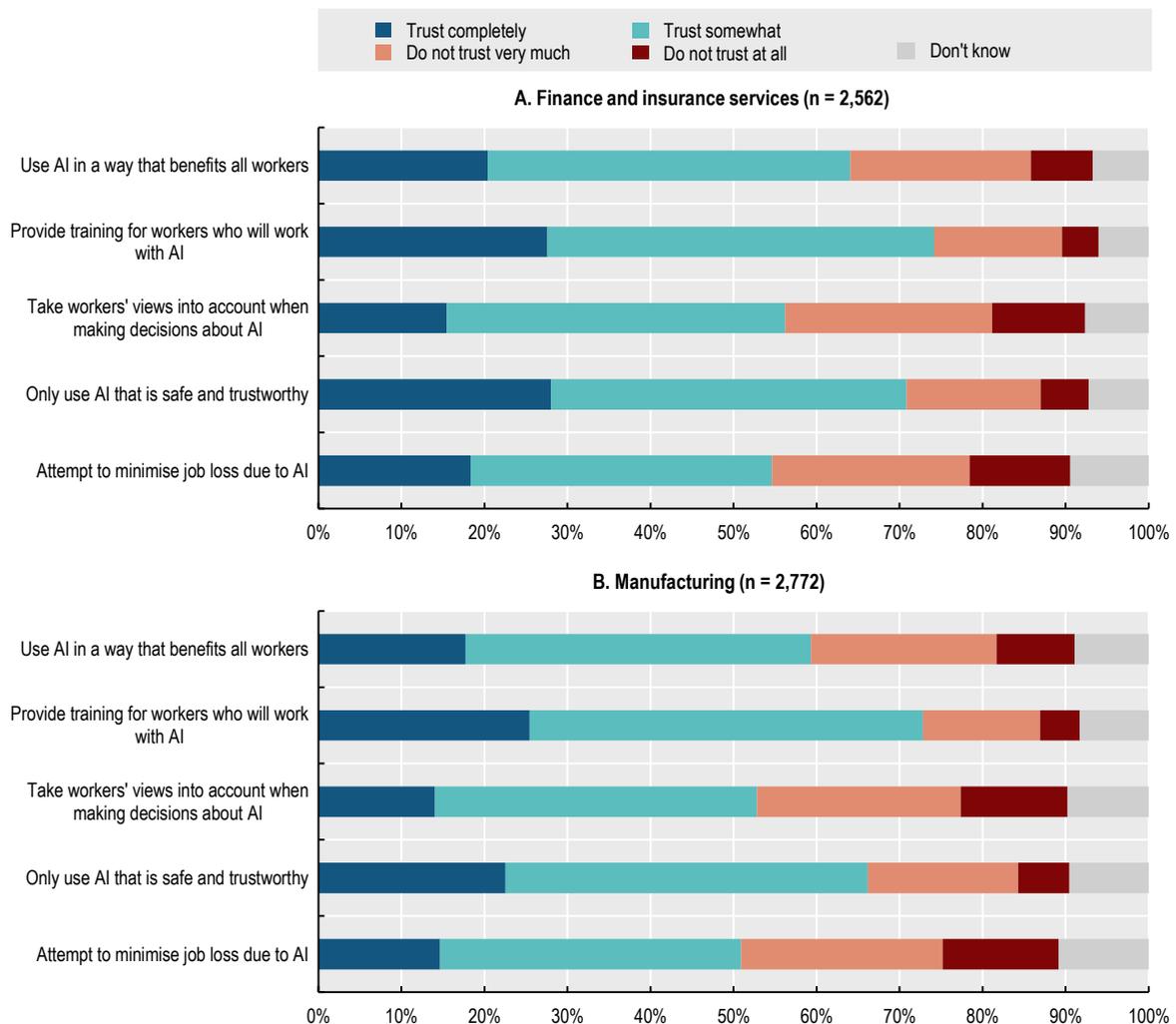


Note: Workers were asked: "[Imagine that your company was going to adopt AI] To what extent would you trust your company to: use AI in a way that benefits all workers?/provide training for workers who will work with AI?/take workers' views into account when making decisions about AI?/only use AI that is safe and trustworthy?/attempt to minimize job loss due to AI?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

There was less trust that employers would use AI in a way that would benefit all workers; that employers would take workers' views into account in AI-related decisions; and that employers would attempt to minimise job loss due to AI. Over 10% of workers said that they would not trust their employers at all to attempt to minimise job loss and to take workers' views into account.

Trust was higher in companies where workers were consulted regarding the use of new technologies. Workers in these companies were over 20 percentage points more likely to say that they trusted their

employers completely or somewhat across all the areas mentioned, compared to workers in companies without consultation.

## Many workers support banning or restricting the use of AI in hiring and firing

Workers were asked to provide their views on whether some controversial applications of AI – because they relate to important decisions around hiring and firing, involve the monitoring of workers, or risk imbedding or increasing existing bias – should be banned or restricted. Workers suggested that these measures were most appropriate for cases where AI makes decisions on the firing, promotion and hiring of workers (Figure 8.2).[38] 57% of workers in both sectors supported a ban on AI that would decide which workers were dismissed, and a further quarter of workers thought that this use of AI should be allowed, but with restrictions. 47% of workers in both sectors supported a ban on AI that would make promotion decisions, while 40% of workers in finance and 41% in manufacturing supported a ban on AI that would make recruitment decisions.

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[38] The prevalence of AI in firing, promotion and hiring decisions is not known. However, the McKinsey *State of AI* surveys suggest that 8% of respondents used AI for human resources more generally (McKinsey, 2021[31]), while the 2019 *Gartner Artificial Intelligence Survey* provides a figure of 17% (Baker, 2020[32]).

### Figure 8.2. Many workers support banning or restricting the use of AI in hiring and firing

% of all workers
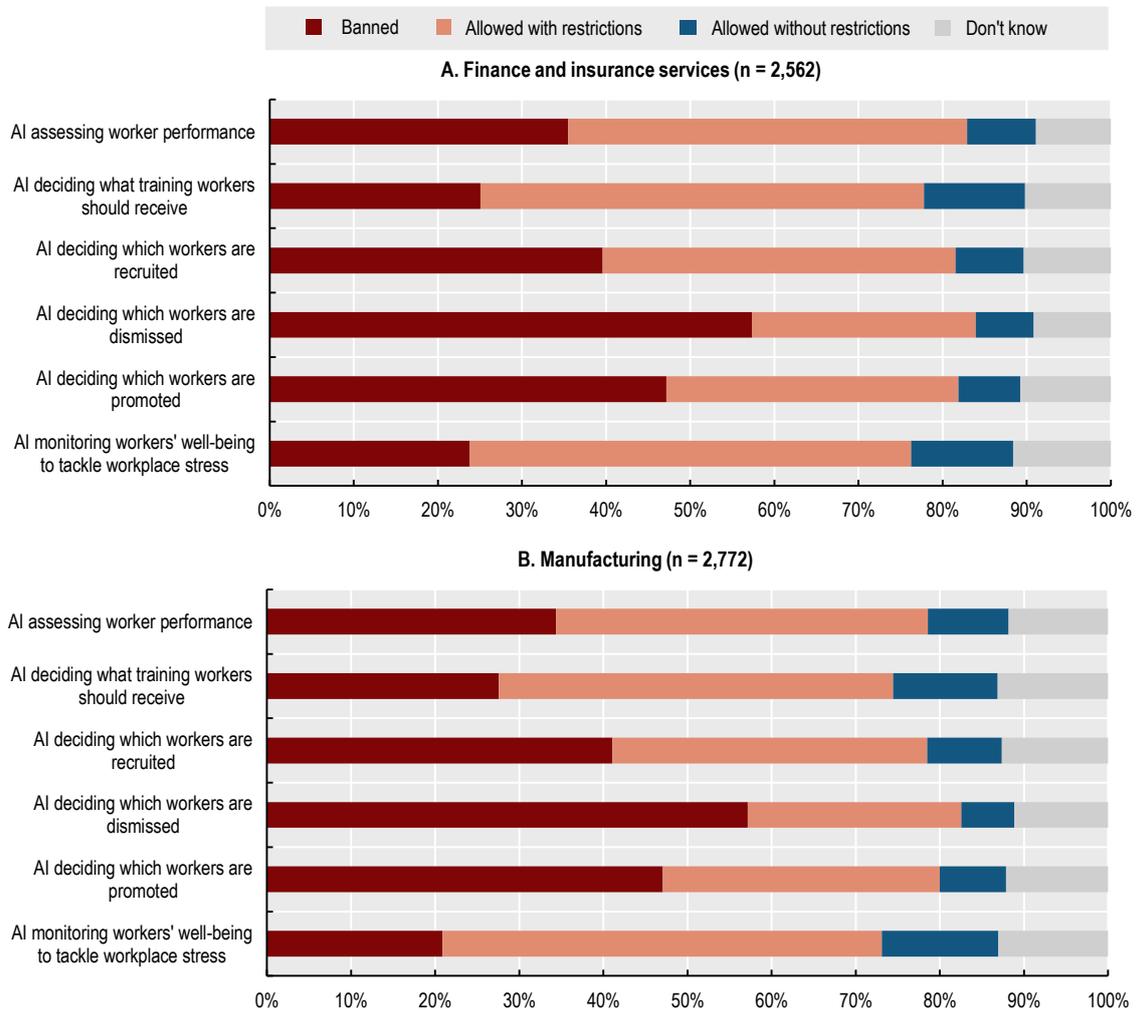


Note: Workers were asked: "Do you think that the following uses of AI should be banned, allowed with restrictions or allowed without restrictions?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

Uses of AI to assess worker performance, to decide what training workers should receive and to monitor worker well-being in the interests of tackling workplace stress gathered less opposition, although more than one in five still supported a ban.

## Workers express some worries about AI-related data collection

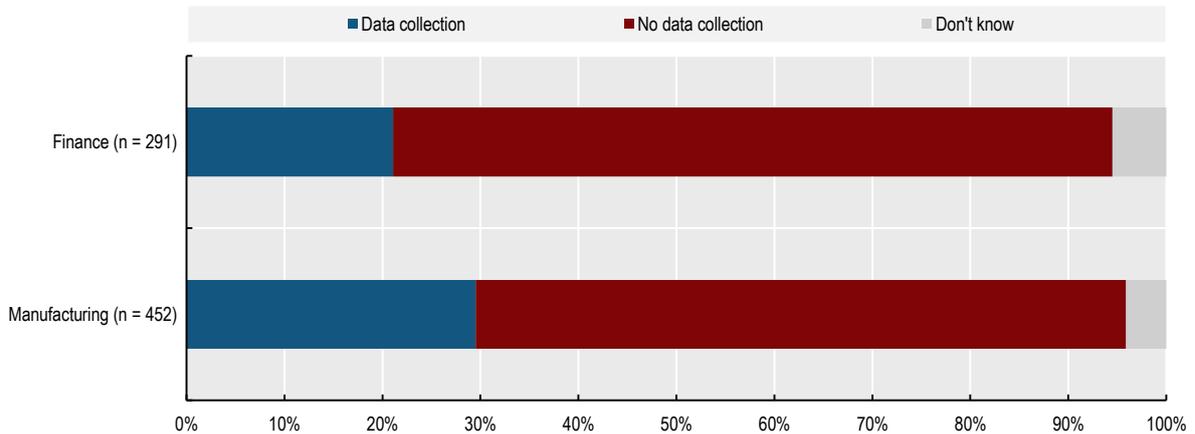### A quarter of employers that have adopted AI engage in AI-related data collection

21% of employers in finance that have adopted AI and 30% in manufacturing indicated that their use of AI involved the collection of data on workers or their work (Figure 8.3). In both sectors, AI-related data collection appeared to be most prevalent in the United Kingdom and Ireland, and least prevalent in

Germany. This could reflect differences in awareness between countries, the different types of AI used within each country and/or differences in policy governing collection of data by employers.[39]

**Figure 8.3. A quarter of employers that have adopted AI engage in AI-related data collection**

% of employers that have adopted AI



Note: Employers that have adopted AI were asked: "Does your company's use of artificial intelligence involve collecting data on workers or their work?"
Source: OECD employer survey on the impact of AI on the workplace (2022).

### *Under half of workers report that their employers engage in AI-related data collection*

Workers were more likely to report AI-related data collection than employers. 49% of workers in finance and 39% in manufacturing said that their company's application of AI collected data on them as individuals or how they do their work (Figure 8.4). Among workers who reported AI-related data collection, approximately 75% in both sectors reported that the data collected was used to assess worker performance.

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[39] In Germany, the General Right of Personality, together with the Data Protection Act, require a justification of the legitimate interest of the employer and permission to process employees' data on the basis of collective agreements (Salvi del Pero, Wyckoff and Vourc'h, 2022[30]).

% of workers in companies that have adopted AI



Note: Workers in companies that have adopted AI were asked: "To the best of your knowledge, does your company's application of AI collect data on you as an individual or how you do your work? Yes; No; Don't know".
Source: OECD worker survey on the impact of AI on the workplace (2022).

There was a clear divergence[40] between employers and workers on this point, with employers less likely to report AI-related data collection. This divergence could reflect differences in awareness or in opinion of what data collection is AI-related and what is not, or indeed in what data pertains to workers and their work. It could be that employers prefer not to report AI-related data collection due to a social desirability bias. There were many more "don't know" answers among workers (just over 20% of all responses), indicating a level of uncertainty in responding to this question (and could even indicate that the question was not appropriate for this group of respondents). However, even excluding "don't know" answers, workers were more likely to report that AI-related data collection was taking place and employers were more likely to report that it was not.

Workers in companies that consult workers when introducing new technologies in the workplace were more likely to report AI-related data collection (58%/47% in manufacturing/finance) than those whose companies did not (42%/34%). It may be that worker consultation enables employers to collect data or that there is a greater awareness where workers are consulted, especially since use of data was one of the most discussed topics in consultations.

*Workers express some worries about AI-related data collection*

Most workers who reported AI-related data collection expressed some worries about data collection (Figure 8.5).[41] 62% of such workers in finance and 56% in manufacturing agreed (strongly or somewhat) that they felt increased pressure to perform at work due to data collection, while 62% and 51% expressed worries regarding their privacy. 58% and 54% in finance and manufacturing respectively said that they

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[40] The results presented previously cannot be compared directly. However, the difference is even more stark when the results are reweighted to facilitate comparison (i.e. the employer survey is weighted by employee weights and the worker survey is weighted by employer weights with workers working in companies with fewer than 20 employees excluded).

[41] Workers expressed similar concerns in a 2018 survey (BCG Gamma and IPSOS, 2018[38]). Among workers whose companies had adopted AI, 82% saw a danger that AI could result in more surveillance, 71% that it could dehumanise work and 71% that it could pose ethical problems with regard to the protection of personal data.

worried that too much of their data was being collected, while 58% and 51% worried that data collection would lead to decisions biased against them. Just a quarter of workers disagreed (strongly or somewhat) with each of these worries. Workers who said that the data was collected to assess worker performance were more likely to express worries.

**Figure 8.5. Workers express some worries about AI-related data collection**

% of workers who report AI-related data collection
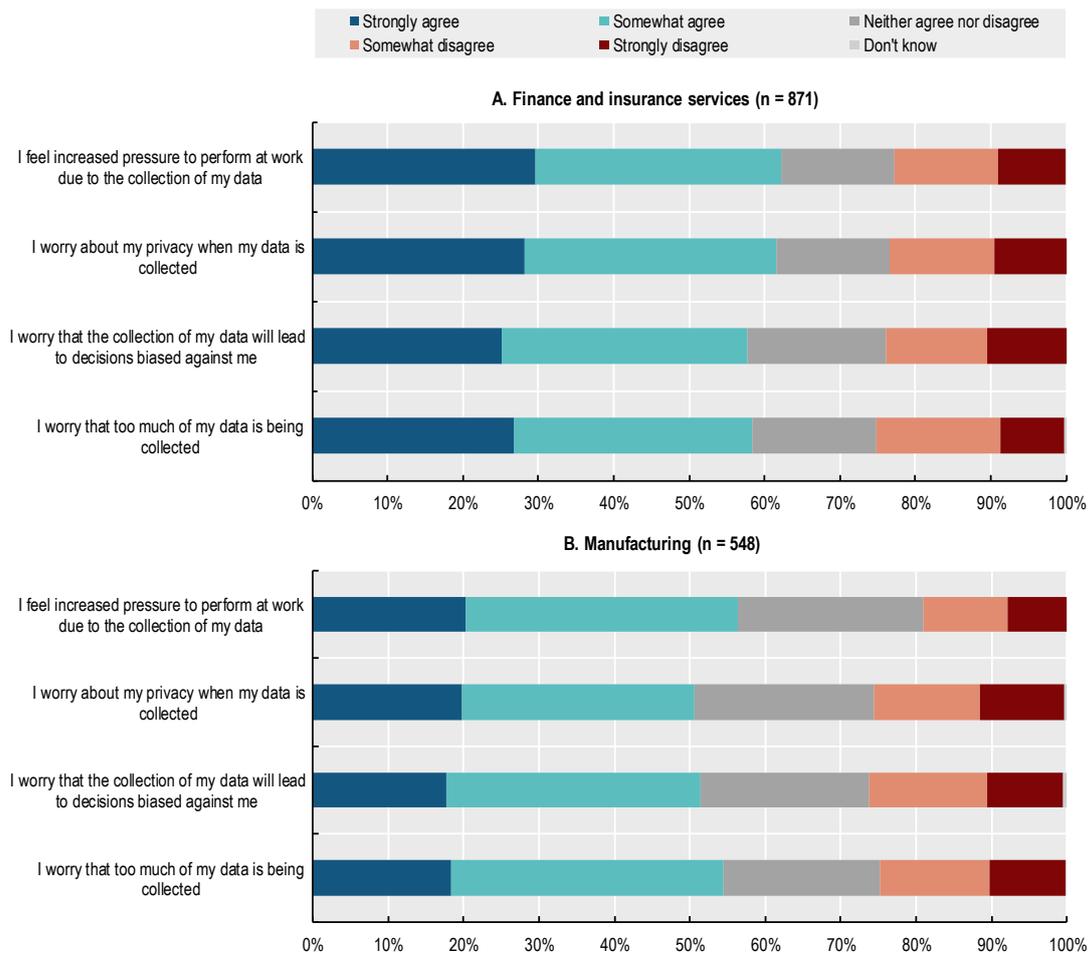


Note: Workers who reported AI-related data collection were asked: "To what extent do you agree or disagree with the following statements? I feel increased pressure to perform at work due to the collection of my data/I worry that the collection of my data will lead to decisions biased against me/I worry about my privacy when my data is collected/I worry that too much of my data is being collected".
Source: OECD worker survey on the impact of AI on the workplace (2022).

Workers in finance were more likely than workers in manufacturing to strongly agree with each of these worries, and the differences were statistically significant. This could be attributable to the different types of AI used in each sector and the different ways that they use worker data. As shown in Box 8.1, some groups of workers were more concerned that AI-related data collection would lead to decisions biased against them.

> **Box 8.1. Workers aged under 35 are more worried about data collection leading to decisions biased against them**
>
> Given broad concern about algorithmic bias, one of the goals of the worker survey was to examine whether workers were concerned that the collection of their data may lead to decisions biased against them, and whether these concerns were greater among particular groups. Previous OECD research has explained how AI systems can struggle with bias (Salvi del Pero, Wyckoff and Vourc'h, 2022[30]), due to the use of historical data that is biased, to the use of non-representative samples, or to the use of incomplete, incorrect or outdated data.
>
> Across all workers (including both those that do and do not experience AI-related data collection),[42] approximately half (53%/50% in finance/manufacturing) said that they were extremely or very worried that the collection of their data would lead to decisions biased against them. These worries were greater among workers aged under 35 (57%/56%). In finance, worries were also greater among workers with a university degree (57%) and among workers born abroad (61%), but differences were minor in the manufacturing sector. In both sectors, male and female workers were roughly equally likely to be worried.
>
> In the United States, where responses could be broken down by race and ethnicity, there were some notable differences. In the manufacturing sectors, workers of Hispanic, Latino or Spanish origin appeared to be more worried – in particular, workers of Puerto Rican or Mexican, Mexican American or Chicano origin. In manufacturing, workers who described themselves as Asian were also more worried that data collection would lead to decisions biased against them, while in finance, workers who described themselves as American Indians or Alaska Natives were also more worried.

## AI could help some potentially vulnerable groups but harm others

Employers saw workers with disabilities as a group that could really benefit from AI in the workplace. According to their responses, workers with disabilities were the group most likely to be helped by AI, out a list of potentially vulnerable groups which also included older workers and low-skilled workers (Figure 8.6). Employers were more than 4 times as likely (46%/50% in finance/manufacturing) to say that AI would help workers with disabilities as to say that it would harm them (8%/12%). This could be because employers think that AI can supplement and complement their skills in the workplace and enable more such workers to enter the workforce.[43]

---

[42] In addition to using the responses presented in Figure 8.5, this analysis draws on similar questions asked of workers who did not report AI-related data collection, in which they were asked to imagine that their company started using AI-based software that collected data on them and their work. Most respondents to these more "hypothetical" questions strongly or somewhat agreed that they would feel increased pressure to perform at work due to the collection of their data, that they would worry about their privacy if their data were being collected, and that they worry that the collection of their data would lead to decisions biased against them. The analysis here aggregates the responses of those that do and do not experience AI-related data collection in order to break down worries about biased decision-making with more precision.

[43] Forthcoming OECD research will investigate the challenges and opportunities regarding AI and labour market accessibility (OECD, 2023[34]).

**Figure 8.6. Workers with disabilities are likely to be helped by AI while older and low-skilled workers could face some harm**

% of all employers
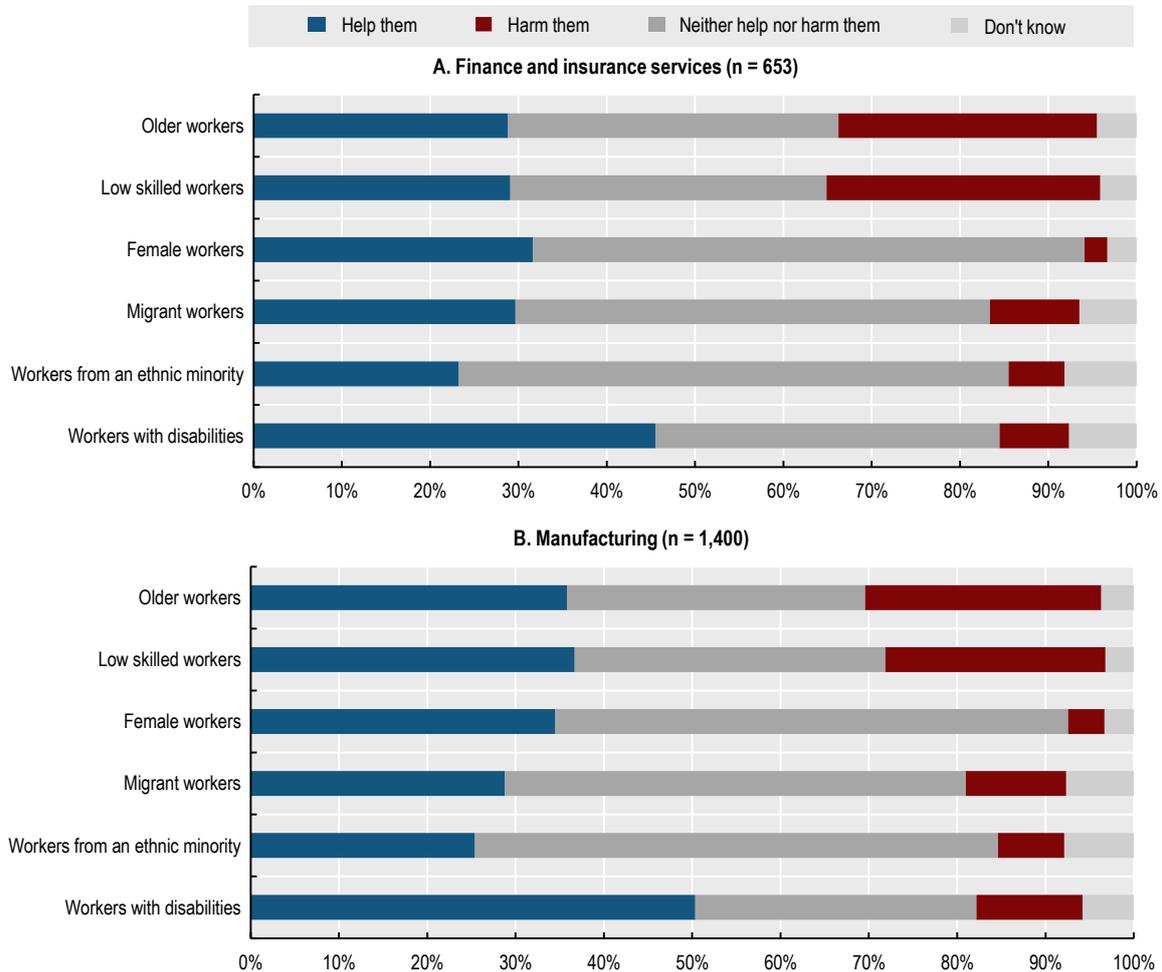


Note: All employers were asked: "I'm going to name a few different groups of workers. For each of them, please tell me whether you think artificial intelligence is more likely to help them or harm them or neither help nor harm them in their work."
Source: OECD employer survey on the impact of AI on the workplace (2022).

In the eyes of employers in both sectors, the groups most associated with harm were older workers and low-skilled workers. 31% of employers in finance and 25% in manufacturing thought that AI was likely to harm low-skilled workers. 29% in finance and 27% in manufacturing said the same for older workers. In finance, similar proportions of employers said that these groups would be helped by AI, which suggests a difference in opinion. In manufacturing, more employers said that these groups would be helped than harmed.

Employers saw female workers, migrant workers and workers from an ethnic minority as among the least likely to be harmed by AI. In fact, most employers said that AI would neither help nor harm them and a further 20% or higher said that AI would help them.

## Cost is a bigger barrier to AI adoption than government regulation

### *Employers say cost is the highest barrier to adopting AI*

The most commonly reported barrier to adoption of AI, according to employers, was the cost of the technology (Figure 8.7). In both sectors, most employers (53% in finance and 58% in manufacturing) reported that high costs had been a barrier. The next most commonly reported barrier was a lack of relevant skills (41% in finance and 43% in manufacturing),[44] followed by not being convinced of the technology (29% in finance and 35% in manufacturing). Government regulation was the least common barrier, reported by 25% of employers in finance and 19% in manufacturing.

**Figure 8.7. Cost is the highest barrier to adopting AI**

% of all employers
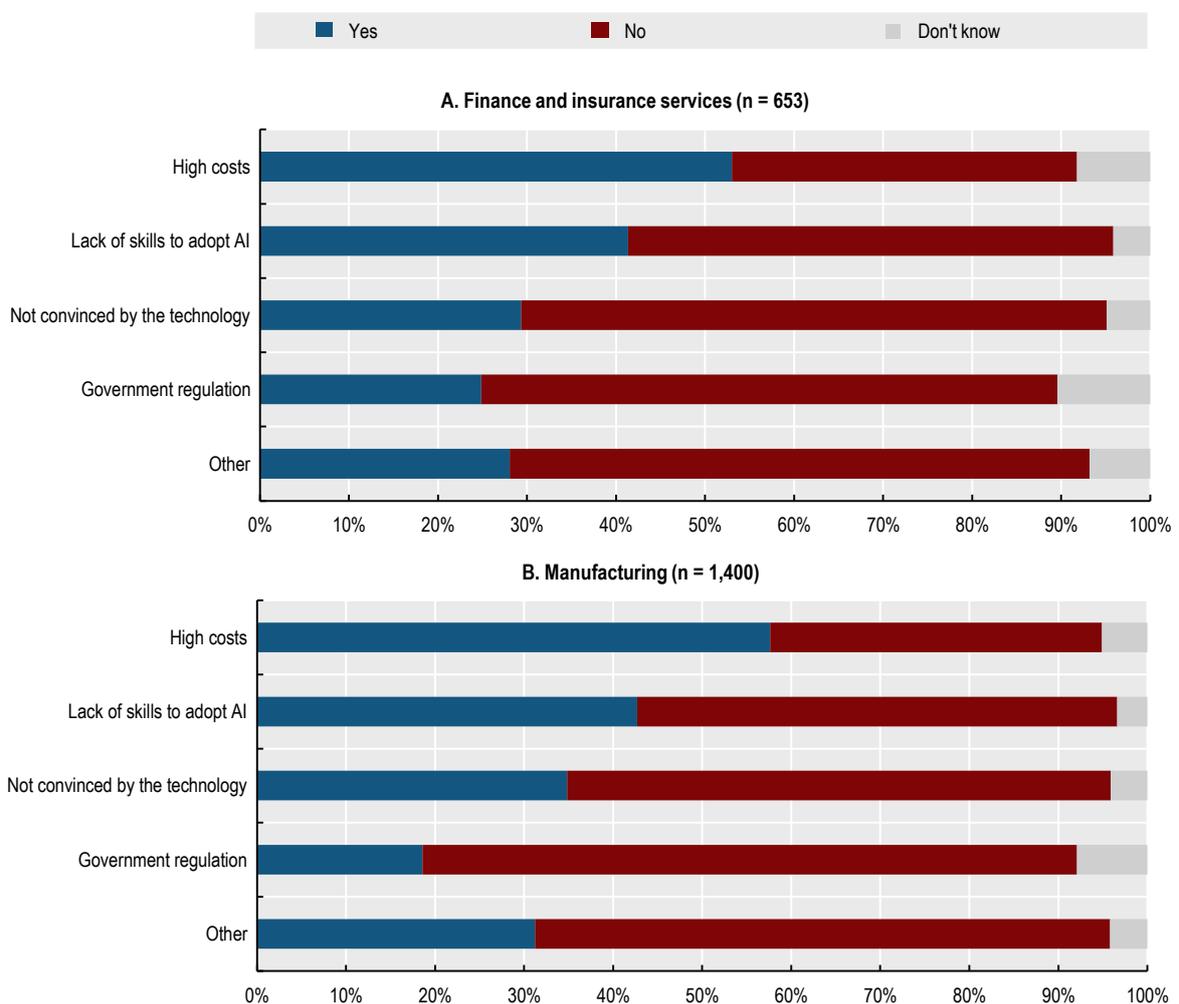


Note: All employers were asked: "I'm going to list a few potential barriers to the adoption of artificial intelligence. In each case, please tell me whether it has ever been a barrier to adopting artificial intelligence in your company: High costs/Lack of skills to adopt artificial intelligence/Government regulation/Not convinced by the technology/Any other barriers not previously mentioned".
Source: OECD employer survey on the impact of AI on the workplace (2022).

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[44] The order of the top two barriers was reversed in another business survey (IBM Watson, 2022[6]), which stated that the top five things hindering successful AI adoption for businesses were: limited AI skills; expertise or knowledge (34%); the price being too high (29%); lack of tools or platforms to develop models (25%); projects being too complex or difficult to integrate and scale (24%); and too much data complexity (24%).

There were sectoral differences in the barriers reported, most of which were statistically significant. Employers in manufacturing were more likely to report cost barriers and not being convinced by the technology, whereas employers in finance were more likely to say that government regulation had been a barrier. These sectoral differences could be attributable to how AI is used within each sector. For instance, costs could be higher in manufacturing where AI is commonly combined with machinery, whilst government regulation could be a bigger barrier in finance where AI may have a higher reliance on personal data and where decisions may be subject to financial conduct and reporting requirements.

### *There are country differences in the proportions reporting that skills and government regulation are barriers*

There were some differences between countries for two of the barriers: lack of skills to adopt AI and government regulation (Figure 8.8). Employers in the United States, Germany and Austria and were most likely to report that skills had been a barrier to AI adoption, with almost half of employers in these countries reporting as such. Employers in France, Austria, Germany and Ireland were the most likely to report that government regulation had been a barrier to adoption. The fact that these are all countries within the European Union may point at the impact of applicable regulation (e.g. GDPR) or anticipated regulation (e.g. the AI Act), and/or may reflect a greater awareness of regulation. The associations between each of the other two barriers and country were not statistically significant.

**Figure 8.8. There are country differences in the proportions reporting that skills and government regulation are barriers**

% of all employers
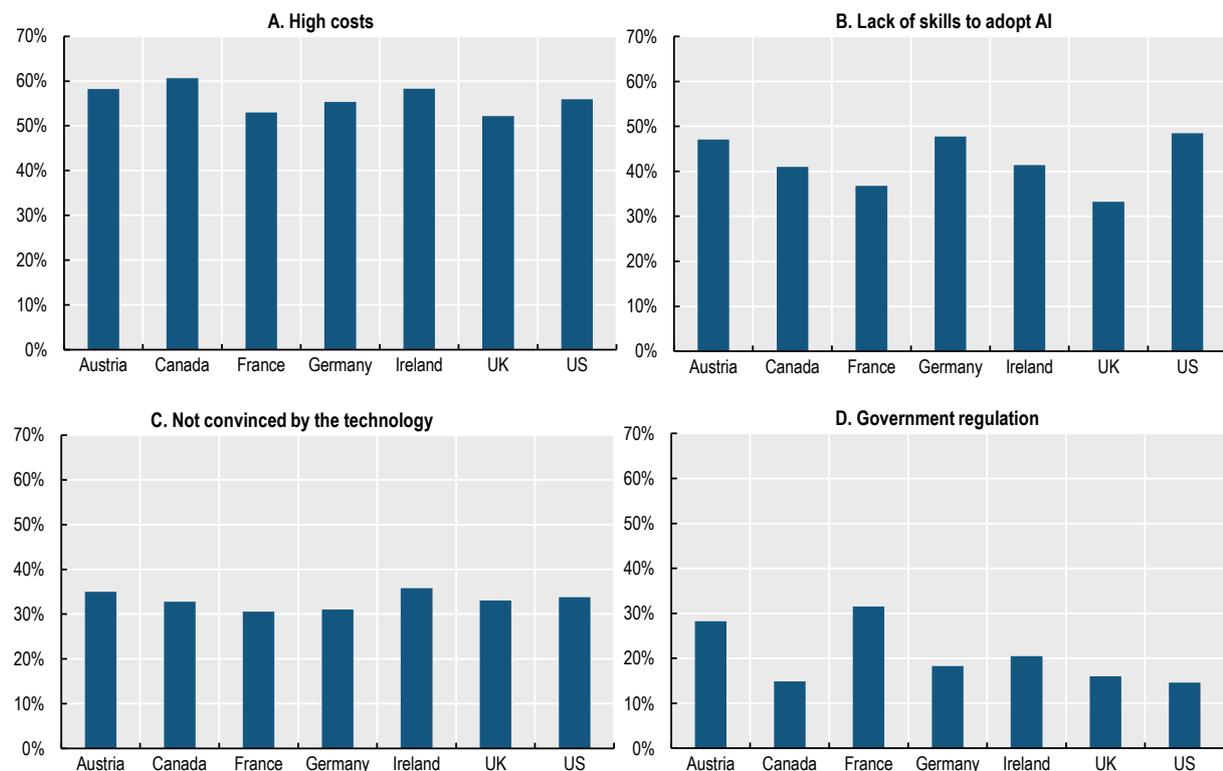


Note: All employers were asked: "I'm going to list a few potential barriers to the adoption of artificial intelligence. In each case, please tell me whether it has ever been a barrier to adopting artificial intelligence in your company: High costs/Lack of skills to adopt artificial intelligence/Government regulation/Not convinced by the technology/Any other barriers not previously mentioned".
Source: OECD employer survey on the impact of AI on the workplace (2022).

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# Annex A. Worker questionnaire

| **B001 - INTRO: SCREENING AND INTRODUCTION** | **Begin block** |

| **Q001 - country: Country (sample source)** | **Single coded** |

**Not back | Dummy**

**Normal**

| 1 | Austria |
| 2 | Canada |
| 3 | Germany |
| 4 | Ireland |
| 5 | UK |
| 6 | USA |
| 7 | France |

Ask only if **Q001 - country**,2

| **Q002 - languagecanada: Language choice within Canada** | **Single coded** |

**Not back**

In which language do you want to continue?
Dans quelle langue voulez-vous continuer ?

**Normal**

| 1 | English |
| 2 | Français |

| **Q003 - employeeageyear: Year of birth** | **Single coded** |

**Not back**

Before we begin, please answer the following questions:

In which year were you born?

**Normal**

| 1 | 2007 |
| 2 | 2006 |
| 3 | 2005 |
| 4 | [PROG: offer all potential years in a drop-down menu until 1930] |
| 99 | No answer |

---

Ask only if **Q003 - employeeageyear**,99

---

**Q004 - employeeagecat1: age groups asked** | Single coded

**Not back**

Which of the following age groups do you fall into?

**Normal**

| | |
|---|---|
| 1 | Below 16 years |
| 2 | Between 16 and 24 years |
| 3 | Between 25 and 34 years |
| 4 | Between 35 and 49 years |
| 5 | Between 50 and 64 years |
| 6 | 65 years or more |

**Q005 - employeeagecat2: age groups all** | Single coded

**Not back | Dummy**

**Normal**

| | | |
|---|---|---|
| 1 | Below 16 years | ➔ GO TO SCREEN OUT |
| 2 | Between 16 and 24 years | |
| 3 | Between 25 and 34 years | |
| 4 | Between 35 and 49 years | |
| 5 | Between 50 and 64 years | |
| 6 | 65 years or more | |

**Q006 - employed: Employment screening** | Single coded

**Not back**

What is your current employment status?

**Normal**

| | | |
|---|---|---|
| 1 | I am employed | |
| 2 | I am self-employed | ➔ GO TO SCREEN OUT |
| 3 | I am currently not employed | ➔ GO TO SCREEN OUT |

**Q007 - sector: Sector** | Single coded

**Not back**

What sector do you work in?

**Normal**

| | | |
|---|---|---|
| 1 | Finance and insurance | |
| 2 | Manufacturing | |
| 3 | None of these | ➔ GO TO SCREEN OUT |

| **Q008 - intro1: Introduction to survey** | **Text** |
|---|---|

**Not back**

Welcome and thank you for participating in our survey, which is commissioned by the **OECD** = the Organisation for Economic Co-operation and Development. The OECD is an international research and policy organisation that works to shape policies that foster prosperity, opportunity and well-being for all.
This survey aims to understand the impact of **advanced technologies in the workplaces** in your sector.

The survey will take about 15 minutes. This survey may include some optional questions that could be considered sensitive and which you need not answer. All answers will of course be evaluated anonymously. No personal data will be passed on to third parties.

Please click on the button below to begin the survey.

| **B001 - INTRO: SCREENING AND INTRODUCTION** | **End block** |
|---|---|

| **B002 - ADOPT: ADOPTION OF AI** | **Begin block** |
|---|---|

| **Q009 - techfeel: Initial feeling about technology** | **Left-right slider** |
|---|---|

**Not back | Number of rows: 1**

How would you describe your feelings about the overall impact of technology on society?

**Normal**

| Strongly negative | 1 2 3 4 5 6 7 | Strongly positive |
|---|---|---|

**[**If respondent wants to skip the question, show question again with "No answer" option below the scale/slider.]

| **Q010 - familiarity1: Ever heard of AI** | **Single coded** |
|---|---|

**Not back**

Have you ever heard the term **artificial intelligence** or **AI**?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |

Ask only if **Q010 - familiarity1**,1

**Q011 - familiarity2: Familiarity with AI if heard before** | Single coded

**Not back**

Can you explain what the term artificial intelligence (AI) means?

**Normal**

| 1 | I can explain well what is meant by that. |
| 2 | I know roughly what it means, but it is difficult to explain. |
| 3 | I don't know what it means. |
| 9 | No answer |

**Q012 - aidefinition: AI definition** | Text

**Not back**

No matter how familiar you are with the term, please have the following definition in mind when answering the subsequent questions:

Artificial intelligence - or AI in short - is what enables smart computer programs and machines to carry out tasks that would typically require human intelligence.
Some examples where AI can be found in your everyday life include:
- Siri, Alexa and other smart assistants,
- Netflix or YouTube recommendations, and
- Self-driving cars

Some examples where AI can be found in the [IF sector = code 1 THEN insert: finance and insurance sector] [IF sector = code 2 THEN insert: manufacturing sector] include:
[IF sector = code 1 (finance) THEN:]
- Robo-advisors,
- Chatbots used for customer service, and
- Fraud detection software
[IF sector = code 2 (manufacturing) THEN:]
- Robots that use cameras to check items for flaws,
- Software used to predict prices and demand, and
- Technology that predicts when machines should be serviced

**[**The following definition implemented in a help button available in Q015, 016, 107:

Artificial intelligence is what enables smart computer programs and machines to carry out tasks that would typically require human intelligence.

Some examples where AI can be found in your everyday life include: Siri, Alexa and other smart assistants, Netflix or YouTube recommendations, and self-driving cars

Some examples where AI can be found in the sector you work in include:
[IF sector = code 1 (finance) THEN:] Robo-advisors, chatbots used for customer service, and fraud detection software
[IF sector = code 2 (manufacturing) THEN:] Robots that use cameras to check items for flaws, software used to predict prices and demand, and technology that predicts when machines should be serviced]

**Q013 - adoption: Adoption of AI in company - in general** | `Single coded`

**Not back**

To the best of your knowledge, does your company use artificial intelligence (AI)?

Please think of all areas within your company, not just the area you work in.
To read the definition again, please click on the information button.

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q014 - adopter: Adopters vs non-adopters of AI** | `Single coded`

**Not back | Dummy**

**Normal**

| | |
|---|---|
| 1 | Adopters |
| 2 | Non-adopters |

[Using answers from previous question:
IF adoption code 1 (yes) => THEN in this question code 1 (adopters);
IF adoption code 2 (no) OR code 8 (DK) => THEN in this question code 2 (non-adopters)]

Ask only if **Q014 - adopter**,1

| | |
|---|---|
| **B003 - ADOPTDETAIL: DETAILED INFORMATION FROM ADOPTERS** | **Begin block** |

**Q015 - aiusesfinance: AI usage in financial sector**      Matrix

**Not back | Number of rows: 9 | Number of columns: 3**

You will find possible uses of AI in your sector below. Does your company use AI for ...

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Data analytics? | 1 | ⭘ | ⭘ | ⭘ |
| Risk management? | 2 | ⭘ | ⭘ | ⭘ |
| Fraud detection? | 3 | ⭘ | ⭘ | ⭘ |
| Trading and investment? | 4 | ⭘ | ⭘ | ⭘ |
| Administration? | 5 | ⭘ | ⭘ | ⭘ |
| Customer service and advice? | 6 | ⭘ | ⭘ | ⭘ |
| Reporting? | 7 | ⭘ | ⭘ | ⭘ |
| Human resources? | 8 | ⭘ | ⭘ | ⭘ |
| Other areas? *Fixed* | 9 | ⭘ | ⭘ | ⭘ |

**Q016 - aiusesmanufacturing: AI usage in manufacturing sector** Matrix

**Not back | Number of rows: 6 | Number of columns: 3**

You will find possible uses of AI in your sector below. Does your company use AI for ...

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Product design? | 1 | ⭘ | ⭘ | ⭘ |
| Planning and scheduling? | 2 | ⭘ | ⭘ | ⭘ |
| Production processes? | 3 | ⭘ | ⭘ | ⭘ |
| Maintenance tasks? | 4 | ⭘ | ⭘ | ⭘ |
| Human resources? | 5 | ⭘ | ⭘ | ⭘ |
| Other areas? *Fixed* | 6 | ⭘ | ⭘ | ⭘ |

Ask only if **Q016 - aiusesmanufacturing** ROW=3 & COL=1

| **Q017 - aiappsmanufacturing: AI usage in manufacturing sector in production** | **Matrix** |

**Not back | Number of rows: 6 | Number of columns: 3**

You reported that your company uses AI for production processes. Is this for ...

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Quality control? | 1 | ○ | ○ | ○ |
| Digital twins and simulation? | 2 | ○ | ○ | ○ |
| Robotics? | 3 | ○ | ○ | ○ |
| Worker assistance? | 4 | ○ | ○ | ○ |
| Autonomous vehicles? | 5 | ○ | ○ | ○ |
| Other areas? *Fixed* | 6 | ○ | ○ | ○ |

| **Q018 - how: AI usage of respondent** | **Multi coded** |

**Not back | Min = 1**

Which of these statements best describes your interaction with AI at work?

Multiple answers are possible.

**Normal**

| 1 | I work with AI |
|---|---|
| 2 | I manage workers who work with AI |
| 3 | I develop/maintain AI |
| 4 | I am managed by AI |
| 5 | I interact with AI in another way |
| 6 | I have no interaction with AI at work *Fixed *Exclusive* |
| 8 | Don't know *Fixed *Exclusive* |

| **Q019 - aiuser: AI users vs non-users** | **Single coded** |

**Not back | Dummy**

**Normal**

| 1 | AI users |
|---|---|
| 2 | AI non-users |

[Using answers from previous question:
IF how code 1, 2, 3, 4 or 5 => THEN in this question code 1 (ai user);
IF how code 6 or 8 => THEN in this question code 2 (ai non-user)]

Ask only if **Q019 - aiuser**,2

**Q020 - foreseeai: Likelihood of working with AI in future**    `Single coded`

**Not back**

How likely do you think it is that you will work with AI or interact with it in any other way in your job in the next 10 years?

**Normal**

| | |
|---|---|
| 1 | Very likely |
| 2 | Somewhat likely |
| 3 | Somewhat unlikely |
| 4 | Very unlikely |
| 8 | Don't know |

**B003 - ADOPTDETAIL: DETAILED INFORMATION FROM ADOPTERS**    **End block**

Ask only if **Q014 - adopter**,2

**B004 - NONADOPTDETAIL: DETAILED INFORMATION FROM NON-ADOPTERS**    **Begin block**

Ask only if **Q007 - sector**,1

**Q021 - aiheardfinance1: Heard of AI usage in financial sector in general**    `Single coded`

**Not back**

Have you heard of AI being used in other companies in the finance and insurance sector?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

Ask only if **Q021 - aiheardfinance1**,1

| **Q022 - aiheardfinance2: Heard of AI usage in financial sector in concrete areas** | Matrix |
|---|---|

**Not back | Number of rows: 9 | Number of columns: 3**

You said that you have heard of AI being used in other companies in the finance and insurance sector. Is this for …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Data analytics? | 1 | ○ | ○ | ○ |
| Risk management? | 2 | ○ | ○ | ○ |
| Fraud detection? | 3 | ○ | ○ | ○ |
| Trading and investment? | 4 | ○ | ○ | ○ |
| Administration? | 5 | ○ | ○ | ○ |
| Customer service and advice? | 6 | ○ | ○ | ○ |
| Reporting? | 7 | ○ | ○ | ○ |
| Human resources? | 8 | ○ | ○ | ○ |
| Other areas? *Fixed* | 9 | ○ | ○ | ○ |

Ask only if **Q007 - sector**,2

| **Q023 - aiheardmanufacturing1: Heard of AI usage in manufacturing sector in general** | Single coded |
|---|---|

**Not back**

Have you heard of AI being used in other companies in the manufacturing sector?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

Ask only if **Q023 - aiheardmanufacturing1**,1

| **Q024 - aiheardmanufacturing2: Heard of AI usage in manufacturing sector** | Matrix |
|---|---|

**Not back | Number of rows: 10 | Number of columns: 3**

You said that you have heard of AI being used in other companies in the manufacturing sector.
Is this for ...

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Product design? | 1 | ○ | ○ | ○ |
| Planning and scheduling? | 2 | ○ | ○ | ○ |
| Quality control? | 3 | ○ | ○ | ○ |
| Digital twins and simulation? | 4 | ○ | ○ | ○ |
| Robotics? | 5 | ○ | ○ | ○ |
| Worker assistance? | 6 | ○ | ○ | ○ |
| Autonomous vehicles? | 7 | ○ | ○ | ○ |
| Maintenance tasks? | 8 | ○ | ○ | ○ |
| Human resources? | 9 | ○ | ○ | ○ |
| Other areas? *Fixed* | 10 | ○ | ○ | ○ |

| **Q025 - foreseecompany: Likelihood of company working with AI in future** | Single coded |
|---|---|

**Not back**

How likely do you think it is that your company will use AI in the next 10 years?

**Normal**

| 1 | Very likely |
|---|---|
| 2 | Somewhat likely |
| 3 | Somewhat unlikely |
| 4 | Very unlikely |
| 8 | Don't know |

| **B004 - NONADOPTDETAIL: DETAILED INFORMATION FROM NON-ADOPTERS** | End block |
|---|---|

| **B002 - ADOPT: ADOPTION OF AI** | End block |
|---|---|

| B005 - IMPACTUSER: AI IMPACT FOR USERS | Begin block |
|---|---|

[Question block presented only to aiuser code 1]

| Q261 - replacetasksuser: Replaced tasks by AI | Single coded |
|---|---|

**Not back**

Thinking about your job, has AI automated any tasks that you used to do?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

Ask only if **Q261 - replacetasksuser**,1

| Q027 - replacetasksuserhow: Attributes for tasks replaced by AI | Matrix |
|---|---|

**Not back | Number of rows: 3 | Number of columns: 3**

You said that AI automated some tasks that you used to do. Were most of these tasks …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Yes | No | Don't know |
|---|---|---|---|---|
| | | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

| Q262 - createtasksuser: Created tasks by AI | Single coded |
|---|---|

**Not back**

Thinking about your job, has AI created new tasks that you did not do previously?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

| **Q028 - createtasksuserhow: Attributes for new tasks created by AI** | Matrix |
|---|---|

**Not back | Number of rows: 3 | Number of columns: 3**

You said that AI created tasks that you did not do previously. Are most of these new tasks …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

| **Q029 - helpdecisionsuser: AI help with decisions** | Single coded |
|---|---|

**Not back**

Thinking about your job, does AI assist you with decision-making?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| **Q030 - impactdecisionsuser: AI impact on decisions** | Matrix |
|---|---|

**Not back | Number of rows: 4 | Number of columns: 6**

You said that AI assists you with decision-making. To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | 4 | 5 | 8 |
| AI helps me make faster decisions. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| AI helps me make better decisions. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I like that AI assists me with decision-making. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| Because of AI, I have less control over decision-making. | 4 | ○ | ○ | ○ | ○ | ○ | ○ |

**Q031 - impactautonomyuser: AI impact on autonomy of work** `Matrix`

**Not back | Number of rows: 2 | Number of columns: 6**

How has AI changed how you work, in terms of …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Increased it a lot | Increased it a little | Decreased it a little | Decreased it a lot | No effect | Don't know |
|---|---|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | 4 | 5 | 8 |
| The pace at which you perform your tasks. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| The control you have over the sequence in which you perform your tasks. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |

**Q032 - impactperformanceuser: AI impact on performance of work** `Single coded`

**Not back**

How do you think AI has changed your own job performance?

**Normal**

| 1 | Improved it a lot |
|---|---|
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q033 - impactenjoymentuser: AI impact on enjoyment of work** `Single coded`

**Not back**

How do you think AI has changed how much you enjoy your job?

**Normal**

| 1 | Increased it a lot |
|---|---|
| 2 | Increased it a little |
| 3 | Decreased it a little |
| 4 | Decreased it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q034 - impacthealthuser: AI impact on health and safety | Single coded |
| --- | --- |

**Not back**

How do you think AI has changed <u>your physical health and safety in the workplace?</u>

**Normal**

| | |
| --- | --- |
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q035 - impactmentaluser: AI impact on mental health | Single coded |
| --- | --- |

**Not back**

How do you think AI has changed <u>your mental health and well-being</u> in the workplace?

**Normal**

| | |
| --- | --- |
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q036 - impactmanagementuser: AI impact on management fairness | Single coded |
| --- | --- |

**Not back**

How do you think that AI has changed <u>how fairly your manager or supervisor treats you</u>?

**Normal**

| | |
| --- | --- |
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q037 - attitudesuser: Attitudes of users about AI**  `Matrix`

**Not back | Number of rows: 3 | Number of columns: 6**

To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | 4 | 5 | 8 |
| I worry about taking instructions from an AI-powered robot or software. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry about being left behind due to AI in my workplace. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that AI is being introduced too quickly in my workplace. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |

**B005 - IMPACTUSER: AI IMPACT FOR USERS**  `End block`

**B006 - IMPACTNONUSER: AI IMPACT ON COMPANY FOR ADOPTERS WHO DO NOT USE AI**  `Begin block`

[Question block presented only to aiuser code 2]

**Q381 - replacetasksnonuser: Replaced tasks by AI**  `Single coded`

**Not back**

In your company, has AI automated any tasks that workers used to do?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q039 - replacetasksnonuserhow: Attributes for tasks replaced by AI** | Matrix

**Not back | Number of rows: 3 | Number of columns: 3**

You said that AI automated some tasks that workers used to do. Were most of these tasks …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

**Q382 - createtasksnonuser: Created tasks by AI** | Single coded

**Not back**

In your company, has AI created new tasks that workers did not do previously?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

**Q040 - createtasksnonuserhow: Attributes for new tasks created by AI** | Matrix

**Not back | Number of rows: 3 | Number of columns: 3**

You said that AI created tasks that workers did not do previously. Are most of these new tasks …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

**Q041 - helpdecisionsnonuser: AI help with decisions**   `Single coded`

**Not back**

In your company, does AI assist workers in making decisions?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

Ask only if **Q041 - helpdecisionsnonuser**,1

**Q042 - impactdecisionsnonuser: AI impact on decisions**   `Matrix`

**Not back | Number of rows: 4 | Number of columns: 6**

You said that AI assists workers in your company with decision-making. To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| AI helps these workers make faster decisions. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| AI helps these workers make better decisions. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| These workers like that AI assists them with decision-making. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| Because of AI, these workers have less control over decision-making. | 4 | ○ | ○ | ○ | ○ | ○ | ○ |

**Q043 - impactautonomynonuser: AI impact on autonomy of work**   `Matrix`

**Not back | Number of rows: 2 | Number of columns: 6**

How do you think AI has changed how workers in your company do their work, in terms of …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Increased it a lot | Increased it a little | Decreased it a little | Decreased it a lot | No effect | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| The pace at which they perform their tasks. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| The control workers have over the sequence in which they perform their tasks. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |

| Q044 - impactperformancenonuser: AI impact on performance of work | Single coded |
|---|---|

**Not back**

How do you think AI has changed the <u>job performance</u> of workers in your company?

**Normal**

| | |
|---|---|
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q045 - impactenjoymentnonuser: AI impact on enjoyment of work | Single coded |
|---|---|

**Not back**

How do you think AI has changed how much workers in your company <u>enjoy their jobs</u>?

**Normal**

| | |
|---|---|
| 1 | Increased it a lot |
| 2 | Increased it a little |
| 3 | Decreased it a little |
| 4 | Decreased it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q046 - impacthealthnonuser: AI impact on health and safety | Single coded |
|---|---|

**Not back**

How do you think AI has changed the <u>physical health and safety</u> of workers in your company?

**Normal**

| | |
|---|---|
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q047 - impactmentalnonuser: AI impact on mental health** | `Single coded`

**Not back**

How do you think AI has changed the <u>mental health and well-being</u> of workers in your company?

**Normal**

| | |
|---|---|
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q048 - impactmanagementnonuser: AI impact on management fairness** | `Single coded`

**Not back**

How do you think that AI has changed how <u>fairly managers or supervisors in your company treat workers</u>?

**Normal**

| | |
|---|---|
| 1 | Improved it a lot |
| 2 | Improved it a little |
| 3 | Worsened it a little |
| 4 | Worsened it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q049 - attitudesnonuser: Attitudes of non-users about AI** | `Matrix`

**Not back | Number of rows: 3 | Number of columns: 6**

To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| I worry about taking instructions from an AI-powered robot or software. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry about being left behind due to AI in the workplace. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that AI is being introduced too quickly in my workplace. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |

| B006 - IMPACTNONUSER: AI IMPACT ON COMPANY FOR ADOPTERS WHO DO NOT USE AI | **End block** |
|---|---|

| Ask only if **Q014 - adopter**,2 |
|---|

| B007 - IMPACTNONADOPTER: AI IMPACT IN SECTOR FOR NON-ADOPTERS | **Begin block** |
|---|---|

| Q050 - impactperformancesector: AI impact on performance of work | **Single coded** |
|---|---|

**Not back**

How do you think AI will change the <u>job performance</u> of workers in your sector?

**Normal**

| 1 | Improve it a lot |
|---|---|
| 2 | Improve it a little |
| 3 | Worsen it a little |
| 4 | Worsen it a lot |
| 5 | No effect |
| 8 | Don't know |

| Q051 - impactenjoymentsector: AI impact on enjoyment of work | **Single coded** |
|---|---|

**Not back**

How do you think AI will change how much workers in your sector <u>enjoy their job</u>?

**Normal**

| 1 | Increase it a lot |
|---|---|
| 2 | Increase it a little |
| 3 | Decrease it a little |
| 4 | Decrease it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q052 - impacthealthsector: AI impact on health and safety**    `Single coded`

**Not back**

How do you think AI will change the <u>physical health and safety</u> of workers in your sector?

**Normal**

| | |
|---|---|
| 1 | Improve it a lot |
| 2 | Improve it a little |
| 3 | Worsen it a little |
| 4 | Worsen it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q053 - impactmentalsector: AI impact on mental health**    `Single coded`

**Not back**

How do you think AI will change the <u>mental health and well-being</u> of workers in your sector?

**Normal**

| | |
|---|---|
| 1 | Improve it a lot |
| 2 | Improve it a little |
| 3 | Worsen it a little |
| 4 | Worsen it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q054 - impactmanagementsector: AI impact on management fairness**    `Single coded`

**Not back**

How do you think AI will change how <u>fairly managers or supervisors treat workers</u> in your sector?

**Normal**

| | |
|---|---|
| 1 | Improve it a lot |
| 2 | Improve it a little |
| 3 | Worsen it a little |
| 4 | Worsen it a lot |
| 5 | No effect |
| 8 | Don't know |

**Q055 - attitudessector: Attitudes of non-adopters about AI** <span>Matrix</span>

**Not back | Number of rows: 3 | Number of columns: 6**

To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 | 8 |
| I worry about taking instructions from an AI-powered robot or software. 1 | O | O | O | O | O | O |
| I worry about being left behind due to AI in my sector. 2 | O | O | O | O | O | O |
| I worry that AI is being introduced too quickly in my sector. 3 | O | O | O | O | O | O |

**B007 - IMPACTNONADOPTER: AI IMPACT IN SECTOR FOR NON-ADOPTERS** <span>End block</span>

**B008 - IMPACTALL: AI IMPACT - GENERAL** <span>Begin block</span>

**Q056 - generalimpact: General AI impact on your sector** <span>Single coded</span>

**Not back**

Thinking about the next 10 years, do you think that AI is likely to have a positive or a negative impact on workers in your sector?

**Normal**

| 1 | Very positive |
|---|---|
| 2 | Somewhat positive |
| 3 | No impact |
| 4 | Somewhat negative |
| 5 | Very negative |
| 8 | Don't know |

**Q057 - wagesai: AI impact on wages**　　　　　　　**Single coded**

**Not back**

Do you think that AI will have an impact on wages in your sector in the next 10 years?

**Normal**

| | |
|---|---|
| 1 | Yes, AI will increase wages |
| 2 | Yes, AI will decrease wages |
| 3 | No, AI will not impact wages |
| 8 | Don't know |

**Q058 - joblossai: Worries about jobloss**　　　　　　**Matrix**

**Not back | Number of rows: 2 | Number of columns: 6**

How worried are you about losing your job as a result of AI …

**Rows: Normal | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Extremely worried | Very worried | Moderately worried | Slightly worried | Not worried at all | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| In the next 2 years? | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| In the next 10 years? | 2 | ○ | ○ | ○ | ○ | ○ | ○ |

Ask only if **Q014 - adopter**,1

**Q059 - impactredundancies: AI impact on redundancies in company**　**Single coded**

**Not back**

Do you know of anyone in your company who has lost their job because of AI?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q060 - impactredundanciesall: AI impact on redundancies in sector**　**Single coded**

**Not back**

Do you know of anyone outside of your company in the [PROG IF sector code 1 insert "finance and insurance"; IF sector code 2 insert "manufacturing"] sector who has lost their job because of AI?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

Ask only if **Q014 - adopter**,1

## Q061 - impactjobchange: Job changes within company due to AI | Single coded

**Not back**

Do you know of anyone, including yourself, who has had to change jobs within your company because of AI?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

## Q062 - impactjobchangeall: AI impact on job changes in sector | Single coded

**Not back**

Do you know people outside your company in the [PROG IF sector code 1 insert "finance and insurance"; IF sector code 2 insert "manufacturing"] sector, who have had to change their jobs because of AI?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

## B008 - IMPACTALL: AI IMPACT - GENERAL | End block

## B009 - CONSULT: WORKER CONSULTATION | Begin block

## Q063 - unionmembership: Trade union member | Single coded

**Not back**

Are you a member of a trade union?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 9 | Prefer not to answer |

**Q064 - unionmembership2: Other trade union members in company** | Single coded

**Not back**

To the best of your knowledge, are any other workers in your company members of a trade union?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 9 | Prefer not to answer |

Ask only if **Q001 - country**,2,4,5,6,7

| Q065 - workerrep: Other worker representation in the company - not in DE/AT | Single coded |
|---|---|

**Not back**

Apart from a trade union, is there any other form of worker representation in your company, such as a works council?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

Ask only if **Q001 - country**,1,3

| Q066 - workerrep2: Other worker representation in the company - in DE/AT | Single coded |
|---|---|

**Not back**

Is there a works council in your company?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| Q067 - consultrep: Consultation of workers when introducing new technologies | Single coded |
|---|---|

**Not back**

In your experience, does your employer consult workers or worker representatives regarding the use of new technologies in the workplace?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| Q068 - frame2: Framing on big data | Text |
|---|---|

**Not back**

In general, AI relies on large amounts of data to make predictions.

**Q069 - workerdata: AI collecting worker data**  Single coded

**Not back**

To the best of your knowledge, does your company's application of AI collect data on you as an individual or how you do your work?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q070 - datapurpose: Purpose of worker data collection**  Single coded

**Not back**

To the best of your knowledge, is the data used to assess worker performance?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q071 - dataworriesuser: Worries about data collection for AI by users**  Matrix

**Not back | Number of rows: 4 | Number of columns: 6**

To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| I feel increased pressure to perform at work due to the collection of my data. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry about my privacy when my data is collected. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that the collection of my data will lead to decisions biased against me. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that too much of my data is being collected. | 4 | ○ | ○ | ○ | ○ | ○ | ○ |

Ask only if **Q069 - workerdata**,2,8 or **Q014 - adopter**,2

| **Q072 - dataworriesnonuser: Potential worries if there were data collection for AI** | Matrix |
|---|---|

**Not back | Number of rows: 3 | Number of columns: 6**

Imagine your company started using AI-based software that collected data on you and your work. To what extent do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| I would feel increased pressure to perform at work due to the collection of my data. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| I would worry about my privacy if my data were being collected. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that the collection of my data would lead to decisions biased against me. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |

Ask only if **Q014 - adopter**,1

| **Q099 - training: Training provided/funded** | Single coded |
|---|---|

**Not back**

Has your company provided or funded training so that you can work with AI?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

**Q073 - skillsattitudesuser: Attitudes on skills for AI by users**  **Matrix**

**Not back | Number of rows: 4 | Number of columns: 6**

Please think about the skills you need in your job. Do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| AI has made some of my skills less valuable. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| AI complements my skills. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I have specialised AI skills, such as those needed to maintain or develop AI. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| I am enthusiastic to learn more about AI. | 4 | ○ | ○ | ○ | ○ | ○ | ○ |

[Question shown only to AI users as identified in variable "aiuser" code 1]

**Q074 - skillsattitudesnonuser: Attitudes on skills for AI by non-users/non-adopters**  **Matrix**

**Not back | Number of rows: 4 | Number of columns: 6**

Do you agree or disagree with the following statements?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Strongly agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Strongly disagree | Don't know |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 8 |
| I worry that I do not have the skills to work with new technologies. | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| I worry that new technologies will make my existing skills less valuable. | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel confident that new technologies will complement my existing skills. | 3 | ○ | ○ | ○ | ○ | ○ | ○ |
| I am enthusiastic to learn how to work with new technologies. | 4 | ○ | ○ | ○ | ○ | ○ | ○ |

[Question shown only to AI non-users as identified in variable "aiuser" code 2 OR non-adopters in variable "adopter" code 2]

| **B009 - CONSULT: WORKER CONSULTATION** | **End block** |
|---|---|

| **B010 - POLICY: POLICY ATTITUDES** | **Begin block** |
|---|---|

| **Q075 - trustcompany: Trust in the company to handle AI** | **Matrix** |
|---|---|

**Not back | Number of rows: 5 | Number of columns: 5**

[PROG: IF adopters code 2, THEN insert:] Imagine that your company was going to adopt AI.
To what extent would you trust your company to …

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Trust completely | Trust somewhat | Do not trust very much | Do not trust at all | Don't know |
|---|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | 4 | 8 |
| Use AI in a way that benefits all workers? | 1 | ○ | ○ | ○ | ○ | ○ |
| Provide training for workers who will work with AI? | 2 | ○ | ○ | ○ | ○ | ○ |
| Take workers' views into account when making decisions about AI? | 3 | ○ | ○ | ○ | ○ | ○ |
| Only use AI that is safe and trustworthy? | 4 | ○ | ○ | ○ | ○ | ○ |
| Attempt to minimize job loss due to AI? | 5 | ○ | ○ | ○ | ○ | ○ |

**Q076 - bannedai: Banning or regulation of AI**  `Matrix`

**Not back | Number of rows: 6 | Number of columns: 4**

Do you think that the following uses of AI should be banned, allowed with restrictions or allowed without restrictions?

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Banned | Allowed with restrictions | Allowed without restrictions | Don't know |
|---|---|---|---|---|---|
|  |  | 1 | 2 | 3 | 8 |
| AI assessing worker performance should be … | 1 | ○ | ○ | ○ | ○ |
| AI deciding what training workers should receive should be … | 2 | ○ | ○ | ○ | ○ |
| AI deciding which workers are recruited should be … | 3 | ○ | ○ | ○ | ○ |
| AI deciding which workers are dismissed should be … | 4 | ○ | ○ | ○ | ○ |
| AI deciding which workers are promoted should be … | 5 | ○ | ○ | ○ | ○ |
| AI monitoring workers' well-being to tackle workplace stress should be … | 6 | ○ | ○ | ○ | ○ |

**B010 - POLICY: POLICY ATTITUDES**  `End block`

**B011 - PROFILE: RESPONDENT CHARACTERISTICS**  `Begin block`

**Q077 - employeesex: Gender**  `Single coded`

**Not back**

How would you describe yourself?

**Normal**

| 1 | Male |
|---|---|
| 2 | Female |
| 3 | In another way |

## Q078 - origin: Migration background

**Matrix**

**Not back | Number of rows: 3 | Number of columns: 3**

Which of the following applies to you?

**Rows: Normal | Columns: Normal**

**Rendered as Dynamic Grid**

|  |  | Yes | No | No answer |
|---|---|---|---|---|
|  |  | 1 | 2 | 3 |
| I was born in another country. | 1 | ◯ | ◯ | ◯ |
| My mother was born in another country. | 2 | ◯ | ◯ | ◯ |
| My father was born in another country. | 3 | ◯ | ◯ | ◯ |

## Q079 - race: Race (US sample)

**Multi coded**

**Not back | Min = 1**

Which of the following best describes you?

Choose one or more.

**Normal**

| | |
|---|---|
| 1 | White |
| 2 | Black or African American |
| 3 | American Indian or Alaska Native |
| 4 | Asian |
| 5 | Native Hawaiian or Other Pacific Islander |
| 9 | No answer *Exclusive* |

Ask only if **Q001 - country**,6

## Q080 - ethnicity: Ethnic background (US sample)

**Multi coded**

**Not back | Min = 1**

Are you of Hispanic, Latino or Spanish origin?

Choose one or more.

**Normal**

| | |
|---|---|
| 1 | No, not of Hispanic, Latino, or Spanish origin *Exclusive* |
| 2 | Yes, Mexican, Mexican American, Chicano |
| 3 | Yes, Puerto Rican |
| 4 | Yes, Cuban |
| 5 | Yes, another Hispanic, Latino, or Spanish origin, please specify: *Open* |
| 9 | No answer *Exclusive* |

**Q081 - education: University degree**  `Single coded`

**Not back**

Have you completed at least a bachelor's degree or equivalent?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 9 | No answer |

Note: this question should collect the education level ISCED 6 or higher. For Germany, the question is translated as follows: "Haben Sie ein abgeschlossenes Studium an einer Hochschule, Fach- order Meisterschule order Fachakademie?"

**Q082 - employeerole: Role in the organisation**  `Single coded`

**Not back**

Which of the following categories best describe your job in your company?

**Normal**

| | |
|---|---|
| 1 | Manager |
| 2 | Professional |
| 3 | Technician and associate professional |
| 4 | Clerical support worker |
| 5 | Service and sales worker |
| 6 | Craft and related trades worker |
| 7 | Plant and machine operator and assembler |
| 8 | Elementary occupation |
| 9 | Other |
| 10 | No answer |

Ask only if **Q082 - employeerole**,2,3,4,5,6,7,8,9,10

**Q083 - employeetype: Supervisory role**  `Single coded`

**Not back**

In your job, do you supervise or manage other workers?

**Normal**

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 9 | No answer |

**Q084 - employeetenure: Employee tenure**  `Numeric`

**Not back | Min = 1971 | Max = 2022**

Since what year have you been with your current employer?

| |
|---|
| |

[Drop-down menu of years with "No answer" option]

### Q085 - businesssizebands: Size of company
<div style="float:right">**Single coded**</div>

**Not back**

How many persons work for your company, in the country where you are working? Please include both full-time and part-time staff.

**Normal**

| | |
|---|---|
| 1 | Up to 19 workers |
| 2 | 20 to 49 workers |
| 3 | 50 to 99 workers |
| 4 | 100 to 249 workers |
| 5 | 250 to 499 workers |
| 6 | 500 workers or more |
| 9 | Don't know |

Ask only if **Q001 - country**,2,6

### Q086 - emphourly: Hourly wage vs salary in USA and Canada
<div style="float:right">**Single coded**</div>

**Not back**

Are you paid an hourly wage or are you a salaried employee?

Hourly pay is based on the number of hours you work, while salaried pay generally does not change by pay period.

**Normal**

| | |
|---|---|
| 1 | I am paid an hourly wage. |
| 2 | I am paid a salary. |
| 9 | No answer |

Ask only if **Q001 - country**,1,3,4,5,7

### Q087 - emptemp: Type of employment contract in DE, AT, IE, UK, FR
<div style="float:right">**Single coded**</div>

**Not back**

Are you currently employed on a …

**Normal**

| | |
|---|---|
| 1 | Permanent/open-ended contract? |
| 2 | Temporary/fixed-term contract? |
| 3 | Neither of these |
| 9 | No answer |

### Q088 - empfullorpart: Full-time or part-time employment
<div style="float:right">**Single coded**</div>

**Not back**

Do you currently work …

**Normal**

| | |
|---|---|
| 1 | Full-time? |
| 2 | Part-time? |
| 9 | No answer |

## Q089 - location: Location of work    Single coded

**Not back**

Do you currently work ...

**Normal**

| | |
|---|---|
| 1 | Entirely at home? |
| 2 | Mostly at home? |
| 3 | Mostly on company premises? |
| 4 | Entirely on company premises? |
| 9 | No answer |

## Q090 - lifesatisfaction: Satisfaction with life    Matrix

**Not back | Number of rows: 3 | Number of columns: 6**

How satisfied are you with ...

**Rows: Random | Columns: Normal**

**Rendered as Dynamic Grid**

| | | Very satisfied | Somewhat satisfied | Neither satisfied nor dissatisfied | Somewhat dissatisfied | Very dissatisfied | No answer |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 9 |
| Your job? | 1 | ○ | ○ | ○ | ○ | ○ | ○ |
| Your health? | 2 | ○ | ○ | ○ | ○ | ○ | ○ |
| Your financial situation? | 3 | ○ | ○ | ○ | ○ | ○ | ○ |

**B011 – PROFILE: RESPONDENT CHARACTERISTICS**    **End block**

Ask only if **Q006 - employed**,2,3 or **Q007 - sector**,3 or **Q005 - employeeagecat2**,1

## Q096 - out1: Screenout - not part of the target group    Text

**Not back**

Thank you for answering these questions.
Unfortunately, you do not belong to the group of persons we are looking for this time.
To ensure you receive your reward you must click on the button below to be taken back to the panel site home page.

## Q097 - out2: Screenout - quota full    Text

**Not back**

Thank you for answering these questions.
Unfortunately, it has reached its target number of participants and is now closed.
To ensure you receive your reward you must click on the button below to be taken back to the panel site home page.

| **Q098 - out3: End of survey** | **Text** |
|---|---|

**Not back**

Thank you for taking part in this survey.
To ensure you receive your reward you must click on the button below to be taken back to the panel site home page.

# Annex B. Employer questionnaire

| **B001 - INTRO: SCREENING AND INTRODUCTION** | **Begin block** |
|---|---|

| **Q001 - country: Country (sample source)** | **Single coded** |
|---|---|

**Not back | Dummy**

**Normal**

| | |
|---|---|
| 1 | Austria |
| 2 | Canada |
| 3 | Germany |
| 4 | Ireland |
| 5 | the United Kingdom |
| 6 | the United States |
| 7 | France |

| **Q002 - industry1: Industry type (sample source)** | **Single coded** |
|---|---|

**Not back | Dummy**

**Normal**

| | |
|---|---|
| 1 | Finance and insurance activities |
| 2 | Manufacturing |

| **Q003 - size1: Size of company (sample source)** | **Single coded** |
|---|---|

**Not back | Dummy**

**Normal**

| | |
|---|---|
| 1 | < 20 workers |
| 2 | 20 to 49 workers |
| 3 | 50 to 249 workers |
| 3 | 250 to 499 workers |
| 4 | 500 or more workers |

### Q004 - languagecanada: Language choice within Canada
**Single coded**

**Not back**

In which language do you want to continue?
Dans quelle langue voulez-vous continuer?

**Normal**

| | |
|---|---|
| 1 | English |
| 2 | Francais |

### Q005 - intro1: Introduction to survey
**Single coded**

**Not back**

Good morning/afternoon. My name is ... from [PROG: institute] in [PROG: location of the institute].

On behalf of the OECD, we are conducting a survey about advanced technologies and their impact on workplaces.
To this end, I would like to talk to the person who has the best overview of the advanced technologies applied in this company.
[PROG if size1 &lt; 250:] Usually, this is the owner or manager of the company, but it can also be a specific manager for technology.
[PROG if size1 = 250 or more AND industry1, code 1:] Usually, this is either the managing director of the company or the head of technology.
[PROG if size1 = 250 or more AND industry1, code 2:] Usually, this is either the managing director of the company or the head of technology or the head of production.

Explain if needed:
**The OECD (or Organisation for Economic Co-operation and Development) is** an international research and policy organisation that works to shape policies that foster prosperity, opportunity and well-being for all.
**The aim of the study is** to find out how the adoption of advanced technologies impacts workplaces in companies within two sectors: manufacturing as well as finance and insurance.
**The results of the survey will be used** to better understand the opportunities and risks associated with these new developments and to shape policies in this area. The OECD will publish a report based on this survey, which you will be able to access on their website next year.
If more topic details required:
The aim is to explore whether advanced technologies are used in your company and if so, how they impact workplaces. If you and your company do not work with advanced technologies, we also would like to get to know your view on these new developments in your sector.
I can send you a cover letter by email. This explains the objectives of this study and the data protection measures.

**Normal**

| | |
|---|---|
| 1 | Respondent is this person and OK to continue |
| 2 | Appointment for a later call |
| 3 | Respondent puts through to another person |
| 4 | Respondent names another person to call |
| 5 | Refused |
| 6 | Motivation letter and data privacy information |

## Q006 - participate: Data privacy and agreement to participate `Single coded`

### Not back

The survey is conducted on behalf of the OECD by the research institute Kantar.
Your participation is of course voluntary and you have the right to revoke your consent at any time.
Your workplace has been selected at random to represent its sector and size. To obtain representative results, however, it is important that as many of the selected companies as possible take part.
All data will be treated with absolute confidentiality and all analyses of results will be totally anonymous, not revealing your name or the name of your company at any time.
Do you have any questions about data privacy at this stage or do you want to get any written information about the survey and the data protection rules by email beforehand?
Would you be so kind as to participate in this interview?

<div style="border:1px solid green">

Explain if needed:
**The OECD (or Organisation for Economic Co-operation and Development) is** an international research and policy organisation that works to shape policies that foster prosperity, opportunity and well-being for all.
**The aim of the study is** to find out how the adoption of advanced technologies impacts workplaces in companies within two sectors: manufacturing as well as finance and insurance.
**The results of the survey will be used** to better understand the opportunities and risks associated with these new developments and to shape policies in this area. The OECD will publish a report based on this survey, which you will be able to access on their website towards the end of this year.
If more topic details required:
The aim is to explore whether advanced technologies are used in your company and if so, how they impact workplaces. If you and your company do not work with advanced technologies, we also would like to get to know your view on these new developments in your sector.
I can send you a cover letter by email. This explains the objectives of this study and the data protection measures.

</div>

### Normal

| | |
|---|---|
| 1 | OK to conduct interview right now |
| 2 | Appointment for a later call |
| 3 | Refused because there is no target person for this topic in this company |
| 4 | Does generally not participate in telephone interviews |
| 5 | Refusal for other reasons |
| 6 | Motivation letter and data privacy information |

## Q007 - industry2: Industry confirmation by respondent `Single coded`

### Not back

According to the information we have available, the sector your company is in is [PROG: insert industry1].
Is this correct?

### Normal

| | | |
|---|---|---|
| 1 | Yes | |
| 2 | No | ➔ GO TO SCREEN OUT |
| 8 | DO NOT READ OUT: I don't know | ➔ GO TO SCREEN OUT |

[IF code 2 or 8 THEN show screen out text: Unfortunately we are only looking for respondents in this specific sector. Thank you very much for your time. This is the end of the survey. ]

## Q008 - industry3: Industry according to respondent
**Single coded**

**Not back | Dummy**

**Normal**

| | |
|---|---|
| 1 | Finance and insurance |
| 2 | Manufacturing |

[Pipe in answers as follows:
IF in industry1 code 1 and in industry2 code 1 (yes) => THEN in this question code 1 (finance and insurance).
IF in industry1 code 2 and in industry2 code 1 (yes) => THEN in this question code 2 (manufacturing).]

## Q009 - size2: Size by respondent - numeric
**Numeric**

**Not back | Min = 1 | Max = 99000**

Including yourself, approximately how many workers work for your company in [PROG: insert country]?
Please include both full-time and part-time staff on your payroll, as well as any directors or owners.

*Probe for the best estimate before selecting 'don't know'.*

| | |
|---|---|
| 999 | Don't know *Fixed *Exclusive* |

## Q010 - size3: Size by respondent - categories
**Single coded**

**Not back | Dummy**

**Normal**

| | | |
|---|---|---|
| 1 | < 20 workers | ➔ GO TO SCREEN OUT |
| 2 | 20 to 49 workers | |
| 3 | 50 to 249 workers | |
| 4 | 250 to 499 workers | |
| 5 | 500 or more workers | |

[Assign answers from size2 (numeric), but IF DK in size2 => THEN use the same category as in size1.
IF code 1 in size3, THEN show screen out text: Unfortunately we are only looking for respondents in larger companies. Thank you very much for your time. This is the end of the survey.]

| | |
|---|---|
| **B001 - INTRO: SCREENING AND INTRODUCTION** | **End block** |

| | |
|---|---|
| **B002 - ADOPT: ADOPTION OF AI** | **Begin block** |

**Q012 - aidefinition: AI definition**  Text

<u>**Not back**</u>

In the questions that follow, the term 'artificial intelligence' is used. No matter how familiar you are with the term, please have the following definition in mind when answering the subsequent questions:

Artificial intelligence - or 'AI' in short - is, what enables smart computer programs and machines to carry out tasks that would typically require human intelligence.
Some examples where AI can be found in your everyday life include:
- Siri, Alexa and other smart assistants,
- Netflix or YouTube recommendations, and
- Self-driving cars

Some examples where AI can be found in your sector include:
[IF industry1 = code 1 (finance) THEN:] Robo-advisors, chatbots used for customer service, and fraud detection software
[IF industry1 = code 2 (manufacturing) THEN:] Robots that use cameras to check items for flaws, software used to predict prices and demand and technology that predicts when machines should be serviced

**Q013 - adoption: Adoption of AI in company - in general**  Single coded

<u>**Not back**</u>

To the best of your knowledge, does your company use artificial intelligence?
Please think of all areas within your company in [PROG: insert country], not just the area you work in.

<div style="border:1px solid green">
Interviewer hints:
Respondents reporting that they use artificial intelligence but have outsourced the development or maintenance of the technology to another company should be encouraged to report "yes" here.
Respondents reporting that they don't use artificial intelligence themselves, but that some of their suppliers use it, should be encouraged to report "no" here.
The key point of this question is whether artificial intelligence is used within the respondent's company.
</div>

<u>**Normal**</u>

| | |
|---|---|
| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**Q014 - adopter: Adopters vs Non-Adopters of AI**  Single coded

<u>**Not back | Dummy**</u>

<u>**Normal**</u>

| | |
|---|---|
| 1 | Adopters |
| 2 | Non-adopters |

[Pipe in answers from previous question adoption:
IF adoption code 1 (yes) => THEN in this question code 1 (adopters);
IF adoption code 2 (no) OR code 8 (DK) => THEN in this question code 2 (non-adopters).]

Ask only if **Q014 - adopter**,1

| **B003 - ADOPTDETAIL: DETAILED INFORMATION FROM ADOPTERS** | **Begin block** |

---

**Q016 - lengthai: Length of AI experience in company**     **Numeric**

**Not back | Min = 0 | Max = 40**

Approximately how many years ago did your company first start using artificial intelligence?

999     Don't know *Fixed *Exclusive

---

Ask only if **Q008 - industry3**,1

**Q017 - aiusesfinance: AI usage in finance sector**     **Matrix**

**Not back | Number of rows: 9 | Number of columns: 3**

I am going to list some possible uses of artificial intelligence in the finance and insurance sector. Please tell me whether or not your company uses AI for each of the following purposes:

Please read out.

**Rows: Rotated | Columns: Normal**

|  |  | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Data analytics? | 1 | ○ | ○ | ○ |
| Risk management? | 2 | ○ | ○ | ○ |
| Fraud detection? | 3 | ○ | ○ | ○ |
| Trading and investment? | 4 | ○ | ○ | ○ |
| Administration? | 5 | ○ | ○ | ○ |
| Customer service and advice? | 6 | ○ | ○ | ○ |
| Reporting? | 7 | ○ | ○ | ○ |
| Human resources? | 8 | ○ | ○ | ○ |
| Other areas? *Fixed | 9 | ○ | ○ | ○ |

Ask only if **Q008 - industry3**,2

**Q018 - aiusesmanufacturing: AI usage in manufacturing sector** Matrix

**Not back | Number of rows: 6 | Number of columns: 3**

I am going to list some possible uses of artificial intelligence in the manufacturing sector. Please tell me whether or not your company uses AI for each of the following purposes:

Please read out.

**Rows: Rotated | Columns: Normal**

|  |  | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Product design? | 1 | ○ | ○ | ○ |
| Planning and scheduling? | 2 | ○ | ○ | ○ |
| Production processes? | 3 | ○ | ○ | ○ |
| Maintenance tasks? | 4 | ○ | ○ | ○ |
| Human Resources? | 5 | ○ | ○ | ○ |
| Other areas? *Fixed* | 6 | ○ | ○ | ○ |

Ask only if **Q018 - aiusesmanufacturing** ROW=3 & COL=1

**Q019 - aiappsmanufacturing: AI usage in manufacturing sector in production** Matrix

**Not back | Number of rows: 6 | Number of columns: 3**

You reported that your company uses artificial intelligence for production processes. Is it used for any of the following applications?

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Quality control? | 1 | ○ | ○ | ○ |
| Digital twins and simulation? | 2 | ○ | ○ | ○ |
| Robotics? | 3 | ○ | ○ | ○ |
| Worker assistance? | 4 | ○ | ○ | ○ |
| Autonomous vehicles? | 5 | ○ | ○ | ○ |
| Other areas? *Fixed* | 6 | ○ | ○ | ○ |

| Q020 - frame1: Framing for adopters | Text |
|---|---|

**Not back**

I'm going to ask a few questions about how you think artificial intelligence impacts workers. To answer these questions, please think of the technologies that you've mentioned that your company uses here in [PROG: insert country].

| Q021 - motivation: Motivations for adopting AI | Matrix |
|---|---|

**Not back | Number of rows: 4 | Number of columns: 3**

There are many reasons why companies choose to adopt artificial intelligence. To the best of your knowledge, were any of the following motivations for your company adopting artificial intelligence?

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| To improve worker performance? | 1 | ○ | ○ | ○ |
| To reduce staff costs? | 2 | ○ | ○ | ○ |
| To improve workers' health and safety? | 3 | ○ | ○ | ○ |
| To address skill shortages? | 4 | ○ | ○ | ○ |

| B003 - ADOPTDETAIL: DETAILED INFORMATION FROM ADOPTERS | End block |
|---|---|

| B002 - ADOPT: ADOPTION OF AI | End block |
|---|---|

Ask only if **Q014 - adopter**,1

| B005 - IMPACTCOMPANY: IMPACT IN COMPANY BY ADOPTERS | Begin block |
|---|---|

**Q026 - impacttasks: Changing tasks by AI**　Matrix

**Not back | Number of rows: 2 | Number of columns: 3**

Thinking about your company, has artificial intelligence …

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Automated tasks that workers used to do? | 1 | ○ | ○ | ○ |
| Created new tasks that workers did not do previously? | 2 | ○ | ○ | ○ |

Ask only if **Q026 - impacttasks** ROW=1 & COL=1

**Q027 - replacetasks: Attributes for tasks replaced by AI**　Matrix

**Not back | Number of rows: 3 | Number of columns: 3**

You said that artificial intelligence automated tasks that workers used to do before. Were most of these tasks …

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

Ask only if **Q026 - impacttasks** ROW=2 & COL=1

| **Q028 - createtasks: Attributes for new tasks created by AI** | Matrix |
|---|---|

**Not back | Number of rows: 3 | Number of columns: 3**

You said that artificial intelligence created tasks that workers didn't do previously. Are most of these new tasks …

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Repetitive? | 1 | ○ | ○ | ○ |
| Complex? | 2 | ○ | ○ | ○ |
| Dangerous? | 3 | ○ | ○ | ○ |

| **Q030 - emp: AI impact on overall employment in company** | Single coded |
|---|---|

**Not back**

Has artificial intelligence increased, decreased or had no effect on <u>overall employment</u> in your company?

**Normal**

| 1 | Increased |
|---|---|
| 2 | Decreased |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

| **Q034 - productivity: AI impact on worker productivity in company** | Single coded |
|---|---|

**Not back**

Has artificial intelligence increased, decreased or had no effect on <u>worker productivity</u> in your company?

**Normal**

| 1 | Increased |
|---|---|
| 2 | Decreased |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

### Q035 - satisfaction: AI impact on worker satisfaction in company
**Single coded**

**Not back**

Has artificial intelligence increased, decreased or had no effect on <u>worker satisfaction</u> in your company?

**Normal**

| | |
|---|---|
| 1 | Increased |
| 2 | Decreased |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

### Q036 - oshrisk: AI impact on health and safety in company
**Single coded**

**Not back**

Has artificial intelligence had a positive, negative or no effect on the <u>health and safety</u> of workers in your company?

**Normal**

| | |
|---|---|
| 1 | Positive effect |
| 2 | Negative effect |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

### Q038 - management: AI impact on measuring worker performance in company
**Single coded**

**Not back**

Has artificial intelligence increased, decreased or had no effect on <u>managers' ability to measure worker performance</u> in your company?

**Normal**

| | |
|---|---|
| 1 | Increased |
| 2 | Decreased |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

**B005 - IMPACTCOMPANY: IMPACT IN COMPANY BY ADOPTERS** **End block**

Ask only if **Q014 - adopter**,2

**B006 - IMPACTSECTOR: IMPACT IN SECTOR BY NON-ADOPTERS** **Begin block**

| Q043 - frame2: Framing for non-adopters | Text |
|---|---|

**Not back**

I'm going to ask a few questions about how you think artificial intelligence will impact workers. Your company does not need to have adopted artificial intelligence in order for you to be able to answer the questions. Please think of what you have heard of artificial intelligence, particularly how it is used in your sector here in [PROG: insert country].

| Q044 - empsector: AI impact on overall employment in sector | Single coded |
|---|---|

**Not back**

Do you think that artificial intelligence will increase, decrease or have no effect on overall employment in your sector in the next 10 years?

**Normal**

| | |
|---|---|
| 1 | Increase |
| 2 | Decrease |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

| Q048 - productivitysector: AI impact on worker productivity in sector | Single coded |
|---|---|

**Not back**

Do you think that artificial intelligence will increase, decrease or have no effect on <u>worker productivity</u>?

Repeat if needed: Please think about your sector as a whole and how it will develop in the next 10 years.

**Normal**

| | |
|---|---|
| 1 | Increase |
| 2 | Decrease |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

| Q050 - oshrisksector: AI impact on health and safety in sector | Single coded |
|---|---|

**Not back**

Do you think that artificial intelligence will have a positive, negative or no effect on the <u>health and safety</u> of workers?

Repeat if needed: Please think about your sector as a whole and how it will develop in the next 10 years.

**Normal**

| | |
|---|---|
| 1 | Positive effect |
| 2 | Negative effect |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

| B006 - IMPACTSECTOR: IMPACT IN SECTOR BY NON-ADOPTERS | End block |
|---|---|

| Ask only if **Q014 - adopter**,1 | |
|---|---|
| **B007 - DATA: DATA** | **Begin block** |

| Q053 - frame3: Framing on big data | Text |
|---|---|

**Not back**

Artificial intelligence often requires large amounts of data.

| Q054 - workerdata: AI collecting worker data | Single coded |
|---|---|

**Not back**

Does your company's use of artificial intelligence involve collecting data on workers or their work?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| **B007 - DATA: DATA** | **End block** |
|---|---|

| **B009 - SOCIAL: SOCIAL DIALOGUE - EMPLOYEE RELATIONS** | **Begin block** |
|---|---|

| Ask only if **Q001 - country**,2,4,5,6,7 | |
|---|---|
| Q060 - workerrep: Worker representation in company | Single coded |

**Not back**

Is there trade union representation, a works council or any other form of worker representation in your company?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| **Q063 - consultrep: Consultation of workers when introducing new technologies** | **Single coded** |
|---|---|

**Not back**

Does your company consult workers or worker representatives regarding the use of new technologies in the workplace?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

---

Ask only if **Q063 - consultrep**,1

| **Q064 - techconsult: Topics discussed with workers** | **Matrix** |
|---|---|

**Not back | Number of rows: 6 | Number of columns: 3**

I'm going to list a few topics that might have been discussed in consultations regarding the use of new technologies in the workplace. For each of these topics, please tell me whether or not they were discussed.

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| Potential job loss | 1 | ○ | ○ | ○ |
| Impact on wages | 2 | ○ | ○ | ○ |
| Impact on working conditions | 3 | ○ | ○ | ○ |
| Skills and training needs | 4 | ○ | ○ | ○ |
| Use of data | 5 | ○ | ○ | ○ |
| Impact on specific groups of workers | 6 | ○ | ○ | ○ |

Ask only if **Q014 - adopter**,1 and **Q063 - consultrep**,1

| Q065 - agreement: Agreements achieved at worker consultations | Matrix |
|---|---|

**Not back | Number of rows: 3 | Number of columns: 3**

Have these consultations led to …

Please read out.

**Rows: Random | Columns: Normal**

|  |  | Yes | No | Don't know |
|---|---|---|---|---|
|  |  | 1 | 2 | 8 |
| A collective agreement which addresses the use of artificial intelligence? | 1 | ○ | ○ | ○ |
| Changes to or the adoption of an artificial intelligence strategy? | 2 | ○ | ○ | ○ |
| Changes to or the adoption of guidelines for the use of artificial intelligence? | 3 | ○ | ○ | ○ |

| B009 - SOCIAL: SOCIAL DIALOGUE - EMPLOYEE RELATIONS | End block |
|---|---|

Ask only if **Q014 - adopter**,1

| B010 - SKILLSADOPT: SKILLS AND TRAINING NEEDS BY ADOPTERS | Begin block |
|---|---|

| Q066 - skillchange: Change in skill needs by AI in company | Single coded |
|---|---|

**Not back**

Do you think that artificial intelligence has changed skill needs in your company?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

Ask only if **Q066 - skillchange**,1

| Q069 - sourceskills: Sources for meeting skill needs | Matrix |
|---|---|

**Not back | Number of rows: 4 | Number of columns: 3**

Has your company addressed these changing skill needs in any of the following ways?

Please read out.

**Rows: Random | Columns: Normal**

| | | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
| | | 1 | 2 | 8 |
| By retraining or upskilling internal workers? | 1 | ○ | ○ | ○ |
| By hiring new workers? | 2 | ○ | ○ | ○ |
| By buying services from external companies? | 3 | ○ | ○ | ○ |
| By attrition or redundancies *Fixed* | 4 | ○ | ○ | ○ |

| Q067 - skillneeded1: Higher relevance of AI skills in company | Single coded |
|---|---|

**Not back**

In your company, has artificial intelligence made it more important to have <u>specialised artificial intelligence skills</u>, such as those needed to maintain or develop artificial intelligence?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

| Q068 - skillneeded2: Higher relevance of human skills in company | Single coded |
|---|---|

**Not back**

In your company, has artificial intelligence made it more important to have <u>human skills</u>, such as creativity and communication?

**Normal**

| 1 | Yes |
|---|---|
| 2 | No |
| 8 | Don't know |

**Q070 - skillneeded3: Higher relevance of university education in company** | Single coded

**Not back**

In your company, has artificial intelligence made it more important to have highly educated workers?

**Normal**

| 1 | Yes |
| 2 | No |
| 8 | Don't know |

**B010 - SKILLSADOPT: SKILLS AND TRAINING NEEDS BY ADOPTERS** | End block

**B012 - POLICY: GOVERNMENT POLICY AND REGULATION** | Begin block

**Q076 - barriers: Barriers of adopting AI** | Matrix

**Not back | Number of rows: 5 | Number of columns: 3**

I'm going to list a few potential barriers to the adoption of artificial intelligence. In each case, please tell me whether it has ever been a barrier to adopting artificial intelligence <u>in your company.</u>

Please read out.

**Rows: Random | Columns: Normal**

| | | Yes | No | DO NOT READ OUT: Don't know |
|---|---|---|---|---|
| | | 1 | 2 | 8 |
| High costs? | 1 | ○ | ○ | ○ |
| Lack of skills to adopt artificial intelligence? | 2 | ○ | ○ | ○ |
| Government regulation? | 3 | ○ | ○ | ○ |
| Not convinced by the technology? | 4 | ○ | ○ | ○ |
| Any other barriers not previously mentioned? *Fixed* | 5 | ○ | ○ | ○ |

Ask only if **Q014 - adopter**,1

**Q078 - covidinvestment: Impact of covid on investment in AI** | Single coded

**Not back**

Would you say that the COVID-19 has increased, decreased or had no effect on your company's investment in artificial intelligence?

**Normal**

| | |
|---|---|
| 1 | Increased |
| 2 | Decreased |
| 3 | No effect |
| 8 | DO NOT READ OUT: Don't know |

**Q080 - subgroupdisadvantaged: AI impact on subgroups of workers** | Matrix

**Not back | Number of rows: 6 | Number of columns: 4**

I'm going to name a few different groups of workers.
For each of them, please tell me whether you think artificial intelligence is more likely to <u>help them or harm them or neither help nor harm them in their work.</u>

Please read out.

**Rows: Random | Columns: Normal**

| | | Help them | Harm them | Neither help nor harm them | DO NOT READ OUT: Don't know |
|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 8 |
| Older workers | 1 | ◯ | ◯ | ◯ | ◯ |
| Low-skilled workers | 2 | ◯ | ◯ | ◯ | ◯ |
| Female workers | 3 | ◯ | ◯ | ◯ | ◯ |
| Migrant workers | 4 | ◯ | ◯ | ◯ | ◯ |
| Workers from an ethnic minority | 5 | ◯ | ◯ | ◯ | ◯ |
| Workers with disabilities | 6 | ◯ | ◯ | ◯ | ◯ |

**B012 - POLICY: GOVERNMENT POLICY AND REGULATION** | **End block**

**Q091 - out1: End of survey** | **Text**

**Not back**

We have reached the end of the interview. We thank you for your time and we wish you a lovely day.

# Annex C. Adoption rates by country from the worker survey

In finance, the proportion of workers who say that their companies have adopted AI is highest in Ireland whereas in manufacturing, it is highest in the US (Figure C.1.). There are many reasons why the results of the worker survey would differ from the results of the employer survey (Figure 2.3), including:

1. Respondents to the worker survey may be less aware of whether/how AI is being used within their companies. By comparison, respondents to the employer survey tended to be the individuals with the best overview of the advanced technologies applied in the company. Lack of awareness of AI among workers could move the adoption rates in either direction, as less aware respondents could understate or overstate adoption.

2. The employer survey was restricted to companies with at least 20 employees, whereas the worker survey includes employees of smaller companies. As firm size is positively related with AI adoption, this would likely overestimate the adoption rate in the employer survey.

3. The weighting of the two surveys differs given that they represent different units and different populations (i.e. the population of companies vs. the population of employees within the relevant sectors and countries). If sampling is representative, then company-proportional weighting gives larger companies and smaller companies an equal weight, whereas employee-proportional weighting assigns more weight to larger companies. As firm size is positively related with AI adoption, this would likely underestimate the adoption rate in the employer survey.

**Figure C.1. The proportion of workers who say that their companies use AI is highest in Ireland in finance and highest in the US in manufacturing**

% of all workers
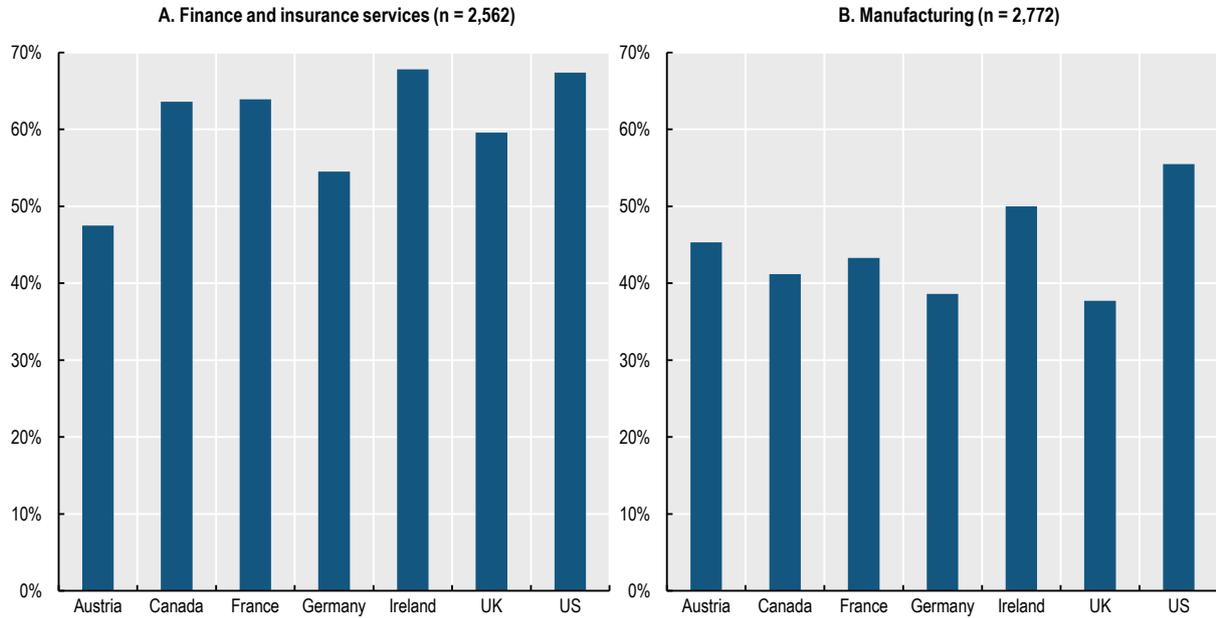


Note: Workers were asked, "To the best of your knowledge, does your company use artificial intelligence (AI)?"
Source: OECD worker survey on the impact of AI on the workplace (2022).

# Annex D. Error tolerance tables

## Figure D.1. Error tolerance with design factor, worker survey[45]

**Error tolerance table with design factor**  KANTAR PUBLIC=

with a confidence level of   **95,0** % ← Please select this value (max. 99,9)

N = **179.244** ← Please enter the size of the universe

| Sample size N = | Proportion values in the sample | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | 55% | 60% | 70% | 80% | 90% | 95% |
| 50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19,9% | 20,2% | 20,3% | 20,2% | 19,9% | 18,6% | 16,2% | 12,2% | 8,8% |
| 100 | --- | --- | --- | --- | --- | --- | --- | 12,2% | 12,9% | 13,4% | 13,8% | 14,0% | 14,1% | 14,0% | 13,8% | 12,9% | 11,3% | 8,5% | 6,1% |
| 200 | --- | --- | --- | --- | --- | 7,1% | 7,9% | 8,6% | 9,1% | 9,4% | 9,7% | 9,8% | 9,9% | 9,8% | 9,7% | 9,1% | 7,9% | 5,9% | 4,3% |
| 300 | --- | --- | --- | --- | 4,8% | 5,7% | 6,4% | 7,0% | 7,4% | 7,7% | 7,9% | 8,0% | 8,0% | 8,0% | 7,9% | 7,4% | 6,4% | 4,8% | 3,5% |
| 400 | --- | --- | --- | --- | 4,2% | 5,0% | 5,6% | 6,0% | 6,4% | 6,6% | 6,8% | 6,9% | 7,0% | 6,9% | 6,8% | 6,4% | 5,6% | 4,2% | 3,0% |
| 500 | --- | --- | --- | --- | 3,7% | 4,4% | 5,0% | 5,4% | 5,7% | 5,9% | 6,1% | 6,2% | 6,2% | 6,2% | 6,1% | 5,7% | 5,0% | 3,7% | 2,7% |
| 600 | --- | --- | --- | 2,5% | 3,4% | 4,0% | 4,5% | 4,9% | 5,2% | 5,4% | 5,6% | 5,6% | 5,7% | 5,6% | 5,6% | 5,2% | 4,5% | 3,4% | 2,5% |
| 700 | --- | --- | --- | 2,3% | 3,1% | 3,7% | 4,2% | 4,5% | 4,8% | 5,0% | 5,1% | 5,2% | 5,2% | 5,2% | 5,1% | 4,8% | 4,2% | 3,1% | 2,3% |
| 800 | --- | --- | --- | 2,1% | 2,9% | 3,5% | 3,9% | 4,2% | 4,5% | 4,7% | 4,8% | 4,9% | 4,9% | 4,9% | 4,8% | 4,5% | 3,9% | 2,9% | 2,1% |
| 900 | --- | --- | --- | 2,0% | 2,8% | 3,3% | 3,7% | 4,0% | 4,2% | 4,4% | 4,5% | 4,6% | 4,6% | 4,6% | 4,5% | 4,2% | 3,7% | 2,8% | 2,0% |
| 1.000 | --- | --- | 1,5% | 1,9% | 2,6% | 3,1% | 3,5% | 3,8% | 4,0% | 4,2% | 4,3% | 4,4% | 4,4% | 4,4% | 4,3% | 4,0% | 3,5% | 2,6% | 1,9% |
| 1.100 | --- | --- | 1,4% | 1,8% | 2,5% | 3,0% | 3,3% | 3,6% | 3,8% | 4,0% | 4,1% | 4,2% | 4,2% | 4,2% | 4,1% | 3,8% | 3,3% | 2,5% | 1,8% |
| 1.200 | --- | --- | 1,4% | 1,7% | 2,4% | 2,9% | 3,2% | 3,5% | 3,7% | 3,8% | 3,9% | 4,0% | 4,0% | 4,0% | 3,9% | 3,7% | 3,2% | 2,4% | 1,7% |
| 1.300 | --- | --- | 1,3% | 1,7% | 2,3% | 2,7% | 3,1% | 3,3% | 3,5% | 3,7% | 3,8% | 3,8% | 3,8% | 3,8% | 3,8% | 3,5% | 3,1% | 2,3% | 1,7% |
| 1.400 | --- | --- | 1,3% | 1,6% | 2,2% | 2,6% | 3,0% | 3,2% | 3,4% | 3,5% | 3,6% | 3,7% | 3,7% | 3,7% | 3,6% | 3,4% | 3,0% | 2,2% | 1,6% |
| 1.500 | --- | 1,0% | 1,2% | 1,6% | 2,1% | 2,5% | 2,9% | 3,1% | 3,3% | 3,4% | 3,5% | 3,5% | 3,6% | 3,5% | 3,5% | 3,3% | 2,9% | 2,1% | 1,6% |
| 1.600 | --- | 1,0% | 1,2% | 1,5% | 2,1% | 2,5% | 2,8% | 3,0% | 3,2% | 3,3% | 3,4% | 3,4% | 3,5% | 3,4% | 3,4% | 3,2% | 2,8% | 2,1% | 1,5% |
| 1.700 | --- | 0,9% | 1,1% | 1,5% | 2,0% | 2,4% | 2,7% | 2,9% | 3,1% | 3,2% | 3,3% | 3,3% | 3,3% | 3,3% | 3,3% | 3,1% | 2,7% | 2,0% | 1,5% |
| 1.800 | --- | 0,9% | 1,1% | 1,4% | 2,0% | 2,3% | 2,6% | 2,8% | 3,0% | 3,1% | 3,2% | 3,2% | 3,3% | 3,2% | 3,2% | 3,0% | 2,6% | 2,0% | 1,4% |
| 1.900 | --- | 0,9% | 1,1% | 1,4% | 1,9% | 2,3% | 2,5% | 2,7% | 2,9% | 3,0% | 3,1% | 3,1% | 3,2% | 3,1% | 3,1% | 2,9% | 2,5% | 1,9% | 1,4% |
| 2.000 | --- | 0,9% | 1,1% | 1,3% | 1,9% | 2,2% | 2,5% | 2,7% | 2,8% | 2,9% | 3,0% | 3,1% | 3,1% | 3,1% | 3,0% | 2,8% | 2,5% | 1,9% | 1,3% |
| 3.000 | 0,5% | 0,7% | 0,9% | 1,1% | 1,5% | 1,8% | 2,0% | 2,2% | 2,3% | 2,4% | 2,5% | 2,5% | 2,5% | 2,5% | 2,5% | 2,3% | 2,0% | 1,5% | 1,1% |
| 4.000 | 0,4% | 0,6% | 0,7% | 0,9% | 1,3% | 1,5% | 1,7% | 1,9% | 2,0% | 2,1% | 2,1% | 2,2% | 2,2% | 2,2% | 2,1% | 2,0% | 1,7% | 1,3% | 0,9% |
| 5.000 | 0,4% | 0,5% | 0,7% | 0,8% | 1,2% | 1,4% | 1,5% | 1,7% | 1,8% | 1,8% | 1,9% | 1,9% | 1,9% | 1,9% | 1,9% | 1,8% | 1,5% | 1,2% | 0,8% |
| 6.000 | 0,4% | 0,5% | 0,6% | 0,8% | 1,1% | 1,3% | 1,4% | 1,5% | 1,6% | 1,7% | 1,7% | 1,8% | 1,8% | 1,8% | 1,7% | 1,6% | 1,4% | 1,1% | 0,8% |

*Red fields* can be changed, i.e. adapted to the respective question

Example:
In a sample of 300 companies from the universe of all companies in the manufacturing and finance and insurance sector in the selected countries, a proportion of 50% of companies said that they adopted AI. Then the true value of the companies with the probability chosen above for this proportion is ± 8%.
In fields with '---' the confidence interval is more than half the proportion and is therefore not shown.
The table is based on the formula for the confidence interval for samples without reserve with design factor: $s(p) = t \sqrt{p(1-p)/(n-1)} \sqrt{1-n/N} \sqrt{2}$

Source: Kantar Public.

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[45] The purpose of these tables is to give a quick overview of the error tolerance based on the formula using a standardised design factor that can be applied to any survey without strict random sampling approach.

### Figure D.2. Error tolerance with design factor, employer survey

**Error tolerance table with design factor**  KANTAR PUBLIC=

with a confidence level of **95,0** % ← Please select this value (max. 99,9)

N = **37.074.053** ← Please enter the size of the universe

| Sample size N = | Proportion values in the sample | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1% | 2% | 3% | 5% | 10% | 15% | 20% | 25% | 30% | 35% | 40% | 45% | 50% | 55% | 60% | 70% | 80% | 90% | 95% |
| 50 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19,9% | 20,2% | 20,3% | 20,2% | 19,9% | 18,6% | 16,2% | 12,2% | 8,8% |
| 100 | --- | --- | --- | --- | --- | --- | --- | 12,2% | 12,9% | 13,5% | 13,8% | 14,0% | 14,1% | 14,0% | 13,8% | 12,9% | 11,3% | 8,5% | 6,1% |
| 200 | --- | --- | --- | --- | --- | 7,1% | 7,9% | 8,6% | 9,1% | 9,4% | 9,7% | 9,8% | 9,9% | 9,8% | 9,7% | 9,1% | 7,9% | 5,9% | 4,3% |
| 300 | --- | --- | --- | --- | 4,8% | 5,7% | 6,4% | 7,0% | 7,4% | 7,7% | 7,9% | 8,0% | 8,0% | 8,0% | 7,9% | 7,4% | 6,4% | 4,8% | 3,5% |
| 400 | --- | --- | --- | --- | 4,2% | 5,0% | 5,6% | 6,0% | 6,4% | 6,6% | 6,8% | 6,9% | 7,0% | 6,9% | 6,8% | 6,4% | 5,6% | 4,2% | 3,0% |
| 500 | --- | --- | --- | --- | 3,7% | 4,4% | 5,0% | 5,4% | 5,7% | 5,9% | 6,1% | 6,2% | 6,2% | 6,2% | 6,1% | 5,7% | 5,0% | 3,7% | 2,7% |
| 600 | --- | --- | --- | 2,5% | 3,4% | 4,1% | 4,5% | 4,9% | 5,2% | 5,4% | 5,6% | 5,6% | 5,7% | 5,6% | 5,6% | 5,2% | 4,5% | 3,4% | 2,5% |
| 700 | --- | --- | --- | 2,3% | 3,2% | 3,7% | 4,2% | 4,5% | 4,8% | 5,0% | 5,1% | 5,2% | 5,3% | 5,2% | 5,1% | 4,8% | 4,2% | 3,2% | 2,3% |
| 800 | --- | --- | --- | 2,1% | 2,9% | 3,5% | 3,9% | 4,3% | 4,5% | 4,7% | 4,8% | 4,9% | 4,9% | 4,9% | 4,8% | 4,5% | 3,9% | 2,9% | 2,1% |
| 900 | --- | --- | --- | 2,0% | 2,8% | 3,3% | 3,7% | 4,0% | 4,2% | 4,4% | 4,5% | 4,6% | 4,6% | 4,6% | 4,5% | 4,2% | 3,7% | 2,8% | 2,0% |
| 1.000 | --- | --- | 1,5% | 1,9% | 2,6% | 3,1% | 3,5% | 3,8% | 4,0% | 4,2% | 4,3% | 4,4% | 4,4% | 4,4% | 4,3% | 4,0% | 3,5% | 2,6% | 1,9% |
| 1.100 | --- | --- | 1,4% | 1,8% | 2,5% | 3,0% | 3,3% | 3,6% | 3,8% | 4,0% | 4,1% | 4,2% | 4,2% | 4,2% | 4,1% | 3,8% | 3,3% | 2,5% | 1,8% |
| 1.200 | --- | --- | 1,4% | 1,7% | 2,4% | 2,9% | 3,2% | 3,5% | 3,7% | 3,8% | 3,9% | 4,0% | 4,0% | 4,0% | 3,9% | 3,7% | 3,2% | 2,4% | 1,7% |
| 1.300 | --- | --- | 1,3% | 1,7% | 2,3% | 2,7% | 3,1% | 3,3% | 3,5% | 3,7% | 3,8% | 3,8% | 3,8% | 3,8% | 3,8% | 3,5% | 3,1% | 2,3% | 1,7% |
| 1.400 | --- | --- | 1,3% | 1,6% | 2,2% | 2,6% | 3,0% | 3,2% | 3,4% | 3,5% | 3,6% | 3,7% | 3,7% | 3,7% | 3,6% | 3,4% | 3,0% | 2,2% | 1,6% |
| 1.500 | --- | --- | 1,2% | 1,6% | 2,1% | 2,6% | 2,9% | 3,1% | 3,3% | 3,4% | 3,5% | 3,6% | 3,6% | 3,6% | 3,5% | 3,3% | 2,9% | 2,1% | 1,6% |
| 1.600 | --- | 1,0% | 1,2% | 1,5% | 2,1% | 2,5% | 2,8% | 3,0% | 3,2% | 3,3% | 3,4% | 3,5% | 3,5% | 3,5% | 3,4% | 3,2% | 2,8% | 2,1% | 1,5% |
| 1.700 | --- | 0,9% | 1,1% | 1,5% | 2,0% | 2,4% | 2,7% | 2,9% | 3,1% | 3,2% | 3,3% | 3,3% | 3,4% | 3,3% | 3,3% | 3,1% | 2,7% | 2,0% | 1,5% |
| 1.800 | --- | 0,9% | 1,1% | 1,4% | 2,0% | 2,3% | 2,6% | 2,8% | 3,0% | 3,1% | 3,2% | 3,3% | 3,3% | 3,3% | 3,2% | 3,0% | 2,6% | 2,0% | 1,4% |
| 1.900 | --- | 0,9% | 1,1% | 1,4% | 1,9% | 2,3% | 2,5% | 2,8% | 2,9% | 3,0% | 3,1% | 3,2% | 3,2% | 3,2% | 3,1% | 2,9% | 2,5% | 1,9% | 1,4% |
| 2.000 | --- | 0,9% | 1,1% | 1,4% | 1,9% | 2,2% | 2,5% | 2,7% | 2,8% | 3,0% | 3,0% | 3,1% | 3,1% | 3,1% | 3,0% | 2,8% | 2,5% | 1,9% | 1,4% |
| 3.000 | --- | 0,7% | 0,9% | 1,1% | 1,5% | 1,8% | 2,0% | 2,2% | 2,3% | 2,4% | 2,5% | 2,5% | 2,5% | 2,5% | 2,5% | 2,3% | 2,0% | 1,5% | 1,1% |
| 4.000 | 0,4% | 0,6% | 0,7% | 1,0% | 1,3% | 1,6% | 1,8% | 1,9% | 2,0% | 2,1% | 2,1% | 2,2% | 2,2% | 2,2% | 2,1% | 2,0% | 1,8% | 1,3% | 1,0% |
| 5.000 | 0,4% | 0,5% | 0,7% | 0,9% | 1,2% | 1,4% | 1,6% | 1,7% | 1,8% | 1,9% | 1,9% | 2,0% | 2,0% | 2,0% | 1,9% | 1,8% | 1,6% | 1,2% | 0,9% |
| 6.000 | 0,4% | 0,5% | 0,6% | 0,8% | 1,1% | 1,3% | 1,4% | 1,5% | 1,6% | 1,7% | 1,8% | 1,8% | 1,8% | 1,8% | 1,8% | 1,6% | 1,4% | 1,1% | 0,8% |

*Red fields* can be changed, i.e. adapted to the respective question

**Example:**
In a sample of 800 workers from the universe of all workers in the manufacturing and finance and insurance sector in the selected countries,
a proportion of 50% of companies said that they adopted AI. Then the true value of the companies with the probability chosen above for this proportion is ± 4,9%.
In fields with '---' the confidence interval is more than half the proportion and is therefore not shown.
The table is based on the formula for the confidence interval for samples without reserve with design factor: $s(p) = t \sqrt{p(1-p)/(n-1)} \sqrt{1-n/N} \sqrt{2}$

Source: Kantar Public.