Internet Appendix to "Artificial Intelligence, Productivity, and the Workforce: Evidence from Corporate Executives"

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Internet Appendix

A1 Additional Data Details and Sample Validation

The primary survey was fielded from November 11 to December 8, 2025, and produced 602 responses; it targeted panel members of The CFO Survey, a survey conducted jointly by Duke University and the Federal Reserve Banks of Richmond and Atlanta. We supplement this sample with surveys sent to senior financial decision-makers at firms that are members of Financial Executives International (FEI) and/or NASDAQ, as well as Duke University alumni; these supplemental surveys ran from mid-December 2025 to mid-January 2026 and yielded 132 additional responses.

Table A1 presents summary statistics for key variables used in our analysis.[1] Like the US economy broadly, the sample contains a small number of very large firms and a large number of small-to-medium-sized firms. The median (mean) firm had revenue of $46 million ($3.5 billion) and 118 (2,715) employees, with 22.8% of companies having at least 500 employees. The median (mean) firm expects to invest $35,000 ($8.3 million) in AI in 2026. The mean reported increase in labor productivity (ΔLP) attributable to AI investment was 1.8% in 2025 and is expected to reach 3.0% in 2026.

The full CFO Survey panel consists of approximately 2500 executives who participate in The CFO Survey, which is conducted jointly each quarter since June 2020 by Duke University and the Federal Reserve Banks of Atlanta and Richmond. Prior to working with the Federal Reserve starting in June 2020, Duke University conducted the survey each quarter starting in summer 1996. Many of the Duke CFO Survey participants were carried over into the joint Duke-Fed CFO Survey in June 2020, and additional CFOs have been invited to join the sample in each quarter since. This section summarizes panel information on The CFO Survey.

The full CFO Survey panel contains approximately 2500 financial executives, and therefore the 602 respondents to the 2025Q4 AI survey reflect a 24% response rate. Of course, some CFOs may have left their positions or stopped engaging with the survey, so 2500 is likely too large a denominator to measure the response rate among *active* CFOs. Approximately 1330 unique CFOs participated in at least one quarterly CFO survey during 2024-2025. Using this denominator, the AI survey response rate is 45%.

We validate the quality of our sample along several dimensions: sample coverage and forecast accuracy relative to both same-firm realized outcomes and aggregate economy outcomes. First, the CFO Survey sample spans 48 out of 50 states, a wide range of firm sizes,

[1] Appendix A5 presents variable definitions and the survey questions underlying each variable.

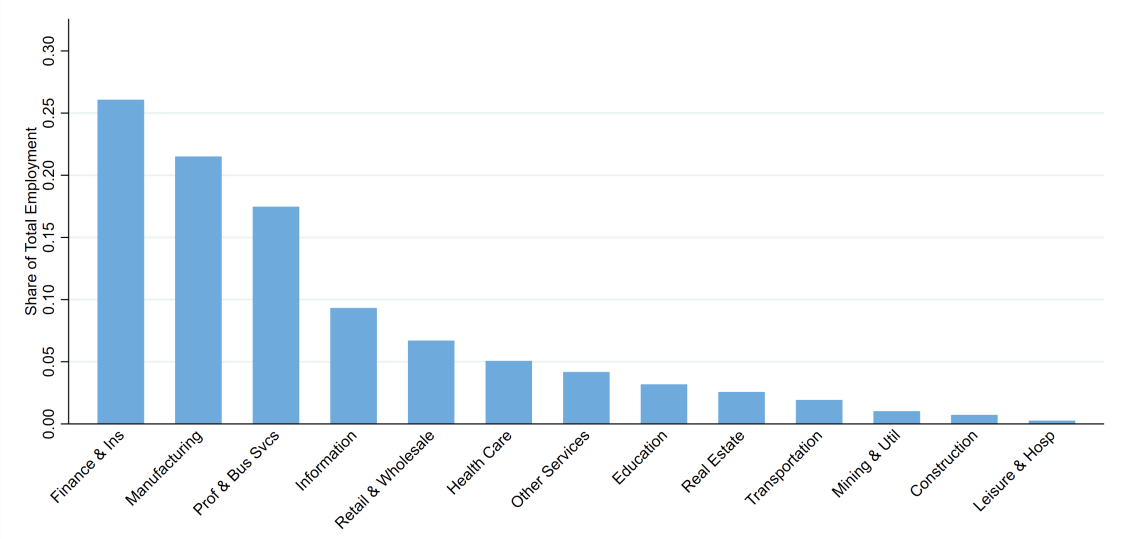
Appendix Table A1: Summary Statistics

		N	Mean	Median	Std. Dev.	Pctl. 10	Pctl. 25	Pctl. 75	Pctl. 90
Panel A: General Demographics									
	Large Firm (dummy)	722	0.222	0.000	0.416	0.000	0.000	0.000	1.000
	No. Employees	722	2,714	118	16,049	5	29	418	1,800
	Revenue ('25)	599	$3,461,042	$46,000	$25,154,316	$1,771	$10,300	$252,000	$1,743,775
	Book Value PP&E	660	$633,936	$6,000	$3,961,175	$10	$300	$56,703	$520,000
	Routine Job Share	637	0.190	0.100	0.205	0.020	0.050	0.250	0.500
	Technical Job Share	636	0.247	0.120	0.276	0.000	0.010	0.435	0.700
	Creative Job Share	637	0.191	0.110	0.203	0.020	0.050	0.250	0.470
	Other Job Share	637	0.370	0.260	0.354	0.000	0.000	0.730	0.880
Panel B: AI-related Variables									
2025	AI Invest (dummy)	723	0.585	1.000	0.493	0.000	0.000	1.000	1.000
	AI Investment	691	$5,762	$2	$115,147	$0	$0	$75	$300
	Reported Δ LP	699	0.018	0.000	0.032	0.000	0.000	0.030	0.075
	Implied Δ LP	678	0.006	0.000	0.022	0.000	0.000	0.000	0.030
	Implied Δ TFP	657	0.005	0.000	0.020	0.000	0.000	0.000	0.030
2026	AI Invest (dummy)	700	0.854	1.000	0.353	0.000	1.000	1.000	1.000
	AI Investment	700	$8,294	$35	$153,507	$0	$2	$300	$750
	Reported Δ LP	672	0.030	0.030	0.034	0.000	0.000	0.030	0.075
	Implied Δ LP	644	0.018	0.000	0.033	0.000	0.000	0.030	0.060
	Implied Δ TFP	611	0.015	0.000	0.028	0.000	0.000	0.030	0.051

Notes: All dollar-denominated values are in thousands of USD. Large Firm is a dummy variable indicating whether a firm has at least 500 employees. Reported ΔLP is change in labor productivity reported by CFOs on the survey; Implied ΔLP is the calculated change in labor productivity based on revenue growth reported by CFOs on the survey; Implied TFP is the residual change in total factor productivity (i.e., change in labor productivity not captured by change in capital deepening, which itself is measured as the change in AI-attributed K/L). N indicates the number of CFOs who responded to a given question or an item about which we have sufficient information to include in our analysis. For example, we have employment data, and therefore can determine firm size, for 722 companies. Of these 722, 22.6% are defined as large (500 or more employees).

and every major nonfarm industry,[2] with the four most frequently represented industries being finance and insurance, manufacturing, professional and business services, and information technology (see Figure A1). Because the sample is not perfectly representative of the U.S. economy, we adjust our aggregate analysis using weights that align the sample with the sectoral and size distribution of firms in the U.S. Census. Specifically, many of our baseline results are unweighted and should be interpreted as applying to the average firm in our sample. When reporting aggregate implied effects, we apply two sets of weights: *representativeness* weights that match the distribution of firms by broad sector (four bins) and firm size (three bins) to Census benchmarks, and *importance* weights that aggregate firm-level outcomes to economy-wide totals using firms' 2024 employment shares.[3]

Figure A1: Sector Employment Share



Notes: This figure shows share of total employment by sector among firms in the full AI survey sample.

Second, since we rely on firms' expectations in our examination of AI investment and its impact, we assess whether these expectations are accurate in key business areas. Figure A2 plots year-ahead forecasts of four key variables against the self-reported realizations that the same companies experience over the same timeframes. The four variables are sales revenue growth, price growth for the goods and services that companies produce, unit cost growth for the inputs that companies use, and wage growth. Each graph contains 56 points representing

[2]See `https://www.richmondfed.org/research/national_economy/cfo_survey/survey_participation`.

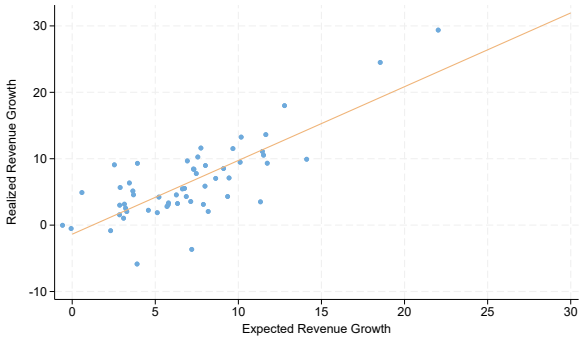
[3]Since our variables of interest are percent changes in employment, labor productivity, and related outcomes, the appropriate importance weights are prior-year (2024) revenue or employment shares.

the average value of the variable in each of 14 industry sectors for each year from 2022–2025 (e.g., one dot represents the average price change forecast vs. realization for the finance sector in 2022, another dot represents the same in 2023, etc.). Overall, the aggregate forecast for each variable aligns closely with its realization, suggesting that the within-firm expectations reported in The CFO Survey are informative and lending credibility to the forward-looking expectations we use throughout the paper.

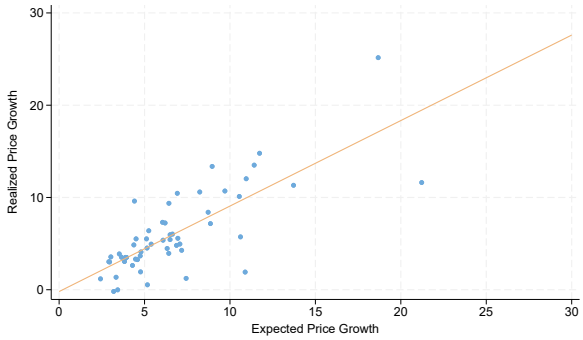
Third, we show that aggregate sales revenue from CFO Survey respondents tracks closely with economy-wide realized sales growth, illustrating the reasonable forecasting accuracy of our respondents and the close alignment between our panel and the broader US economy. Figure A3 shows that year-ahead sales revenue growth forecasts for CFOs align closely with the realized revenue growth for the full US economy over the same period, as reported by the Bureau of Economic Analysis. The CFO forecasts missed the strong recovery in 2021 revenue coming out of the COVID downturn but performed reasonably well during 2022-2025.

Lastly, the accuracy of forecasts from the long history of The CFO Survey has also been verified by external sources. Gennaioli et al. (2016) provide evidence that CFO forecasts of earnings and corporate investment closely track realized outcomes over the following 12 months, during both up and down cycles. Recently, Fried and Singh (2026) demonstrate that price forecasts produced by The CFO Survey accurately anticipate future inflation readings at the national level. These external validations further support the reliability of the expectations reported in our survey and the use of our panel to draw inferences about the broader U.S. economy.

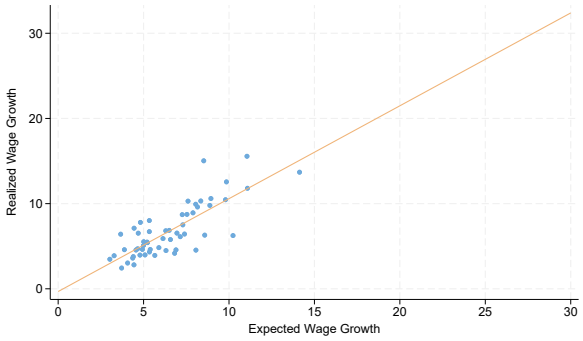
Figure A2: Expectations against Realizations for CFO Firms



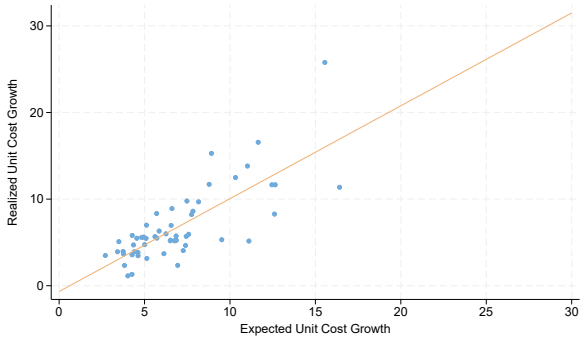
(a) Expected Revenue Growth



(b) Expected Price Growth



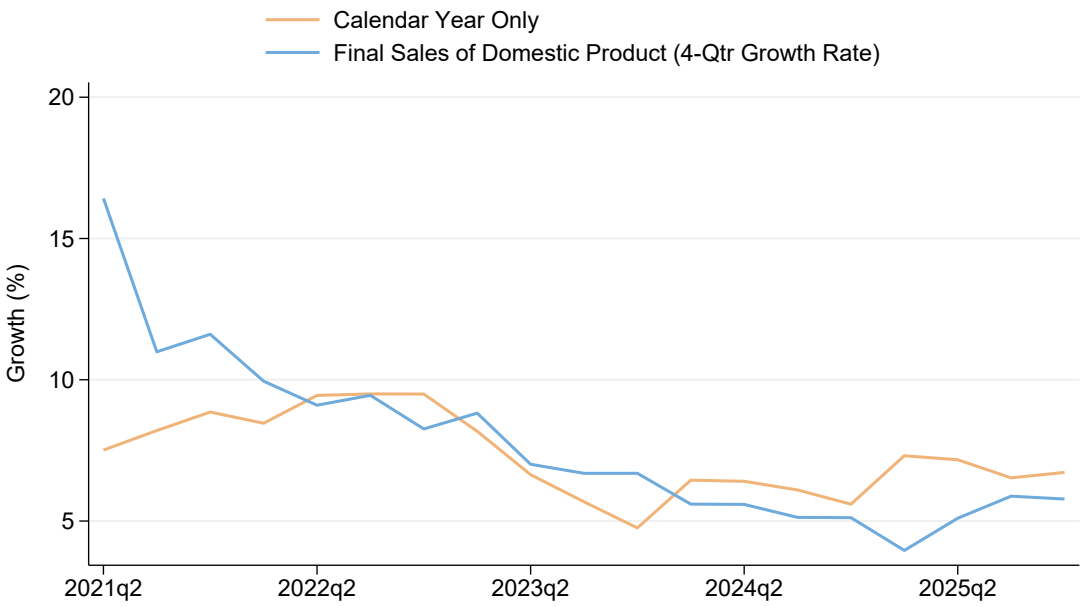
(c) Expected Wage Growth



(d) Expected Unit Cost Growth

Notes: CFO's expectations are presented for revenue growth (a), price growth (b), wage growth (c) and unit cost growth (d), against average same-firm realizations of the four variables. Each dot represents a sector for a given calendar year. X-axis values reflects the average expectations for variable growth in a single calendar year, calculated as the average across respondents in each quarter within that calendar year. Y-axis value reflects the average realized growth in that variable (by sector) for that same calendar year, averaged across all responding firms. All calculations are unweighted. Line of best fit is plotted; A linear 45-degree line through the origin would represent average variable growth equaling averaged realized growth in a calendar year for a given sector.

Figure A3: Firm Sales Growth vs. Aggregate Sales Growth



Notes: Calculations based on respondents to The CFO Survey for year-ahead forecasts made during 2020Q2 to 2024Q4, compared to realizations over 12-month periods ending in 2021Q2 to 2025Q4. The orange line is expected growth in sales revenue among CFOs, based on forecasts made in the four quarters ending in a given quarter, and the blue line is the realization of sales growth over the same four quarters (as measured by final sales of domestic product for the U.S. economy). CFO responses are weighted by firm revenue. Realized data from the Bureau of Economic Analysis, Haver Analytics; forecast data are from the CFO Survey.

A2 Descriptive Evidence

To assess the prevalence, scale, and composition of AI investment across firms, we begin with descriptive evidence about firms' AI expenditures. We ask CFOs whether and how much their companies had invested in AI in 2025, and how much they expect to invest in 2026. Panel (a) of Figure A4 reports the proportion of firms investing, by sector. Companies in high-skill sectors have invested (and plan to continue investing) the most in AI. Also, across all sectors, the percentage of companies investing in AI is expected to grow substantially from 2025 into 2026. Table A6 shows that many small firms are coming off the sidelines in 2026, with about half having invested in AI by 2025, but a marked increase in investment is expected in 2026.

While AI adoption is widespread, there have been barriers to AI adoption in that more than 40% of companies did not invest in 2025. Panel (b) lists the main reasons for not investing in AI. Around 42% of firms indicated that they view AI technology as too immature, while 36% indicate that their workforce is not yet trained to use AI in the workplace, and 36% say that they have privacy concerns.

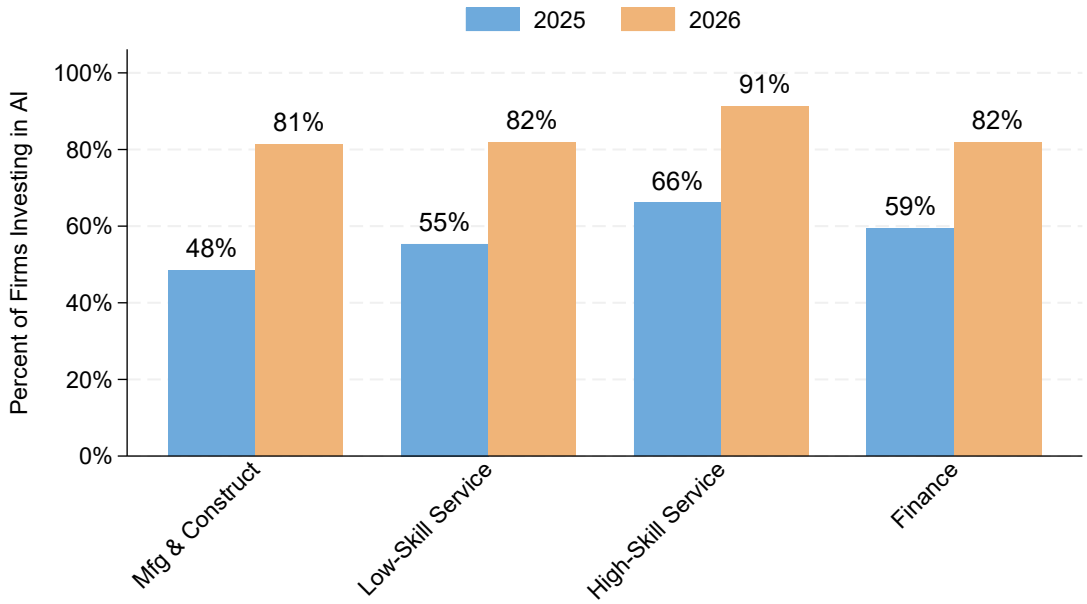
The survey respondents indicate the dollar amount they spent on AI in 2025 and 2026 (see Figure A7, which presents results separately for small firms vs. large firms, where large is defined as companies with at least 500 employees). The figure shows a wide range of spending, with 31% of large firms expecting to spend over $1,000,000 on AI in 2026; in contrast, more than half of small companies plan to spend $20,000 or less on AI. In 2026, the median large (small) firm expects to spend $300,000 ($12,500). Mean spending levels (not reported) are considerably higher due to a small number of firms reporting very large expenditures. Although larger firms spend more on AI in absolute terms, AI investment intensity—measured per employee or relative to capital expenditures—is somewhat higher among smaller firms (Figures A8 and A9).

A supplemental survey (which gathered 183 valid responses) asked about the *type* of AI spending (see Figure A10). In 2026, large (small) companies expected to allocate on average 54% (65%) of AI spending on operations (AI subscriptions, services, and training), 31% (24%) on internal development of customized systems, and 13% (7%) on hardware, GPUs, and servers.

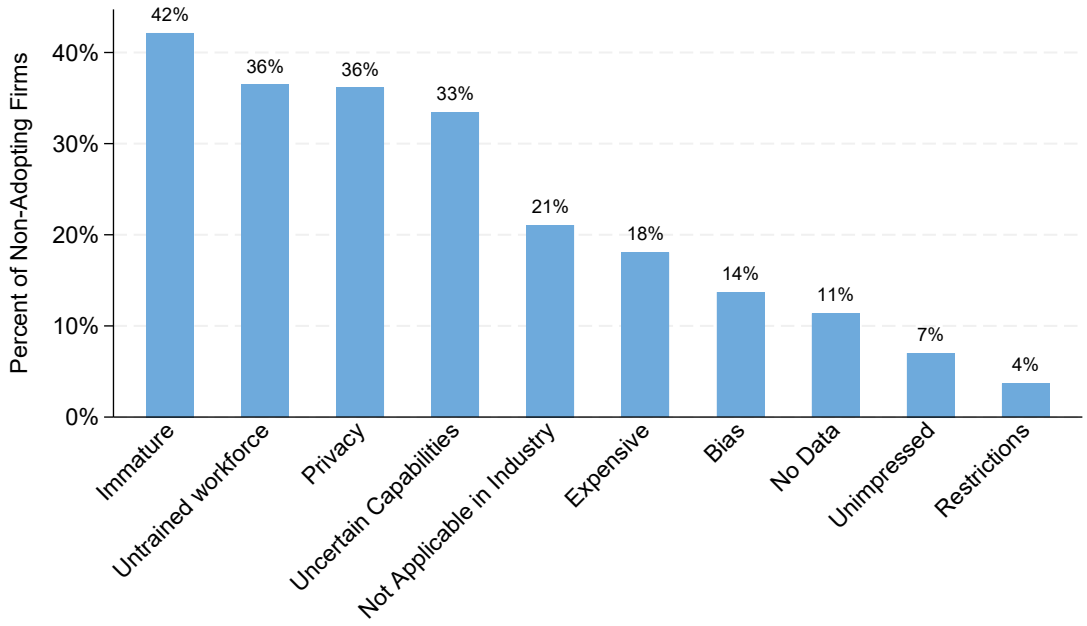
Figure A11 summarizes the factors that motivate companies to invest in AI.[4] Responses to this question are on a scale from 0 (the factor was not a motivation to invest in AI) to 4 (an extremely important motivation). Many of the responses range from 2 (moderate motivation) to 3 (very large motivation). Two of the top motivations reflect a desire to

[4]These motivations are used as explanatory variables in the analysis in Table 4 in the main text.

Figure A4: AI Investment and Reasons for Not Investing



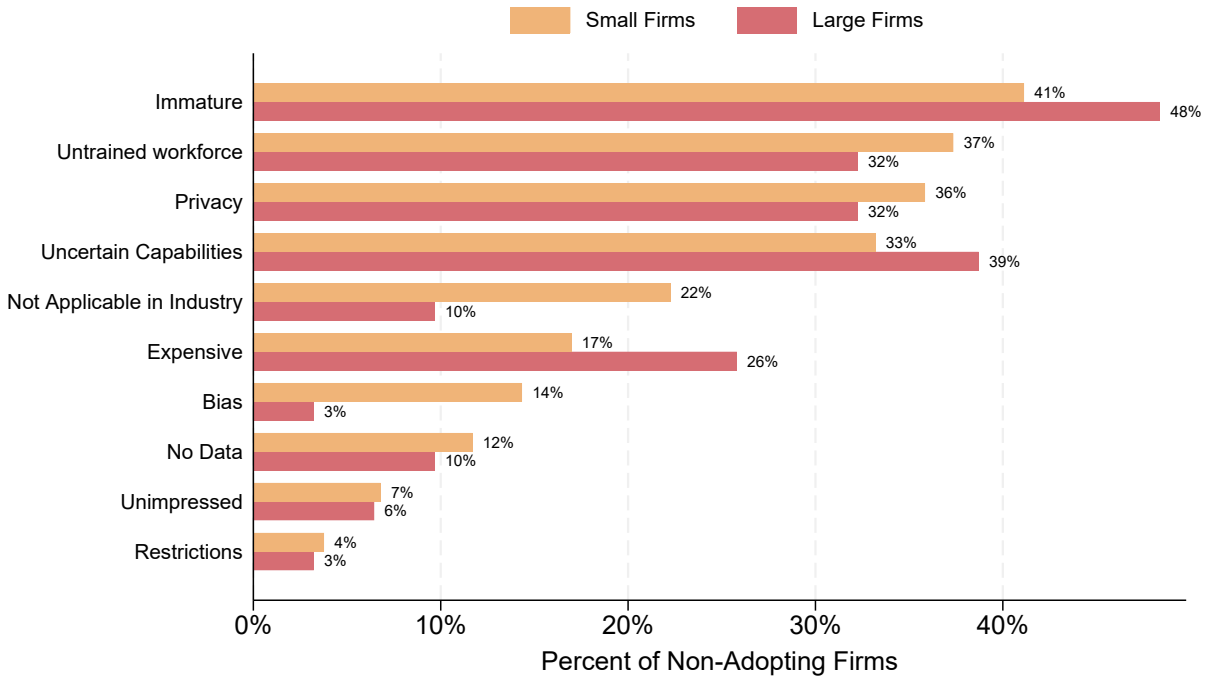
(a) Percent of Firms Investing in AI



(b) Reasons for Not Investing

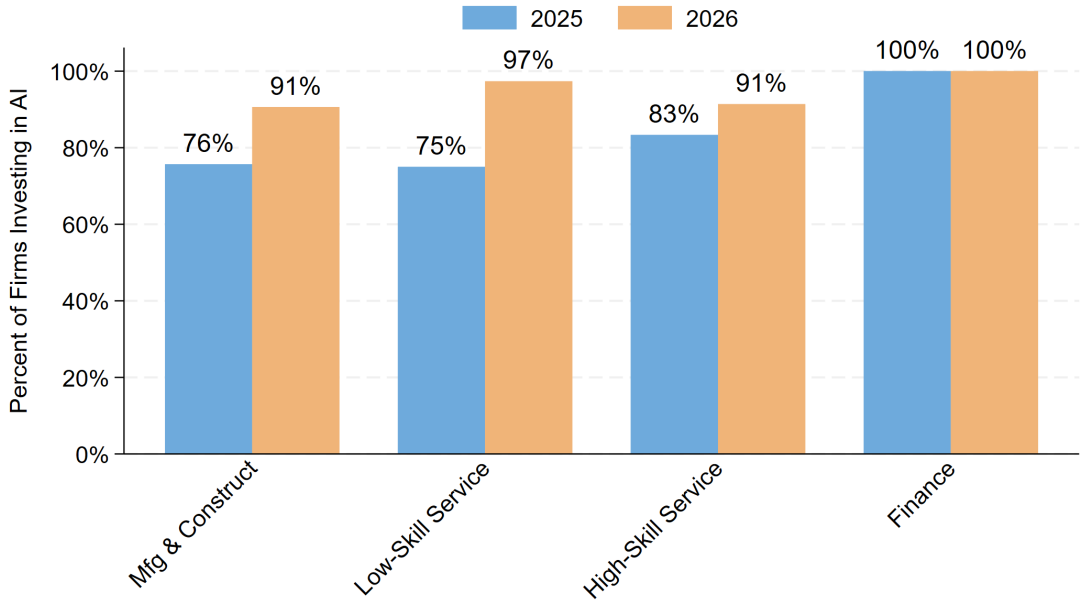
Notes: Panel (a) shows the extensive margin percentage of firms that have invested in 2025 (or expect to invest 2026) in AI technology, which in 2025 (2026) is determined by a Yes answer to a question asking whether the firm has invested in AI (a positive dollar amount for expected to AI investment in 2026). Mnfg&Constr includes "construction", "manufacturing", and "mining and utilities"; high-skill services include "educational services", "health care and social assistance", "information", "professional and business services", and "real estate and rental and leasing"; low-skill services include "leisure and hospitality", "retail and wholesale trade", "transportation and warehousing", and "other services except government". High-skill services are those services for which the share of employees (from the 2024 CPS) with at least a bachelor's degree is greater than the cross-sector average. Low-skill services are the remaining services with lower-than-average share of bachelor degree holders. For the subsample of companies that indicated that they had not invested in AI in 2025, Panel (b) presents the percentage of respondents who selected a given reason for not investing in AI.

Figure A5: Reasons for Not Investing in AI, by Firm Size

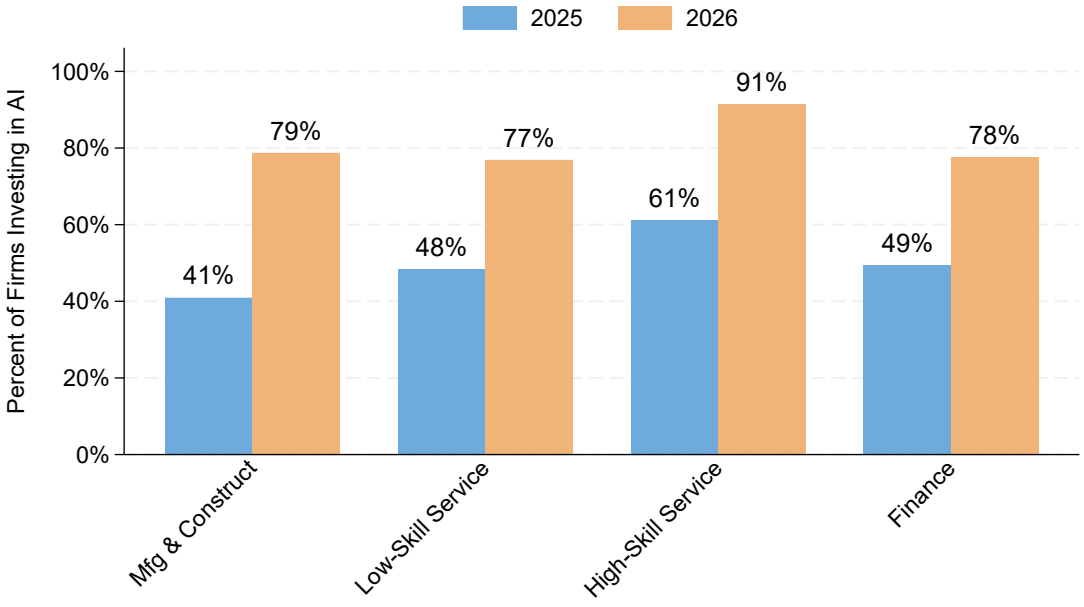


Notes: This figure reports reasons for not investing in AI among firms that indicated they had not made expenditures or financial investments in AI technology or solutions over the previous 12 months. Bars show the percentage of non-investing firms within each firm-size group that selected each reason. Large firms are defined as firms with at least 500 employees; small firms have fewer than 500 employees. Respondents could select multiple reasons, so percentages need not sum to 100%.

Figure A6: Share of Firms Investing in AI by Sector and Firm Size.



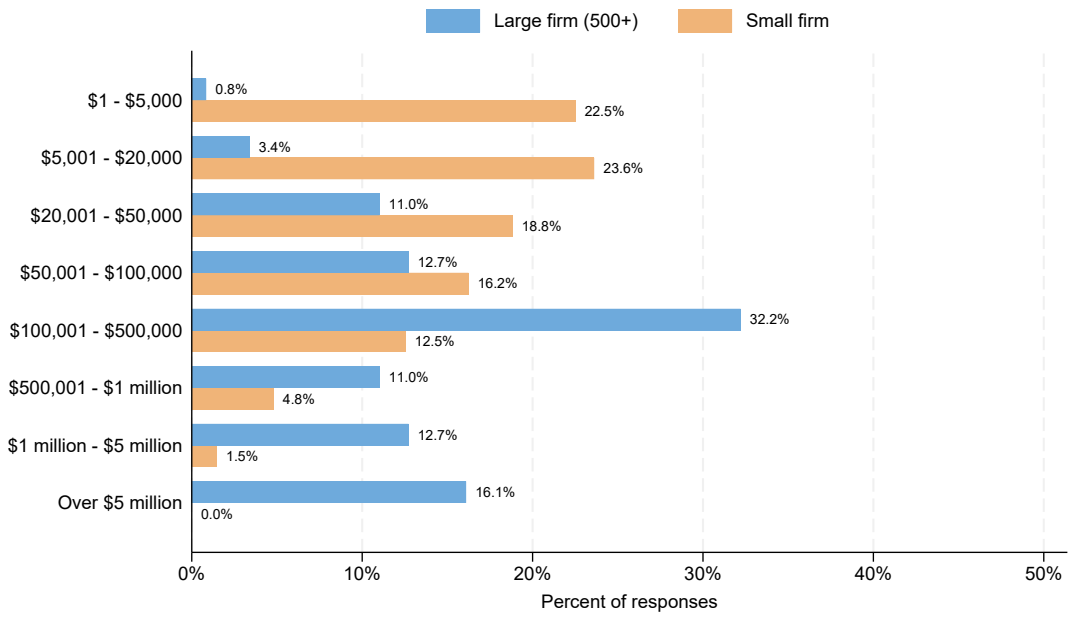
(a) Large Firms



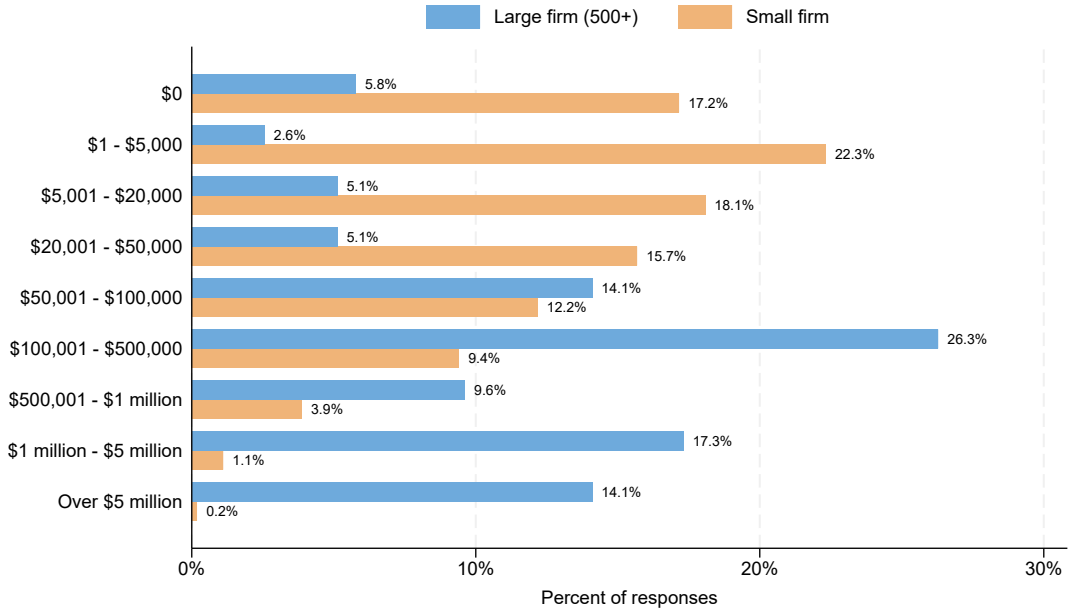
(b) Small Firms

Notes: Figure shows the extensive margin percentage of firms that have invested in 2025 (or expect to invest 2026) in AI technology, which in 2025 (2026) is determined by a Yes answer to a question asking whether the firm has invested in AI (a positive dollar amount for AI investment in 2026). Mnfg&Constr includes "construction", "manufacturing", and "mining and utilities"; high-skill services include "educational services", "health care and social assistance", "information", "professional and business services", and "real estate and rental and leasing"; low-skill services include "leisure and hospitality", "retail and wholesale trade", "transportation and warehousing", and "other services except government". High-skill services are selected as those services for which the share of employees (from the 2024 CPS) with at least a bachelor's degrees is greater than the cross-sector average. Low-skill services are the remaining services with lower-than-average share of bachelor's degree holders.

Figure A7: AI Investment, Total Dollars Spent



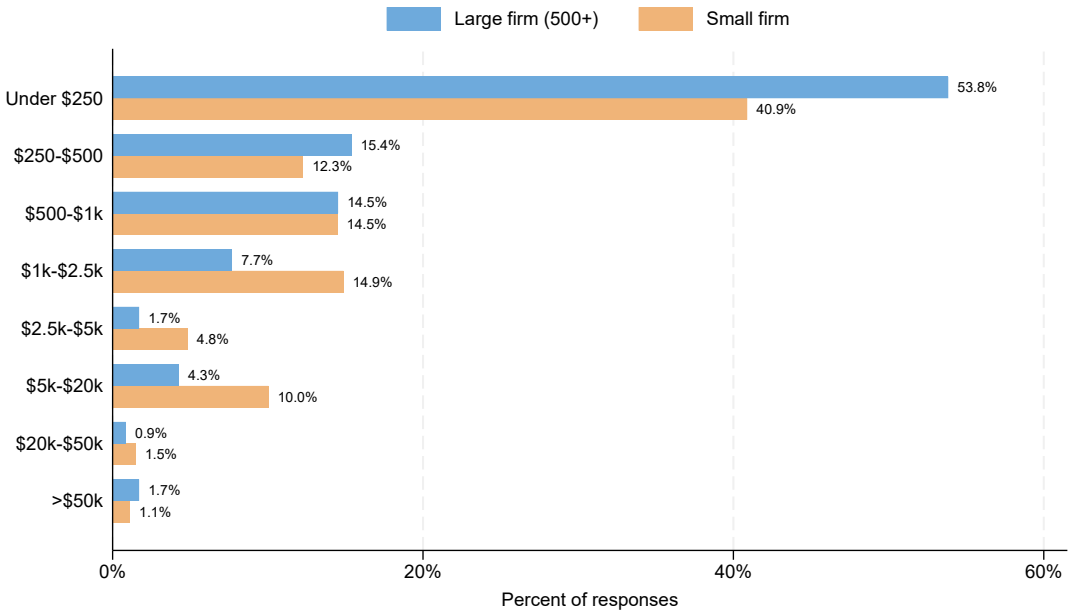
(a) 2025



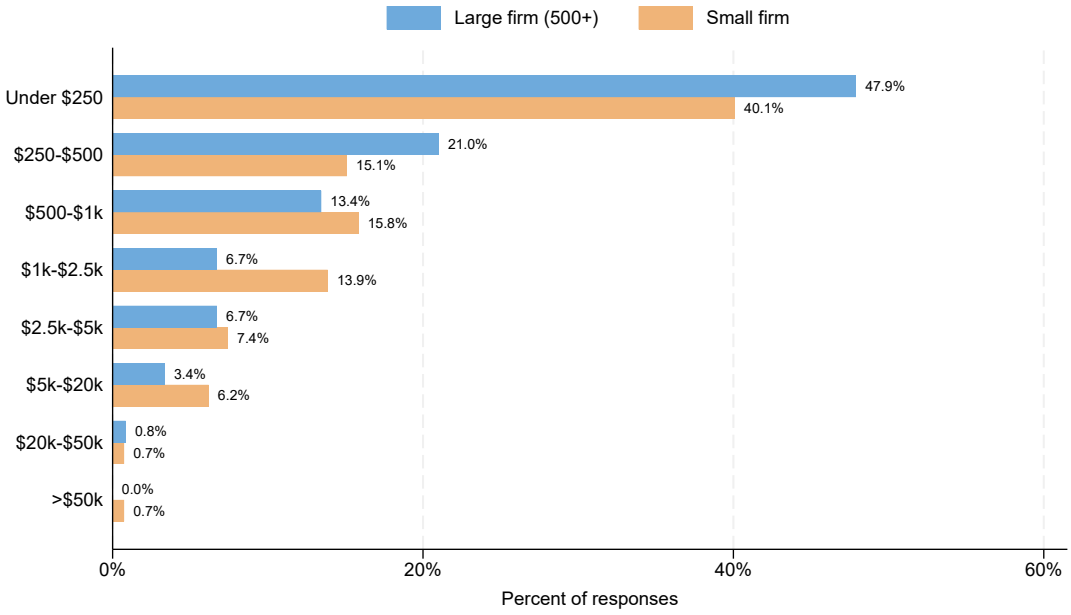
(b) 2026

Notes: This figure depicts the amount of realized (expected) investment in AI technologies in 2025 in the left panel (2026 in right panel) for both large (blue, upper bars) and small (orange) firms. Large firms are defined as having more than 500 employees. In 2026, the median AI spending for large (small) companies is expected to be $300,000 ($12,500).

Figure A8: AI Investment, Dollars Spent per Employee



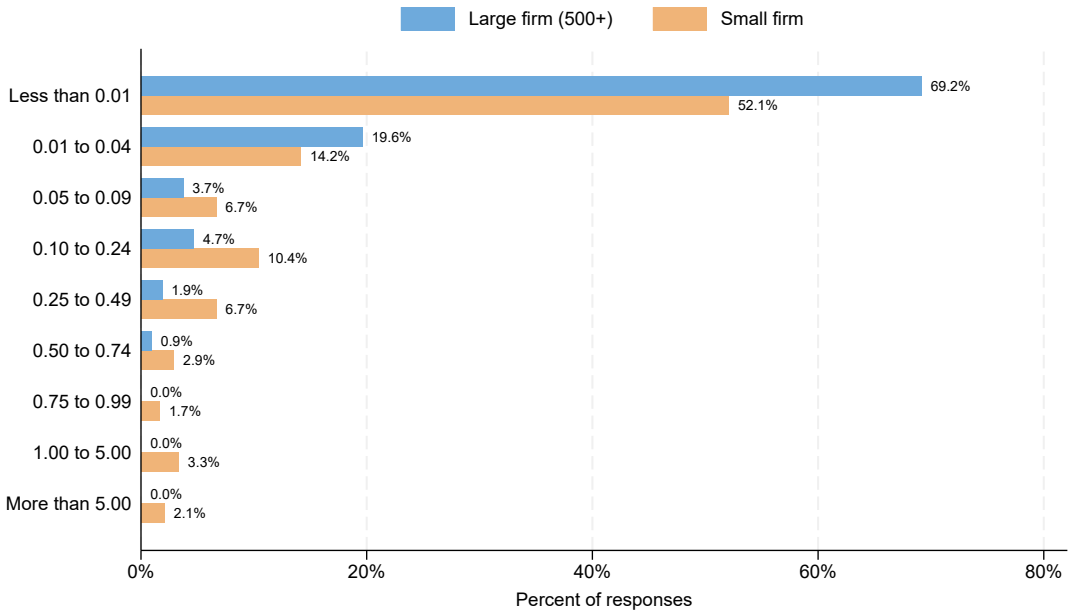
(a) 2025



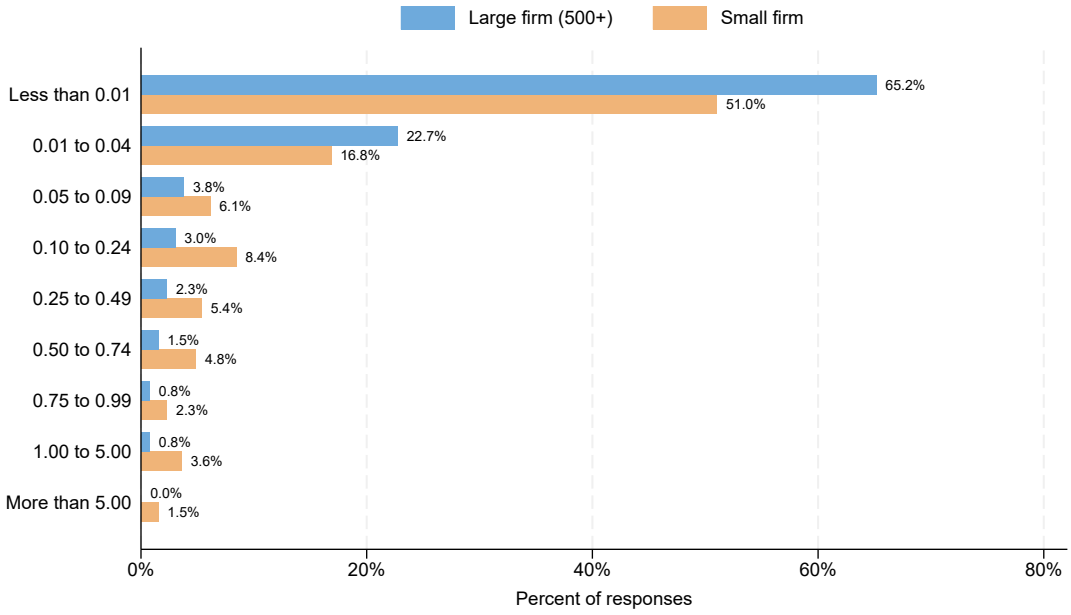
(b) 2026

Notes: This figure depicts the differences in the amount of realized (expected) investment in AI technologies over 2025 (2026), divided by the firm's number of employees, between large and small firms. Blue bars represent 'large' firms with more than 500 employees. Orange bars represent firms with fewer than 500 employees. In 2026, the median AI spending per employee for small (large) companies is expected to be $357.14 ($258.09).

Figure A9: AI Investment, per Dollar of CapEx



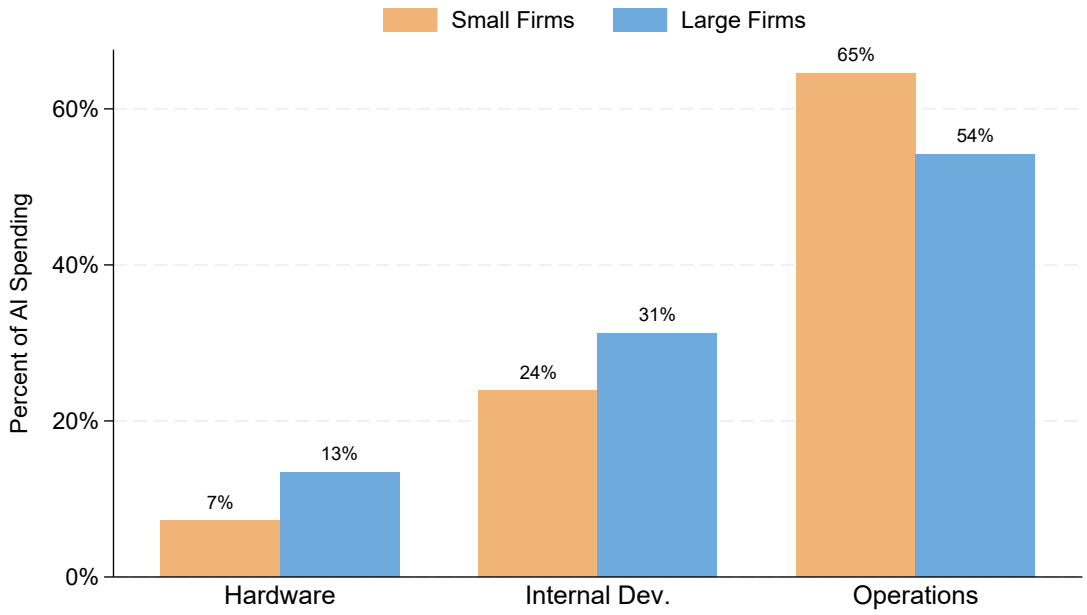
(a) 2025



(b) 2026

Notes: This figure depicts the differences in the amount of realized (expected) investment in AI technologies over 2025 (2026), divided by the firm's capital expenditures, for large versus small firms. Blue bars represent 'large' firms with more than 500 employees. Orange bars represent firms with fewer than 500 employees. In 2026, the median AI spending per dollar of capital expenditures is expected to be less than 0.9%(0.2%).

Figure A10: AI Investment by Investment Category



Notes: This figure shows the composition of expected 2026 AI expenditure by type and firm size (large firms have at least 500 employees). The question was drawn from a supplemental survey question on the 2026Q1 CFO Survey; the question produced 183 2026Q1 responses from CFOs who also participated in the main 2025Q4 sample we study in this paper. Operational expenses include AI subscriptions, services, and training; hardware includes servers, GPUs, and devices; internal development includes developing or customizing proprietary AI systems. Allocations do not necessarily sum to 100% due to an "Other" category that is not shown.

improve productivity: Improve production efficiency (average rating of 2.9) and improve labor productivity (2.7). Another top motive is to enhance decision-making and management (2.7). At the other end of the spectrum, while still moderately important, two of the least important motives to invest in AI are to achieve cost savings: reducing labor costs (2.0) and reducing non-labor costs (1.8). Overall, in the near term, AI investment appears less focused on reducing workforce or costs and more oriented toward improving productivity, which is the central focus of our paper.

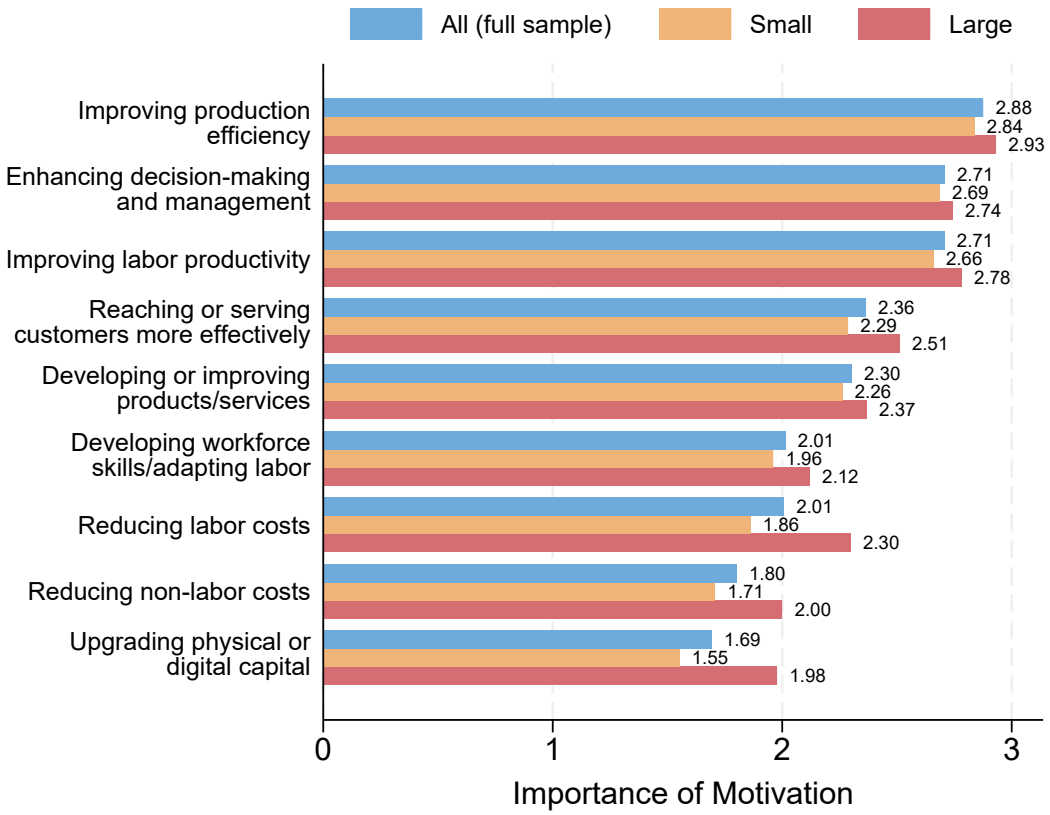
A3 Additional Analysis: AI and the Labor Force

Appendix Table A2: Employment Changes by AI Role Replacement Status

	Firms reporting no replacement of roles	Firms reporting some replacement of roles
Employment change in 2025, %	0.08	-0.14
Employment change in 2026, %	0.22	-0.55

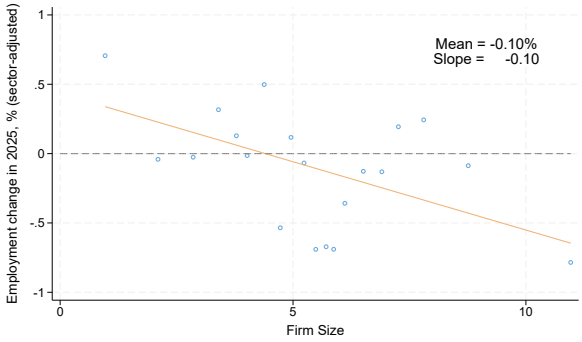
Notes: The table reports average employment changes attributed to AI in 2025 and expected changes in 2026 based on survey questions 8 and 9. Firms report the change in their total employment that they attribute to AI investment. Firms are grouped by whether they indicate that AI will replace any roles or responsibilities ("some replacement") or report no such replacement ("no replacement"), based on their open-ended responses to survey questions 10 and 11. The table reports the average (unweighted) employment change within each group. Takeaway: among companies that report (do not report) that AI will replace employees roles, AI-attributed changes in employment are small and negative (positive).

Figure A11: Motivations for AI Investment

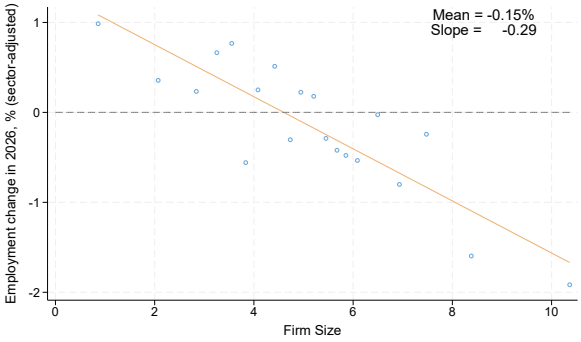


Notes: This figure depicts the motivations CFOs state for why their firm invested in AI. The results are broken down by firm size, with large firms having at least 500 employees. The Mean Likert Value for each category is calculated by averaging the following importance in choosing to invest in AI:'Not' important as 0, 'Slightly' as 1, 'Moderately' as 2, 'Very' as 3, and 'Extremely' as 4. The complete list of various categories, and examples, are as follows: improving production efficiency (e.g., faster processes, automation or optimization of internal operations, logistics, or maintenance); reducing labor costs; reducing non-labor costs; enhancing decision-making and management (e.g., data analysis, forecasting, workflow or HR optimization); developing or improving products and services (e.g., new or higher-quality offerings, personalization, testing, faster R&D cycles); reaching or serving customers more effectively (e.g., marketing, customer interaction, after-sales support); upgrading physical or digital capital (e.g., hardware, data infrastructure, or cloud systems); developing workforce skills or adapting labor (e.g., training, hiring, or reorganizing teams for AI use); and other motivations.

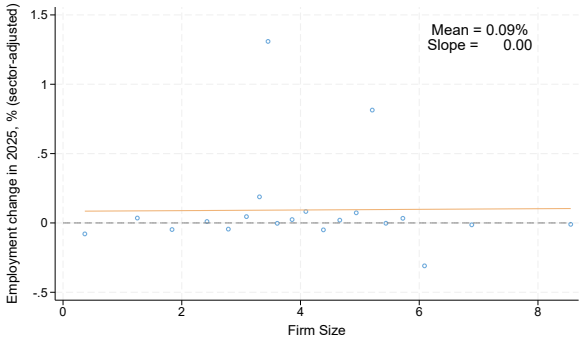
Figure A12: AI-Driven Employment Changes by Firm Size and Investment Status



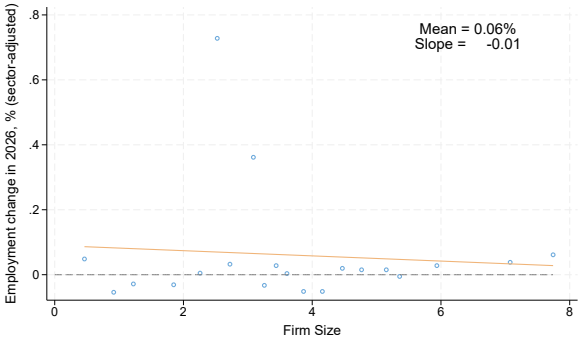
(a) 2025, AI Investors



(b) 2026, AI Investors



(c) 2025, Non-Investors



(d) 2026, Non-Investors

Notes: Binscatter plots of employment changes due to AI (realized for 2025, expected for 2026) firm size as measured by the firms log number of employees in 2024. The top panels show firms with positive AI investment; the bottom panels show firms with no AI investment in the respective period. Binscatters are residualized for sector fixed effects. Red lines indicate linear regression fits. Takeaway: among companies that report they are investing in AI (top row of figure), there is a negative relation between firm size and AI-attributed change in employment, with small (large) companies increasing (decreasing) employment due to AI usage; in the bottom row, among companies not investing in AI, there is no relation between firm size and AI-attributed employment effects, which are near-zero for both small and large companies.

Appendix Table A3: Expected Change in Types of Jobs and AI Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Routine-Clerical		Δ Creative		Δ Skilled-Technical	
	2026	2028	2026	2028	2026	2028
Panel A: AI invest dummy						
AI Adopt ('25)	-0.727**		-0.225		0.427**	
	(0.301)		(0.358)		(0.216)	
AI adopt ('25/'26)		-3.198***		-0.038		1.206***
		(0.728)		(0.418)		(0.349)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.02	0.02	0.01	0.01	0.01	0.01
Observations	623	630	623	630	623	630
Panel B: AI investment (all firms, unconditional)						
Log AI Inv ('25)	-0.087***		-0.013		0.036	
	(0.024)		(0.028)		(0.023)	
Log AI inv ('25/'26)		-0.346***		0.032		0.119***
		(0.059)		(0.037)		(0.043)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.04	0.01	0.01	0.01	0.02
Observations	597	591	597	591	597	591
Panel C: AI investment (only positives, conditional)						
Log AI Inv ('25)	-0.268***		0.036		0.004	
	(0.097)		(0.101)		(0.111)	
Log AI inv ('25/'26)		-0.512***		0.132		0.148
		(0.130)		(0.122)		(0.135)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.04	0.02	0.01	0.01	0.01	0.01
Observations	381	517	381	517	381	517

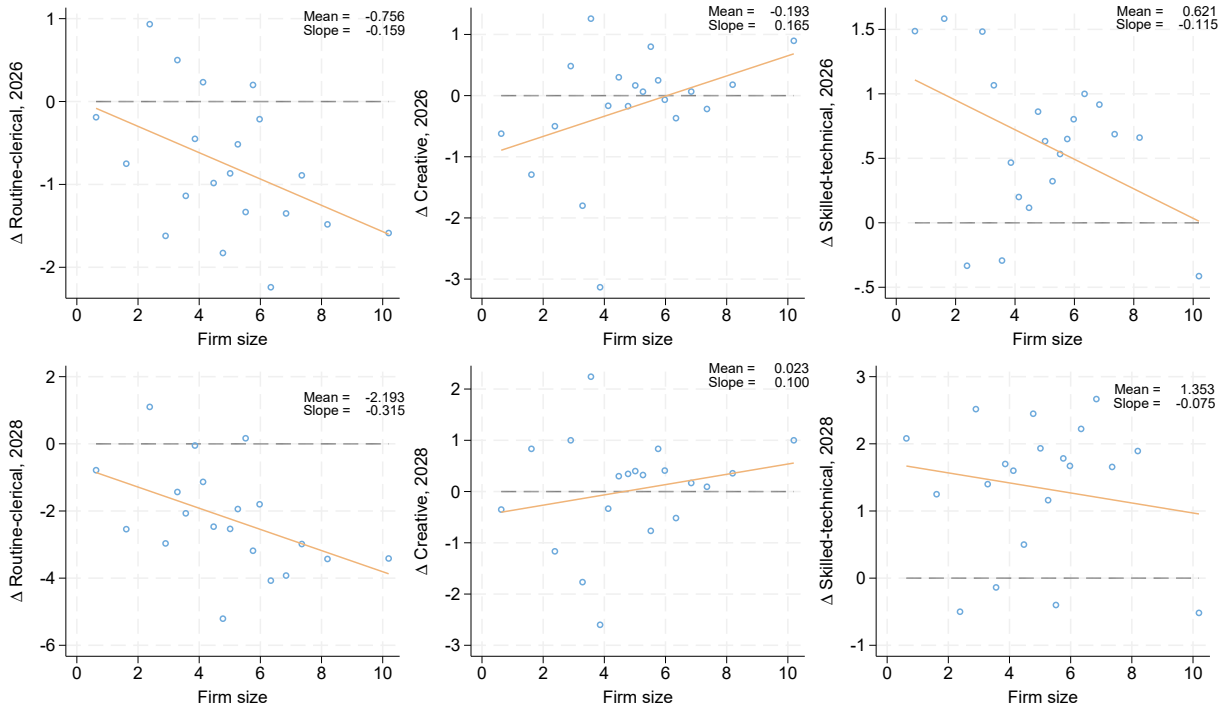
Notes: The table reports firm-level regressions of changes in the share of routine, creative, and technical workforce in 2026 and 2028 relative to 2025 on extensive and intensive measures of AI investment. Panel A studies the extensive margin of AI investment. *AI Adopt'25* equals one if the firm reports any AI investment in 2025, and *AI Adopt'25/'26* equals one if the firm reports any AI investment in either 2025 or 2026. Panel B studies the intensive margin for all firms. *Log AI Inv'25* is the logarithm of AI investment reported in 2025 (plus one), and *Log AI Inv'25/'26* is the logarithm of total AI investment reported over 2025 and 2026 (plus one). Panel C restricts the sample to firms with positive AI investment. All regressions include broad sector fixed effects (manufacturing and construction, low-skill services, high-skill services, and finance) and report heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Takeaway: Among companies that invest in (i.e., adopt) AI, firms expect to reduce the proportion of employees doing routine clerical work, offset somewhat by an increase in skilled technical workers. Results are stronger at the extensive margin (Panel A).

Appendix Table A4: Expected Change in Types of Jobs and AI Investment. Weighted Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Routine-Clerical		Δ Creative		Δ Skilled-Technical	
	2026	2028	2026	2028	2026	2028
Panel A: AI invest dummy						
AI Adopt ('25)	-0.790***		-0.618		0.389	
	(0.270)		(0.846)		(0.267)	
AI adopt ('25/'26)		-2.897***		0.416		0.775
		(0.655)		(1.030)		(0.493)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.02	0.03	0.01	0.02	0.02	0.03
Observations	611	618	611	618	611	618
Panel B: AI investment (all firms, unconditional)						
Log AI Inv ('25)	-0.081**		-0.068		0.051	
	(0.033)		(0.058)		(0.043)	
Log AI inv ('25/'26)		-0.265***		-0.015		0.100
		(0.076)		(0.083)		(0.083)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.05	0.01	0.02	0.02	0.04
Observations	585	580	585	580	585	580
Panel C: AI investment (only positives, conditional)						
Log AI Inv ('25)	-0.178		-0.047		0.070	
	(0.132)		(0.148)		(0.185)	
Log AI inv ('25/'26)		-0.297*		-0.043		0.110
		(0.157)		(0.132)		(0.189)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.03	0.02	0.02	0.01	0.03
Observations	375	508	375	508	375	508

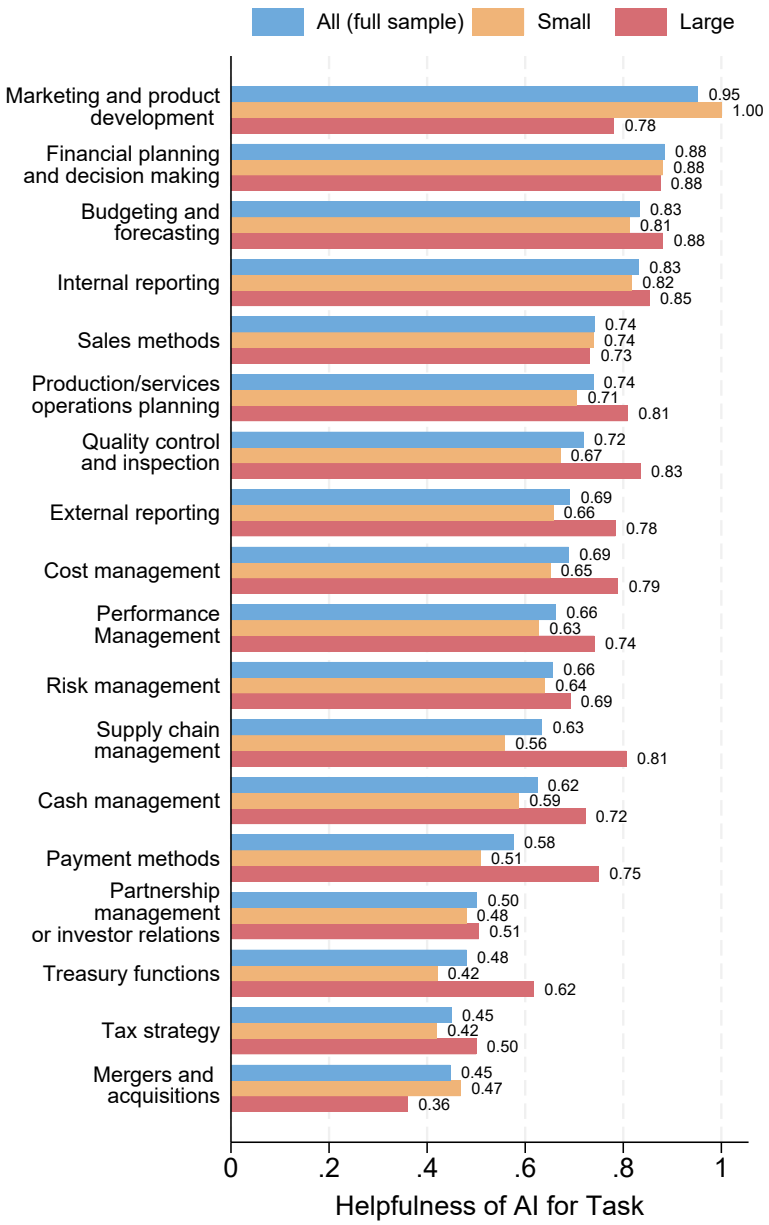
Notes: The table is similar to Table A3 but applies firm-level weights in the regressions. Firm-level weights are the combined representativeness and importance weights. Representativeness weights are constructed to match the Census distribution of firms (count) by sector (four broad categories: manufacturing and construction, low-skill services, high-skill services, and finance) and firm size (1–99, 100–499, and 500+ employees). The importance weight is firm-level employment in 2024 (winsorized at 1/95 level to reduce the impact of noise). Takeaway: Among companies that invest in AI, firms expect to reduce the proportion of employees doing routine clerical work, offset somewhat by an increase in skilled technical workers. Results are stronger at the extensive margin (Panel A).

Figure A13: Expected Change in Types of Jobs Conditional on Firm Size



Notes: Figures show binscatter plots of expected changes in workforce composition in 2026 (top panels) and 2028 (bottom panels) as a function of firm size. Changes are measured relative to 2025. Firm size is defined as the log number of employees in 2024. Worker categories include routine/clerical roles (e.g., data entry, accounting), skilled technical roles (e.g., engineers, data analysts, scientists), and creative or managerial roles (e.g., design, strategy, leadership). Workers not falling into these categories are classified as "Other" and are not shown in the graphs; therefore, employment changes across the displayed groups do not sum to 0%. Takeaway: In 2026 (top row), small firms plan to hold steady the proportion of routine clerical workers and increase the number of technical workers; while large companies expect to reduce the routine-clerical proportion and hold steady the technical proportion.

Figure A14: AI Helpfulness for Various Tasks



Notes: Based on Survey Question 13 (see Appendix Section A5), CFOs were asked to evaluate how helpful AI tools have been for accomplishing a range of business tasks. Responses are recorded on a Likert scale from 0 to 2 (0 = Not helpful, 1 = Moderately helpful, 2 = Very helpful). The figure reports mean responses by task category. Firms report that AI is most helpful in marketing and product development, financial planning and decision-making, budgeting and forecasting, and internal reporting, indicating strong perceived usefulness in analytical and information-processing tasks. In contrast, AI is reported to be less helpful for treasury management, tax strategy, and mergers and acquisitions, which tend to involve greater reliance on strategic judgment, institutional knowledge, and relationship-based activities. The figure also reports responses by firm size (large firms have at least 500 employees; small firms have fewer than 500 employees).

Appendix Table A5: Firm Exposure and Negative Exposure Index by Sector

Sector	Share of Firms Exposed	NEI (RM/EM)
Information	0.704	0.929
Transportation and Warehousing	0.677	0.765
Professional and Business Services	0.636	0.731
Health Care and Social Assistance	0.625	0.688
Other Services Except Government	0.622	1.308
Construction	0.609	0.520
Leisure and Hospitality	0.609	1.000
Real Estate and Rental and Leasing	0.603	1.227
Manufacturing	0.596	0.580
Finance and Insurance	0.582	1.100
Retail and Wholesale Trade	0.575	0.758
Mining and Utilities	0.524	0.800
Educational Services	0.409	0.714

Notes: The table summarizes AI exposure across sectors based on firms' open-ended responses describing roles and responsibilities expected to be replaced or enhanced by AI (Survey Questions 10–11; see Appendix Section A5). The first column reports exposure: the share of firms within each sector that mention either replacement or enhancement due to AI. The second column reports the Negative Exposure Index (NEI), defined as the ratio of replacement mentions to enhancement mentions within a sector. RM means mentions of AI replacing a role; EM means mentions of AI enhancing a role. An index greater than one indicates that AI is more frequently described as replacing rather than enhancing tasks in that sector, while values below one indicate that enhancement mentions dominate. Mentions are aggregated across all firms in the sector.

Appendix Table A6: Replacement and Enhancement Mentions and Firm Employment Change

	(1) Δ Emp. 2025	(2) Δ Emp. 2026	(3) Δ Emp. 2025	(4) Δ Emp. 2026	(5) Δ Emp. 2025	(6) Δ Emp. 2026
Enhancement Mentions (EM)	0.071	0.107				
	(0.061)	(0.077)				
Replacement Mentions (RM)	-0.255***	-0.426***				
	(0.084)	(0.115)				
RM/(RM+EM)			-0.663***	-1.162***		
			(0.231)	(0.324)		
RM/(RM+EM) - Office Admin					-0.036	-0.879***
					(0.207)	(0.294)
RM/(RM+EM) - Bus. & Fin.					-0.298	-0.355
					(0.225)	(0.425)
RM/(RM+EM) - Info. Tech					-0.208	0.419
					(0.779)	(0.819)
RM/(RM+EM) - Other					-0.634**	0.002
					(0.301)	(0.486)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.03	0.03	0.03	0.03	0.03	0.03
Observations	684	657	684	657	654	626

Notes: The table reports firm-level regressions of percent changes in employment between 2024 and 2025 (odd columns) and between 2025 and 2026 (even columns) on measures of AI's impact on roles and responsibilities of employees derived from open-ended responses. Columns (1) and (2) use the number of occupations within a firm for which respondents report enhancement (EM) or replacement (RM). Columns (3) and (4) use the relative strength of replacement mentions, defined as the ratio of occupations with replacement mentioned to those with either replacement or enhancement mentioned, RM/(RM+EM). Columns (5) and (6) construct analogous ratios for the most frequently cited occupations across firms (Office and Administrative Support, Business and Financial, and Computer and Information Technology) versus all other occupations to assess whether specific occupations drive the overall firm-level relationship. These firm–occupation-level ratios take values of 0, 0.5, or 1, and are defined as RM (a dummy indicating whether replacement is mentioned for that occupation) divided by RM+EM (where EM is a corresponding dummy for enhancement). All regressions include broad sector fixed effects (manufacturing and construction, low-skill services, high-skill services, and finance) and report heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

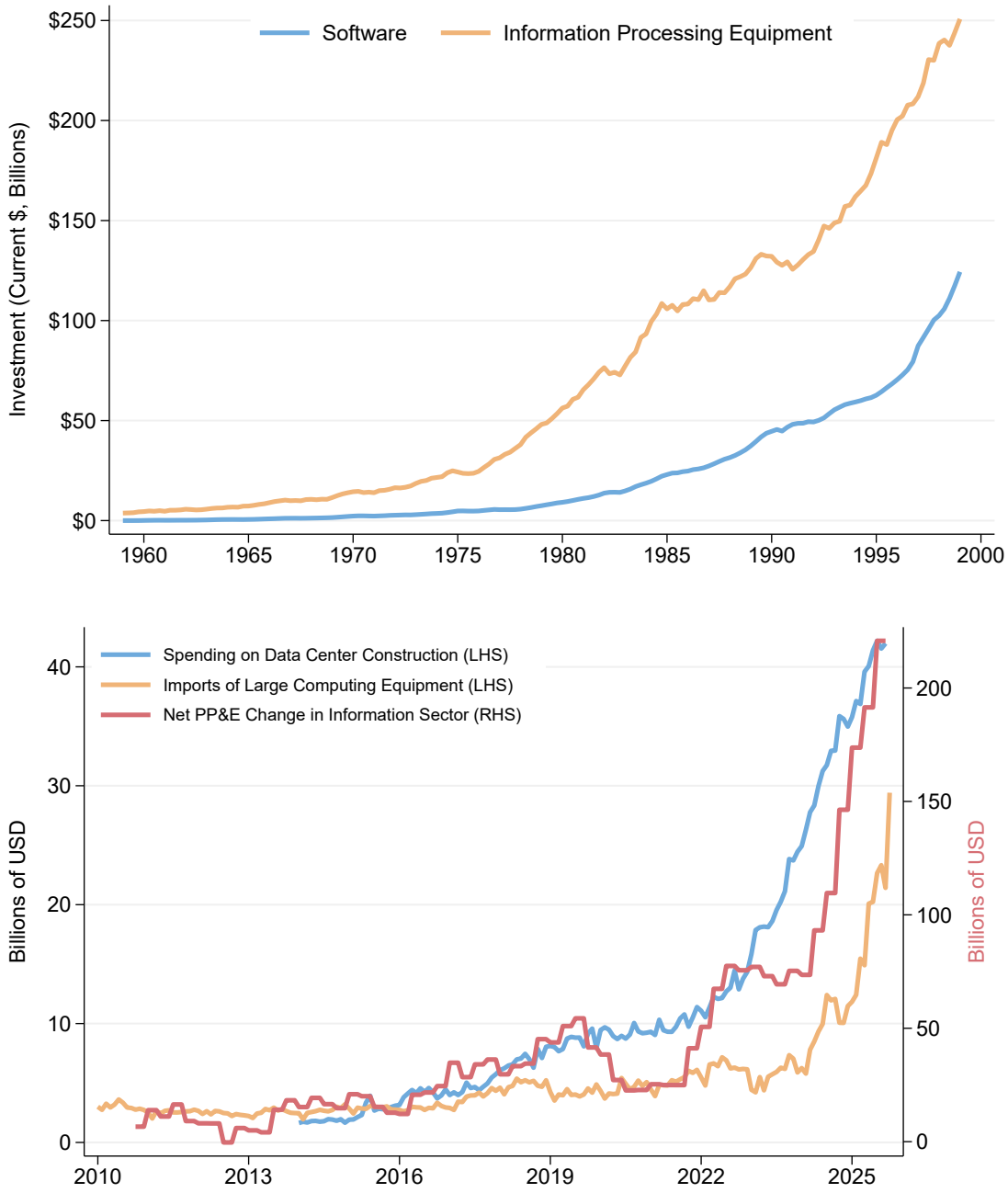
Figure A15: Word Clouds of Tasks and Roles Enhanced or Replaced by AI

(a) Enhancement (b) Replacement

Notes: The figure displays word clouds summarizing roles and responsibilities described by firms as being enhanced (left) or replaced (right) by AI based on open-ended survey responses (Survey Questions 10–11; see Appendix Section A5). Text responses are processed as follows. We first manually identify fragments of each response corresponding to meaningful occupations or tasks. These fragments are decomposed into bigrams and clustered into semantically similar groups using agglomerative clustering based on cosine similarity of 384-dimensional dense vector embeddings generated by the `all-MiniLM-L6-v2` sentence transformer. Based on these clusters, we manually compile a list of 48 task categories frequently appearing in the responses and reclassify the original text into these categories. We then compute embeddings for the full text responses, their bigrams, and the 48 task categories and assign tasks when the cosine similarity exceeds 30% for full-text embeddings or 50% for bigram embeddings. This procedure yields 5,165 distinct firm–task observations in the enhancement category and 2,130 in the replacement category. Word sizes reflect the frequency with which tasks appear in the corresponding category. The figure is intended as a descriptive visualization of frequently mentioned roles rather than a quantitative measure of occupational exposure. Takeaway: within each graph, the frequency a given task or role is affected is shown via the size of the word or phrase. Among words that are large in both figures (i.e., for both enhance and replace), these roles are enhanced by AI, which can lead to a concurrent reduction in workers performing this role.

A4 Additional Analysis: AI and Productivity

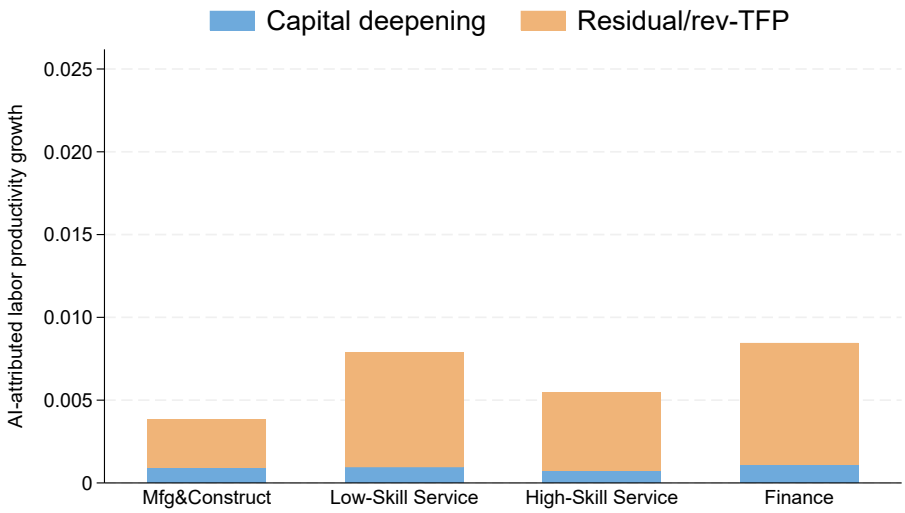
Figure A16: IT vs. AI Investment Waves



Notes: Panel A compares private fixed investment in current dollars between Software (BEA Series: B985RC) and Information Processing Equipment (BEA Series: B935RC). Information Processing Equipment contains categories for computers, peripheral equipment, photocopy machines, etc. Panel B compares spending on data center construction (US Census Bureau's Construction Spending Series) with imports of large computing equipment (HS Codes 847150 and 847330) and net year-over-year change in Property, Plant, and Equipment expenditures by US corporations from the US Census Bureau's Quarterly Financial Report (QFR).

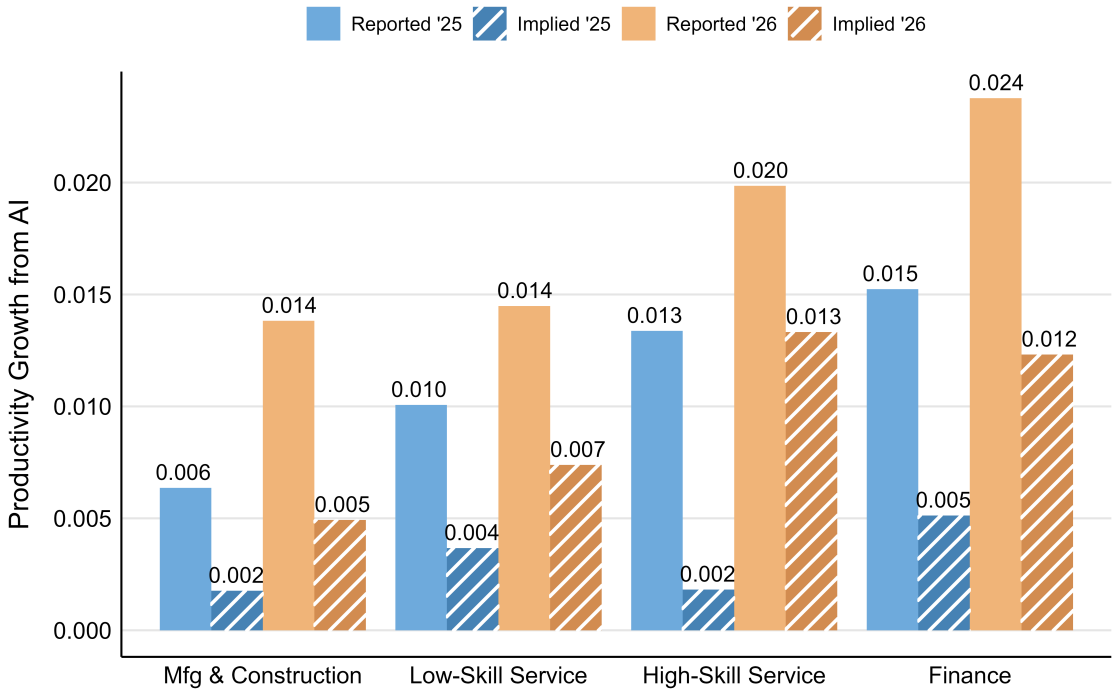
A4.1 Robustness and Heterogeneity

Figure A17: Decomposing Implied Productivity Effects, 2025

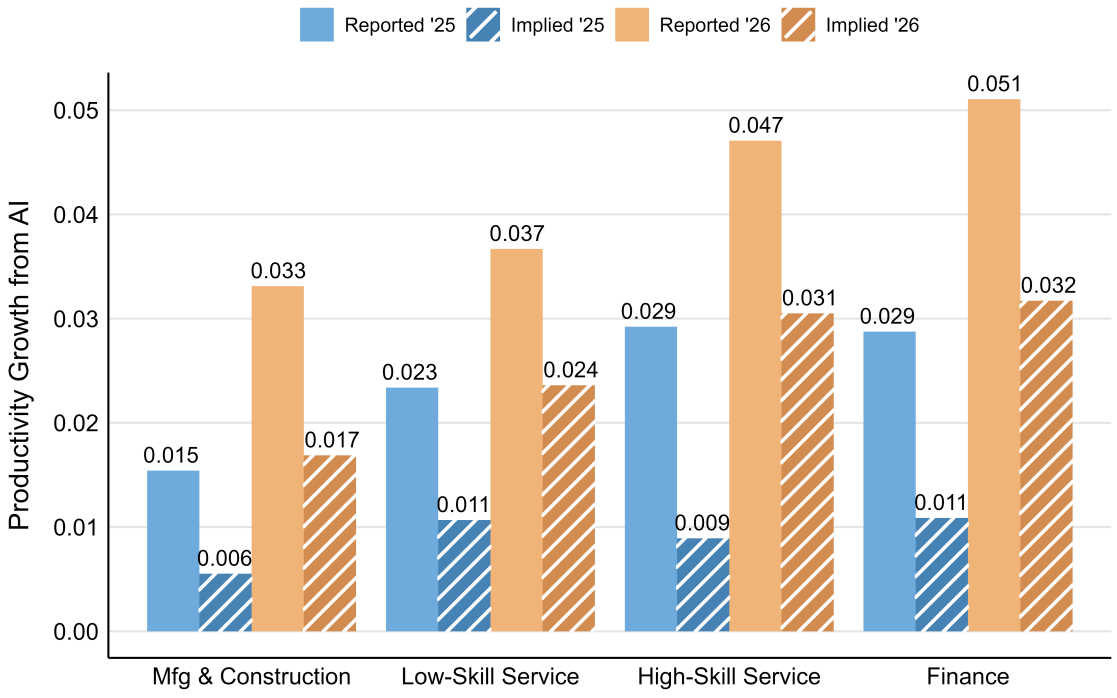


Notes: The figure decomposes mean implied AI-attributed labor productivity growth, $\Delta \ln(Y/L)_{it}^{AI}$, for 2025 into capital deepening and the residual (revenue-based TFP), as defined in Equation (**??**). This is the 2025 counterpart to Panel (b) of Figure 4

Figure A18: Reported vs. Implied Productivity Effects of AI. Robustness to Midpoint-Measurement



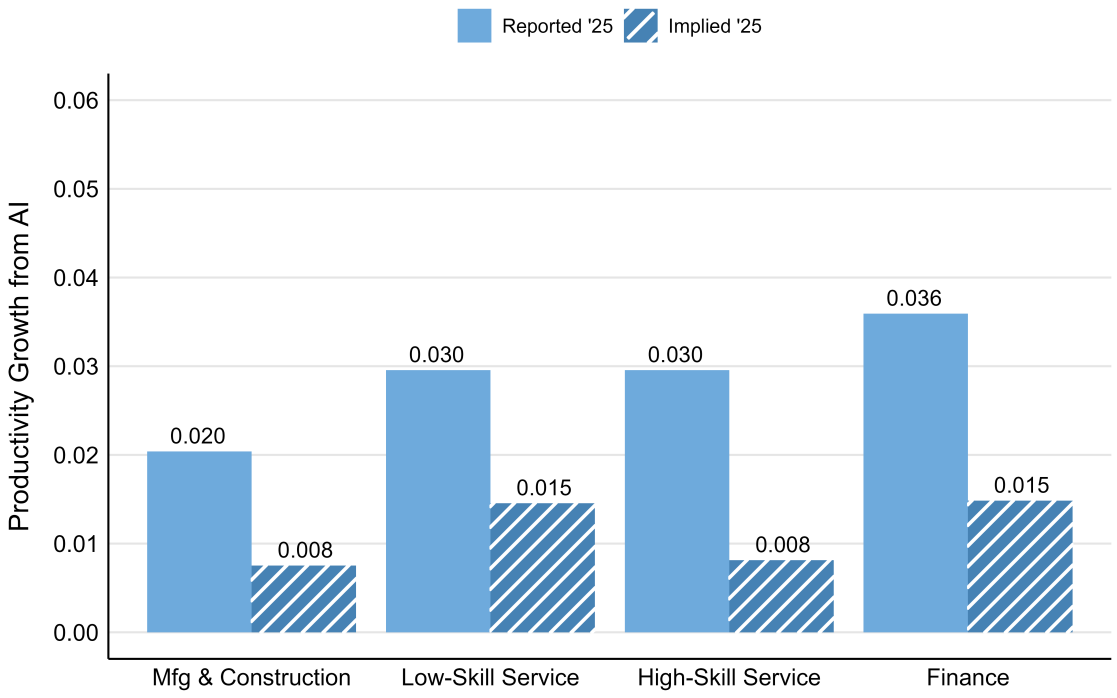
(a) Midpoint → lower end



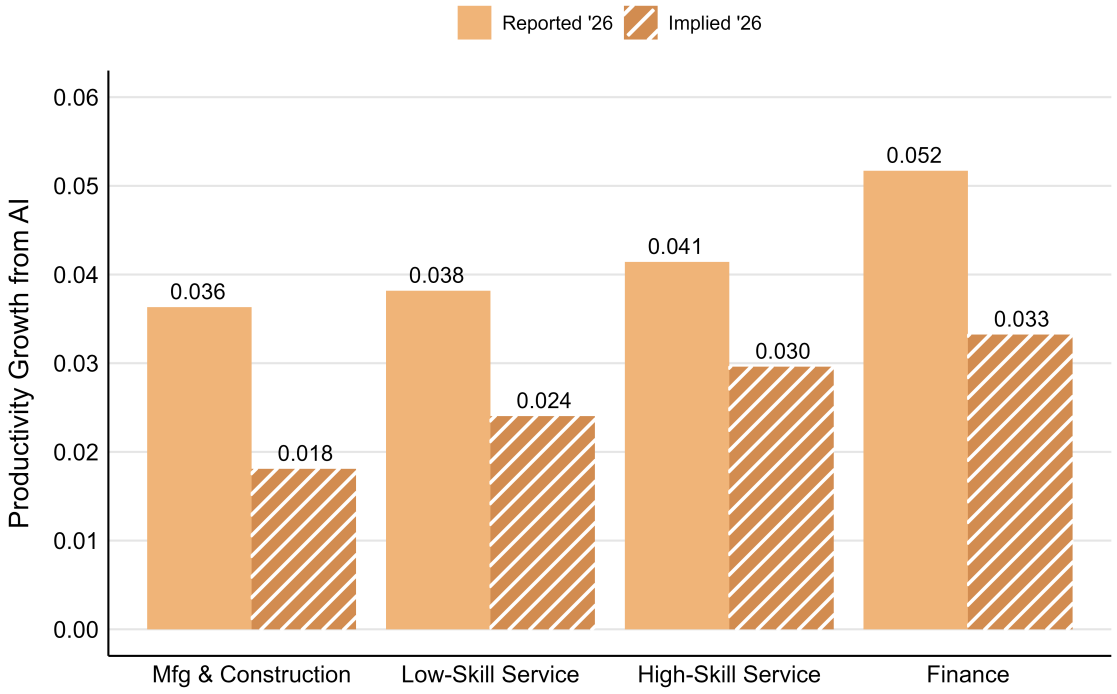
(b) Midpoint → upper end

Notes: The figure is similar to Panel (a) of Figure 4 in the main text but explores robustness to alternative codings of the survey responses. Bars show the mean reported (light-colored bars), $\Delta \ln LP_{it}^{AI,\,CFO}$, and implied (dark-shaded bars), $\Delta \ln(Y/L)_{it}^{AI}$, productivity growth attributable to AI for 2025 and 2026 across sectors. Panel (a) assigns the lower bound of each categorical response when mapping survey ranges to continuous outcomes, while panel (b) assigns the upper bound.

Figure A19: Reported vs. Implied Productivity Effects of AI. Firms with Positive Investment



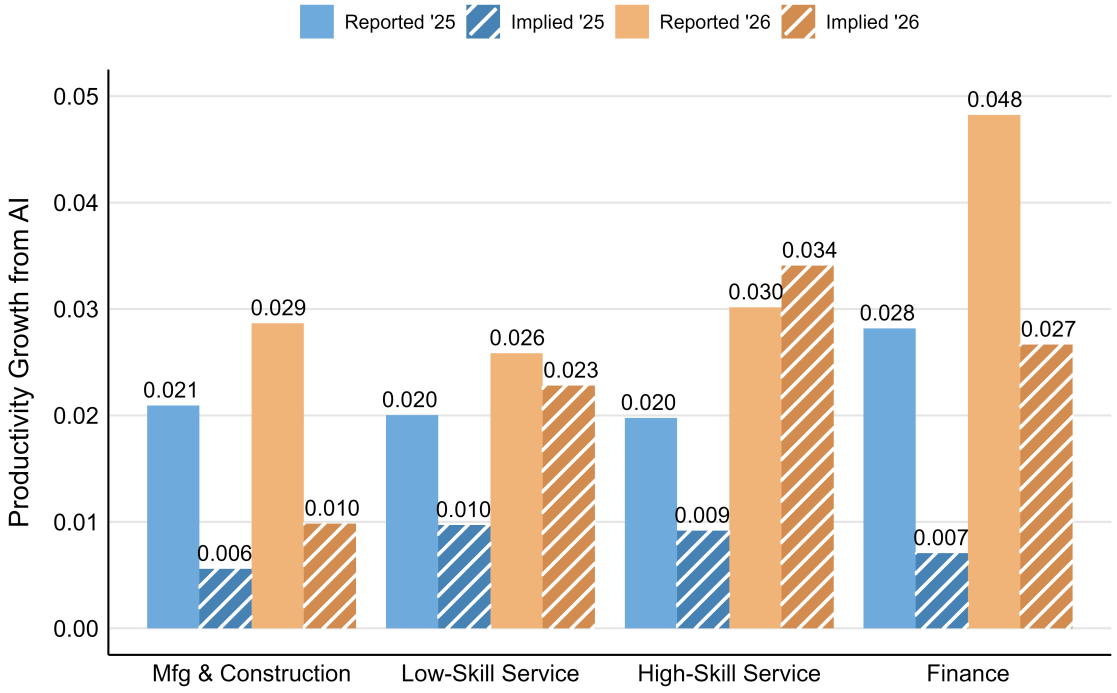
(a) Companies that Invested in AI in '25



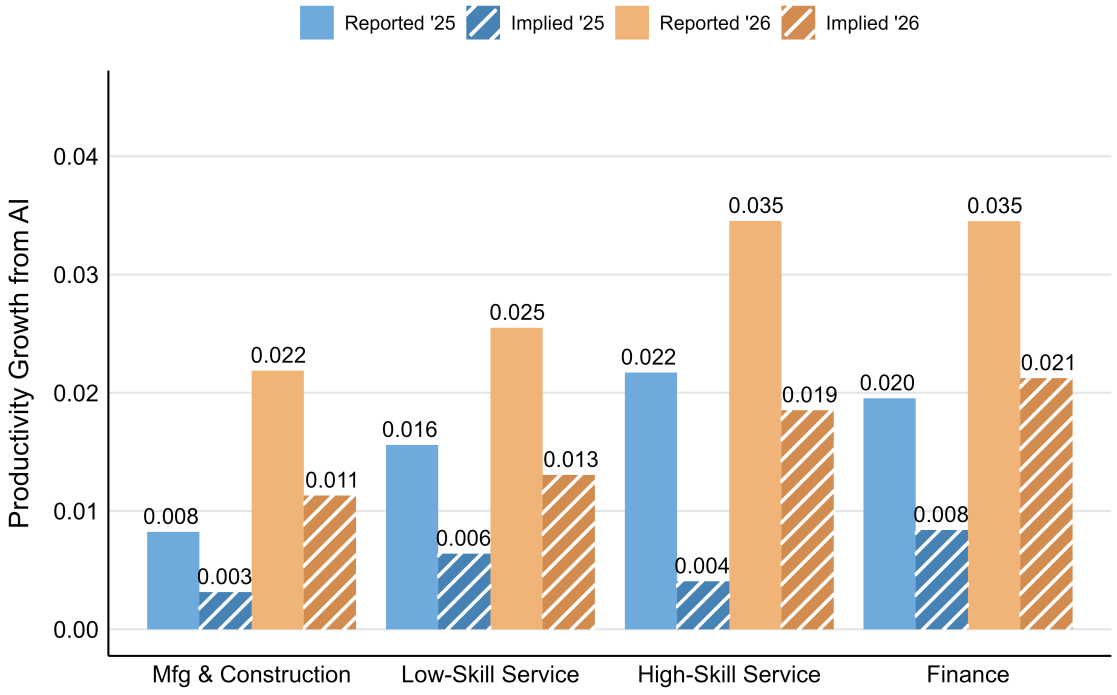
(b) Companies that Invested in AI in '25 or '26

Notes: Bars show mean reported (light-colored bars), $\Delta \ln LP_{it}^{AI,\,CFO}$, and implied (dark-shaded bars), $\Delta \ln(Y/L)_{it}^{AI}$, productivity growth attributable to AI for 2025 and 2026 for firms with positive AI investment. Panel (a) reports results for firms with positive AI investment in 2025, while panel (b) reports results for firms with positive AI investment in 2025 and/or positive expected investment in 2026.

Figure A20: Reported vs. Implied Productivity Effects of AI: by Firm Size



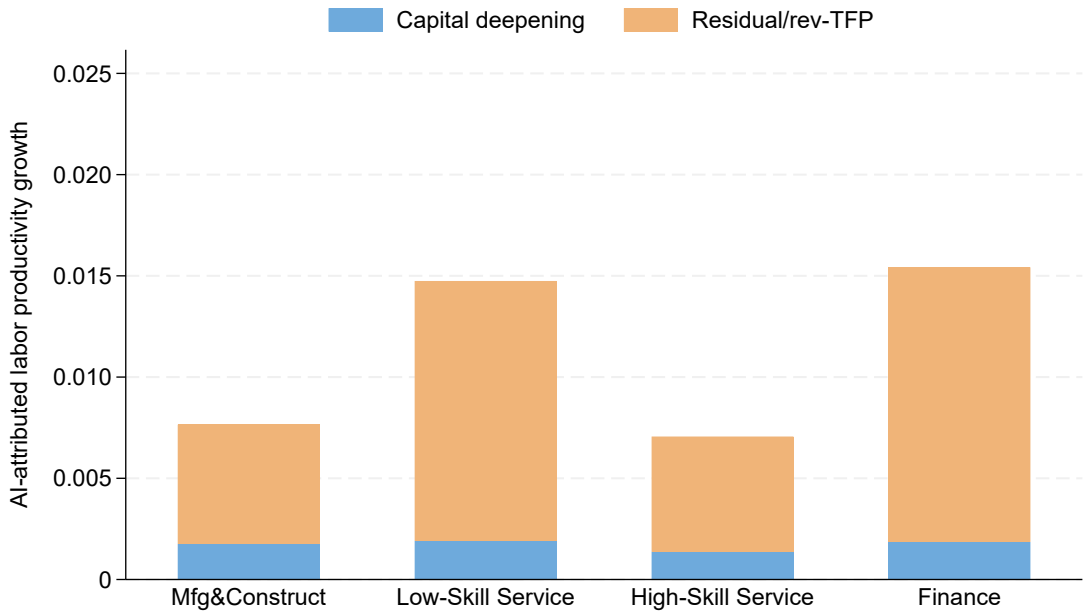
(a) Large Firms



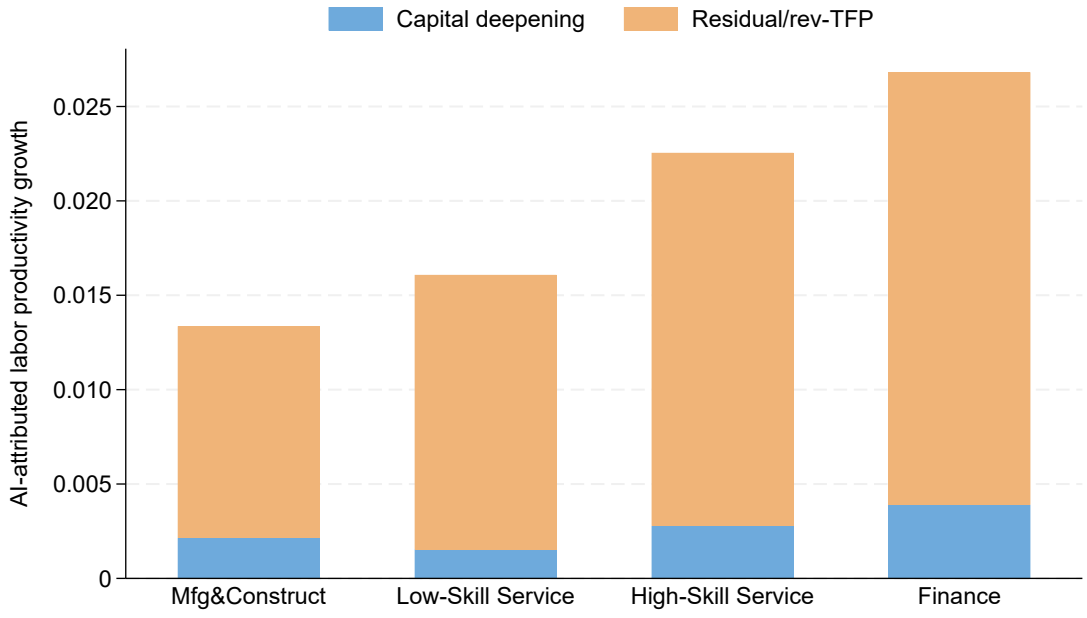
(b) Small Firms

Notes: Bars show mean reported (light-colored bars), $\Delta \ln LP_{it}^{AI,\,CFO}$, and implied (dark-shaded bars), $\Delta \ln(Y/L)_{it}^{AI}$, productivity growth attributable to AI for 2025 and 2026 across sectors. Panel (a) reports results for large firms with more than 500 employees, while panel (b) reports results for small firms.

Figure A21: Decomposing Labor Productivity Growth from AI: Firms with Positive Investment



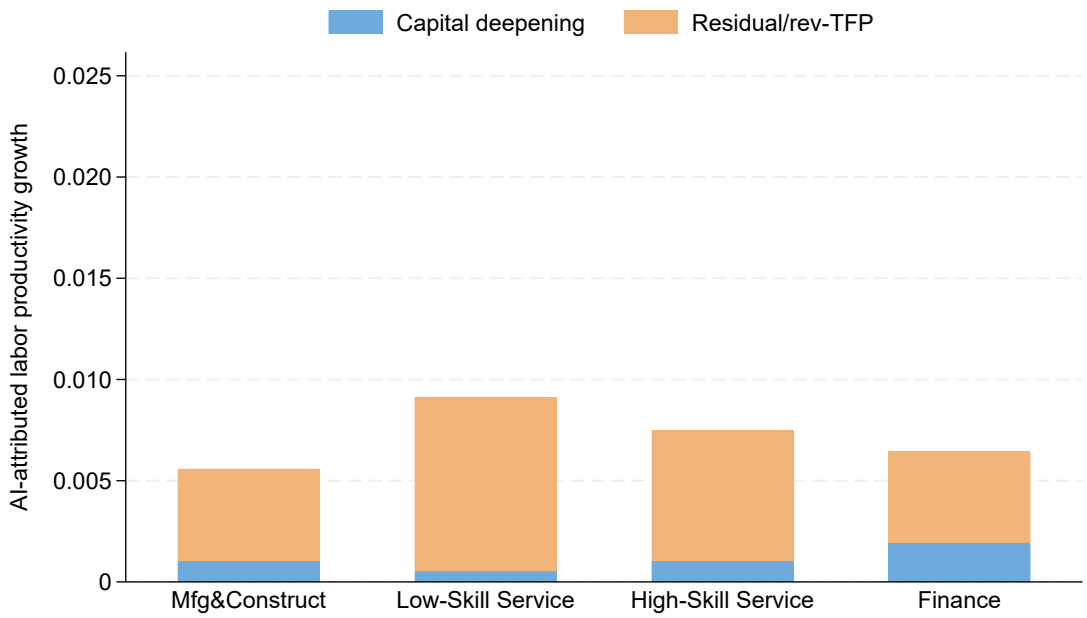
(a) 2025



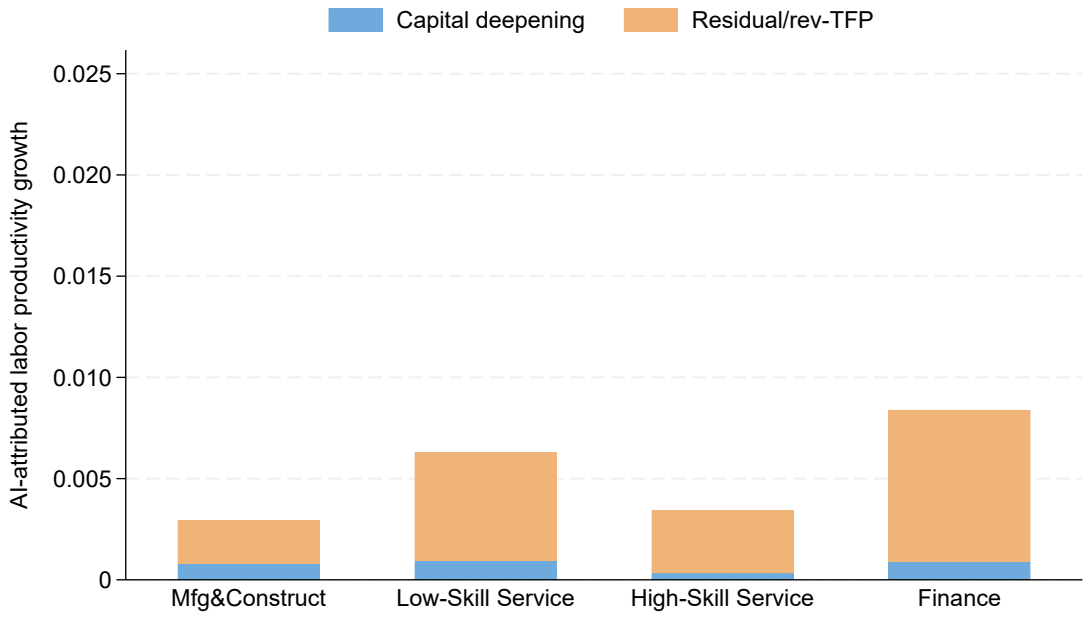
(b) 2026

Notes: Bars show the decomposition of mean implied AI-attributed labor productivity growth, $\Delta \ln(Y/L)_{it}^{AI}$, across sectors into capital deepening and the residual (revenue-based TFP), as defined in Equation (4) for firms with positive AI investment. Panel (a) reports results for firms with positive AI investment in 2025, while panel (b) reports results for firms with positive AI investment in 2025 and/or positive expected investment in 2026.

Figure A22: Decomposing Labor Productivity Growth from AI: by Firm Size, 2025



(a) Large Firms



(b) Small Firms

Notes: Bars show the decomposition of mean implied AI-attributed labor productivity growth, $\Delta \ln(Y/L)^{AI}_{i2025}$, across sectors into capital deepening and the residual (revenue-based TFP), as defined in Equation (4). Panel (a) reports results for large firms with more than 500 employees, while panel (b) reports results for small firms.

Appendix Table A7: Labor Productivity Gains from AI: Mechanisms. Weighted Estimation (representativeness)

	(1)	(2)	(3)	(4)
	2025		2026	
	Implied ΔLP	Implied ΔTFP	Implied ΔLP	Implied ΔTFP
Operational Efficiency Channel				
Production Efficiency	-0.001	-0.004	0.002	-0.002
	(0.006)	(0.005)	(0.006)	(0.006)
Reduce Labor Costs	0.004	0.009	0.007	0.007
	(0.007)	(0.008)	(0.009)	(0.008)
Reduce Other Costs	-0.011	-0.018	-0.012	-0.012
	(0.012)	(0.013)	(0.010)	(0.010)
Decision Making/Mgmt	-0.003	-0.006	0.010	0.005
	(0.006)	(0.006)	(0.007)	(0.006)
Innovation & Demand Channel				
Product Development/Improvement	-0.001	-0.003	0.014**	0.013**
	(0.009)	(0.008)	(0.006)	(0.006)
Reach/Serve Customers	0.018***	0.013**	0.019**	0.019***
	(0.006)	(0.006)	(0.008)	(0.006)
Factor Upgrading				
Upgrade Capital	-0.019	-0.013	0.006	0.005
	(0.013)	(0.013)	(0.012)	(0.011)
Workforce Development				
	0.000	0.006	-0.028***	-0.020***
	(0.007)	(0.007)	(0.009)	(0.007)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.13	0.13	0.28	0.28
Observations	351	337	364	343

Notes: The table is similar to Panel (c) of Figure 4 in the main text but applies firm-level weights in the regressions. Firm-level representativeness weights are constructed to match the Census distribution of firms (count) by sector (four broad categories: manufacturing and construction, low-skill services, high-skill services, and finance) and firm size (1–99, 100–499, and 500+ employees).

Appendix Table A8: Labor Productivity Gains from AI: Mechanisms. Weighted Estimation (importance)

	(1)	(2)	(3)	(4)
	2025		2026	
	Implied ΔLP	Implied ΔTFP	Implied ΔLP	Implied ΔTFP
Operational Efficiency Channel				
Production Efficiency	-0.008	-0.009	-0.004	-0.004
	(0.006)	(0.006)	(0.009)	(0.008)
Reduce Labor Costs	0.003	-0.000	0.022**	0.016*
	(0.008)	(0.006)	(0.010)	(0.009)
Reduce Other Costs	-0.002	-0.002	-0.007	-0.005
	(0.007)	(0.006)	(0.010)	(0.010)
Decision Making/Mgmt	-0.006	-0.011	0.010	0.003
	(0.008)	(0.008)	(0.008)	(0.007)
Innovation & Demand Channel				
Product Development/Improvement	0.017*	0.013*	0.026***	0.022***
	(0.009)	(0.008)	(0.008)	(0.007)
Reach/Serve Customers	0.010	0.013	-0.006	-0.002
	(0.010)	(0.009)	(0.008)	(0.007)
Factor Upgrading				
Upgrade Capital	0.000	0.001	0.012*	0.013**
	(0.007)	(0.007)	(0.007)	(0.006)
Workforce Development	-0.005	0.003	-0.021**	-0.014*
	(0.006)	(0.006)	(0.009)	(0.008)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.12	0.15	0.21	0.19
Observations	351	337	364	343

Notes: The table is similar to Panel (c) of Figure 4 in the main text but applies firm-level weights in the regressions. Firm-level weights are the combined representativeness and importance weights. Representativeness weights are constructed to match the Census distribution of firms (count) by sector (four broad categories: manufacturing and construction, low-skill services, high-skill services, and finance) and firm size (1–99, 100–499, and 500+ employees). The importance weight is firm-level employment in 2024 (winsorized at 1/95 level to reduce the impact of noise).

Appendix Table A9: Revenue and Employment Changes: Mechanisms

	(1)	(2)	(3)	(4)	(5)	(6)
	Δ Revenue		Δ Employment		Δ Routine-Clerical	
	2025	2026	2025	2026	2026	2028
Operational Efficiency Channel						
Production Efficiency	-0.004	0.003	0.073	-0.616**	-1.494**	-1.731**
	(0.003)	(0.004)	(0.220)	(0.268)	(0.688)	(0.864)
Reduce Labor Costs	0.003	-0.004	-0.131	-1.014***	-0.777	-1.679
	(0.004)	(0.004)	(0.258)	(0.374)	(0.509)	(1.046)
Reduce Other Costs	-0.000	0.001	0.063	0.235	0.416	0.832
	(0.004)	(0.004)	(0.287)	(0.396)	(0.535)	(1.097)
Decision Making/Mgmt	-0.001	-0.001	0.099	0.075	0.275	-0.532
	(0.003)	(0.004)	(0.211)	(0.275)	(0.522)	(0.928)
Innovation & Demand Channel						
Product Development/Improvement	0.007**	0.012***	-0.009	0.092	0.553	0.183
	(0.003)	(0.004)	(0.184)	(0.284)	(0.735)	(1.154)
Reach/Serve Customers	0.005*	0.007*	-0.386*	-0.380	0.560	1.063
	(0.003)	(0.004)	(0.199)	(0.350)	(0.587)	(0.948)
Factor Upgrading						
Upgrade Capital	0.003	0.010**	0.384	0.593	0.248	0.403
	(0.003)	(0.005)	(0.259)	(0.403)	(0.617)	(0.922)
Workforce Development	-0.001	-0.003	0.301	0.327	-1.201**	-1.067
	(0.003)	(0.004)	(0.221)	(0.319)	(0.522)	(0.879)
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.06	0.11	0.04	0.06	0.06	0.04
Observations	368	377	368	380	392	392

Notes: This table reports firm-level regressions of changes in revenue, total employment, and routine-clerical employment on indicators for the importance of different motivations for AI investment. Columns (1)–(2) report revenue changes in 2025 and 2026, columns (3)–(4) report total employment changes in 2025 and 2026, and columns (5)–(6) report routine-clerical employment changes in 2026 and 2028. For conciseness, the Δ Creative and Δ Skilled-Technical columns are omitted; the corresponding coefficients are statistically insignificant at conventional levels. Each motivation is coded as a dummy equal to one if the firm rates it as *very important* or *extremely important*, and zero otherwise (*not at all*, *slightly*, or *moderately* important). All regressions include broad sector fixed effects, defined as manufacturing and construction, low-skill services, high-skill services, and finance, and report heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A4.2 Extensive and Intensive Margins of AI Investment

We examine more closely the quantitative effects of AI investment—along both the extensive and intensive margins—on reported and implied labor productivity growth and on the revenue-based productivity residual (see Table A10).[5]

Panel A presents results for the extensive margin of AI investment. Relative to firms that do not invest in AI, investing firms show AI-related labor productivity growth that is 1.0 percentage points higher in 2025 and expect gains that are 1.8 percentage points higher in 2026.[6] Most of these gains are accounted for by increases in implied revenue-based TFP (the productivity residual); for example, the TFP coefficient in column (2) is nearly as large as the column (1) coefficient, and likewise for columns (3) and (4).

The next panels examine the intensive margin of AI investment, including zero-investment firms in Panel B and restricting to firms with positive AI investment in Panel C. The estimated semi-elasticities are modest, even for 2026. In Panel B column (1), a 10% increase in AI investment is associated with a 0.01 percentage-point increase in implied productivity growth in 2025, with effects that are roughly twice as large in 2026. To aid interpretation, a one-standard-deviation increase in log AI investment is associated with a 0.5 percentage-point increase in implied labor productivity growth. Restricting the sample to firms with positive AI investment (Panel C) shows that these semi-elasticities are statistically insignificant for 2025, but remain statistically significant and economically larger for expected productivity growth in 2026.

[5]Tables A11 and A12 report similar results using weighted regressions.

[6]Recall that the survey question is asked of all firms, irrespective of whether they invest in AI – even firms that do not explicitly invest company resources in AI solutions may experience changes in productivity.

Appendix Table A10: Revenue-Productivity Growth and Extensive and Intensive Margins of AI Investment

	(1)	(2)	(3)	(4)
	2025		2026	
	Implied ΔLP	Implied ΔTFP	Implied ΔLP	Implied ΔTFP
Panel A: AI invest dummy				
AI Adopt ('25)	0.010***	0.008***		
	(0.002)	(0.001)		
AI Adopt ('25/'26)			0.018***	0.014***
			(0.002)	(0.002)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.05	0.04	0.06	0.06
Observations	663	649	639	611
Panel B: AI investment (all firms, unconditional)				
Log AI Inv ('25)	0.001***	0.001***		
	(0.000)	(0.000)		
Log AI inv ('25/'26)			0.002***	0.002***
			(0.000)	(0.000)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.06	0.05	0.12	0.10
Observations	642	630	601	575
Panel C: AI investment (only positives, conditional)				
Log AI Inv ('25)	0.001	0.001		
	(0.001)	(0.001)		
Log AI inv ('25/'26)			0.004***	0.004***
			(0.001)	(0.001)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.02	0.02	0.13	0.10
Observations	334	334	504	478

Notes: The table reports firm-level regressions of changes in reported labor productivity, implied revenue-based labor productivity (Δ LP), and implied revenue-based total factor productivity (Δ TFP) for 2025 and 2026 on extensive and intensive measures of AI investment. Growth in reported labor productivity and implied revenue-based labor productivity are defined in Section 4.1, and revenue-based TFP (the productivity residual) is defined in equation (4). Panel A studies the extensive margin of AI investment. *AI Adopt'25* equals one if the firm reports any AI investment in 2025, and *AI Adopt'25/'26* equals one if the firm reports any AI investment in either 2025 or 2026. Panel B studies the intensive margin for all firms. *Log AI Inv'25* is the logarithm of AI investment reported in 2025 (plus one), and *Log AI Inv'25/'26* is the logarithm of total AI investment reported over 2025 and 2026 (plus one). Panel C restricts the sample to firms with positive AI investment. All regressions include broad sector fixed effects (manufacturing and construction, low-skill services, high-skill services, and finance) and report heteroskedasticity-robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix Table A11: Productivity Growth and Extensive and Intensive Margins of AI Investment. Weighted Estimation (representativeness)

	(1)	(2)	(3)	(4)
	2025		2026	
	Implied ΔLP	Implied ΔTFP	Implied ΔLP	Implied ΔTFP
Panel A: AI invest dummy				
AI Adopt ('25)	0.008**	0.006*		
	(0.004)	(0.004)		
AI adopt ('25/'26)			0.014***	0.012***
			(0.003)	(0.003)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.04	0.03	0.08	0.09
Observations	650	636	628	600
Panel B: AI investment (all firms, uncond)				
Log AI Inv ('25)	0.001	0.000		
	(0.001)	(0.001)		
Log AI inv ('25/'26)			0.002***	0.001***
			(0.000)	(0.000)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.03	0.02	0.09	0.10
Observations	629	617	591	565
Panel C: AI investment (only positives, cond)				
Log AI Inv ('25)	-0.005	-0.004		
	(0.004)	(0.004)		
Log AI inv ('25/'26)			0.003	0.002
			(0.002)	(0.002)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.12	0.11	0.05	0.06
Observations	329	329	496	470

Notes: The table is similar to Table A10 but applies firm-level weights in the regressions. Firm-level representativeness weights are constructed to match the Census distribution of firms (count) by sector (four broad categories: manufacturing and construction, low-skill services, high-skill services, and finance) and firm size (1–99, 100–499, and 500+ employees).

Appendix Table A12: Productivity Growth and Extensive and Intensive Margins of AI Investment. Weighted Estimation (importance)

	(1)	(2)	(3)	(4)
	2025		2026	
	Implied ΔLP	Implied ΔTFP	Implied ΔLP	Implied ΔTFP
Panel A: AI invest dummy				
AI Adopt ('25)	0.011***	0.009***		
	(0.003)	(0.003)		
AI adopt ('25/'26)			0.020***	0.017***
			(0.003)	(0.003)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.05	0.04	0.05	0.05
Observations	650	636	628	600
Panel B: AI investment (all firms, uncond)				
Log AI Inv ('25)	0.001**	0.001*		
	(0.000)	(0.000)		
Log AI inv ('25/'26)			0.003***	0.003***
			(0.001)	(0.001)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.07	0.06	0.21	0.19
Observations	629	617	591	565
Panel C: AI investment (only positives, cond)				
Log AI Inv ('25)	0.001	0.001		
	(0.002)	(0.002)		
Log AI inv ('25/'26)			0.006***	0.005***
			(0.001)	(0.001)
Sector FE	Yes	Yes	Yes	Yes
R^2	0.04	0.04	0.25	0.24
Observations	329	329	496	470

Notes: The table is similar to Table A10 but applies firm-level weights in the regressions. Firm-level weights are the combined representativeness and importance weights. Representativeness weights are constructed to match the Census distribution of firms (count) by sector (four broad categories: manufacturing and construction, low-skill services, high-skill services, and finance) and firm size (1–99, 100–499, and 500+ employees). The importance weight is firm-level employment in 2024 (winsorized at 1/95 level to reduce the impact of noise).

A4.3 Calculating Capital Deepening Using AI Expenditures

This appendix develops an alternative proxy for AI-attributed capital deepening that leverages firms' reported AI expenditures, rather than self-reported changes in the book value of capital.

Recall that implied AI-attributed labor productivity growth decomposes as

$$\Delta \ln(Y/L)_{it}^{AI} = \alpha \, \Delta \ln(K/L)_{it}^{AI} + \Delta \ln A_{it}^{AI}, \qquad \Delta \ln(K/L)_{it}^{AI} = \Delta \ln K_{it}^{AI} - \Delta \ln L_{it}^{AI}.$$

As in the baseline specification, $\Delta \ln L_{it}^{AI}$ is taken directly from company responses. The key difference lies in how we proxy $\Delta \ln K_{it}^{AI}$—the component of the change in the firm's capital input attributable to AI.

$\Delta \ln K_{it}^{AI}$ is a counterfactual object defined as the difference between the firm's end-of-period capital stock in the observed economy and the capital stock that would have prevailed absent AI investment, holding fixed all non-AI investment decisions (denoted as K_{it}^{0}):

$$\Delta \ln K_{it}^{AI} \equiv \ln K_{it} - \ln K_{it}^{0}. \tag{1}$$

Let total capital evolve according to the standard law of motion,

$$K_{it} = (1-\delta) K_{i,t-1} + I_{it}^{nonAI} + I_{it}^{AI}, \tag{2}$$

where δ is depreciation, and I_{it}^{nonAI} and I_{it}^{AI} are non-AI and AI investments, respectively. Then the no-AI counterfactual is obtained by setting $I_{it}^{AI} = 0$:

$$K_{it}^{0} = (1-\delta) K_{i,t-1} + I_{it}^{nonAI}. \tag{3}$$

Then, using a first-order approximation,

$$\Delta \ln K_{it}^{AI} = \ln\left(1 + \frac{I_{it}^{AI}}{K_{it}^{0}}\right) \approx \frac{I_{it}^{AI}}{K_{it}^{0}}. \tag{4}$$

Since K_{it}^{0} is unobserved, we scale AI investment by the beginning-of-period capital stock:[7]

$$\Delta \ln K_{it}^{AI} \approx \frac{I_{it}^{AI}}{K_{i,t-1}}. \tag{5}$$

This expression says that an AI investment equal to x percent of last year's capital stock

[7]For the 2025 calculations, we require $K_{i,2024}$, which is unavailable for most firms. We therefore construct $K_{i,2024}$ from the 2025 book value of PP&E and intangible assets, assuming a 20% depreciation rate.

raises the firm's capital input by approximately x percent due to AI.

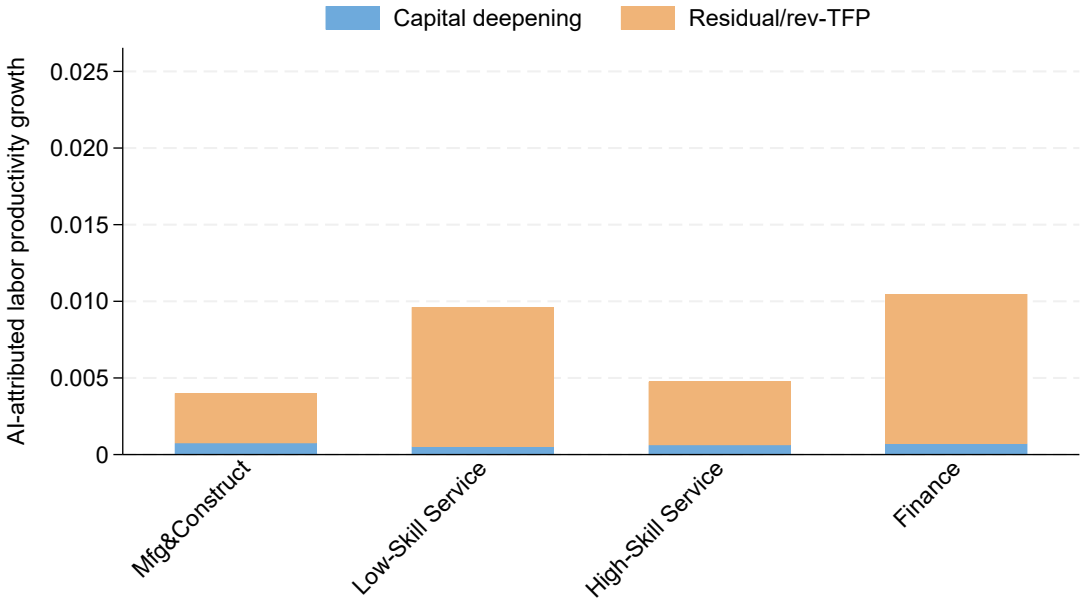
To measure I^{AI}, we partially capitalize the AI expenditure figures reported by the firms. In particular, for a subset of firms (N=183), we asked about the allocation of AI expenditures into capitalizable outlays (e.g., AI-related hardware and internally developed software) and operating expenses (e.g., software subscriptions and cloud computing services). As shown earlier in Figure A10, a large share of AI expenditures is attributable to operating costs, especially for large firms. Following Bureau of Labor Statistics and national accounts practices whereby software subscriptions and cloud computing services (SaaS, IaaS, PaaS) are generally treated as intermediate inputs rather than capital investment, while expenditures on hardware and internally developed software are included in the capital stock, we capitalize only the portion of AI expenditures corresponding to hardware and internal development. For firms for which we do not have the AI expenditure split, we extrapolate the capitalization shares using the allocation from the known sample. In particular, for 2025, a median large firm reports 55% of capitalizable outlays, while the median small firm reports 0%; the same figures for 2026 are 40% and 20%, respectively.[8]

Figure A23 presents the decomposition obtained using this alternative, expenditure-based measure of AI-attributed capital growth. Consistent with the baseline results, capital deepening accounts for a modest share of AI-attributed revenue labor productivity growth (about 16% on average), yielding a decomposition that is nearly identical to the baseline. For 2026, the expenditure-based approach implies a somewhat larger contribution of capital deepening—particularly in high-skill services—but the average contribution remains moderate at 24%.

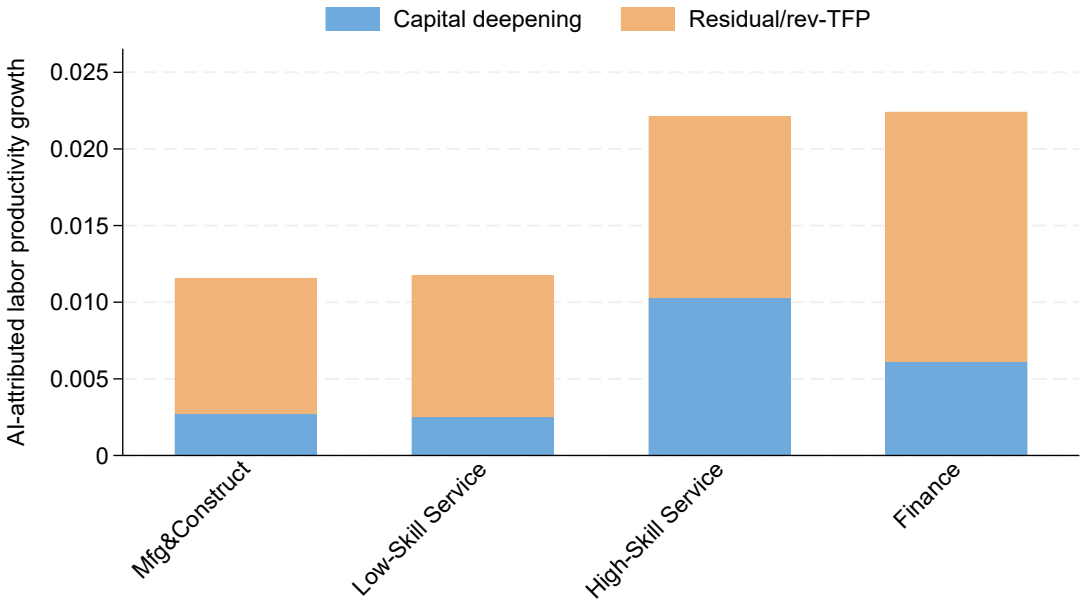
The close alignment between the baseline decomposition and this alternative approach reinforces our conclusions regarding the sources of AI-related productivity growth. In particular, the similarity between the decomposition based on firm-reported AI-attributed changes in PP&E and that obtained by capitalizing AI expenditures related to hardware and internal development suggests that respondents interpreted the PP&E question as intended and appropriately distinguished capital investment from operating AI expenses.

[8]For 2025 calculations, we need to use K_{i2024}, which is not available for most of the firms in the data. We construct the value of K_{i2024} using the 2025 book value of PP&E and intangible assets and a 20% depreciation rate.

Figure A23: Decomposing Labor Productivity Growth from AI: Capitalizing AI Expenditures



(a) 2025



(b) 2026

Notes: Bars show the decomposition of mean implied AI-attributed labor productivity growth, $\Delta \ln(Y/L)_{it}^{AI}$, across sectors into capital deepening and the residual (revenue-based TFP), as defined in Equation (4). Capital growth due to AI is constructed using partial capitalization of firm-reported AI expenditures as described in Section A4.3. Panel (a) decomposes productivity gains for 2025, while panel (b) decomposes expected gains for 2026.

A5 Survey Questions on Artificial Intelligence

Answer options are in italic, separated by a semicolon.

1. Artificial intelligence (AI) refers to the broad field of machines capable of replicating human behavior and intelligence.

   Over the last 12 months, has your firm made any expenditures or financial investments in AI technology or solutions?

   This includes:

   - AI applications (e.g., large language models, machine learning, speech/voice recognition, data/text analytics, virtual agents/chatbots, visual content creation, robotics, mechanization, etc.)
   - Infrastructure to support these applications - including equipment (e.g., semiconductors and information processing equipment), structures (e.g., data centers or power production), and intellectual property (e.g., spending on model R&D and software).

   Yes; No; Not Sure

2. (If "Yes" to 1) Please rate the importance of the following possible motivations behind your firm's expenditure/investment in AI:

   - Improving production efficiency
     - e.g., improving speed of processes, automating or optimizing internal processes, logistics, or maintenance
   - Improving Labor Productivity
     - Increasing revenue per worker or output per worker
   - Reducing Labor Costs
   - Reducing non-labor costs
   - Enhancing Decision-making and Management
     - e.g., data analytics, forecasting, workflow/HR optimization
   - Developing or Improving Products/Services
     - e.g., new or higher-quality offerings, personalization, testing, faster R&D cycles

- Reaching or Serving Customers More Effectively
  - e.g., marketing, customer interaction, after-sales support
- Upgrading Physical or Digital Capital
  - e.g., investments in hardware, data infrastructure, or cloud systems
- Developing Workforce Skills/Adapting Labor
  - e.g., training, hiring, or reorganizing teams for AI use
- Other (Please Specify)

Not at all important; Slightly important; Moderately important; Very important; Extremely important

3. (If "Yes" to 1) What was your company's total expenditure and financial investment in AI technology/solutions over the last 12 months?

   $0; $1-$5,000; $5,001-$20,000; $20,001-$50,000; $50,001-$100,000; $100,001-$500,000; $500,001-$1 million; $1 million - 5 million; Over $5 million; Prefer not to say

4. (If "Over $5 million " in 3) Roughly, what was your company's total expenditure and financial investment in AI technology/solutions over the last 12 months? *(estimates are acceptable)*

5. (If "No" to 1) Why did your firm not make any expenditures or financial investments in AI technology or solutions over the last 12 months? *(Please select all that apply)*

   Too expensive; AI is not a mature enough technology yet; Lack of knowledge on the capabilities of AI; Concerns about privacy/security; Concerns about bias; Our workers are not yet adequately trained on AI; Lack of required data; Laws or regulations prevent or restrict use of AI; Previous or current use of AI did not meet expectations; AI is not applicable to this business; Other (Please explain)

6. What do you expect your company's total expenditure and financial investment in AI technology/solutions will be over the next 12 months?

   $0; $1-$5,000; $5,001-$20,000; $20,001-$50,000; $50,001-$100,000; $100,001-$500,000; $500,001-$1 million; $1 million - 5 million; Over $5 million; Prefer not to say

7. (If "Over $5 million " in 6) Roughly, what do you expect your company's total expenditure and financial investment in AI technology/solutions will be over the next 12 months? *(Estimates are acceptable)*

8. Over the last 12 months, how has your firm's use of AI affected the following outcomes for your firm?

    - Labor Productivity (output per worker)
    - Total employment
    - Book value of PP&E and intangible assets (e.g. software)
    - Operating costs (excluding labor)
    - Labor costs per worker
    - Revenue or sales
    - Revenue from new products
    - Decision-making speed or accuracy
    - Customer satisfaction or retention
    - Time spent on high value-add tasks
    - Other

    Increased significantly (more than 10%); Increased moderately (5.1 to 10%); Increased somewhat (1 to 5%); Little to no change; Decreased somewhat (-1 to -5%); Decreased moderately (-5.1 to -10%); Decreased significantly (more than 10%); Unsure/Not Applicable

9. Over the next 12 months, how do you expect your firm's use of AI to affect the following outcomes for your firm?

    - Labor Productivity (output per worker)
    - Total employment
    - Book value of PP&E and intangible assets (e.g. software)
    - Operating costs (excluding labor)
    - Labor costs per worker
    - Revenue or sales
    - Revenue from new products
    - Decision-making speed or accuracy
    - Customer satisfaction or retention
    - Time spent on high value-add tasks

- Other

Increased significantly (more than 10%); Increased moderately (5.1 to 10%); Increased somewhat (1 to 5%); Little to no change; Decreased somewhat (-1 to -5%); Decreased moderately (-5.1 to -10%); Decreased significantly (more than 10%); Unsure/Not Applicable

10. The questions on this screen pertain to AI tools and your workforce. Please describe the roles/responsibilities of the employees that were (or you expect to be) replaced by AI tools. *[Open-ended response.]*

11. Please describe the roles/responsibilities of employees whose roles were (or you expect to be) complemented or enhanced by AI tools. *[Open-ended response.]*

12. Please provide the percent of your firm's total full-time employees that fall into each of the below categories. Please also provide your expectations for the percent of your total headcount that will fall into these categories 12 and 36 months from now. *(Results for each column should sum to 100%)*

    - Routine/clerical (e.g. data entry, accounting)
    - Skilled Technical (e.g. engineers, data analysts/scientists)
    - Creative/managerial (e.g. design/strategy/leadership)
    - All other

    Current; 12 Months from Now; 36 Months from Now

13. How helpful are AI tools or solutions in performing the following responsibilities?

    - Budgeting and forecasting
    - Cash flow management
    - Cost management
    - Financial planning & decision-making
    - External reporting (e.g. financial statements)
    - Internal reporting (e.g. board reports)
    - Marketing and product development
    - Mergers and acquisitions
    - Partnership management or investor relations

- Payment methods
- Performance management
- Production/services operations planning
- Quality control and inspection
- Risk management
- Sales methods
- Supply chain management
- Tax strategy
- Treasury functions
- Other (Please describe)

Very helpful; Moderately helpful; Not helpful; Unsure; Not Applicable/Do Not Know

14. Please provide specific examples of AI usage or initiatives that provide value for your firm. *[Open-ended response.]*

15. Roughly, how much did your firm spend on capital expenditures (including structures, land, equipment, software, and AI investment) over the last 12 months? *(Estimates are acceptable)*

16. Roughly, what is your company's current book value of PP&E and intangible assets (e.g. software)? *(Estimates are acceptable)*

17. Roughly, what was your firm's total labor costs (including wages, salaries, and benefits) over the last 12 months? *(Estimates are acceptable)*

18. Roughly, what were your firm's costs for intermediate inputs (COGS + materials/energy/hired professional services) over the last 12 months? *(Estimates are acceptable)*

19. Please indicate what percent of your firm's spending on AI technology/solutions over the next 12 months was allocated to each of the below categories. *(Results should sum to %100)*

    - Hardware for AI (e.g. servers/GPUs, devices)
    - Developing or customizing internal AI systems
    - Operational expenses: AI subscriptions, services, and training (cloud-based tools, software fees, consultants, employee training, data prep)
    - Other (Please explain)

References

Fried, S. and Singh, S. R. (2026). What do financial officers predict for price growth? *FRBSF Economic Letter*, 2026-11.

Gennaioli, N., Ma, Y., and Shleifer, A. (2016). Expectations and investment. *NBER Macroeconomics Annual*, 30:379–431.