Figure A.1. Cognism Coverage Relative to U.S. Employment from BLS

This figure plots the fraction of overall full-time employees in the U.S. (based on information from the Bureau of Labor Statistics) that are captured in the Cognism data in each year from 2010 to 2018.
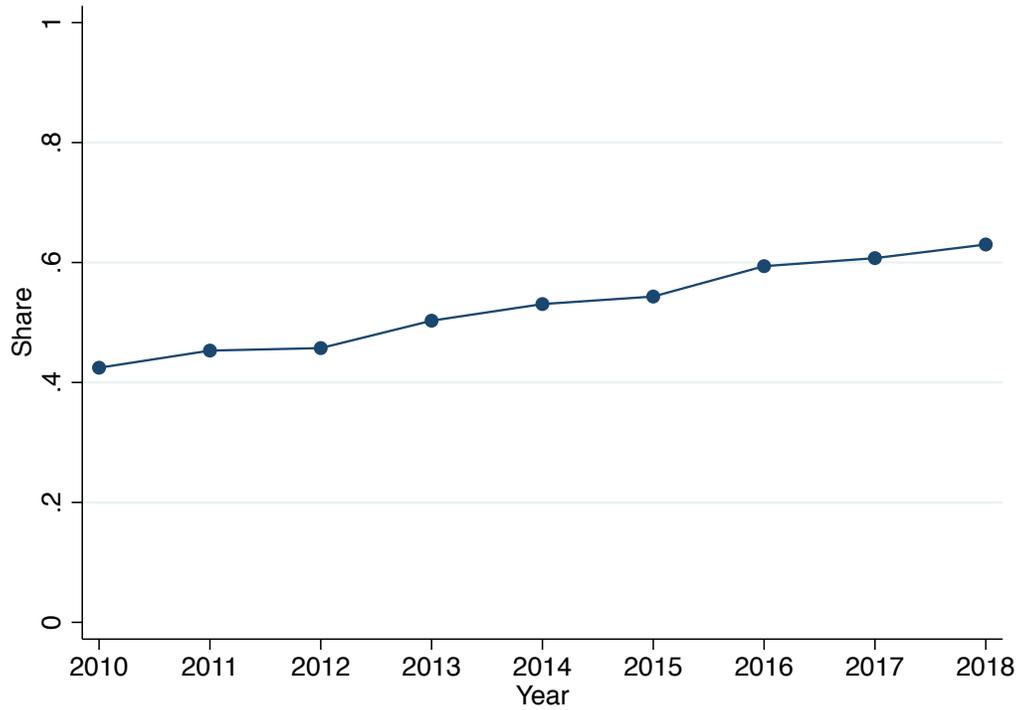
Figure A.2. Cognism Coverage of U.S. Public Firms' Overall Employment

This figure plots the distribution of coverage of public firms' employees in the Cognism data, for each year from 2010 to 2018. Coverage is computed relative to total (global) employment numbers reported by firms in Compsutat. For each year, the figure shows the median and the interquartile range of firm-level coverage rates.
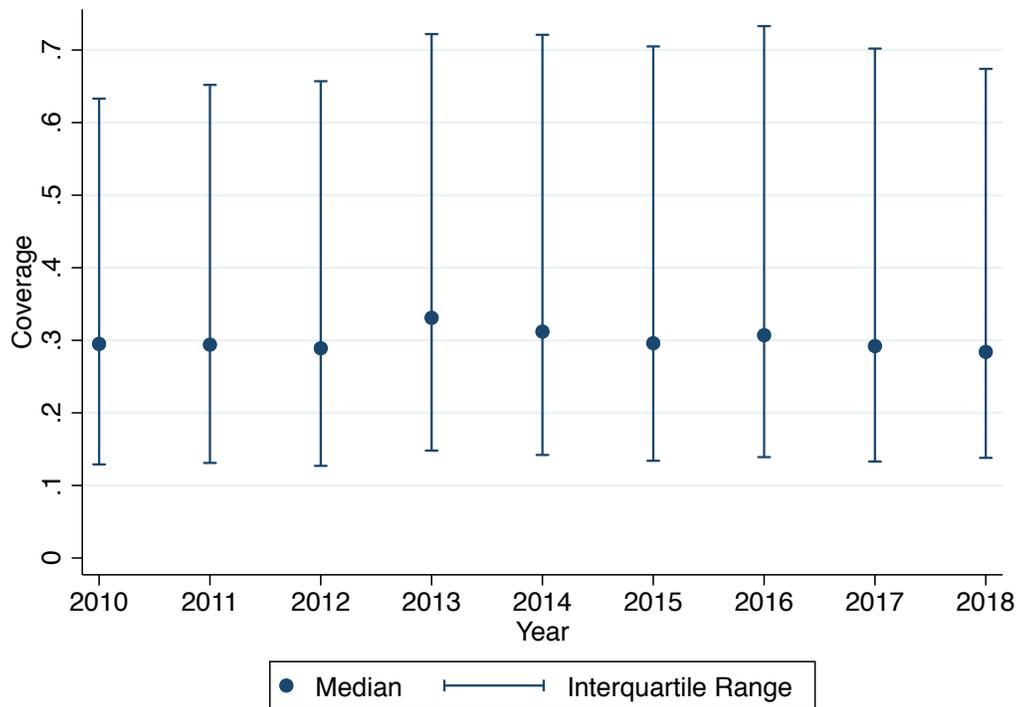
Figure A.3. Times Series of Workers' Education Levels in Census ACS

This figure plots the distribution of education levels for workers with positive earnings in the Census American Community Survey (ACS). Each line is the fraction of workers with each highest education level (less than college, some college or college degree, master's degree, or doctoral degree) in the ACS data in a given year from 2010 to 2018.
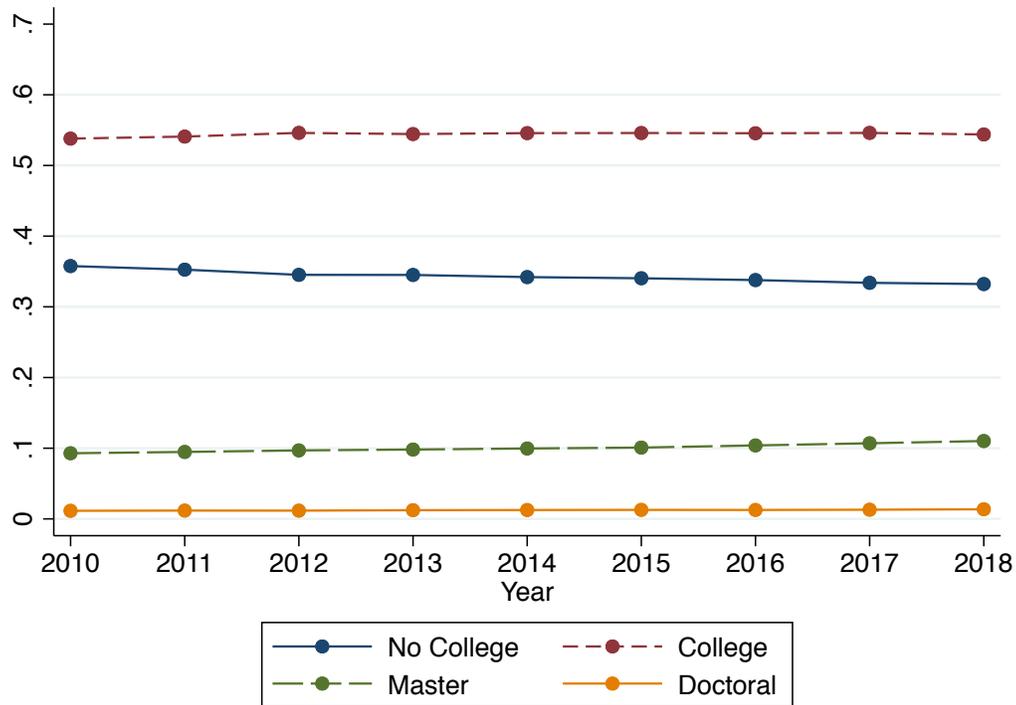
Figure A.4. Times Series of Workers' Majors in Census ACS

This figure plots the distribution of majors of bachelor's degrees for workers with positive earnings in the Census American Community Survey (ACS). Each line is the fraction of all workers receiving their bachelor's degrees in each major (STEM, social science, fine arts, humanities, and medicine) in the ACS data in a given year from 2010 to 2018. STEM includes Environment and Natural Resources, Computer and Information Sciences, Engineering, Engineering Technologies, Biology and Life Sciences, Mathematics and Statistics, Physical Sciences, Nuclear, Industrial Radiology, and Biological Technologies, Transportation Sciences and Technologies. The majors are mutually exclusive.
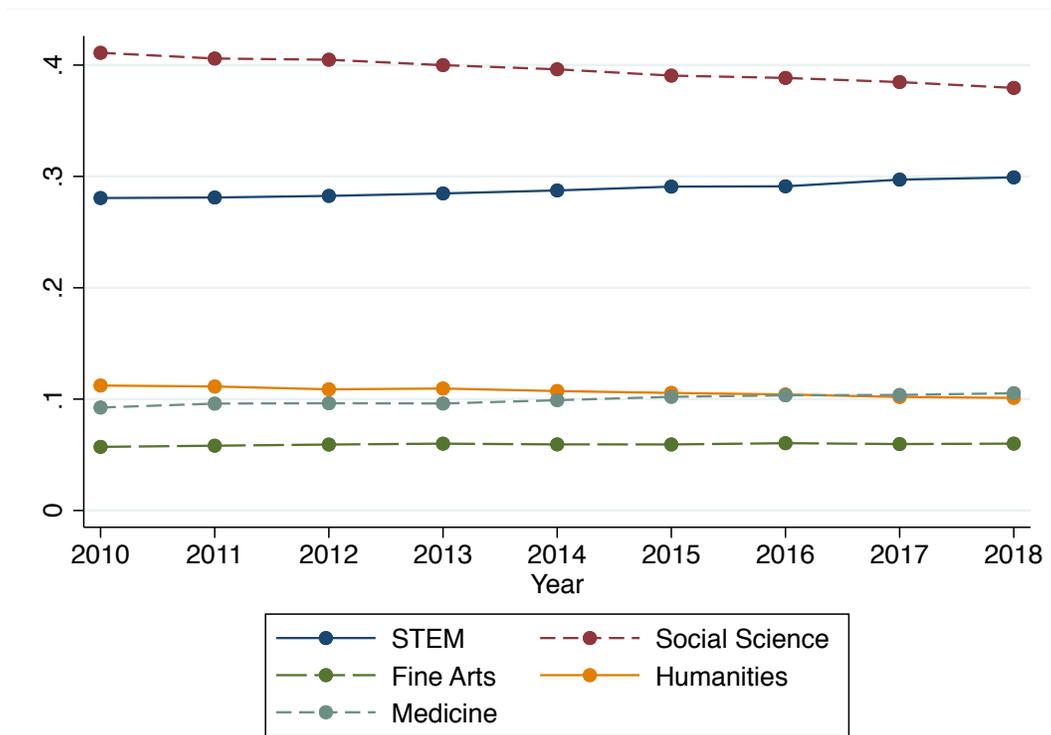
Table A.1. Median Coverage of U.S. Public Firms' Employment in the Cognism Data by Industry Sector

This table reports the median coverage of public firms' employees in the Cognism data for each industry sector. Coverage is computed relative to total (global) employment numbers reported by firms in Compsutat. For each industry sector, the figure shows the median firm-level coverage rate across all firm-year observations between 2010 and 2018.

Industry Sector	Median Coverage Rate
Agriculture	20.09%
Mining	34.97%
Utilities	23.02%
Construction	35.26%
Manufacturing	23.88%
Wholesale	25.15%
Retail Trade	27.86%
Transportation/Warehousing	22.91%
Information	29.70%
Finance/Insurance	52.18%
Real Estate	48.29%
Prof & Business Services	36.41%
Admin Support	21.41%
Education Svcs	28.18%
Health Care	17.78%
Arts/Entertainment	37.22%
Accomodation & Food Services	22.41%
Other Services	20.37%

Table A.2. Skills with Highest AI-Relatedness Measures in Burning Glass Job Postings

This table lists the top skills in the Burning Glass data ranked by the skill-level AI measure. For each skill, we report the percentage of jobs requiring that skill that also require one of the four core AI skills—artificial intelligence, machine learning, computer vision, and natural language processing. For example, for jobs that require "Recurrent Neural Network (RNN)," 96.5% also require one of the four core AI-skills. Only skills that appear in least 50 job postings are included.

#	Skills	AI-relatedness Score
1	Artificial Intelligence	1.000
2	Computer Vision	1.000
3	Machine Learning	1.000
4	Natural Language Processing	1.000
5	ND4J (software)	0.980
6	Kernel Methods	0.979
7	Microsoft Cognitive Toolkit	0.975
8	Xgboost	0.972
9	Sentiment Classification	0.971
10	Long Short-Term Memory (LSTM)	0.971
11	Libsvm	0.968
12	Semi-Supervised Learning	0.968
13	Recurrent Neural Network (RNN)	0.965
14	Word2Vec	0.956
15	MXNet	0.953
16	Caffe Deep Learning Framework	0.950
17	Autoencoders	0.949
18	MLPACK (C++ library)	0.942
19	Keras	0.941
20	Theano	0.938
21	Torch (Machine Learning)	0.932
22	Wabbit	0.929
23	Boosting (Machine Learning)	0.905
24	TensorFlow	0.904
25	Vowpal	0.903
26	Convolutional Neural Network (CNN)	0.897
27	Jung Framework	0.894
28	OpenNLP	0.894
29	Natural Language Toolkit (NLTK)	0.892
30	Unsupervised Learning	0.891
31	Dlib	0.891
32	Scikit-learn	0.889
33	Latent Semantic Analysis	0.889
34	Latent Dirichlet Allocation	0.889
35	Stochastic Gradient Descent (SGD)	0.881
36	Gradient boosting	0.872
37	Dimensionality Reduction	0.861
38	Deep Learning	0.859
39	DBSCAN (Density-Based Spatial Clustering of Applications with Noise)	0.855
40	AI ChatBot	0.844
41	Recommender Systems	0.842
42	Random Forests	0.840
43	Deeplearning4j	0.839
44	Support Vector Machines (SVM)	0.817
45	Unstructured Information Management Architecture	0.806
46	Apache UIMA	0.805
47	Maximum Entropy Classifier	0.799
48	Hidden Markov Model (HMM)	0.796
49	Pybrain	0.786
50	Computational Linguistics	0.780
51	Naive Bayes	0.768
52	H2O (software)	0.763
53	Expectation-Maximization (EM) Algorithm	0.763
54	WEKA	0.761
55	Clustering Algorithms	0.740
56	Matrix Factorization	0.739
57	Object Recognition	0.727
58	Classification Algorithms	0.721
59	Information Extraction	0.709
60	Image Recognition	0.706
61	Bayesian Networks	0.705
62	Supervised Learning (Machine Learning)	0.695
63	OpenCV	0.688
64	K-Means	0.683
65	Sentiment Analysis / Opinion Mining	0.679
66	Machine Translation (MT)	0.655
67	Neural Networks	0.640

Table A.3. Summary Statistics

This table reports summary statistics for the sample of firms in our baseline regressions. All changes in variables are computed over 2010–2018. For each variable, we report the number of observations, the mean, the standard deviation, the median, and 1st, 5th, 10th, 25th, 75th, 90th, 95th, and 99th percentiles. The sample includes Compustat firms (in non-tech sectors) between 2010 and 2018.

Variable Name	N	Mean	Std. Deviation	p1	p5	p10	p25	p50	p75	p90	p95	p99
Change in share of AI workers	1218	.00079	.0025	-.0028	-.00028	0	0	0	.0005	.0021	.0044	.016
Change in share of workers with low seniority	1218	.0018	.055	-.13	-.084	-.065	-.029	-.00065	.028	.067	.1	.16
Change in share of workers with medium seniority	1218	.043	.044	-.08	-.031	-.0096	.02	.044	.068	.095	.11	.16
Change in share of workers with high seniority	1218	-.045	.033	-.16	-.11	-.088	-.059	-.04	-.023	-.01	-.0051	.015
Change in share of workers with college degree	1218	.062	.18	-.43	-.11	-.063	-.017	.031	.1	.21	.33	.97
Change in share of workers with master degree	1218	-.0012	.096	-.34	-.13	-.072	-.029	-.0054	.023	.082	.14	.35
Change in share of workers with doctoral degree	1218	.0014	.023	-.084	-.026	-.015	-.006	-.00047	.0047	.02	.042	.11
Change in share of workers without college degree	1218	-.063	.26	-1.3	-.46	-.31	-.13	-.025	.038	.13	.25	.83
Change in share of workers with STEM major	1216	.017	.092	-.29	-.13	-.083	-.024	.021	.06	.11	.17	.32
Change in share of workers with social science major	1216	-.016	.089	-.3	-.17	-.11	-.055	-.015	.021	.077	.13	.29
Change in share of workers with fine arts major	1216	-.0036	.031	-.13	-.057	-.034	-.014	-.00051	.0071	.024	.047	.1
Change in share of workers with humanities major	1216	-.0042	.035	-.12	-.056	-.039	-.019	-.0045	.0091	.032	.053	.13
Change in share of workers with medicine major	1216	.0087	.03	-.076	-.028	-.012	0	.0026	.013	.035	.063	.15
Change in average number of years of education (Burning Glass)	1060	-3.6	3.2	-14	-10	-8.4	-4.9	-2.7	-1.4	-.58	-.11	1.1
Change in average number of years of experience (Burning Glass)	1059	-.3	1.4	-5.5	-2.6	-1.9	-.94	-.2	.47	1.3	1.9	3
Change in share of job postings with administration skill	1099	.0088	.049	-.19	-.061	-.038	-.011	.0062	.029	.061	.088	.17
Change in share of job postings with analysis skill	1099	.0025	.018	-.076	-.024	-.013	-.0022	.0019	.0098	.021	.029	.057
Change in share of job postings with business skill	1099	-.0037	.07	-.29	-.12	-.079	-.034	.0022	.033	.072	.097	.16
Change in share of job postings with customer service skill	1099	.0067	.069	-.26	-.11	-.051	-.012	.0053	.029	.075	.12	.23
Change in share of job postings with engineering skill	1099	-.011	.052	-.31	-.11	-.05	-.01	0	.0053	.019	.035	.081
Change in share of job postings with finance skill	1099	-.011	.085	-.35	-.17	-.093	-.036	-.0031	.026	.069	.1	.22
Change in share of job postings with healthcare skill	1099	.0035	.053	-.23	-.07	-.029	-.0035	.0019	.012	.044	.084	.21
Change in share of job postings with HR skill	1099	.0062	.034	-.15	-.044	-.023	-.0039	.0059	.02	.039	.057	.12
Change in share of job postings with IT skill	1099	-.0073	.1	-.42	-.19	-.12	-.05	.0028	.045	.11	.14	.24
Change in share of job postings with legal skill	1099	.0012	.022	-.097	-.028	-.013	-.0036	.00059	.006	.018	.032	.095
Change in share of job postings with marketing skill	1099	.00085	.044	-.21	-.061	-.036	-.012	.0018	.018	.044	.065	.12
Change in share of job postings with sales skill	1099	-.0083	.1	-.36	-.19	-.11	-.039	-.002	.026	.083	.17	.32
Change in share of job postings with science skill	1099	-.0061	.041	-.27	-.053	-.025	-.0026	0	.0027	.011	.024	.1
Change in share of job postings with supply chain skill	1099	.013	.057	-.2	-.076	-.036	-.0057	.0079	.033	.08	.11	.22
Change in share of job postings with agriculture skill	1099	.00028	.0024	-.0084	-.00052	-.000048	0	0	7.4e-06	.00081	.0024	.016
Change in share of job postings with construction skill	1099	.0024	.016	-.065	-.014	-.0067	-.00099	.00031	.0045	.014	.026	.074
Change in share of job postings with design skill	1099	-.0015	.016	-.089	-.026	-.014	-.0041	.00013	.0042	.011	.017	.041
Change in share of job postings with economics skill	1099	.00039	.0044	-.019	-.0053	-.0022	-7.9e-06	.000014	.001	.0034	.0062	.02
Change in share of job postings with education skill	1099	.0005	.017	-.08	-.02	-.011	-.0033	.00052	.005	.012	.02	.067
Change in share of job postings with utilities skill	1099	-.002	.017	-.11	-.021	-.0058	-.00014	0	.00055	.0035	.01	.046
Change in share of job postings with environment skill	1099	.00033	.017	-.09	-.017	-.0055	-.00016	0	.0021	.0097	.018	.068
Change in share of job postings with industry knowledge skill	1099	-.0027	.039	-.16	-.076	-.037	-.012	0	.01	.027	.055	.14
Change in share of job postings with maintenance skill	1099	.013	.053	-.2	-.053	-.023	-.0029	.003	.026	.072	.11	.19
Change in share of job postings with manufacturing skill	1099	.0044	.044	-.19	-.061	-.031	-.0064	.001	.015	.05	.087	.15
Change in share of job postings with media skill	1099	.00046	.011	-.046	-.014	-.0091	-.0022	.00028	.0038	.0091	.016	.044
Change in share of job postings with personal care skill	1099	.0026	.023	-.084	-.01	-.0013	0	0	.00039	.0079	.025	.13
Change in share of job postings with public safety skill	1099	.000035	.0071	-.033	-.01	-.0032	-.000091	0	.0013	.0045	.008	.026

Variable Name	N	Mean	Std. Deviation	p1	p5	p10	p25	p50	p75	p90	p95	p99
Share of AI workers in 2010	1218	.00054	.0025	0	0	0	0	0	.0002	.0011	.0022	.0099
Share of workers with low seniority in 2010	1218	.61	.1	.29	.42	.48	.56	.62	.68	.73	.75	.82
Share of workers with medium seniority in 2010	1218	.22	.087	.081	.12	.14	.17	.21	.26	.33	.41	.53
Share of workers with high seniority in 2010	1218	.16	.085	.026	.045	.063	.097	.15	.21	.27	.31	.43
Share of workers with college degree in 2010	1218	.43	.77	.08	.13	.16	.2	.29	.44	.7	1	2.3
Share of workers with master degree in 2010	1218	.21	.35	.02	.036	.047	.077	.13	.22	.4	.63	1.4
Share of workers with doctoral degree in 2010	1218	.038	.065	0	0	.0018	.009	.021	.042	.077	.13	.33
Share of workers without college degree in 2010	1218	.32	1.1	-2.7	-.73	-.16	.31	.55	.69	.78	.81	.88
Share of workers with STEM major in 2010	1216	.37	.21	0	.086	.13	.19	.33	.51	.69	.76	.86
Share of workers with social science major in 2010	1216	.49	.19	.087	.17	.23	.35	.5	.61	.74	.8	.91
Share of workers with fine arts major in 2010	1216	.047	.062	0	0	0	.01	.032	.062	.11	.14	.29
Share of workers with humanities major in 2010	1216	.061	.05	0	0	0	.029	.054	.083	.12	.14	.23
Share of workers with medicine major in 2010	1216	.037	.071	0	0	0	0	.014	.038	.095	.16	.39
Average number of years of education (Burning Glass) in 2010	1060	15	1.3	12	12	13	14	15	16	16	17	18
Average number of years of experience (Burning Glass) in 2010	1059	4.3	1.6	1.1	2	2.2	3.1	4.2	5.2	6.3	6.9	9.5
Share of job postings with administration skill in 2010	1099	.046	.05	0	0	0	.014	.034	.06	.096	.14	.26
Share of job postings with analysis skill in 2010	1099	.014	.02	0	0	0	.00014	.0074	.019	.033	.049	.097
Share of job postings with business skill in 2010	1099	.11	.083	0	0	.018	.059	.1	.15	.19	.23	.45
Share of job postings with customer service skill in 2010	1099	.064	.091	0	0	0	.013	.032	.076	.17	.24	.44
Share of job postings with engineering skill in 2010	1099	.042	.082	0	0	0	0	.0077	.052	.12	.19	.43
Share of job postings with finance skill in 2010	1099	.098	.12	0	0	.0019	.032	.067	.12	.23	.3	.5
Share of job postings with healthcare skill in 2010	1099	.04	.11	0	0	0	0	.0056	.023	.11	.22	.67
Share of job postings with HR skill in 2010	1099	.024	.049	0	0	0	.0009	.012	.029	.057	.089	.19
Share of job postings with IT skill in 2010	1099	.15	.14	0	0	.013	.059	.12	.2	.33	.43	.68
Share of job postings with legal skill in 2010	1099	.012	.021	0	0	0	0	.0054	.014	.028	.046	.13
Share of job postings with marketing skill in 2010	1099	.037	.062	0	0	0	.0069	.024	.048	.078	.11	.26
Share of job postings with sales skill in 2010	1099	.11	.13	0	0	0	.018	.057	.15	.29	.37	.54
Share of job postings with science skill in 2010	1099	.025	.068	0	0	0	0	.0011	.015	.068	.15	.38
Share of job postings with supply chain skill in 2010	1099	.047	.067	0	0	0	.005	.028	.063	.12	.16	.32
Share of job postings with agriculture skill in 2010	1099	.00074	.0081	0	0	0	0	0	0	.00026	.0018	.016
Share of job postings with construction skill in 2010	1099	.0082	.023	0	0	0	0	.0014	.0076	.02	.032	.099
Share of job postings with design skill in 2010	1099	.011	.027	0	0	0	0	.0049	.012	.026	.043	.12
Share of job postings with economics skill in 2010	1099	.0025	.0099	0	0	0	0	0	.0019	.0061	.011	.027
Share of job postings with education skill in 2010	1099	.011	.028	0	0	0	0	.0055	.012	.022	.037	.11
Share of job postings with utilities skill in 2010	1099	.01	.043	0	0	0	0	0	.0016	.02	.055	.19
Share of job postings with environment skill in 2010	1099	.0099	.048	0	0	0	0	0	.0038	.02	.046	.15
Share of job postings with industry knowledge skill in 2010	1099	.033	.049	0	0	0	.0061	.018	.043	.077	.11	.22
Share of job postings with maintenance skill in 2010	1099	.033	.056	0	0	0	0	.011	.043	.087	.13	.31
Share of job postings with manufacturing skill in 2010	1099	.04	.063	0	0	0	.00061	.014	.058	.11	.16	.28
Share of job postings with media skill in 2010	1099	.0081	.036	0	0	0	0	.0032	.0088	.016	.024	.065
Share of job postings with personal care skill in 2010	1099	.0081	.038	0	0	0	0	0	.00013	.0094	.04	.2
Share of job postings with public safety skill in 2010	1099	.0039	.015	0	0	0	0	0	.0018	.0081	.019	.067

Table A.4. AI Investments and Workers' Seniority Levels Weighted by Coverage Rate

This table reports the coefficients from long-differences regressions of the change in the share of workers in each seniority level from 2010 to 2018 on the contemporaneous firm-level changes in AI investments among U.S. public firms (in non-tech sectors). The independent variable is the growth in the share of AI workers from 2010 to 2018 based on the Cognism resume data, standardized to mean zero and standard deviation of one. The dependent variables are the changes in the share of workers in each seniority level (low in columns 1 and 2; medium in columns 2 and 4; and high in columns 5 and 6) in the Cognism resume data. Regressions are weighted by the coverage rate of firm employment in Cognism data in 2010, where the coverage rate is the number of Cognism resumes divided by the total (global) employment numbers reported by firms in Compsutat. All specifications control for industry sector fixed effects. Columns 2, 4, and 6 also include the baseline controls all measured as of 2010: firm-level characteristics (log sales, cash/assets, R&D/sales, log markup, and log number of jobs, log industry wage, and characteristics of the commuting zones where the firms are located (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers). Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share Seniority Low		Δ Share Seniority Middle		Δ Share Seniority High	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Share AI Workers	0.012***	0.010***	-0.007***	-0.006***	-0.004***	-0.003**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Industry Sector FE	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y
Adj R-Squared	0.078	0.134	0.115	0.141	0.097	0.137
Observations	1,218	1,218	1,218	1,218	1,218	1,218

Table A.5. AI Investments and Workers' Seniority Levels Controlling for Firm Growth

This table reports the coefficients from long-differences regressions of the change in the share of workers in each seniority level from 2010 to 2018 on the contemporaneous firm-level changes in AI investments controlling for contemporaneous firm sales growth among U.S. public firms (in non-tech sectors). The independent variable is the growth in the share of AI workers from 2010 to 2018 based on the Cognism resume data, standardized to mean zero and standard deviation of one. The dependent variables are the changes in the share of workers in each seniority level (low in columns 1 and 2; medium in columns 2 and 4; and high in columns 5 and 6) in the Cognism resume data. Regressions are weighted by the number of Cognism resumes in 2010. All specifications control for industry sector fixed effects and firm-level growth in log sales from 2010 to 2018. Columns 2, 4, and 6 also include the baseline controls all measured as of 2010: firm-level characteristics (log sales, cash/assets, R&D/sales, log markup, and log number of jobs, log industry wage, and characteristics of the commuting zones where the firms are located (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers). Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share Seniority Low		Δ Share Seniority Middle		Δ Share Seniority High	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Share AI Workers	0.012***	0.014***	-0.006**	-0.007***	-0.005**	-0.006**
	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Δ Log Sales	0.027***	0.019***	-0.008***	-0.004	-0.018***	-0.014***
	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
Industry Sector FE	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y
Adj R-Squared	0.291	0.376	0.188	0.227	0.296	0.386
Observations	1,218	1,218	1,218	1,218	1,218	1,218

Table A.6. AI Investments and Workers' Education Excluding AI Workers

This table reports the coefficients from long-differences regressions of the change in the share of non-AI workers in each highest education level and the share of non-AI workers in STEM majors from 2010 to 2018 on the contemporaneous firm-level changes in AI investments among U.S. public firms (in non-tech sectors). The independent variable is the growth in the share of AI workers from 2010 to 2018 based on the Cognism resume data, standardized to mean zero and standard deviation of one. The dependent variables are measured using the Cognism resume data and represent the changes in the share of non-AI workers whose maximal attainment is a college degree in columns 1 and 2, the share of non-AI workers whose maximal attainment is a masters degree in columns 3 and 4, the share of non-AI workers with doctoral degrees in columns 5 and 6, and the share of non-AI workers whose most recent degree was in a STEM field in columns 7 and 8. STEM includes engineering (e.g., electrical, chemical, mechanical), physical sciences (e.g., math, physics, chemistry, computer science, statistics), and biological sciences (e.g., biology, pharmacology). Regressions are weighted by the number of Cognism resumes in 2010. All specifications control for industry sector fixed effects. Columns 2, 4, 6, and 8 also include the baseline controls all measured as of 2010: firm-level characteristics (log sales, cash/assets, R&D/sales, log markup, and log number of jobs, log industry wage, and characteristics of the commuting zones where the firms are located (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers). Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share College		Δ Share Master		Δ Share Doctoral		Δ Share STEM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Share AI Workers	0.031***	0.035***	0.026***	0.027***	0.006***	0.006***	0.016***	0.016***
	(0.012)	(0.011)	(0.004)	(0.004)	(0.001)	(0.001)	(0.004)	(0.005)
Industry Sector FE	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y	N	Y
Adj R-Squared	0.096	0.197	0.100	0.209	0.141	0.197	0.158	0.204
Observations	1,218	1,218	1,218	1,218	1,218	1,218	1,216	1,216

Table A.7. AI Investments and Workers' Education Levels Weighted by Coverage Rate

This table reports the coefficients from long-differences regressions of the change in the share of workers in each highest education level from 2010 to 2018 on the contemporaneous firm-level changes in AI investments among U.S. public firms (in non-tech sectors). The independent variable is the growth in the share of AI workers from 2010 to 2018 based on the Cognism resume data, standardized to mean zero and standard deviation of one. The dependent variables are measured using the Cognism resume data and represent the changes in the share of workers whose maximal attainment is a college degree in columns 1 and 2, the share of employees whose maximal attainment is a masters degree in columns 3 and 4, the share of employees with doctoral degrees in columns 5 and 6, and the share of employees with no college degree in columns 7 and 8. Regressions are weighted by the coverage rate of firm employment in Cognism data in 2010, where the coverage rate is the number of Cognism resumes divided by the total (global) employment numbers reported by firms in Compsutat. All specifications control for industry sector fixed effects. Columns 2, 4, 6, and 8 also include the baseline controls all measured as of 2010: firm-level characteristics (log sales, cash/assets, R&D/sales, log markup, and log number of jobs, log industry wage, and characteristics of the commuting zones where the firms are located (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers). Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share College		Δ Share Master		Δ Share Doctoral		Δ Share No College	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Share AI Workers	0.012**	0.013**	0.012***	0.010***	0.005**	0.005***	-0.030***	-0.028***
	(0.006)	(0.005)	(0.003)	(0.003)	(0.002)	(0.002)	(0.008)	(0.007)
Industry Sector FE	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y	N	Y
Adj R-Squared	0.048	0.085	0.045	0.081	0.056	0.086	0.060	0.097
Observations	1,218	1,218	1,218	1,218	1,218	1,218	1,218	1,218

Table A.8. AI Investments and Workers' Education Levels Controlling for Firm Growth

This table reports the coefficients from long-differences regressions of the change in the share of workers in each highest education level from 2010 to 2018 on the contemporaneous firm-level changes in AI investments controlling for contemporaneous firm sales growth among U.S. public firms (in non-tech sectors). The independent variables include the growth in the share of AI workers from 2010 to 2018 based on the Cognism resume data, standardized to mean zero and standard deviation of one, and firm-level growth in log sales from 2010 to 2018. The dependent variables are measured using the Cognism resume data and represent the changes in the share of workers whose maximal attainment is a college degree in columns 1 and 2, the share of employees whose maximal attainment is a masters degree in columns 3 and 4, the share of employees with doctoral degrees in columns 5 and 6, and the share of employees with no college degree in columns 7 and 8. Regressions are weighted by the number of Cognism resumes in 2010. All specifications control for industry sector fixed effects and firm-level growth in log sales from 2010 to 2018. Columns 2, 4, 6, and 8 also include the baseline controls all measured as of 2010: firm-level characteristics (log sales, cash/assets, R&D/sales, log markup, and log number of jobs, log industry wage, and characteristics of the commuting zones where the firms are located (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers). Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share College		Δ Share Master		Δ Share Doctoral		Δ Share No College	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Share AI Workers	0.032***	0.036***	0.024***	0.027***	0.007***	0.006***	-0.063***	-0.069***
	(0.012)	(0.011)	(0.005)	(0.004)	(0.001)	(0.001)	(0.016)	(0.015)
Δ Log Sales	0.009	0.018	0.023***	0.016**	0.004***	0.003***	-0.035**	-0.037
	(0.011)	(0.020)	(0.007)	(0.008)	(0.001)	(0.001)	(0.015)	(0.026)
Industry Sector FE	Y	Y	Y	Y	Y	Y	Y	Y
Controls	N	Y	N	Y	N	Y	N	Y
Adj R-Squared	0.100	0.201	0.140	0.228	0.176	0.221	0.123	0.222
Observations	1,218	1,218	1,218	1,218	1,218	1,218	1,218	1,218

Table A.9. AI Investments and Workers' Seniority Levels: IV Estimates

This table estimates the relationship between AI investments and the change in the share of workers in each seniority level from 2010 to 2018 for U.S. public firms (in non-tech sectors), where firm AI investments are instrumented with ex-ante firm-level exposure to AI-skilled graduates from AI-strong universities. The independent variable is the change in the share of AI workers from 2010 to 2018 based on the resume data. See the definition of the instrument in Section 4.4. The independent variable and the instrument are standardized to mean zero and standard deviation of one. The dependent variables are the changes in the share of workers in each seniority level (low in columns 1 and 2; medium in columns 2 and 4; and high in columns 5 and 6) in the Cognism resume data. All specifications control for industry sector fixed effects and ex-ante exposure to universities that are strong in computer science research as well as top 10 universities. Columns 2, 4, and 6 also control for firm-level characteristics in 2010 (log sales, cash/assets, R&D/sales, log markup, and log number of resumes), log industry wage in 2010, characteristics of the commuting zones where the firms are located in 2010 (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers), firm-level changes in log sales and log employment from 2000 to 2008, and state fixed effects. Regressions are weighted by the number of Cognism resumes in 2010. Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. The first-stage F-statistics of the instrument are reported for all specifications. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share Seniority Low		Δ Share Seniority Middle		Δ Share Seniority High	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ Share AI Workers	0.021	0.024*	0.001	-0.001	-0.019	-0.022**
	(0.017)	(0.015)	(0.012)	(0.014)	(0.014)	(0.010)
Industry FE	Y	Y	Y	Y	Y	Y
CS Control	Y	Y	Y	Y	Y	Y
Baseline Controls	N	Y	N	Y	N	Y
Control Pre-trend	N	Y	N	Y	N	Y
State FE	N	Y	N	Y	N	Y
F Statistic	11.9	11.5	11.9	11.5	11.9	11.5
Observations	1,090	840	1,090	840	1,090	840

Table A.10. AI Investments and Workers' Education Levels: IV Estimates

This table estimates the relationship between AI investments and the change in the share of workers in each highest education level from 2010 to 2018 for U.S. public firms (in non-tech sectors), where firm AI investments are instrumented with ex-ante firm-level exposure to AI-skilled graduates from AI-strong universities. The independent variable is the change in the share of AI workers from 2010 to 2018 based on the resume data. See the definition of the instrument in Section 4.4. The independent variable and the instrument are standardized to mean zero and standard deviation of one. The dependent variables are measured using the Cognism resume data and represent the changes in the share of workers whose maximal attainment is a college degree in columns 1 and 2, the share of employees whose maximal attainment is a masters degree in columns 3 and 4, the share of employees with doctoral degrees in columns 5 and 6, and the share of employees with no college degree in columns 7 and 8. All specifications control for industry sector fixed effects and ex-ante exposure to universities that are strong in computer science research as well as top 10 universities. Columns 2, 4, 6, and 8 also control for firm-level characteristics in 2010 (log sales, cash/assets, R&D/sales, log markup, and log number of resumes), log industry wage in 2010, characteristics of the commuting zones where the firms are located in 2010 (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers), firm-level changes in log sales and log employment from 2000 to 2008, and state fixed effects. Regressions are weighted by the number of Cognism resumes in 2010. Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. The first-stage F-statistics of the instrument are reported for all specifications. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share College		Δ Share Master		Δ Share Doctoral		Δ Share No College	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ Share AI Workers	0.089**	0.115***	0.024	0.047**	0.007**	0.008*	-0.119**	-0.170***
	(0.045)	(0.040)	(0.020)	(0.021)	(0.004)	(0.004)	(0.060)	(0.056)
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y
CS Control	Y	Y	Y	Y	Y	Y	Y	Y
Baseline Controls	N	Y	N	Y	N	Y	N	Y
Control Pre-trend	N	Y	N	Y	N	Y	N	Y
State FE	N	Y	N	Y	N	Y	N	Y
F Statistic	11.9	11.5	11.9	11.5	11.9	11.5	11.9	11.5
Observations	1,090	840	1,090	840	1,090	840	1,090	840

Table A.11. AI Investments and Workers' Majors: IV Estimates

This table estimates the relationship between AI investments and the change in the share of workers in each major from 2010 to 2018 for U.S. public firms (in non-tech sectors), where firm AI investments are instrumented with ex-ante firm-level exposure to AI-skilled graduates from AI-strong universities. The independent variable is the change in the share of AI workers from 2010 to 2018 based on the resume data. See the definition of the instrument in Section 4.4. The independent variable and the instrument are standardized to mean zero and standard deviation of one. The dependent variables are the share of employees whose most recent degree was in a STEM field in columns 1 and 2, the share of employees whose last degree was in social science in columns 3 and 4, the share of employees whose most recent degree was in fine arts in columns 5 and 6, the share of employees whose last degree was in humanities in columns 7 and 8, and the share of employees whose last degree was in medicine in columns 9 and 10. All specifications control for industry sector fixed effects and ex-ante exposure to universities that are strong in computer science research as well as top 10 universities. Columns 2, 4, 6, 8, and 10 also control for firm-level characteristics in 2010 (log sales, cash/assets, R&D/sales, log markup, and log number of resumes), log industry wage in 2010, characteristics of the commuting zones where the firms are located in 2010 (the share of workers in IT-related occupations, the share of college-educated workers, log average wage, the share of foreign-born workers, the share of routine workers, the share of workers in finance and manufacturing industries, and the share of female workers), firm-level changes in log sales and log employment from 2000 to 2008, and state fixed effects. Regressions are weighted by the number of Cognism resumes in 2010. Standard errors are clustered at the 5-digit NAICS industry level and reported in parentheses. The first-stage F-statistics of the instrument are reported for all specifications. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Δ Share STEM		Δ Share Social Science		Δ Share Fine Arts		Δ Share Humanities		Δ Share Medicine	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Δ Share AI Workers	0.023	0.017	-0.012	-0.008	-0.010	-0.008	0.006	0.007	-0.007	-0.008
	(0.022)	(0.018)	(0.020)	(0.016)	(0.006)	(0.006)	(0.005)	(0.008)	(0.006)	(0.005)
Industry FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CS Control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Baseline Controls	N	Y	N	Y	N	Y	N	Y	N	Y
Control Pre-trend	N	Y	N	Y	N	Y	N	Y	N	Y
State FE	N	Y	N	Y	N	Y	N	Y	N	Y
F Statistic	11.9	11.5	11.9	11.5	11.9	11.5	11.9	11.5	11.9	11.5
Observations	1,088	838	1,088	838	1,088	838	1,088	838	1,088	838