

SKILL DEPRIORITIZATION: REORGANIZING IN THE AGE OF GENERATIVE AI

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ONLINE APPENDIX

This Online Appendix is organized as follows:

- Appendix A: Treatment and Control Descriptives
- Appendix B: Problems of Organizing
- Appendix C: Demand for GenAI-relevant skills
- Appendix D: Descriptives and Full Tables
- Appendix E: Placebo Test
- Appendix F: Sensitivity Analysis
- Appendix G: Keyword based replication
- Appendix H: Excluding Tech Companies (NAICS 51 and 54)
- Appendix I: Autor-based Treatment and Control
- Appendix J: Coarsened Exact Matching
- Appendix K: Additional Specifications
- Appendix L: Exploratory Analysis

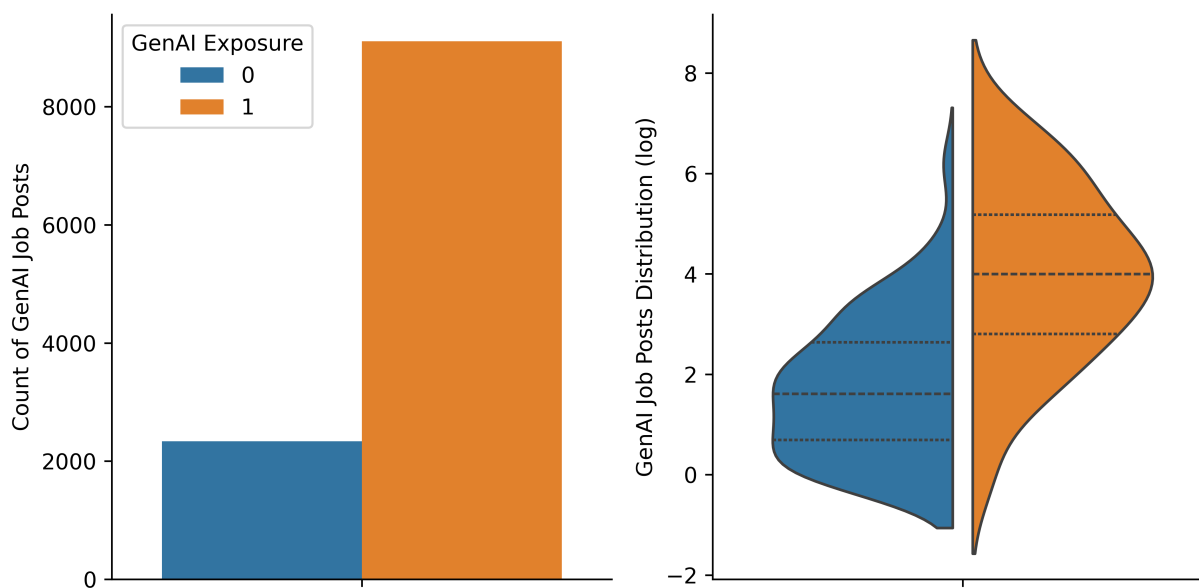
Each section provides supplementary analyses, robustness checks, and detailed methodological information supporting the results presented in the main text.

Appendix A: Treatment and Control Descriptives

Our dataset integrates information from three sources. We began by collecting job posting data from Lightcast for 3,608 companies with valid CUSIP identifiers (company-level taxonomy version 2.77 – 16th of March 2025). We then merged this dataset with quarterly financial information from Compustat, using the CUSIP as a unique firm identifier, resulting in a combined sample of 2,036 firms. Then, we incorporated monthly workforce change data from Revelio, which also provides CUSIP identifiers. We manually inspected CUSIP matches to ensure accurate matching across datasets. Merging these three sources yields a sample of 1,840 companies. Finally, we excluded observations with missing values and companies for which we held observations only pre- or post- GPT-3.5 introduction. This final step results in a sample of 1,820 companies and 40,465 company-month observations.

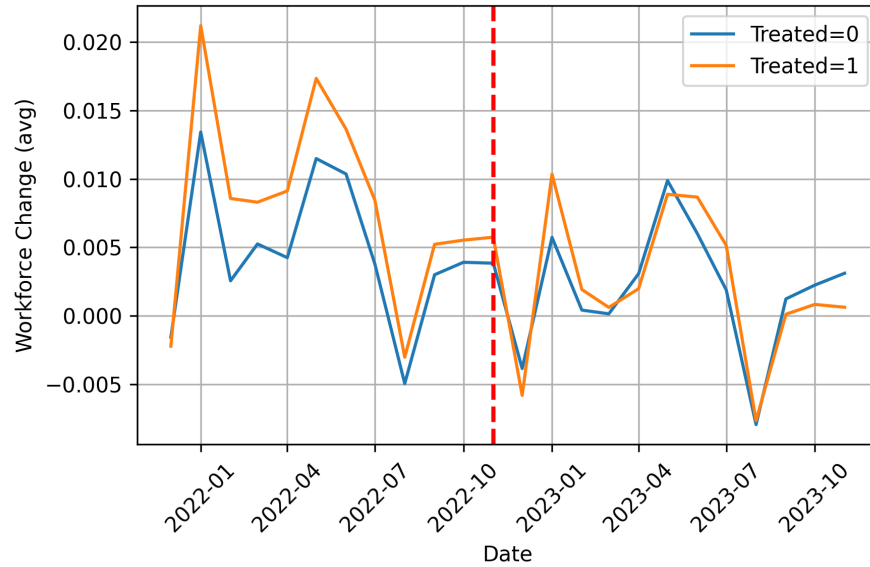
Tables A1 and A2 provide a snapshot of the top and bottom 20 sectors for GenAI Exposure in our sample. Figure A1 shows the distribution of GenAI skills demand between treated and control groups, considering the 12 months after the ChatGPT release. Figure A2 illustrates the evolution of workforce changes over time, comparing trends between these two groups.

FIGURE A1
Demand for GenAI Skills by GenAI Exposure Level



Notes: data retrieved from Lightcast between 01-12-2022 and 30-11-2023. The left panel reports a bar plot for the count of unique job posts requiring the ‘generative artificial intelligence’ skill. The right panel reports a violin plot of the distribution (logged) for GenAI skill demand.

FIGURE A2
Workforce Change by Treatment and Control



Notes. We computed the workforce change using data from Revelio.

TABLE A1
Top 20 Sectors for GenAI Exposure

NAICS Title	NAICS code	GenAI Exposure
Legal Services	5411	1.013694
Agencies, Brokerages, and Other Insurance Related Activities	5242	0.936802
Depository Credit Intermediation	5221	0.885620
Activities Related to Credit Intermediation	5223	0.877840
Insurance Carriers	5241	0.826548
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	5412	0.818752
Securities and Commodity Contracts Intermediation and Brokerage	5231	0.816202
Nondepository Credit Intermediation	5222	0.811137
Other Financial Investment Activities	5239	0.790301
Web Search Portals, Libraries, Archives, and Other Information Services	5192	0.766905
Software Publishers	5132	0.743215
Computing Infrastructure Providers, Data Processing, Web Hosting, and Related Services	5182	0.734189
Educational Support Services	6117	0.705947
Radio and Television Broadcasting Stations	5161	0.700241
Computer and Peripheral Equipment Manufacturing	3341	0.685188
Other Schools and Instruction	6116	0.681740
Securities and Commodity Exchanges	5232	0.674335
Other Investment Pools and Funds	5259	0.643600
Computer Systems Design and Related Services	5415	0.627818

NAICS Title	NAICS code	GenAI Exposure
Scientific Research and Development Services	5417	0.622408

TABLE A2
Bottom 20 Sectors for AI Exposure

NAICS Title	NAICS code	GenAI Exposure
Other Support Activities for Transportation	4889	-0.243747
Animal Slaughtering and Processing	3116	-0.250871
Utility System Construction	2371	-0.256780
Grocery and Related Product Merchant Wholesalers	4244	-0.259969
Lumber and Other Construction Materials Merchant Wholesalers	4233	-0.267907
Automotive Repair and Maintenance	8111	-0.269255
Pipeline Transportation of Crude Oil	4861	-0.269932
Other Miscellaneous Retailers	4599	-0.276169
Sawmills and Wood Preservation	3211	-0.281595
Special Food Services	7223	-0.307203
Cement and Concrete Product Manufacturing	3273	-0.372163
Nonmetallic Mineral Mining and Quarrying	2123	-0.392776
Support Activities for Rail Transportation	4882	-0.421967
Waste Treatment and Disposal	5622	-0.428406
Fuel Dealers	4572	-0.466280
Waste Collection	5621	-0.467310
Services to Buildings and Dwellings	5617	-0.476827
Couriers and Express Delivery Services	4921	-0.490278
General Freight Trucking	4841	-0.716541
Specialized Freight Trucking	4842	-0.723811

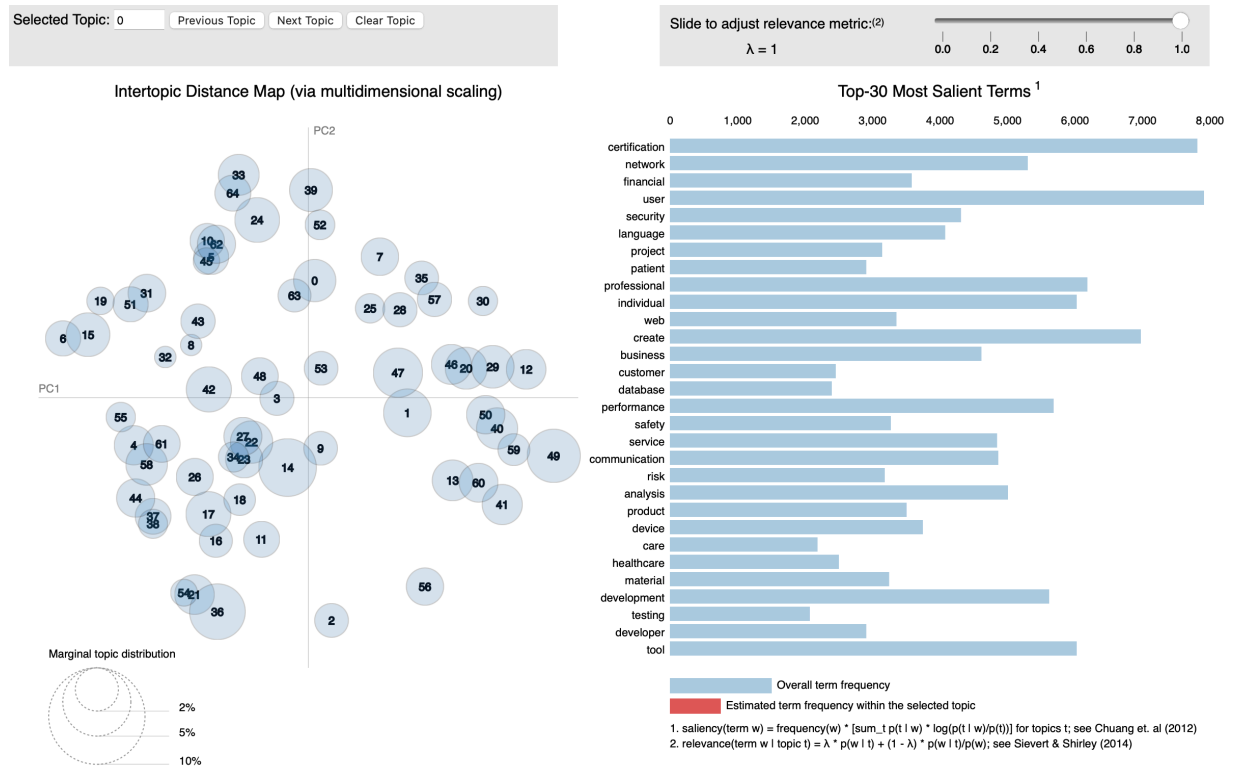
Appendix B: Problems of Organizing

For the following analysis, we use Lightcast’s skill-level taxonomy (version 9.25), which includes 33,832 unique skills linked to job postings and accompanied by short descriptions.

B1. Topic Modeling

Figure B1 presents an intertopical distance map generated using LDAvis, illustrating the final 65-topic LDA solution. We selected the number of topics $k=65$ after evaluating 20 alternative models ranging from 5 to 100 topics in increments of 5. By jointly considering coherence scores and a semantic inspection of topic-to-word distributions, we narrowed the selection down to models with $k=25$ and $k=65$. Upon comparing their document-to-topic distributions, we chose the 65-topic model for its superior alignment with our categories of interest. Within this 65-topic solution, we specifically selected Topics 17, 18, 23, and 55 to filter skill descriptions for manual annotation.

FIGURE B1
LDAvis for $k=65$



B2. Scaling with GPT-4o

To scale our classification to the full set of Skills from Lightcast (version 9.25), we passed the following categories’ descriptions to each GPT-4o agent:

Task Division

- Definition: Breaking down, structuring, and organizing work before execution, focusing on sorting, sequencing, and prioritizing tasks in preparation for action.
- Answering to: What needs to be done and when?
- Includes: Workflows, scheduling, planning, sequencing.
- Excludes: non-task related plans (e.g., financial plans); skills related to the use of software or tools; skills that refers to executing, enforcing, or managing ongoing processes, rather than structuring tasks in advance; skills that refer to broad management functions (e.g., managing an organization, department, or project) unless they explicitly describe breaking work into smaller components; skills referring to identifying, analyzing, and resolving unexpected operational problems and failures.
- Examples:
 1. Process Sequencing refers to the systematic arrangement of tasks or activities in a specific order to achieve desired outcomes efficiently.
 2. Planning is the skill of developing a strategy or a course of action to achieve a specific goal or objective.
 3. Scheduling is the ability to plan and organize time to ensure that tasks or events are completed within a given timeframe.
 4. Activity Sequencing refers to the process of arranging tasks or activities in a logical order to achieve specific objectives efficiently.
 5. Prioritization is the ability to effectively plan and prioritize by assessing the relative importance and urgency of a task, activity, or event.

Task Allocation (mapping)

- Definition: Assigning specific human or non-human resources (tools, technology, financial) to tasks.
- Answering to: Who is responsible for what? What resources (people, tools, technology) are needed to complete the task?
- Includes: Resource allocation, workforce planning, delegating, role definition, job architecture, job rotation, staffing models.
- Excludes: skills referring to identifying, analyzing, and resolving unexpected operational problems and failures.
- Examples:
 1. Assigning employees is the process of matching the right people with the right job or task, based on their skills, abilities, and expertise.
 2. Competency Mapping refers to the process of identifying and defining the skills, knowledge, and behaviors required for specific roles within an organization.
 3. Organizational Architecture refers to the structured framework that defines the arrangement of roles, responsibilities, processes, and systems within an organization.
 4. Resource Allocation is the ability to create and maintain a high-performing workforce tailored to the needs and overall objectives of the business.
 5. Delegated authority is the act of assigning responsibility and decision-making power to someone else in order to accomplish a specific task or goal.

Task Allocation (staffing)

- Definition: Recruiting and selecting individuals for specific tasks based on skill fit and job requirements.
- Answering to: Who should be brought into the organization to perform specific tasks?
- Includes: Talent acquisition, workforce strategy, staffing.
- Examples:
 1. Human Resource Planning refers to the process of forecasting an organization's future human resource needs and aligning them with its strategic goals.
 2. Human Resource Strategy is the ability to develop and execute comprehensive and forward-thinking plans that align human resources practices with the overall strategic goals and objectives of an organization.
 3. Capacity planning is a process of forecasting and allocating resources to meet the evolving needs of an organization.
 4. Staff Planning refers to the process of forecasting and organizing the workforce needs of an organization to ensure optimal staffing levels and skill sets.

5. Workforce Planning Operations involves strategic management of employee resources to meet organizational goals.

Information Provision (coordination)

- Definition: refers to the process of actively sharing and exchanging information among individuals and teams within an organization to align efforts and synchronize collaboration toward a common goal.
- Answering to: How should information be shared to align efforts and coordinate people effectively?
- Includes: Cross-functional collaboration, workflow alignment, coordination, synchronization, process integration, multi-location coordination, teamwork, collaboration, team-oriented work.
- Excludes: execution of tasks (implementation, enforcement); training, coaching, or mentorship; interactions with external actors; skills referring to identifying, analyzing, and resolving unexpected operational problems and failures.

- Examples:

1. Cross-functional coordination is the ability to work with individuals from various departments and disciplines within an organization to achieve a common goal.
2. Process Integration refers to the coordination and alignment of various processes within an organization to enhance efficiency and effectiveness.
3. Collaboration is a common skill that is essential for success in many fields. It involves working together with others to achieve a common goal, communicating effectively, and being open to new ideas and perspectives.
4. Coordinating is the ability to effectively manage and organize people, tasks, and resources to achieve a specific goal or objective.
5. Stakeholder Coordination refers to the process of organizing and synchronizing the actions and communications among different stakeholders involved in a project or initiative.

Information Provision (synchronous)

- Definition: Information sharing through real-time, interactive communication channels such as meetings, phone calls, and live discussions.
- Answering to: How should information be communicated in real-time?
- Includes: Active listening, synchronous communication, speaking, non-verbal communication, presentation, oral presentation, face-to-face, interpersonal communication, verbal fluency, real-time engagement, public speaking.
- Excludes: communication with customers, communication with agents external to the organization.

- Examples:

1. Verbal communication skills refer to the ability to communicate effectively using spoken words.
2. Speech Fluency refers to the smoothness and ease of speech production, characterized by the ability to express thoughts clearly and coherently without excessive pauses or disruptions.
3. Professional Speaking refers to the art of delivering information and ideas effectively to an audience in a formal setting.
4. Business Presentations is a skill that involves the ability to deliver effective and engaging presentations.
5. Active listening is a technique used to improve communication between two or more people.

Information Provision (asynchronous)

- Definition: Information sharing via asynchronous, documented communication such as emails, reports, and wikis.
- Answering to: How should information be documented or codified in written form?
- Includes: Documentation, asynchronous work, writing, visual, annual reports, online communication, corporate communications, policy documentation.
- Excludes: communication with customers, communication with agents external to the organization.

- Examples:

1. Report writing refers to the process of creating a document that provides information about a particular topic or issue.
2. Professional Writing refers to the practice of creating clear, concise, and effective written communication for various professional contexts.

3. Project documentation is the process of documenting all aspects of a project, including its goals, scope, timelines, personnel, and progress.

4. Writing Outlines refers to the process of organizing ideas and information in a structured format to facilitate the development of written content.

5. Asynchronous communication refers to communication that does not occur in real-time, and instead may have a delay or be delivered at a different time than it was sent.

Reward Distribution (monitoring)

- Definition: Monitoring or measuring employees' (individuals or teams) tasks and behaviors to assess their performance.

- Answering to: How should employees' tasks and outcomes be monitored and assessed for performance evaluation?

- Includes: Performance evaluation, performance metrics, control, monitoring, productivity tracking, evaluation.

- Excludes: measuring or monitoring tools, equipment, machinery, and systems, or measuring non-task related variables (satisfaction, commitment, and engagement within an organization).

- Examples:

1. Employee monitoring is a complex task that involves tracking, analyzing, and interpreting employee behavior in the workplace.

2. Employee Performance Management is the ability to establish organization-wide performance management strategies to facilitate performance management, including the identification of key performance indicators and employee performance assessment.

3. Workforce Productivity refers to the measure of efficiency and output of a workforce in relation to the resources utilized.

4. Performance Review refers to the systematic evaluation of an employee's job performance and contributions to an organization over a specific period.

5. Work Measurement refers to the process of assessing the time and resources required to complete specific tasks or activities within a work environment.

Reward Distribution (incentives)

- Definition: Designing and implementing motivational rewards (monetary or non-monetary) to encourage desired behavior.

- Answering to: How should employees be rewarded, incentivized, or punished based on their behaviors and outcomes?

- Includes: Compensation strategy, incentives, recognition, rewards, motivation, workforce satisfaction.

- Examples:

1. Reward Management refers to the strategic approach to designing and implementing compensation and benefits systems that motivate and retain employees.

2. Executive Compensation Strategy involves designing, developing, and implementing compensation packages for top-level executives.

3. High-potential programs are specialized talent management programs designed to identify, develop and retain high-potential employees within an organization.

4. Benefits Strategies refer to the systematic approach to designing and implementing employee benefits programs that align with organizational goals and employee needs.

5. Compensation Strategy refers to the systematic approach to designing and implementing compensation structures that align with organizational goals and employee performance.

Exception Management (conflict resolution)

- Definition: Identifying and addressing interpersonal conflict between employees.

- Answering to: How are disputes and problems between employees managed and resolved?

- Includes: Conflict resolution, conflict management, consensus building.

- Excludes: negotiation with agents external to the organization (apart from labor unions).

- Examples:

1. Employee conflict resolution is the process of resolving disputes or disagreements between co-workers or within a team.

2. Organizational conflict refers to disagreements and disputes that arise between individuals or groups within an organization.
3. Conflict Resolution refers to the process of resolving disputes and disagreements between individuals or groups.
4. Conflict Transformation refers to the process of addressing and changing the underlying causes and dynamics of conflict to foster constructive relationships and promote peace.
5. De-escalation techniques are a specialized set of skills aimed at resolving conflicts and reducing tension in tense or potentially volatile situations.

Exception Management (operational exceptions)

- Definition: Identifying, analyzing, and resolving unexpected operational problems and failures that deviate from standard processes. This includes handling unforeseen disruptions and implementing corrective actions to restore normal operations.
- Answering to: How are unexpected operational problems and failures identified, managed, and resolved?
- Includes: problem solving, obstacles, troubleshooting, emergency response, crisis management, incident response, system failure recovery.
- Excludes: Activities aimed at proactively improving efficiency (e.g., continuous improvement, process optimization); routine process management that does not involve unexpected failures; activities related to medical emergencies; activities related to crisis prevention or preparedness, more than response.
- Examples:
 1. Overcoming Obstacles refers to the ability to navigate and resolve challenges or difficulties encountered in various tasks or projects.
 2. Project Recovery refers to the process of identifying and addressing issues that have caused a project to deviate from its planned objectives, timeline, or budget.
 3. Disaster Recovery refers to the strategies and processes implemented to restore systems, data, and operations following a disruptive event, such as natural disasters, cyberattacks, or system failures.
 4. Problem Management refers to the process of identifying, analyzing, and resolving the root causes of incidents to prevent future occurrences.
 5. Operational Resilience refers to an organization's ability to adapt and withstand disruptions while maintaining essential functions and services.

We gave the above ontology to three GPT-4o agents to screen the full corpus of 33,832 skills. The three agents filtered out 1,369 candidate sentences for manual review.

B3. Hand-curated Labelling

In the final step, we manually labelled the GPT-4o filtered skills. Of the 1,369 candidate skills we identified 657 True Positives mapping on 719 skill-label relationships. Figure B2 illustrates the distribution of labels across skill categories. Table B1 report the full list of skills by category.

FIGURE B2
Skills Distribution by Problems of Organizing

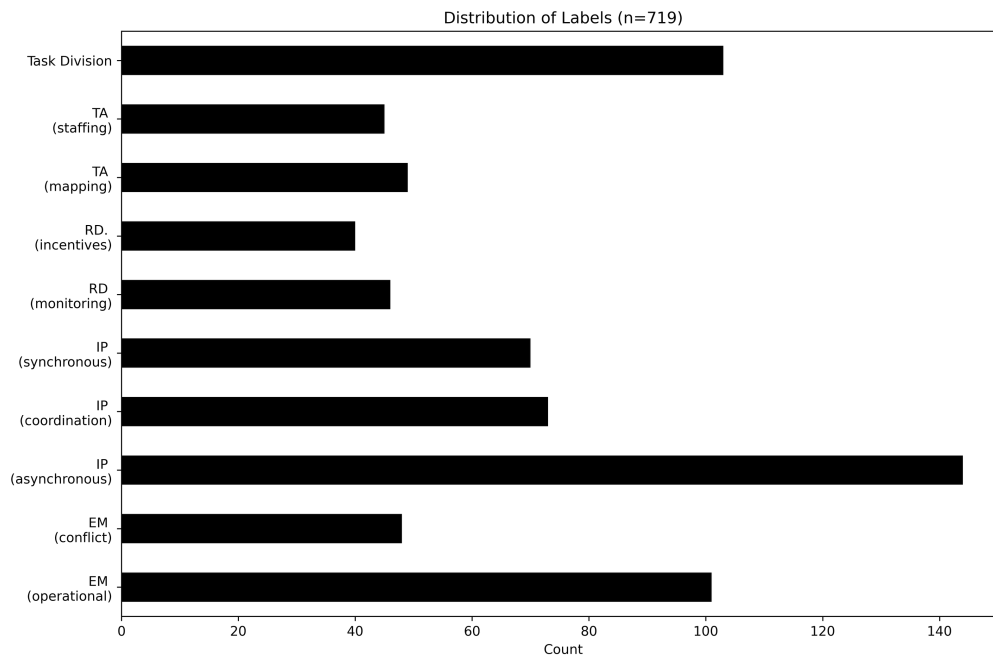


TABLE B1

Lightcast Skills by Problem of Organizing

Problems of Organizing	Skill Name
EM (operational)	'Instrument Troubleshooting', 'System Level Troubleshooting', 'Laptop Troubleshooting', 'Inventory Problem Resolution', 'Computer Security Incident Response', 'Assay Troubleshooting', 'Damage Assessments', 'Emergency Response', 'Mobile Device Troubleshooting', 'Scanner Troubleshooting', 'Pipe Recovery', 'Emergency Response Planning', 'Overcoming Obstacles', 'Signal Repairs', 'Availability Management', 'Defect Life Cycle', 'Hazardous Materials Certification - Incident Commander Level', 'Eight Disciplines (8D) Certification', 'Cyber Incident Response', 'Project Recovery', 'Intervention Plans', 'Solution Design', 'System Recovery', 'Hazard Mitigation', 'Deviation Management', 'Incident Response Management', 'Issue Management', 'Hazard Management', 'Operational Resilience', 'Complex Problem Solving', 'Internal Investigations', 'Remote Troubleshooting', 'Root Cause Corrective Action', 'Oil Spill Contingency Plans', 'CSSP Incident Responder', 'NCCER Abnormal Operating Conditions', 'Spill Response', 'Cyber Resilience', 'Escalation Procedures', 'Resilience Planning', 'Deviation Investigations', 'Eight Disciplines Problem Solving (8D)', 'A3 Problem Solving Techniques', 'Advanced Disaster Management', 'Business Continuity And Disaster Recovery', 'Business Continuanace Volume', 'Business Continuity', 'Corrective And Preventive Action (CAPA)', 'Catastrophic Failure', 'Cooperative Distributed Problem Solving', 'Certified Business Continuity Professional', 'Certified Emergency Manager', 'Certified Functional Continuity Professional', 'Corrective Maintenance', 'Crisis Management', 'Damage Control', 'Debottlenecking', 'Disaster Assessment And Coordination', 'Emergency Management', 'Disaster Recovery', 'Disaster Recovery Plan', 'Disaster Response', 'Disaster Recovery Certified Specialist (DRCS)', 'Emergency Preparedness', 'Emergency Repair', 'Incident Response', 'Emergency Shutdown', 'Environmental Emergency', 'Exception Handling', 'Error Messages', 'Management By Exception', 'Failover', 'Failure Reporting Analysis And Corrective Action Systems', 'Fault Tolerance', 'Incident Command Systems', 'Incident Management', 'Issue Tracking', 'Problem Solving', 'Network Troubleshooting', 'Load Shedding', 'Master Business Continuity Professional', 'Problem Management', 'Problem Reporting', 'Radioactive Contamination', 'Rapid Response Team', 'Recovery Time Objective', 'Remedial Action', 'Fallback', 'Render Safe Procedure', 'Short Circuits', 'Special Emergency Response', 'Troubleshooting (Problem Solving)', 'Windows System Recovery', 'Graphic Response Plans', 'Accident Response Group', 'Mitigation', 'Disaster Recovery Solution', 'Diagnostic Skills', 'Interrupt Handling', 'Solutions Focused', 'Application Restart
EM (conflict)	'Overcoming Objections', 'Union Relationship Management', 'Cross-Functional Project Management', 'Union Avoidance', 'Construction Coordination', 'Employee Conflict Resolution', 'Team Processes', 'Peacemaking', 'Tactfulness', 'Conflict Transformation', 'Alternative Dispute Resolution', 'Employee Relations', 'De-escalation Techniques', 'Settlement Negotiation', 'Relationship Management', 'Peace And Conflict Studies', 'Management Of Aggressive Behavior (MOAB) Certification', 'Dispute Management', 'Project Communications', 'Preventive Labor Relations', 'Verbal And Physical Intervention', 'Escalation Management', 'Crisis Prevention Institute (CPI) Certification', 'Discrimination Complaints', 'Peacebuilding', 'Anger Management', 'Certified Relationship Specialist', 'Collective Bargaining', 'Community Mediation', 'Conflict Management', 'Conflict Resolution', 'Consensus Decision Making', 'Disciplinary Procedures', 'Dispute Resolution', 'Emotional Intelligence', 'Hostile Work Environment', 'Internal Relations', 'Labor Relations Consulting', 'Labor Relations', 'Life Space Crisis Intervention', 'Mediation', 'Nonviolent Communications', 'Organizational Conflict', 'Restorative Justice', 'Workplace Relationships', 'Handling Confrontation', 'Engagement Skills', 'Conciliation '

Problems of Organizing	Skill Name
IP (asynchronous)	'Report Writing', 'Technical Records', 'Ghostwriting', 'Employee Communications', 'Electrical Documentation', 'Online Writing', 'Business Requirements Documentation', 'Taking Messages', 'Legal Correspondence', 'Statistical Reporting', 'Engineering Documentation', 'Blog Posts', 'New Product Information', 'Topic-based Authoring', 'Policy Change Requests', 'Policy Recommendations', 'Construction Documentation', 'Document Review', 'Transportation Terminology', 'Internal Reporting System', 'Project Drawings', 'Results Summary', 'ChatOps', 'Project Status Reports', 'Master Production Records', 'Style Guides', 'Project Proposals', 'Internal Reporting', 'Project Documentation', 'Presentation Design', 'Good Documentation Practices', 'Aggregate Reporting', 'Job Descriptions', 'IT Security Documentation', 'Design Documentation', 'Change Orders', 'Performance Reporting', 'Communication Release', 'Research Reports', 'Informal Writing', 'Proposal Development', 'Internal Communication Strategy', 'Product Roadmaps', 'Record Keeping', 'Batch Sheets', 'Process Mapping', 'Non-Fiction Writing', 'Effective Communication', 'Writing Outlines', 'Digital Content Editing', 'Financial Writing', 'Professional Writing', 'Discharge Summaries', 'Email Etiquette', 'Procedure Writing', 'Callouts', 'Simplified Technical English', 'Annual Energy Management Report', 'Aeronautical Information Service', 'Annual Reports', 'Asynchronous Communication', 'Audit Report Preparation', 'Basic Writing', 'Business Communication', 'Business Correspondence', 'Copy Editing', 'Business English', 'Business Reporting', 'Business Writing', 'Communication Design', 'Computer-Mediated Communication', 'Content Creation', 'Content Design', 'Content Development', 'Content Engineering', 'Content Management', 'Corporate Communications', 'Daily Production Reports', 'Document Development Life Cycle (DDLC)', 'Dissemination', 'Document Engineering', 'Document Preparations', 'Document Production', 'Document Structure Description', 'Employee Newsletters', 'Environmental Reporting', 'Preparing Executive Summaries', 'Expositions', 'Fact Sheets', 'Flowcharts', 'Standard Operating Procedure', 'Human Communication', 'Information Card', 'Infographics', 'Information Design', 'Information Management', 'Information Mapping', 'Information Model', 'Information Structure', 'Integrated Reporting', 'Internal Communications', 'Internal Documentation', 'Instant Messaging', 'Knowledge Base', 'Lateral Communication', 'Medical Communications', 'Taking Meeting Minutes', 'Memos', 'Message Format', 'Message Transmission Optimization Mechanism', 'Online Communication', 'Operational-Level Agreement', 'Operational Reporting', 'Organizational Communications', 'Posted Write', 'Process Flow Diagrams', 'Product Flow Diagram', 'Professional Communication', 'Release Notes', 'Runbook', 'Scientific Writing', 'Spec Sharp', 'Speedwriting', 'Structured Writing', 'Subject Indexing', 'Technical Writing', 'Visual Communications', 'White Paper', 'Written English', 'Writing', 'Progress Reporting', 'Memorandum Of Understanding (MoU)', 'Articulation', 'Instructional Manuals', 'Bulletins', 'Revisions', 'Help Files', 'Drafting Documents', 'Project Files', 'Code Comments', 'Documentation Generation', 'Revision History', 'Email Processing', 'Content Editing'
IP (coordination)	'Product Execution', 'Supply Network Planning', 'Cross-Docking', 'Calendar Management', 'Cross-Functional Project Management', 'Construction Coordination', 'Supply Chain Synchronization', 'Banquet Event Orders', 'Large Scale Agile Development', 'Cross-Functional Integration', 'Maintenance Coordination', 'Supply Chain Integration', 'Cross-Functional Team Leadership', 'Care Coordination', 'Supply Chain Collaboration', 'Team Processes', 'Stage Management', 'Cross-Functional Collaboration', 'Dispatch Coordination', 'DesignOps', 'Multi-Office Execution', 'Cross-Functional Coordination', 'Incident Communication', 'Distributed Team Management', 'Multidisciplinary Rounds', 'Stakeholder Coordination', 'Interdisciplinary Collaboration', 'Advanced Case Management', 'Aircraft Handler', 'Bioanalyst Laboratory Management (BLM)', 'Boundary Spanning', 'Cascading', 'Cooperative Distributed Problem Solving', 'Collaborative Design', 'Collaborative Innovation Networks', 'Collaborative Learning', 'Collaborative Planning Forecasting And Replenishment (CPFR)', 'Concurrent Engineering', 'Construction Communication', 'Control Communications', 'Cooperation', 'Cooperative Learning', 'Virtual Teams', 'Group Decision

Problems of Organizing	Skill Name
	Making', 'Group Dynamics', 'Integrated Architecture Framework', 'Internal Relations', 'Integrated Product And Process Development (IPPD)', 'Joint Application Design (JAD)', 'Enterprise Messaging Systems', 'Multiagency Coordination Systems', 'Multidisciplinary Research', 'Operational-Level Agreement', 'Organizational Structure', 'Problem Reporting', 'Process Integration', 'Project Collaboration', 'Project Coordination', 'Security Liaison', 'Simultaneous Engineering', 'Social Collaboration', 'Unified Command', 'Unified Communications', 'Virtual Collaboration', 'WinComm', 'Team Oriented', 'Enterprise Vocabulary Services (EVS)', 'Collaboration', 'Coordinating', 'Codesign', 'Econnect', 'Business Liaison', 'Teamwork '
IP (synchronous)	'Cross-Docking', 'Technical Demonstrations', 'Business Presentations', 'Employee Consultation', 'Technical Presentations', 'Speech Fluency', 'Banquet Event Orders', 'Transportation Terminology', 'Meeting Facilitation', 'Radio Communication Procedures', 'Facilitator Certification', 'Executive Presentations', 'Discussion Facilitation', 'Pronunciation', 'Employee Relations', 'New Hire Orientations', 'Internal Communication Strategy', 'Relationship Management', 'Executive Conversations', 'Incident Communication', 'Project Communications', 'Accredited Speaker', 'Effective Communication', 'Active Listening', 'Business Communication', 'Business English', 'Collaborative Communications', 'Communication Strategies', 'Debating', 'Connection-Oriented Communication', 'Dissemination', 'Emotional Intelligence', 'Expositions', 'Public Speaking', 'Human Communication', 'Information Sharing', 'Information Structure', 'Interactive Communications', 'Interpersonal Communications', 'Kickoff Meetings', 'Lateral Communication', 'Listening Skills', 'Managerial Communications', 'Message Transmission Optimization Mechanism', 'Non-Verbal Communication', 'Opening Statement', 'Orator', 'Organizational Communications', 'Persuasive Communication', 'Presentations', 'Professional Communication', 'Reflective Listening', 'Telecommuting', 'Situation Background Assessment Recommendation (SBAR)', 'Social Communications', 'Transparency (Projection)', 'Verbal Communication Skills', 'Visual Rhetoric', 'Voice Chat', 'Workplace Relationships', 'Progress Reporting', 'Confident Communicator', 'Commenting', 'Professional Speaking', 'Articulation', 'Advanced Business Language', 'Engagement Skills', 'Questioning Skills', 'Feed Forward', 'Dynamic Communication '
RD (monitoring)	'360-Degree Feedback', 'Vendor Performance Monitoring', 'Business Process Monitoring (BPM)', 'Time Sheet Collection', 'Outcome-Based Quality Management', 'Progress Monitoring', 'Sprint Retrospectives', 'Ongoing Professional Practice Evaluation (OPPE)', 'Healthcare Quality', 'Professional Practice Evaluation', 'Project Baselines', 'Focused Professional Practice Evaluation (FPPE)', 'Kronos (Timekeeping Software)', 'Human Performance Evaluation', 'Business Performance Management', 'Disciplinary Counseling', 'Earned Value Management', 'Employee Monitoring', 'Employee Performance Management', 'Performance Appraisal', 'Performance Management', 'Human Performance Technology', 'Performance Fee', 'Work Order', 'Key Performance Indicators (KPIs)', 'Workforce Productivity', 'Milestones (Project Management)', 'Performance Analysis', 'Performance Auditing', 'Performance Measurement', 'Performance Review', 'Program Evaluation', 'Program Process Monitoring', 'Project Governance', 'Resource Efficiency', 'Rubric', 'Teacher Quality Assessments', 'Team Performance Management', 'Team Role Inventories', 'Work Measurement', 'Work Sampling', 'Annual Salary Increase Process', 'Evaluating Staff', 'Productivity Management', 'Objective Setting', 'Scope Management '
RD (incentives)	'High Potential Identification', 'Compensation Program Design', 'High-Potential Development', 'High Potential Programs', 'Motiva COLIMO', 'Benefits Strategies', 'Benefits Program Design', 'Talent Mining', 'Compensation Programs and Policies', 'Positive Reinforcement', 'Benefits Programs and Policies', 'Talent Management Programs and Policies', 'Talent Management Implementation', 'Compensation Benchmarking', 'Benefits Enrollment Processes', 'Compensation Strategy', 'Employee Centricity', 'Compensation and Benefits Administration', 'Compensation Analysis', 'Kronos (Timekeeping Software)', 'Internal Pay Equity', 'Executive Compensation Strategy',

Problems of Organizing	Skill Name
	'Certified Sales Compensation Professional', 'Benefits Administration', 'Career Management', 'Certified Benefits Professional', 'Certified Compensation Professional', 'Certified Employee Benefit Specialist', 'Compensation Management', 'Cash Or Share Options', 'Employee Satisfaction', 'Employee Benefits', 'Global Remuneration Professional', 'Performance Fee', 'Incentive Stock Option', 'Job Evaluation', 'Registered Employee Benefits Consultant', 'Reward Management', 'Annual Salary Increase Process', 'People Services '
TA (mapping)	'Sales Territory Management', 'Supply Preparation', 'Resource Deployment', 'Scattered Castles', 'Resource Distribution', 'Supply Inventory', 'Talent Mining', 'Device Distribution', 'Product Roadmap Management', 'Mediant Xcelys Staffing', 'Defining Roles And Responsibilities', 'Automated Planning And Scheduling', 'Sustainment Logistics', 'Cutover Planning And Management', 'Strategic Prioritization', 'Project Resources', 'Job Architecture', 'Resource Mobilization', 'Bed Management', 'Business Planning', 'Competency Mapping', 'Certified Professional Utilization Manager', 'Delegated Authority', 'Enterprise Resource Management', 'Financial Planning', 'Greedy Algorithm', 'Job Rotation', 'Loop Facility Assignment Control Systems', 'Marketing Resource Management', 'Marketing Spending', 'Materials Management', 'Operations Architecture', 'Organizational Charts', 'Organizational Structure', 'Production Line', 'Project Flows', 'Resource Allocation', 'Resource Breakdown Structure', 'Resource Leveling', 'Resource Management', 'Resource Planning', 'Role Hierarchy', 'Team Role Inventories', 'Assigning Employees', 'Resourcing', 'Resource Loading', 'Delegation Skills', 'Company Structure', 'Resource Utilization '
TA (staffing)	'Phone Screening', 'Corporate Recruitment', 'Talent Pipelining', 'Full-Cycle Recruitment', 'Talent Acquisition', 'Employment Advertising', 'Human Resource Planning', 'Talent Management Programs and Policies', 'Talent Management Implementation', 'Workforce Trends', 'Human Capital Management (HCM)', 'Certified Temporary Staffing Specialist', 'Talent Planning', 'Talent Attraction', 'Talent Scouting', 'Technical Recruitment', 'Sports Recruitment', 'Talent Management', 'Human Resource Strategy', 'Talent Recruitment', 'Workforce Planning Operations', 'Recruitment Planning', 'Certified Staffing Professional', 'Competency Modeling', 'Talent Sourcing', 'Talent Assessment', 'Talent Acquisition Strategy', 'Recruitment Strategies', 'Talent Strategy', 'Capacity Planning', 'Certified Employment Interview Professional', 'Certified Personnel Consultant', 'Competency Assessment', 'Contingent Workforce', 'Elite Certified Recruitment Expert (ECRE)', 'Personnel Selection', 'Recruiting Concepts', 'Recruitment Consultancy', 'Resume Screening', 'Selective Recruitment', 'Social Recruiting', 'Workforce Planning', 'Staff Planning', 'Professional Recruiter Certification', 'Registered Professional Recruiter '

Problems of Organizing	Skill Name
Task Division	'Process Sequencing', 'Procedure Standardization', 'Project Design', 'Product Execution', 'Calendar Management', 'Software Strategy', 'Solar Development', 'Procedure Development', 'Maintenance Scheduling', 'Shipment Sorting', 'Project Layout', 'Marketing Calendar', 'Plan Of Action And Milestones (POA&M)', 'Project Drawings', 'Maintenance Coordination', 'Plan Revision', 'Product Roadmap Management', 'Broadcast Programming', 'Sprint Backlogs', 'Project Proposals', 'Stage Management', 'Mission Planning', 'Project Schedules', 'Route Management', 'Growth Planning', 'DesignOps', 'Sprint Planning', 'Product Roadmap Development', 'Proposal Development', 'Product Backlog Grooming', 'Curriculum Planning', 'Project Scoping', 'Project Architecture', 'Batch Sheets', 'Process Mapping', 'Ability To Meet Deadlines', 'Dispatch Planning', 'Certified Scheduling Technician (CST)', 'PMI Scheduling Professional', 'Transformation Planning', 'Cutover Planning And Management', 'Strategic Prioritization', 'Planning', 'Goal Setting', 'Aggregate Planning', 'Analytic Hierarchy Process', 'Arrow Diagramming Methods', 'Assembly Lines', 'Audit Scheduling', 'Blueprinting', 'Strategic Planning', 'Business Planning', 'Checklists', 'Crew Scheduling', 'Critical Path Method (CPM) Scheduling', 'Daily Production Reports', 'Project Planning', 'Final Assembly Schedule', 'Flow Process Chart', 'Flowcharts', 'Functional Process', 'Standard Operating Procedure', 'Greedy Algorithm', 'Logical Framework Approach', 'Operational Planning', 'Operations Architecture', 'Pipeline Planning', 'Precedence Diagram Method', 'Requirement Prioritization', 'Process Architecture', 'Process Design', 'Process Flow Diagrams', 'Process Specification', 'Product Flow Diagram', 'Technology Roadmaps', 'Production Line', 'Production Schedule', 'Project Flows', 'Delivery Focused', 'Rolling Wave Planning', 'Runbook', 'Scope Statements', 'Service Planning', 'Shift Scheduling', 'Task Analysis', 'Time Management', 'Task Management', 'Test Planning', 'Timelines', 'Timeboxing', 'TimeMap', 'Workflow Management Coalition', 'Work Breakdown Structure', 'Scheduling', 'Job/Batch Scheduling', 'Activity Sequencing', 'Prioritization', 'Project Structuring', 'Task Planning', 'Futuretask', 'Job Planning', 'Goal-Oriented', 'Application Planning'

B4. Keywords as an alternative filtering approach

This section evaluates keyword-based filtering as an alternative to GPT-4o agents for identifying candidate skills. We began by compiling a list of seed terms from existing definitions of the constructs of interest (e.g., Puranam et al 2014, Puranam 2018, 2024). Using GPT-4o agents, we then expanded each set to 20 terms by providing the agents with both the seed words and the ontology introduced in section B2. As a benchmark, we also tested canonical embedding models (e.g., word2vec, GloVe), but their results were qualitatively weaker. Table B2 reports both the original seed words and the expanded lists. These keyword sets were subsequently applied to filter candidate skills.

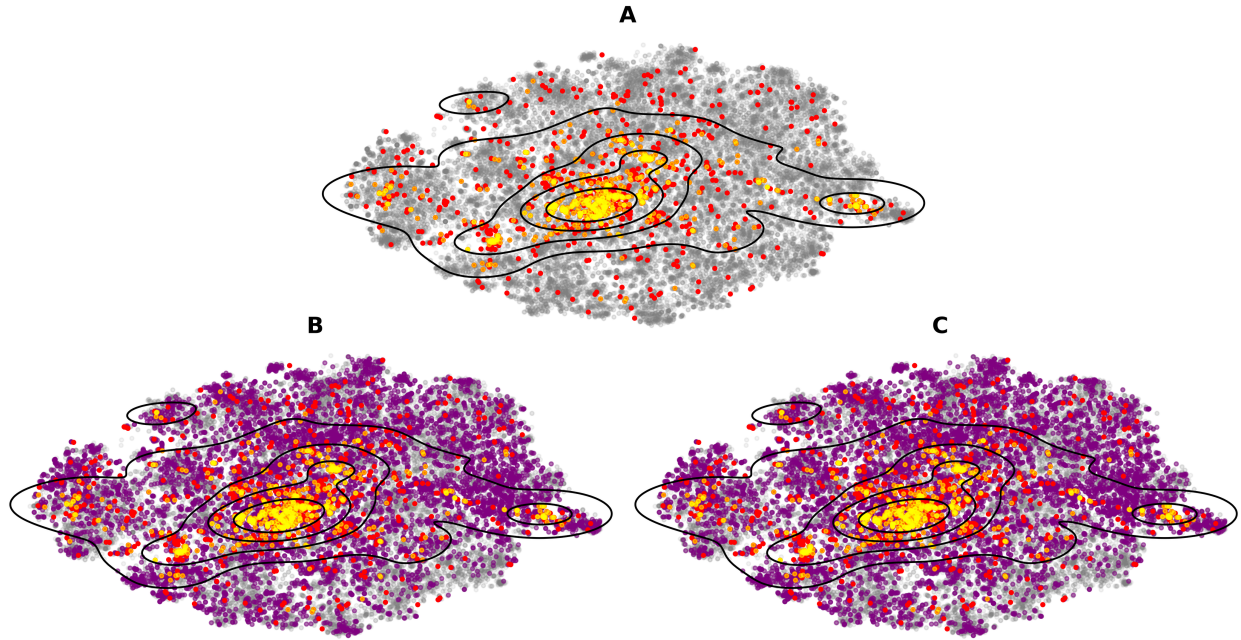
Figure B3 compares results across approaches: GPT-4o agents (panel A), seed keywords (panel B), and expanded keywords (panel C), applied to the full set of 33,832 skills. GPT-4o agents retrieved 1,369 candidates, while seed keywords expanded the pool to 8,892, and expanded keywords to 9,543. In meaning space, GPT-4o results clustered in coherent regions, whereas keyword-based results were widely scattered.

To further compare performance, we tested both approaches on the multi-labeling task of the final 657 skills against human-coded True labels. Figure B4 reports F1-scores (harmonic mean of precision and recall). GPT-4o agents substantially outperformed both seed- and expanded-keyword filters.

A qualitative inspection highlights why keyword filtering underperforms. For example, the skill *‘Hugging Face (NLP Framework)’* was incorrectly flagged under Reward Distribution (incentives) due to the presence of the word *‘recognition,’* which in NLP refers to *‘Named Entity Recognition.’* This illustrates the issue of polysemy, where a word’s meaning depends on context. Conversely, some relevant skills — such as *‘Procedure Standardization’* (standardizing the breakdown and execution of activities) — were missed entirely by keyword filters but correctly identified by GPT-4o agents.

In sum, keyword-based approaches suffer from higher Type I and Type II errors, underscoring our decision to rely on GPT-4o agents for filtering.

FIGURE B3
Search Space Comparison between Keywords and GPT-4o



Notes: full skill-space (grey), skills filtered by keywords (purple), skills filtered by GPT-4o (red), skills selected by human coders (yellow). Black lines identify the kernel-density plot for skills selected by human coders. Panel B uses seed-keywords, while Panel C the expanded set.

FIGURE B4

Filtering Task Performance Comparison against Human Labelled

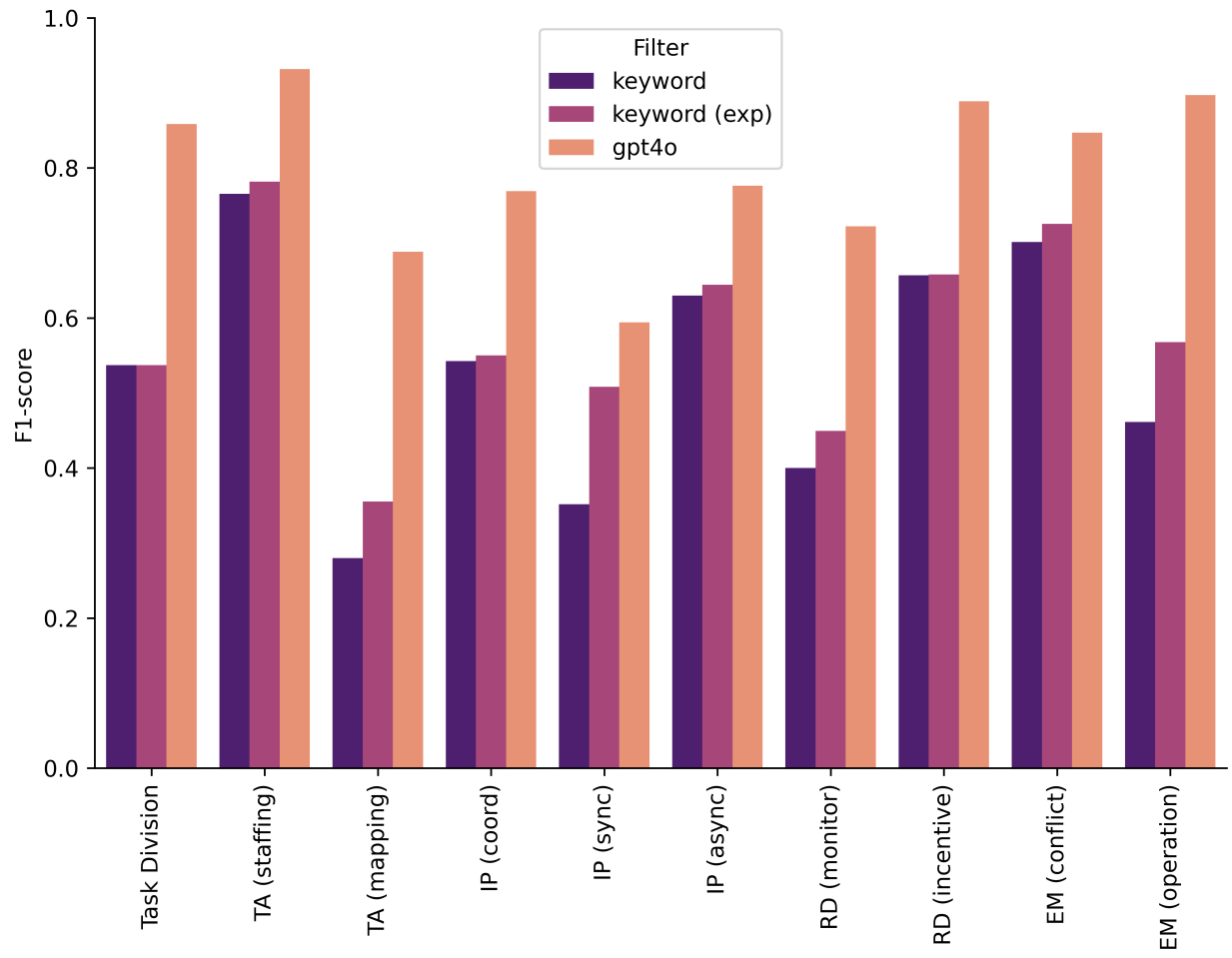


Table B2
Keywords by Problems of Organizing

Problems of Organizing	Seed keywords	Expanded keywords
Task Division	'workflow', 'scheduling', 'planning', 'sequencing', 'prioritizing', 'prioritization', 'task breakdown'	'workflow', 'scheduling', 'planning', 'sequencing', 'prioritizing', 'prioritization', 'task breakdown', 'task structuring', 'task organization', 'task arrangement', 'task sorting', 'task sequencing', 'task prioritization', 'activity planning', 'activity scheduling', 'activity sequencing', 'process planning', 'process scheduling', 'process prioritization', 'process structuring'
Task Allocation (mapping)	'workforce planning', 'delegating', 'role definition', 'job architecture', 'job rotation', 'staffing model', 'resource allocation'	'workforce planning', 'delegating', 'role definition', 'job architecture', 'job rotation', 'staffing model', 'resource allocation', 'task assignment', 'role assignment', 'resource distribution', 'workforce distribution', 'job design', 'position classification', 'task delegation', 'role clarity', 'resource management', 'workforce deployment', 'job structuring', 'task mapping', 'role mapping'
Task Allocation (staffing)	'onboarding', 'recruitment', 'staffing', 'headcount planning', 'talent acquisition', 'workforce strategy', 'interviewing'	'onboarding', 'recruitment', 'staffing', 'headcount planning', 'talent acquisition', 'workforce strategy', 'interviewing', 'candidate selection', 'job posting', 'talent sourcing', 'hiring process', 'employee induction', 'job analysis', 'recruitment marketing', 'talent pipeline', 'candidate assessment', 'job offer negotiation', 'employment branding', 'succession planning', 'diversity hiring'
Information Provision (coordination)	'workflow alignment', 'coordination', 'synchronization', 'process integration', 'teamwork', 'collaboration', 'team-oriented work'	'workflow alignment', 'coordination', 'synchronization', 'process integration', 'teamwork', 'collaboration', 'team-oriented work', 'cross-departmental collaboration', 'interdepartmental coordination', 'team synergy', 'collaborative problem solving', 'process harmonization', 'integrated teamwork', 'collaborative planning', 'team integration', 'cross-functional teamwork', 'collaborative execution', 'inter-team communication', 'process synchronization', 'collaborative alignment'
Information Provision (synchronous)	'speaking', 'non-verbal communication', 'presentation', 'face-to-face', 'interpersonal communication', 'fluency', 'real-time engagement'	'speaking', 'non-verbal communication', 'presentation', 'face-to-face', 'interpersonal communication', 'fluency', 'real-time engagement', 'active listening', 'public speaking', 'verbal communication', 'oral presentation', 'dialogue', 'conversation', 'live discussion', 'interactive communication', 'speech delivery', 'body language', 'gestures', 'eye contact', 'tone of voice'
Information Provision (asynchronous)	'documentation', 'asynchronous work', 'writing', 'visual', 'annual reports', 'online communication', 'corporate communications'	'documentation', 'asynchronous work', 'writing', 'visual', 'annual reports', 'online communication', 'corporate communications', 'email communication', 'technical writing', 'content creation', 'knowledge management', 'report generation', 'memo writing', 'policy drafting', 'internal newsletters', 'meeting minutes', 'white papers', 'case studies', 'editorial planning', 'content management systems'
Reward Distribution (monitoring)	'monitoring', 'performance evaluation', 'performance appraisal', 'performance metrics'	'monitoring', 'performance evaluation', 'performance appraisal', 'performance metrics', 'performance review', 'productivity tracking', 'productivity evaluation', 'employee assessment', 'performance measurement', 'task monitoring', 'efficiency'

Problems of Organizing	Seed keywords	Expanded keywords
	'performance review', 'productivity tracking', 'productivity evaluation'	analysis', 'output evaluation', 'work performance review', 'goal tracking', 'performance benchmarking', 'quality assessment', 'workforce analytics', 'performance auditing', 'performance feedback', 'performance improvement plans'
Reward Distribution (incentives)	'compensation strategy', 'incentives', 'recognition', 'rewards', 'benefits', 'executive compensation', 'workforce satisfaction'	'compensation strategy', 'incentives', 'recognition', 'rewards', 'benefits', 'executive compensation', 'workforce satisfaction', 'bonus programs', 'employee appreciation', 'performance bonuses', 'salary benchmarking', 'profit sharing', 'employee engagement', 'retention strategies', 'non-monetary rewards', 'employee perks', 'merit-based pay', 'career development incentives', 'employee loyalty programs', 'wellness incentives'
Exception Management (conflict resolution)	'arbitrate', 'conciliation', 'conflict de-escalation', 'conflict resolution', 'consensus building', 'dispute settlement', 'peacemaking'	'arbitrate', 'conciliation', 'conflict de-escalation', 'conflict resolution', 'consensus building', 'dispute settlement', 'peacemaking', 'mediation', 'negotiation', 'facilitation', 'dispute resolution', 'conflict management', 'reconciliation', 'peacebuilding', 'tension reduction', 'dispute mediation', 'conflict transformation', 'interpersonal mediation', 'collaborative problem solving', 'harmony restoration'
Exception Management (operational exceptions)	'problem solving', 'obstacles', 'troubleshooting', 'emergency response', 'crisis management', 'incident response', 'system failure recovery'	'problem solving', 'obstacles', 'troubleshooting', 'emergency response', 'crisis management', 'incident response', 'system failure recovery', 'issue resolution', 'fault diagnosis', 'contingency planning', 'disaster recovery', 'risk mitigation', 'corrective action', 'root cause analysis', 'incident management', 'service restoration', 'failure analysis', 'emergency planning', 'operational continuity', 'system restoration'

Appendix B: References

- Puranam P (2018) *The Microstructure of Organizations* (Oxford University Press, Oxford, UK).
- Puranam P (2024) *Re-Humanize: How to Build Human-Centric Organizations in the Age of Algorithms* (Penguin Random House SEA, Singapore).
- Puranam P, Alexy O, Reitzig M (2014) What's "new" about new forms of organizing? *Acad. Management Rev.* 39(2):162–180.

Appendix C: Demand for GenAI-relevant skills

This section examines the shifting demand for skills relevant to GenAI. We draw on the Lightcast’s skill-level taxonomy (version 9.33)¹, which identifies 303 skills under the category ‘*Artificial Intelligence and Machine Learning (AI/ML)*.’ By reviewing the names and descriptions of these skills, we identified 10 that are directly related to GenAI: AgentGPT, Agentic AI, AI Agents, ChatGPT, ChatGPT Integration, ChatGPT Prompt, Generative AI Agents, Generative Artificial Intelligence, Large Language Modeling, and Prompt Engineering.

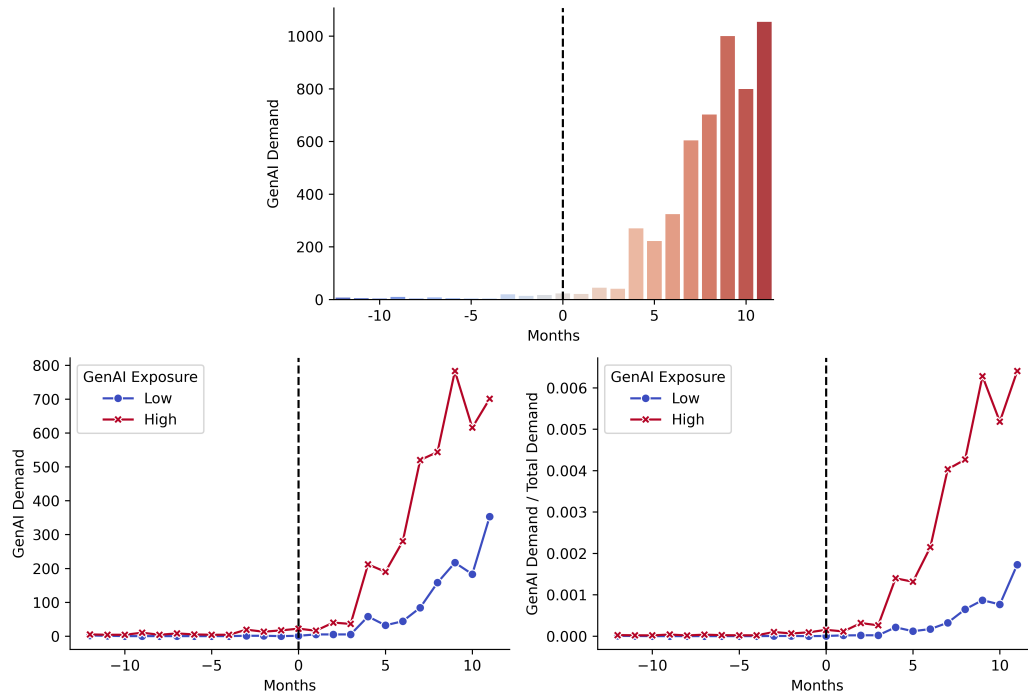
Within the same time frame used in our main analysis, we then counted the number of job postings at time t that mentioned at least one of these GenAI-related skills. The top panel of Figure C1 illustrates the evolution of company-wide demand, revealing a pronounced increase—particularly after March 2023.

The bottom panels of Figure C1 break this trend down by high- and low-GenAI-exposure companies, as per Felten et al (2023). The left panel presents raw counts of relevant job postings by group, showing that high-exposure companies consistently account for most GenAI-related postings. This pattern intensifies again after March 2023. The right panel adjusts GenAI demand by total job posting volume, highlighting a more pronounced divergence between high- and low-exposure firms.

Taken together, this descriptive evidence indicates that during the period of analysis, demand for GenAI skills rose markedly—driven primarily by companies with high GenAI exposure. This supports the notion of a broader ‘reprioritization’ of skill demand in response to advancements in GenAI.

¹ We acknowledge the use of two different versions of the Lightcast skills taxonomy in this paper. This discrepancy is a result of the paper’s development timeline and arose due to practical constraints during the research process. It does not affect the integrity of the results.

Figure C1
Demand for GenAI-relevant skills



Appendix D: Descriptives and Full Tables

TABLE D1
Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) EM (conflict)	1.00									
(2) EM (operational)	0.53*	1.00								
(3) IP (asynchronous)	0.68*	0.74*	1.00							
(4) IP (coordination)	0.61*	0.64*	0.83*	1.00						
(5) IP (synchronous)	0.70*	0.65*	0.80*	0.81*	1.00					
(6) RD (incentives)	0.33*	0.44*	0.41*	0.43*	0.43*	1.00				
(7) RD (monitoring)	0.50*	0.69*	0.80*	0.75*	0.60*	0.38*	1.00			
(8) TA (mapping)	0.47*	0.72*	0.70*	0.66*	0.60*	0.43*	0.75*	1.00		
(9) TA (staffing)	0.26*	0.47*	0.41*	0.39*	0.33*	0.21*	0.55*	0.45*	1.00	
(10) Task Division	0.70*	0.77*	0.91*	0.88*	0.81*	0.45*	0.82*	0.73*	0.43*	1.00

TABLE D2
Demand for Skills after the GenAI availability shock with control variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.260*** (0.068)	0.181 (0.308)	-0.087 (0.081)	-0.237** (0.082)	-0.204* (0.086)	-0.243** (0.082)	-0.259** (0.079)	-0.151 (0.103)	-0.218 (0.130)	-0.209** (0.075)
Size	0.334 (0.195)	-0.060 (0.221)	0.034 (0.181)	0.073 (0.244)	0.230 (0.250)	0.204 (0.217)	0.188 (0.223)	0.333 (0.332)	0.407 (0.290)	0.099 (0.230)
ROA	-0.088 (0.586)	-1.517 (2.028)	0.373 (0.676)	0.208 (0.702)	0.615 (0.610)	0.465 (0.610)	-0.110 (0.728)	-0.411 (1.117)	0.233 (0.683)	0.314 (0.554)
Leverage	0.120 (0.436)	-1.563 (1.080)	-0.440 (0.457)	0.525 (0.581)	0.220 (0.560)	0.038 (0.504)	-0.221 (0.507)	-0.487 (0.673)	0.162 (0.724)	0.162 (0.470)
R&D/TA	-2.886 (3.443)	-14.808 (9.676)	-5.464 (4.563)	-4.824 (3.859)	-6.057 (4.613)	-1.631 (3.018)	-5.678 (3.968)	-7.936 (6.085)	-4.727 (4.356)	-1.259 (3.938)
R&D (dummy)	0.015 (0.065)	0.299 (0.154)	0.060 (0.073)	0.060 (0.073)	0.093 (0.089)	0.092 (0.065)	0.102 (0.078)	0.308* (0.123)	0.052 (0.115)	-0.033 (0.093)
CAPEX/TA	0.241 (0.945)	-0.122 (1.375)	0.470 (1.096)	0.362 (1.071)	-0.182 (1.103)	-0.104 (0.891)	0.180 (0.824)	0.705 (1.238)	0.309 (0.927)	-0.646 (0.915)
WFC	1.623*** (0.460)	2.308 (1.215)	1.332** (0.428)	1.336** (0.501)	1.509** (0.525)	1.102* (0.519)	1.052* (0.479)	-0.145 (1.350)	1.152 (0.677)	1.725*** (0.496)
Constant	2.780 (2.014)	5.121* (2.357)	4.166* (1.896)	4.953 (2.536)	3.753 (2.574)	3.772 (2.242)	3.286 (2.291)	-0.897 (3.395)	0.404 (3.103)	4.854* (2.401)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.819	0.865	0.920	0.921	0.919	0.902	0.685	0.882	0.918

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D3
Demand for Skills after the GenAI availability shock using sample median

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated (median)	-0.276*** (0.068)	0.165 (0.317)	-0.091 (0.082)	-0.249** (0.081)	-0.221* (0.086)	-0.264** (0.081)	-0.280*** (0.079)	-0.148 (0.103)	-0.229 (0.128)	-0.229** (0.074)
Size	0.327 (0.195)	-0.050 (0.221)	0.030 (0.179)	0.066 (0.244)	0.227 (0.251)	0.200 (0.217)	0.182 (0.222)	0.326 (0.332)	0.403 (0.289)	0.093 (0.230)
ROA	-0.111 (0.583)	-1.508 (2.019)	0.359 (0.681)	0.182 (0.698)	0.602 (0.610)	0.451 (0.609)	-0.135 (0.725)	-0.430 (1.115)	0.217 (0.678)	0.294 (0.554)
Leverage	0.105 (0.435)	-1.551 (1.071)	-0.447 (0.459)	0.515 (0.579)	0.215 (0.559)	0.029 (0.501)	-0.237 (0.505)	-0.492 (0.675)	0.152 (0.721)	0.148 (0.470)
R&D/TA	-2.861 (3.420)	-14.784 (9.716)	-5.467 (4.551)	-4.813 (3.837)	-5.992 (4.575)	-1.597 (3.004)	-5.581 (3.924)	-7.936 (6.088)	-4.686 (4.341)	-1.214 (3.884)
R&D (dummy)	0.014 (0.064)	0.299 (0.155)	0.060 (0.072)	0.059 (0.072)	0.092 (0.089)	0.090 (0.064)	0.099 (0.077)	0.308* (0.123)	0.051 (0.115)	-0.034 (0.092)
CAPEX/TA	0.214 (0.946)	-0.134 (1.370)	0.454 (1.099)	0.337 (1.071)	-0.212 (1.104)	-0.135 (0.893)	0.147 (0.823)	0.703 (1.237)	0.287 (0.925)	-0.678 (0.923)
WFC	1.608*** (0.459)	2.302 (1.199)	1.328** (0.426)	1.326** (0.500)	1.499** (0.524)	1.088* (0.518)	1.032* (0.477)	-0.149 (1.352)	1.137 (0.676)	1.709*** (0.494)
Constant	2.860 (2.011)	5.014* (2.358)	4.211* (1.883)	5.033* (2.540)	3.779 (2.586)	3.821 (2.244)	3.358 (2.288)	-0.822 (3.396)	0.446 (3.093)	4.930* (2.401)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.930	0.819	0.865	0.920	0.921	0.919	0.902	0.685	0.882	0.919

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D4
Demand for Skills after the GenAI availability shock with Industry-level GenAI exposure as of November 2022

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*GenAI Exposure	-0.349**	0.502	-0.118	-0.311*	-0.241	-0.343**	-0.321*	-0.186	-0.321	-0.293*
(November 2022)	(0.107)	(0.520)	(0.124)	(0.132)	(0.132)	(0.125)	(0.126)	(0.148)	(0.169)	(0.118)
Size	0.314	-0.080	0.033	0.057	0.212	0.179	0.177	0.317	0.397	0.085
	(0.187)	(0.213)	(0.177)	(0.233)	(0.240)	(0.208)	(0.215)	(0.335)	(0.288)	(0.223)
ROA	-0.068	-1.458	0.380	0.215	0.609	0.459	-0.105	-0.388	0.260	0.340
	(0.606)	(1.962)	(0.676)	(0.715)	(0.612)	(0.614)	(0.751)	(1.128)	(0.685)	(0.570)
Leverage	0.073	-1.571	-0.453	0.445	0.215	0.007	-0.267	-0.516	0.181	0.157
	(0.445)	(1.073)	(0.461)	(0.593)	(0.560)	(0.508)	(0.525)	(0.678)	(0.703)	(0.471)
R&D/TA	-3.206	-14.230	-5.545	-5.088	-6.495	-1.905	-6.215	-8.405	-5.105	-1.602
	(3.546)	(8.947)	(4.620)	(3.939)	(4.789)	(3.055)	(4.180)	(6.303)	(4.504)	(4.165)
R&D (dummy)	0.024	0.286*	0.062	0.070	0.104	0.101	0.116	0.316*	0.062	-0.025
	(0.068)	(0.146)	(0.073)	(0.077)	(0.094)	(0.068)	(0.083)	(0.127)	(0.118)	(0.096)
CAPEX/TA	0.273	0.079	0.477	0.368	-0.123	-0.091	0.197	0.736	0.291	-0.625
	(0.943)	(1.293)	(1.099)	(1.051)	(1.086)	(0.891)	(0.825)	(1.223)	(0.919)	(0.911)
WFC	1.694***	2.351	1.362**	1.387**	1.563**	1.145*	1.128*	-0.060	1.186	1.769***
	(0.461)	(1.250)	(0.430)	(0.503)	(0.531)	(0.518)	(0.484)	(1.334)	(0.692)	(0.499)
Constant	3.001	5.303*	4.177*	5.145*	3.927	4.043	3.410	-0.725	0.503	5.004*
	(1.927)	(2.292)	(1.859)	(2.425)	(2.473)	(2.144)	(2.218)	(3.437)	(3.077)	(2.328)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.820	0.865	0.919	0.921	0.919	0.902	0.685	0.882	0.918

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D5
Demand for Skills after the GenAI availability shock with monthly Industry-level GenAI exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*GenAI Exposure	-0.327**	0.418	-0.181	-0.290*	-0.193	-0.317*	-0.336**	-0.155	-0.246	-0.298*
(monthly)	(0.112)	(0.534)	(0.110)	(0.134)	(0.139)	(0.131)	(0.116)	(0.151)	(0.161)	(0.117)
GenAI Exposure (monthly)	1.458***	0.784	2.331***	1.355***	1.459***	1.506***	2.207***	1.480*	1.221*	1.570***
	(0.315)	(0.910)	(0.395)	(0.406)	(0.430)	(0.371)	(0.361)	(0.602)	(0.541)	(0.346)
Size	0.297	-0.048	0.021	0.062	0.213	0.169	0.166	0.324	0.405	0.083
	(0.182)	(0.205)	(0.161)	(0.227)	(0.235)	(0.203)	(0.202)	(0.327)	(0.294)	(0.210)
ROA	-0.172	-1.544	0.164	0.126	0.488	0.408	-0.233	-0.499	0.197	0.220
	(0.572)	(1.910)	(0.598)	(0.680)	(0.601)	(0.598)	(0.693)	(1.085)	(0.681)	(0.524)
Leverage	-0.053	-1.716	-0.686	0.370	0.053	-0.101	-0.462	-0.645	0.094	-0.038
	(0.444)	(1.021)	(0.418)	(0.602)	(0.562)	(0.502)	(0.492)	(0.674)	(0.758)	(0.431)
R&D/TA	-2.894	-13.405	-4.755	-4.679	-5.968	-1.609	-5.306	-7.499	-4.633	-1.296
	(3.334)	(8.960)	(4.285)	(3.655)	(4.494)	(2.811)	(3.652)	(6.029)	(4.281)	(3.905)
R&D (dummy)	0.022	0.282*	0.059	0.066	0.102	0.099	0.107	0.309*	0.064	-0.027
	(0.065)	(0.143)	(0.067)	(0.072)	(0.088)	(0.062)	(0.075)	(0.122)	(0.116)	(0.093)
CAPEX/TA	0.102	-0.363	0.344	0.175	-0.382	-0.272	-0.034	0.662	0.165	-0.810
	(0.938)	(1.266)	(1.060)	(1.059)	(1.082)	(0.889)	(0.766)	(1.218)	(0.963)	(0.917)
WFC	1.649***	2.197	1.226**	1.365**	1.545**	1.124*	1.035*	-0.126	1.160	1.702***
	(0.457)	(1.324)	(0.411)	(0.496)	(0.529)	(0.512)	(0.472)	(1.362)	(0.696)	(0.484)
Constant	2.711	4.718*	3.467*	4.675*	3.467	3.651	2.870	-1.319	0.003	4.524*
	(1.855)	(2.190)	(1.710)	(2.338)	(2.396)	(2.063)	(2.070)	(3.273)	(3.108)	(2.191)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.930	0.820	0.869	0.920	0.922	0.920	0.905	0.686	0.882	0.920

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D6
Demand for Skills post GPT-3.5 and GPT-4

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
GPT-3.5*Treated	-0.262** (0.092)	-0.265 (0.164)	-0.096 (0.094)	-0.272* (0.106)	-0.203 (0.113)	-0.220* (0.108)	-0.164 (0.090)	-0.145 (0.133)	-0.213 (0.135)	-0.150 (0.100)
GPT-4*Treated	-0.260*** (0.069)	0.299 (0.362)	-0.083 (0.086)	-0.225** (0.084)	-0.204* (0.086)	-0.250** (0.079)	-0.291*** (0.082)	-0.153 (0.113)	-0.219 (0.134)	-0.230** (0.073)
Size	0.334 (0.195)	-0.080 (0.215)	0.034 (0.180)	0.072 (0.243)	0.230 (0.250)	0.204 (0.217)	0.192 (0.224)	0.333 (0.334)	0.407 (0.290)	0.101 (0.231)
ROA	-0.087 (0.586)	-1.488 (1.953)	0.371 (0.671)	0.210 (0.700)	0.615 (0.608)	0.464 (0.610)	-0.117 (0.732)	-0.411 (1.117)	0.234 (0.682)	0.310 (0.555)
Leverage	0.120 (0.435)	-1.583 (1.087)	-0.442 (0.457)	0.519 (0.578)	0.220 (0.556)	0.041 (0.500)	-0.208 (0.506)	-0.487 (0.671)	0.162 (0.725)	0.171 (0.471)
R&D/TA	-2.886 (3.444)	-14.736 (9.644)	-5.466 (4.561)	-4.824 (3.858)	-6.057 (4.613)	-1.628 (3.018)	-5.729 (3.960)	-7.936 (6.087)	-4.726 (4.356)	-1.269 (3.939)
R&D (dummy)	0.015 (0.065)	0.296 (0.154)	0.060 (0.073)	0.060 (0.073)	0.093 (0.089)	0.091 (0.065)	0.103 (0.078)	0.308* (0.123)	0.052 (0.115)	-0.031 (0.093)
CAPEX/TA	0.240 (0.938)	-0.457 (1.439)	0.470 (1.095)	0.358 (1.062)	-0.181 (1.097)	-0.097 (0.893)	0.219 (0.838)	0.704 (1.240)	0.311 (0.927)	-0.639 (0.917)
WFC	1.623*** (0.460)	2.350* (1.171)	1.333** (0.428)	1.337** (0.502)	1.509** (0.526)	1.100* (0.518)	1.042* (0.479)	-0.146 (1.351)	1.152 (0.676)	1.719*** (0.494)
Constant	2.781 (2.012)	5.344* (2.314)	4.168* (1.896)	4.961* (2.531)	3.752 (2.574)	3.766 (2.242)	3.236 (2.300)	-0.901 (3.409)	0.404 (3.103)	4.830* (2.408)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.820	0.865	0.920	0.921	0.919	0.902	0.685	0.882	0.918

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D7
Demand for Skills post GPT-3.5 and GPT-4 with Industry-level GenAI exposure in November 2022

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
GPT-3.5* GenAI Exposure	-0.337*	-0.163	-0.010	-0.364*	-0.248	-0.315	-0.172	-0.045	-0.278	-0.178
(November 2022)	(0.163)	(0.253)	(0.151)	(0.178)	(0.184)	(0.177)	(0.149)	(0.219)	(0.185)	(0.161)
GPT-4* GenAI Exposure	-0.353***	0.685	-0.155	-0.293*	-0.239	-0.352**	-0.371**	-0.242	-0.336	-0.333**
(November 2022)	(0.103)	(0.627)	(0.132)	(0.132)	(0.127)	(0.116)	(0.127)	(0.154)	(0.173)	(0.111)
Size	0.314	-0.092	0.034	0.057	0.212	0.178	0.179	0.322	0.397	0.085
	(0.187)	(0.209)	(0.178)	(0.233)	(0.240)	(0.208)	(0.215)	(0.336)	(0.288)	(0.223)
ROA	-0.069	-1.443	0.389	0.218	0.609	0.458	-0.116	-0.401	0.262	0.337
	(0.608)	(1.896)	(0.685)	(0.713)	(0.611)	(0.615)	(0.757)	(1.133)	(0.685)	(0.573)
Leverage	0.073	-1.578	-0.444	0.443	0.215	0.008	-0.262	-0.513	0.182	0.166
	(0.445)	(1.074)	(0.459)	(0.592)	(0.558)	(0.506)	(0.525)	(0.672)	(0.702)	(0.472)
R&D/TA	-3.205	-14.154	-5.522	-5.090	-6.496	-1.900	-6.239	-8.397	-5.100	-1.599
	(3.547)	(8.885)	(4.629)	(3.938)	(4.788)	(3.054)	(4.180)	(6.320)	(4.510)	(4.169)
R&D (dummy)	0.024	0.285*	0.062	0.070	0.104	0.100	0.116	0.318*	0.062	-0.025
	(0.068)	(0.145)	(0.073)	(0.077)	(0.094)	(0.068)	(0.083)	(0.127)	(0.118)	(0.096)
CAPEX/TA	0.275	-0.249	0.472	0.374	-0.123	-0.089	0.219	0.699	0.307	-0.639
	(0.939)	(1.332)	(1.111)	(1.044)	(1.084)	(0.894)	(0.841)	(1.238)	(0.921)	(0.914)
WFC	1.692***	2.411*	1.356**	1.388**	1.563**	1.143*	1.122*	-0.075	1.182	1.757***
	(0.461)	(1.192)	(0.430)	(0.504)	(0.531)	(0.518)	(0.483)	(1.329)	(0.691)	(0.495)
Constant	3.000	5.428*	4.168*	5.143*	3.928	4.043	3.388	-0.780	0.506	4.996*
	(1.925)	(2.260)	(1.865)	(2.426)	(2.472)	(2.144)	(2.216)	(3.445)	(3.075)	(2.331)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.821	0.865	0.919	0.921	0.919	0.902	0.685	0.882	0.918

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE D8
Demand for Skills post GPT-3.5 and GPT-4 with monthly Industry-level GenAI exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
GPT-3.5*GenAI Exposure (monthly)	-0.272 (0.163)	-0.236 (0.257)	-0.007 (0.146)	-0.304 (0.173)	-0.159 (0.178)	-0.241 (0.185)	-0.148 (0.146)	0.009 (0.226)	-0.203 (0.193)	-0.141 (0.174)
GPT-4*GenAI Exposure (monthly)	-0.346** (0.108)	0.591 (0.643)	-0.238* (0.118)	-0.285* (0.137)	-0.205 (0.138)	-0.342** (0.122)	-0.395*** (0.116)	-0.215 (0.159)	-0.261 (0.164)	-0.349** (0.107)
GenAI Exposure (monthly)	1.468*** (0.319)	0.737 (0.922)	2.363*** (0.394)	1.352** (0.412)	1.466*** (0.434)	1.521*** (0.377)	2.232*** (0.360)	1.516* (0.602)	1.227* (0.543)	1.600*** (0.342)
Size	0.298 (0.182)	-0.060 (0.201)	0.021 (0.163)	0.062 (0.227)	0.214 (0.236)	0.169 (0.203)	0.167 (0.203)	0.329 (0.328)	0.404 (0.294)	0.083 (0.211)
ROA	-0.179 (0.577)	-1.520 (1.853)	0.171 (0.612)	0.128 (0.682)	0.488 (0.601)	0.405 (0.600)	-0.254 (0.700)	-0.519 (1.088)	0.197 (0.681)	0.211 (0.526)
Leverage	-0.052 (0.444)	-1.744 (1.035)	-0.670 (0.415)	0.369 (0.600)	0.055 (0.560)	-0.097 (0.500)	-0.453 (0.492)	-0.642 (0.669)	0.095 (0.757)	-0.024 (0.431)
R&D/TA	-2.890 (3.333)	-13.436 (8.985)	-4.707 (4.286)	-4.680 (3.655)	-5.960 (4.491)	-1.594 (2.806)	-5.312 (3.634)	-7.453 (6.025)	-4.623 (4.282)	-1.279 (3.886)
R&D (dummy)	0.021 (0.065)	0.282* (0.144)	0.058 (0.067)	0.066 (0.072)	0.102 (0.088)	0.098 (0.062)	0.106 (0.075)	0.310* (0.122)	0.063 (0.116)	-0.026 (0.093)
CAPEX/TA	0.106 (0.941)	-0.579 (1.300)	0.334 (1.073)	0.179 (1.062)	-0.388 (1.092)	-0.275 (0.898)	-0.025 (0.775)	0.614 (1.235)	0.173 (0.964)	-0.837 (0.922)
WFC	1.643*** (0.457)	2.268 (1.259)	1.213** (0.410)	1.365** (0.496)	1.543** (0.529)	1.117* (0.511)	1.024* (0.470)	-0.147 (1.358)	1.155 (0.695)	1.682*** (0.477)
Constant	2.703 (1.855)	4.883* (2.170)	3.449* (1.720)	4.676* (2.337)	3.461 (2.396)	3.646 (2.063)	2.841 (2.073)	-1.387 (3.283)	0.002 (3.107)	4.508* (2.196)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.930	0.821	0.869	0.920	0.922	0.920	0.905	0.686	0.882	0.920

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are robust to heteroskedasticity and clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

Appendix E: Placebo Test

TABLE E1
Placebo test with pseudo ChatGPT release at -6 months

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
pseudoGPT*Treated (-6m)	-0.067 (0.071)	-0.180 (0.094)	-0.019 (0.068)	-0.169* (0.078)	-0.064 (0.077)	-0.035 (0.072)	-0.069 (0.074)	-0.082 (0.094)	0.009 (0.111)	-0.087 (0.074)
Size	0.300 (0.173)	-0.084 (0.164)	0.199 (0.142)	0.165 (0.153)	0.409* (0.189)	0.129 (0.211)	0.416* (0.171)	0.595* (0.235)	0.237 (0.247)	0.029 (0.260)
ROA	-0.072 (0.488)	-0.321 (0.967)	0.149 (0.463)	0.278 (0.522)	0.612 (0.496)	0.587 (0.493)	-0.301 (0.596)	-0.047 (1.022)	1.228 (0.840)	0.032 (0.528)
Leverage	0.194 (0.380)	-0.305 (0.719)	-0.348 (0.408)	0.936 (0.541)	-0.115 (0.472)	-0.212 (0.519)	-0.759 (0.621)	0.787 (0.538)	0.389 (0.559)	-0.518 (0.584)
R&D/TA	-2.283 (3.181)	-10.242* (4.891)	-1.876 (3.047)	-4.239 (3.046)	-2.190 (2.715)	1.054 (1.952)	-1.172 (2.227)	-10.299** (3.908)	-2.334 (2.201)	2.443 (2.520)
R&D (dummy)	0.022 (0.052)	0.197 (0.103)	0.036 (0.063)	0.094 (0.058)	0.054 (0.062)	0.029 (0.051)	0.036 (0.058)	0.220* (0.093)	0.096* (0.047)	-0.061 (0.067)
CAPEX/TA	-0.228 (1.123)	1.587 (1.686)	-1.008 (0.958)	0.678 (1.070)	-0.308 (1.182)	-0.815 (1.064)	-0.869 (0.848)	0.039 (1.066)	-0.246 (0.797)	-1.345 (0.852)
WFC	1.081* (0.468)	1.428 (0.735)	0.739 (0.463)	1.014* (0.460)	1.115* (0.440)	0.891 (0.476)	0.821* (0.393)	0.798 (0.481)	0.874 (0.513)	1.107** (0.415)
Constant	3.150 (1.830)	4.903** (1.838)	2.438 (1.512)	3.833* (1.654)	2.062 (2.026)	4.672* (2.300)	1.134 (1.786)	-3.864 (2.420)	2.128 (2.635)	5.888* (2.873)
N	38409	30580	33766	37510	38491	38106	35269	26398	33475	37752
Pseudo R ²	0.930	0.833	0.870	0.921	0.922	0.918	0.907	0.705	0.886	0.918

Notes. $\pm$ 12 Months from Pseudo ChatGPT release (June 2022). All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE E2
Placebo test with pseudo ChatGPT release at -9 months

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
pseudoGPT*Treated (-9m)	0.038 (0.073)	-0.085 (0.109)	0.041 (0.066)	-0.078 (0.082)	-0.010 (0.079)	-0.005 (0.070)	0.047 (0.073)	0.147 (0.122)	0.117 (0.089)	-0.021 (0.074)
Size	0.154 (0.166)	-0.136 (0.141)	0.142 (0.143)	0.043 (0.150)	0.244 (0.158)	0.047 (0.179)	0.299 (0.165)	0.374 (0.286)	0.109 (0.201)	-0.025 (0.221)
ROA	-0.049 (0.478)	0.355 (0.859)	0.505 (0.482)	0.165 (0.515)	0.654 (0.480)	0.478 (0.513)	-0.548 (0.601)	0.169 (1.096)	1.577 (0.899)	-0.048 (0.553)
Leverage	0.139 (0.357)	-0.319 (0.666)	-0.481 (0.410)	0.713 (0.470)	-0.204 (0.424)	-0.111 (0.475)	-1.128 (0.696)	1.677 (0.885)	0.052 (0.390)	-0.302 (0.507)
R&D/TA	-1.275 (2.527)	-8.491 (4.531)	-0.378 (2.508)	-3.029 (2.415)	-0.419 (1.917)	1.006 (1.523)	0.069 (1.456)	-6.953* (2.755)	-0.203 (2.087)	2.504 (2.349)
R&D (dummy)	0.016 (0.051)	0.131 (0.122)	0.038 (0.061)	0.078 (0.051)	-0.000 (0.063)	0.044 (0.051)	0.003 (0.068)	0.210* (0.088)	0.074 (0.046)	-0.078 (0.073)
CAPEX/TA	-0.416 (0.745)	1.204 (2.035)	-0.833 (0.837)	0.823 (0.925)	0.113 (0.966)	-0.833 (0.828)	-0.602 (0.746)	-5.999 (5.149)	-0.612 (0.890)	-0.507 (0.676)
WFC	1.032* (0.471)	1.261 (0.698)	0.676 (0.503)	0.921 (0.505)	1.091* (0.434)	0.797 (0.433)	0.982** (0.368)	0.306 (0.532)	0.887 (0.488)	0.912* (0.399)
Constant	4.678** (1.755)	5.416*** (1.611)	3.056* (1.526)	5.163** (1.606)	3.799* (1.697)	5.475** (1.937)	2.451 (1.717)	-1.824 (2.774)	3.579 (2.124)	6.354** (2.431)
N	39667	31731	34883	38544	39667	39376	36307	27187	34679	38886
Pseudo R ²	0.931	0.831	0.871	0.920	0.922	0.918	0.906	0.707	0.890	0.916

Notes. ± 12 Months from Pseudo ChatGPT release (March 2022). All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE E3
Placebo test with pseudo ChatGPT release at -1 year

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
pseudoGPT*Treated (-1y)	0.092 (0.068)	-0.200 (0.198)	0.034 (0.066)	-0.031 (0.082)	0.020 (0.073)	0.011 (0.066)	0.054 (0.083)	0.153 (0.135)	0.158 (0.087)	-0.035 (0.077)
Size	0.118 (0.154)	-0.131 (0.130)	0.138 (0.145)	-0.002 (0.143)	0.180 (0.142)	-0.003 (0.174)	0.308 (0.179)	0.380 (0.265)	0.050 (0.191)	-0.050 (0.224)
ROA	-0.018 (0.474)	0.794 (0.954)	0.681 (0.529)	0.250 (0.520)	0.343 (0.507)	-0.046 (0.498)	-0.538 (0.655)	-0.027 (1.202)	1.783 (0.917)	-0.119 (0.650)
Leverage	-0.017 (0.325)	-0.248 (0.682)	-0.350 (0.435)	0.559 (0.424)	-0.347 (0.386)	-0.126 (0.457)	-1.207 (0.714)	1.988* (0.922)	0.010 (0.361)	-0.220 (0.508)
R&D/TA	-0.611 (2.411)	-5.205 (4.723)	-0.010 (2.252)	-2.311 (2.487)	0.517 (2.046)	1.281 (2.011)	1.499 (2.583)	-5.435 (3.064)	0.815 (2.251)	3.922 (2.981)
R&D (dummy)	0.022 (0.054)	0.091 (0.130)	0.043 (0.064)	0.079 (0.052)	-0.009 (0.068)	0.050 (0.056)	-0.015 (0.073)	0.190* (0.091)	0.062 (0.047)	-0.076 (0.073)
CAPEX/TA	-1.326 (0.830)	0.787 (2.396)	-0.614 (1.026)	-0.089 (0.979)	-0.816 (0.988)	-1.556 (0.868)	-0.671 (1.103)	-7.101 (5.854)	-1.435 (1.230)	-0.701 (0.673)
WFC	0.758 (0.447)	1.044 (0.703)	0.364 (0.482)	0.636 (0.503)	0.785 (0.421)	0.585 (0.444)	0.769* (0.366)	-0.059 (0.513)	0.727 (0.486)	0.723 (0.422)
Constant	5.117** (1.622)	5.424*** (1.507)	3.069* (1.560)	5.700*** (1.509)	4.537** (1.508)	6.030** (1.884)	2.398 (1.866)	-1.946 (2.576)	4.235* (2.012)	6.622** (2.454)
N	36288	28930	31828	35278	36238	36029	33100	24650	31607	35414
Pseudo R ²	0.935	0.836	0.874	0.923	0.925	0.922	0.909	0.713	0.894	0.920

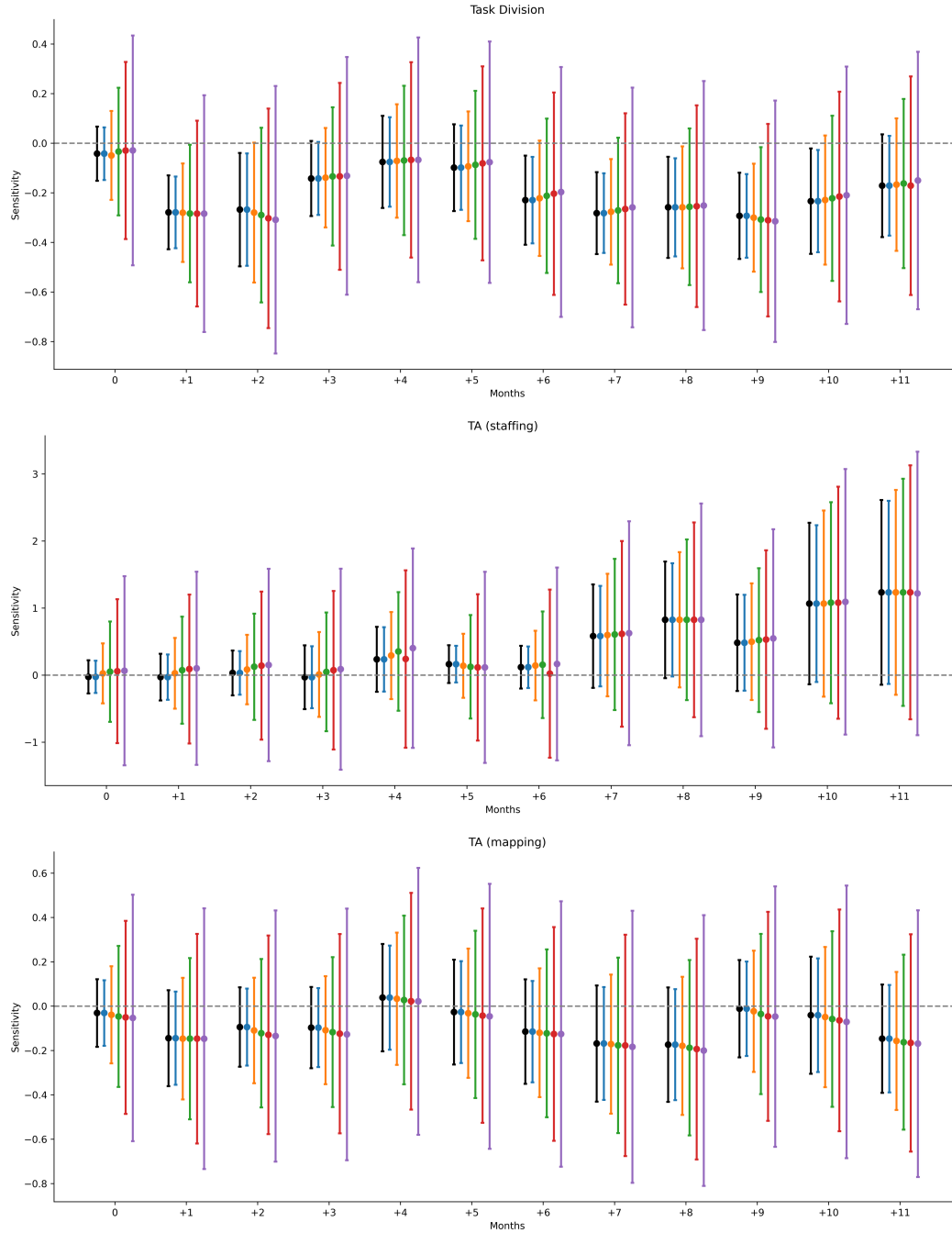
Notes. ± 12 Months from Pseudo ChatGPT release (December 2021). All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

Appendix F: Sensitivity Analysis

This section presents sensitivity analyses for our DiD estimates. Figure F1 replicates the estimates from Figure 1 in the main text, allowing for potential violations of the parallel trends' assumption after treatment, as per Rambachan and Roth (2023). The analysis is conducted at the monthly level, showing how estimates evolve under varying degrees of permissible deviation from parallel trends. We examine bounded deviations characterized by different values of M : blue ($M=0$), yellow ($M=0.5$), green ($M=1$), red ($M=1.5$), and purple ($M=2$). This sensitivity test indicates that effects on Task Division, Information Provision (asynchronous), Reward Distribution (monitoring) and Exception Management (operational) are the most robust to violations of the parallel trends assumption.

We also replicate our main analysis using the ETWFE estimator proposed by Wooldridge (2023). Results are reported in Tables F1 and F2. The estimates remain largely consistent, except for Information Provision (coordination) and Information Provision (synchronous), which become statistically insignificant. Again, Task Division, Information Provision (asynchronous), Reward Distribution (monitoring) and Exception Management (operational) emerge as the most robust outcomes.

FIGURE F1
Sensitivity Analysis for the Dynamic Effects



Notes: The vertical axis shows Poisson coefficients (and 95 percent confidence intervals). The color Black corresponds to the original estimates, Blue to $M = 0$, yellow $M = 0.5$, Green $M = 1$, Red $M = 1.5$, and Purple $M = 2$.

FIGURE F1 (cont'd)
Sensitivity Analysis for the Dynamic Effects

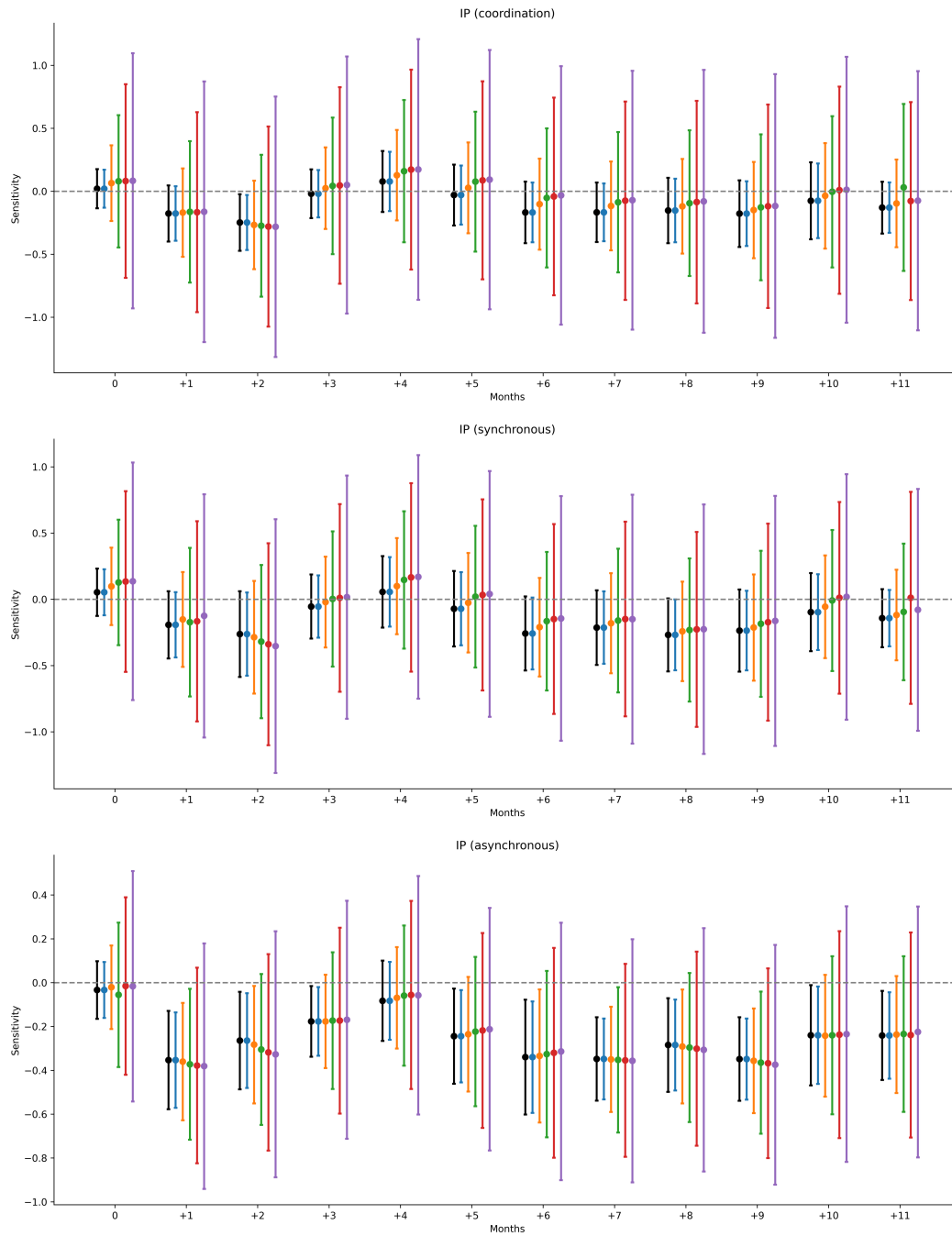


FIGURE F1 (cont'd)
Sensitivity Analysis for the Dynamic Effects

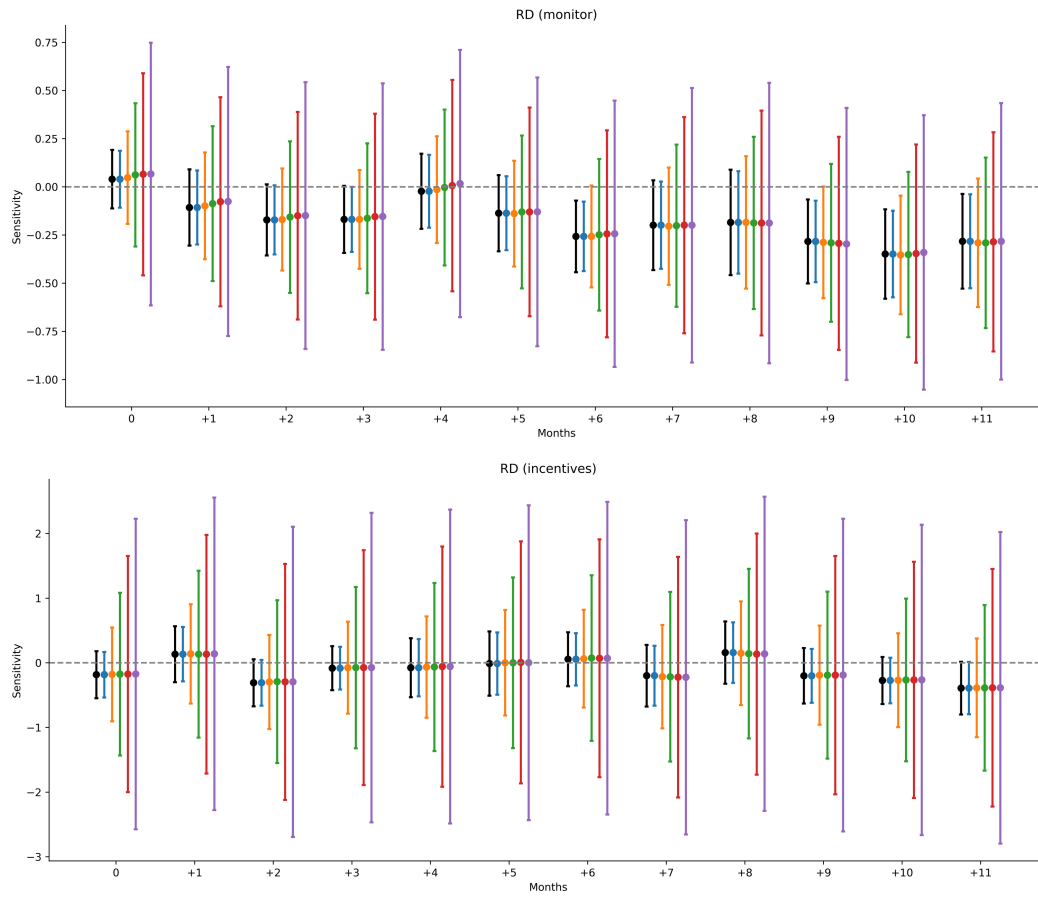


FIGURE F1 (cont'd)
Sensitivity Analysis for the Dynamic Effects

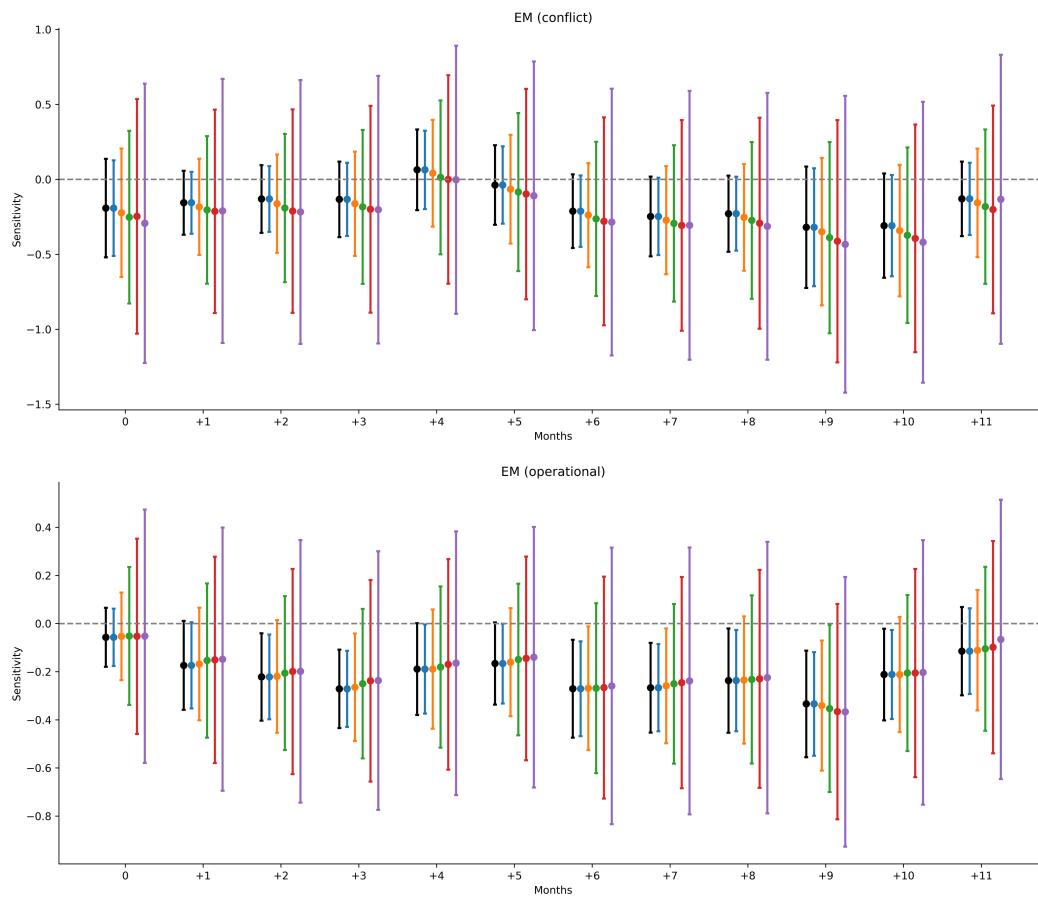


TABLE F1
ATT Effect using ETWFE estimator

DV	Beta	Std. err.	Z	P> z	95% CI	
EM (conflict)	-1.815608	1.3761	-1.32	0.187	-4.512715	.8814983
EM (operational)	-13.32358	4.314526	-3.09	0.002	-21.7799	-4.867266
IP (asynchronous)	-12.72439	4.441679	-2.86	0.004	-21.42992	-4.018857
IP (coordination)	-4.998005	3.720547	-1.34	0.179	-12.29014	2.294133
IP (synchronous)	-7.846097	6.8113	-1.15	0.249	-21.196	5.503806
RD (incentives)	-.1394338	.1934419	-0.72	0.471	-.5185729	.2397053
RD (monitoring)	-3.373081	1.595073	-2.11	0.034	-6.499365	-.2467958
TA (mapping)	-1.17582	1.06874	-1.10	0.271	-3.270512	.9188715
TA (staffing)	1.309095	1.178831	1.11	0.267	-1.001371	3.619562
Task Division	-13.55368	5.052044	-2.68	0.007	-23.45551	-3.65186

Notes: estimates obtained with the jwddid command selecting the option never and using the poisson method. Standard errors are clustered at firm level.

TABLE F2
ATT Effect using ETWFE estimator with controls

DV	Beta	Std. Err.	Z	P> z	95% CI	
EM (conflict)	-1.819238	1.360938	-1.34	0.181	-4.486628	.848152
EM (operational)	-17.37539	5.190701	-3.35	0.001	-27.54898	-7.2018
IP (asynchronous)	-14.17769	4.755906	-2.98	0.003	-23.4991	-4.856288
IP (coordination)	-6.352663	3.871742	-1.64	0.101	-13.94114	1.235812
IP (synchronous)	-9.473889	6.941223	-1.36	0.172	-23.07844	4.130659
RD (incentives)	-.1170177	.1906162	-0.61	0.539	-.4906185	.2565832
RD (monitoring)	-4.060726	1.71559	-2.37	0.018	-7.423221	-.69823
TA (mapping)	-2.012996	1.147362	-1.75	0.079	-4.261784	.2357914
TA (staffing)	1.171457	1.224073	0.96	0.339	-1.227682	3.570597
Task Division	-15.42482	5.311584	-2.90	0.004	-25.83533	-5.014306

Notes: estimates obtained with the jwddid command selecting the option never and using the poisson method. Standard errors are clustered at firm level.

Appendix F: References

- Rambachan & Roth (2023), A More Credible Approach to Parallel Trends, *Review of Economic Studies*, 90(5), 2555–2591.
- Wooldridge, J. M. (2023). Simple approaches to nonlinear difference-in-differences with panel data. *The Econometrics Journal*, 26(3), C31-C66.

Appendix G: Keyword based replication

In this section, we replicate our analysis using the seed and expanded keyword sets reported in Table B2. Adopting a dictionary-based approach, we operationalize the dependent variables as the total number of job postings for firm f in year-month t that contain at least one of the identified keywords.

Tables G1 and G2 present the regression results using the seed set, while Tables G3 and G4 report results with the expanded set. The overall pattern remains consistent with our main analysis. The only exceptions are Task Allocation (staffing) and Exception Management (conflict), where the coefficients turn negative and statistically significant in some specifications. These findings should be interpreted with caution, given the poor performance of keyword filters discussed in section B4. Nevertheless, they provide additional reassurance that our main results are not an artifact of the filtering approach.

TABLE G1

Demand for Skills after GenAI Shock (minimal set of keyword)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.215** (0.079)	-0.229 (0.125)	0.339 (0.239)	-0.254*** (0.075)	-0.265** (0.084)	-0.245*** (0.074)	-0.216** (0.083)	-0.035 (0.081)	-0.022 (0.125)	-0.190*** (0.057)
Constant	6.326*** (0.014)	6.198*** (0.020)	4.605*** (0.032)	6.169*** (0.014)	6.299*** (0.015)	6.290*** (0.013)	5.716*** (0.016)	7.131*** (0.013)	4.768*** (0.020)	5.268*** (0.012)
N	41807	38845	29152	40580	40716	41310	39837	41882	37818	39976
Pseudo R ²	0.930	0.924	0.873	0.926	0.931	0.932	0.927	0.938	0.897	0.898

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE G2

Demand for Skills after GenAI Shock with controls (minimal set of keyword)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.226** (0.076)	-0.267* (0.119)	0.330 (0.240)	-0.257*** (0.073)	-0.272*** (0.075)	-0.259*** (0.071)	-0.217** (0.078)	-0.044 (0.080)	-0.080 (0.108)	-0.195*** (0.056)
Size	0.533** (0.205)	0.537 (0.323)	0.115 (0.398)	0.043 (0.314)	0.214 (0.318)	0.415* (0.198)	0.246 (0.273)	0.240 (0.205)	0.677 (0.434)	0.103 (0.333)
ROA	0.125 (0.550)	0.520 (0.877)	-0.621 (0.707)	1.355 (0.782)	0.319 (0.681)	0.485 (0.698)	0.168 (0.747)	0.957 (0.673)	2.616** (0.996)	0.890 (0.593)
Leverage	-0.114 (0.420)	0.785 (0.600)	0.551 (0.682)	0.583 (0.622)	0.128 (0.659)	0.672 (0.588)	-0.809 (0.651)	0.820 (0.488)	1.268** (0.463)	0.314 (0.508)
R&D/TA	4.462 (4.327)	10.258*** (2.253)	7.382* (3.477)	6.595 (3.820)	9.447 (5.975)	3.131 (4.308)	5.734 (4.857)	6.040* (2.931)	6.241 (5.101)	3.819 (3.871)
R&D (dummy)	-0.097 (0.090)	-0.175* (0.080)	0.031 (0.161)	-0.190* (0.092)	-0.052 (0.177)	-0.010 (0.091)	-0.070 (0.105)	-0.142* (0.064)	-0.095 (0.116)	-0.030 (0.075)
CAPEX/TA	-0.248 (0.933)	-0.884 (1.175)	-3.494* (1.731)	0.572 (0.967)	0.283 (1.309)	-0.499 (0.883)	-0.099 (0.815)	-0.490 (0.827)	-0.294 (1.026)	-1.092 (1.003)
WFC	1.895*** (0.560)	0.863 (0.656)	2.696** (0.832)	0.907 (0.579)	2.551*** (0.693)	1.211* (0.490)	0.480 (0.501)	1.177 (0.804)	1.139* (0.516)	1.770* (0.695)
Constant	0.866 (2.121)	0.447 (3.226)	3.196 (4.076)	5.466 (3.125)	3.967 (3.393)	1.768 (2.035)	3.311 (3.006)	4.378* (2.046)	-2.254 (4.190)	4.099 (3.477)
N	41807	38845	29152	40580	40716	41310	39837	41882	37818	39976
Pseudo R ²	0.930	0.925	0.874	0.927	0.932	0.932	0.928	0.939	0.898	0.899

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE G3**Demand for Skills after GenAI Shock (expanded set of keyword)**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.214** (0.079)	-0.203 (0.119)	0.247 (0.191)	-0.254*** (0.075)	-0.268*** (0.073)	-0.247*** (0.073)	-0.227** (0.082)	-0.037 (0.080)	-0.152 (0.078)	-0.182** (0.057)
Constant	6.326*** (0.014)	6.408*** (0.021)	4.598*** (0.031)	6.170*** (0.014)	6.441*** (0.013)	6.300*** (0.013)	5.738*** (0.016)	7.131*** (0.012)	5.527*** (0.018)	5.533*** (0.012)
N	41807	39437	31539	40580	41608	41382	39864	41954	39810	40447
Pseudo R ²	0.930	0.909	0.877	0.926	0.934	0.932	0.928	0.939	0.921	0.909

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE G4

Demand for Skills after GenAI Shock with controls (expanded set of keyword)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.225** (0.076)	-0.237* (0.116)	0.219 (0.191)	-0.257*** (0.073)	-0.276*** (0.067)	-0.260*** (0.071)	-0.228** (0.077)	-0.046 (0.079)	-0.179* (0.070)	-0.189*** (0.056)
Size	0.534** (0.205)	0.575 (0.352)	0.310 (0.283)	0.045 (0.314)	0.308 (0.286)	0.396* (0.200)	0.248 (0.267)	0.239 (0.204)	0.373 (0.221)	0.204 (0.288)
ROA	0.127 (0.550)	0.738 (0.902)	-0.133 (0.784)	1.348 (0.780)	0.279 (0.592)	0.542 (0.697)	0.122 (0.732)	0.951 (0.671)	1.627* (0.743)	0.882 (0.557)
Leverage	-0.116 (0.420)	0.825 (0.623)	0.428 (0.571)	0.581 (0.621)	0.219 (0.564)	0.650 (0.583)	-0.740 (0.620)	0.817 (0.485)	0.824 (0.511)	0.227 (0.475)
R&D/TA	4.463 (4.326)	10.184*** (1.697)	5.510 (4.027)	6.602 (3.812)	7.679 (5.915)	3.182 (4.193)	5.689 (4.897)	6.036* (2.931)	6.061 (5.539)	4.747 (4.279)
R&D (dummy)	-0.097 (0.090)	-0.303** (0.096)	0.027 (0.116)	-0.190* (0.092)	-0.066 (0.152)	-0.012 (0.090)	-0.079 (0.106)	-0.141* (0.064)	-0.068 (0.100)	-0.025 (0.080)
CAPEX/TA	-0.248 (0.933)	-0.686 (1.393)	-3.486* (1.684)	0.574 (0.968)	0.229 (1.161)	-0.559 (0.880)	0.090 (0.722)	-0.506 (0.822)	-0.770 (1.076)	-1.062 (0.866)
WFC	1.895*** (0.560)	2.273** (0.734)	2.222** (0.764)	0.908 (0.579)	1.640** (0.577)	1.188* (0.511)	0.555 (0.486)	1.187 (0.794)	0.950 (0.584)	1.746* (0.701)
Constant	0.859 (2.121)	0.204 (3.599)	1.254 (2.814)	5.450 (3.124)	3.123 (2.998)	1.989 (2.052)	3.300 (2.937)	4.386* (2.037)	1.271 (2.346)	3.328 (3.008)
N	41807	39437	31539	40580	41608	41382	39864	41954	39810	40447
Pseudo R ²	0.930	0.911	0.878	0.927	0.934	0.932	0.928	0.939	0.922	0.910

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

Appendix H: Excluding Tech Companies (NAICS 51 and 54)

TABLE H1
Demand for Skills after GenAI Shock (Excluding Tech Companies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.249*** (0.074)	0.359 (0.379)	-0.076 (0.090)	-0.226* (0.091)	-0.182 (0.095)	-0.241** (0.085)	-0.239** (0.083)	-0.117 (0.124)	-0.138 (0.129)	-0.190* (0.081)
Constant	6.346*** (0.011)	4.076*** (0.072)	4.463*** (0.018)	6.016*** (0.014)	6.322*** (0.016)	6.002*** (0.013)	5.265*** (0.012)	2.444*** (0.023)	4.836*** (0.021)	5.989*** (0.014)
N	30208	23880	26693	29161	29900	29883	27704	21240	26258	29610
Pseudo R ²	0.934	0.827	0.872	0.923	0.926	0.925	0.910	0.697	0.892	0.923

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05,

** p<0.01, *** p<0.001

TABLE H2
Demand for Skills after GenAI Shock (Excluding Tech Companies; Controls Included)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.252*** (0.074)	0.366 (0.368)	-0.066 (0.089)	-0.230** (0.088)	-0.189* (0.091)	-0.247** (0.086)	-0.238** (0.084)	-0.128 (0.118)	-0.130 (0.130)	-0.192* (0.081)
Size	0.482* (0.243)	0.283 (0.369)	0.253 (0.231)	0.333 (0.265)	0.478 (0.286)	0.405 (0.287)	0.408 (0.254)	0.612 (0.415)	0.414 (0.372)	0.315 (0.233)
ROA	0.004 (0.640)	-1.957 (2.567)	0.400 (0.885)	0.724 (0.901)	0.507 (0.630)	0.607 (0.599)	0.020 (0.625)	-1.109 (1.007)	-0.316 (0.765)	0.377 (0.609)
Leverage	-0.069 (0.455)	-1.729 (1.311)	-0.529 (0.497)	0.500 (0.634)	0.030 (0.567)	0.046 (0.530)	-0.359 (0.484)	-0.701 (0.662)	-0.091 (0.824)	0.172 (0.418)
R&D/TA	-3.395 (4.575)	-17.049 (13.946)	-5.485 (6.456)	-5.125 (5.120)	-6.708 (6.290)	-2.507 (4.008)	-5.811 (5.098)	-9.837 (7.074)	-7.681 (5.596)	-4.028 (5.205)
R&D (dummy)	0.005 (0.069)	0.311 (0.203)	0.010 (0.090)	0.057 (0.075)	0.082 (0.110)	0.077 (0.068)	0.076 (0.086)	0.116 (0.110)	0.162 (0.096)	-0.002 (0.117)
CAPEX/TA	0.293 (1.010)	-0.415 (1.602)	0.729 (1.209)	0.023 (1.100)	-0.591 (1.107)	-0.176 (0.934)	0.072 (0.836)	1.019 (1.237)	0.415 (0.997)	-0.832 (0.963)
WFC	1.593*** (0.458)	1.355 (1.987)	1.137** (0.388)	1.150* (0.531)	1.462* (0.573)	1.114* (0.552)	0.845 (0.490)	-0.593 (1.398)	1.218 (0.719)	1.592** (0.535)
Constant	1.349 (2.567)	1.592 (3.883)	1.912 (2.455)	2.304 (2.857)	1.328 (3.049)	1.736 (3.037)	1.117 (2.699)	-3.606 (4.319)	0.486 (4.017)	2.645 (2.462)
N	30208	23880	26693	29161	29900	29883	27704	21240	26258	29610
Pseudo R ²	0.934	0.828	0.872	0.924	0.926	0.925	0.911	0.698	0.892	0.924

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix I: Autor-based Treatment and Control

For this robustness test, we identified treated companies using the Standard Occupational Classification (SOC)² of the Bureau of Labor Statistics (BLS). Following Jaimovich and Siu (2012), we define “*managerial, professional and technical workers, such as physicians, public relations managers, financial analysts, computer programmers, and economists*” as partaking in non-routine cognitive occupations (p. 8). Based on this definition and BLS classification, we identified the two-digit SOC classes between 11 and 29 as non-routine cognitive.

Using this classification, we calculated the monthly share of non-routine cognitive job postings per four-digit NAICS code class:

$$nrc - ratio_{nt} = \frac{CJ_{nt}}{TJ_{nt}}$$

where n identifies a NAICS sector and t a month-year. CJ_{nt} is the total number of job posts referring to a non-routine cognitive occupation in each sector and month. TJ_{nt} is the total number of job posts posted in each sector and month. We assign a four-digit NAICS to the treatment category if the average $nrc-ratio$ for the 12 months preceding the shock is greater than 0.5. This strategy assigns 1,052 companies to the treatment group and 768 to the control group.

Tables I1 and I2 replicate the main text's analyses. Results remain consistent across all categories, except for Exception Management (conflict resolution), which appears to be negatively affected under this alternative strategy.

² https://www.bls.gov/soc/2018/soc_2018_manual.pdf

TABLE II
Author-based Demand for Skills in the aftermath of GenAI availability shock

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.230*** (0.069)	0.142 (0.300)	-0.096 (0.083)	-0.257** (0.086)	-0.210* (0.089)	-0.213* (0.084)	-0.249** (0.078)	0.026 (0.104)	-0.351** (0.125)	-0.200** (0.076)
Constant	6.273*** (0.014)	3.978*** (0.065)	4.393*** (0.020)	5.934*** (0.018)	6.220*** (0.018)	5.912*** (0.017)	5.173*** (0.015)	2.350*** (0.022)	4.775*** (0.024)	5.925*** (0.017)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.818	0.865	0.919	0.921	0.919	0.902	0.684	0.883	0.918

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE I2
Author-based Demand for Skills in the aftermath of GenAI availability shock with Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.225** (0.068)	0.157 (0.294)	-0.088 (0.083)	-0.253** (0.084)	-0.207* (0.087)	-0.212* (0.084)	-0.244** (0.079)	0.036 (0.102)	-0.344** (0.124)	-0.198** (0.076)
Size	0.285 (0.187)	-0.018 (0.239)	0.022 (0.174)	0.034 (0.236)	0.189 (0.244)	0.149 (0.204)	0.155 (0.216)	0.293 (0.329)	0.378 (0.301)	0.065 (0.222)
ROA	-0.067 (0.589)	-1.511 (2.028)	0.380 (0.671)	0.205 (0.698)	0.639 (0.606)	0.488 (0.608)	-0.099 (0.733)	-0.394 (1.126)	0.310 (0.630)	0.331 (0.555)
Leverage	0.083 (0.437)	-1.565 (1.089)	-0.457 (0.465)	0.477 (0.569)	0.185 (0.559)	-0.013 (0.506)	-0.291 (0.508)	-0.492 (0.684)	0.193 (0.650)	0.140 (0.471)
R&D/TA	-3.021 (3.444)	-14.706 (9.634)	-5.465 (4.547)	-4.842 (3.827)	-6.084 (4.585)	-1.745 (2.990)	-5.696 (3.946)	-8.744 (6.405)	-4.341 (4.303)	-1.326 (3.966)
R&D (dummy)	0.017 (0.065)	0.298 (0.154)	0.060 (0.072)	0.060 (0.073)	0.093 (0.089)	0.093 (0.065)	0.102 (0.078)	0.322* (0.128)	0.043 (0.111)	-0.032 (0.094)
CAPEX/TA	0.306 (0.942)	-0.174 (1.407)	0.484 (1.099)	0.392 (1.081)	-0.159 (1.109)	-0.054 (0.891)	0.235 (0.831)	0.858 (1.200)	0.209 (0.894)	-0.602 (0.908)
WFC	1.690*** (0.460)	2.261 (1.252)	1.347** (0.429)	1.363** (0.502)	1.539** (0.525)	1.146* (0.520)	1.088* (0.480)	-0.055 (1.333)	1.140 (0.692)	1.749*** (0.493)
Constant	3.295 (1.925)	4.674 (2.517)	4.297* (1.824)	5.388* (2.443)	4.188 (2.510)	4.359* (2.104)	3.654 (2.223)	-0.532 (3.361)	0.723 (3.211)	5.221* (2.323)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.929	0.819	0.865	0.920	0.921	0.919	0.902	0.685	0.883	0.918

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix J: Coarsened Exact Matching

We applied CEM using our control variables—Size, ROA, Leverage, R&D/TA, a R&D dummy, Capex/TA, and Workforce Change—to balance the treatment and control groups. To more accurately capture variation in workforce reductions, we customized the coarsening of the Workforce Change variable into three meaningful categories: high layoffs, defined as values between -0.50 and -0.067 corresponding to the bottom 1% of the distribution; moderate layoffs, ranging from -0.066 to -0.013 capturing the 1st to 10th percentile; and no layoffs or workforce growth, covering values between -0.0129 and 2.00 . The k-to-k matching procedure resulted in 105 matched strata, yielding a balanced sample of 397 treated and 397 control units for a total of 794 companies. Univariate imbalance measures across individual covariates indicate relatively low L1 values for the R&D dummy (0), Size (0.048), and R&D/TA (0.011), with moderate imbalance remaining for Leverage (0.161), Workforce Change (0.164), ROA (0.169), and Capex/TA (0.21). Overall, these results suggest an acceptable level of balance between treated and control groups following matching. To address any remaining imbalance, we further estimate the DiD specification, including the control variables.

Tables J1 and J2 replicate the main text's analyses. Results remain consistent across all categories, except for Information Provision (synchronous) and Reward Distribution (monitor).

TABLE J1
Demand for Skills in the aftermath of GenAI availability shock with CEM

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.198*	-0.260	-0.161	-0.247*	-0.191	-0.207*	-0.181	-0.226	-0.018	-0.148*
	(0.083)	(0.152)	(0.113)	(0.097)	(0.097)	(0.092)	(0.097)	(0.157)	(0.219)	(0.071)
Constant	6.147***	3.612***	4.160***	5.840***	6.038***	5.945***	5.052***	2.137***	4.577***	5.461***
	(0.012)	(0.020)	(0.019)	(0.013)	(0.014)	(0.014)	(0.013)	(0.025)	(0.027)	(0.012)
N	16639	13359	14884	16165	16517	16559	15449	11767	14568	16336
Pseudo R ²	0.930	0.820	0.849	0.925	0.915	0.923	0.902	0.643	0.872	0.898

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE J2
Demand for Skills in the aftermath of GenAI availability shock with CEM and controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.210** (0.075)	-0.274 (0.152)	-0.174 (0.113)	-0.247** (0.085)	-0.191* (0.084)	-0.217** (0.082)	-0.195* (0.093)	-0.229 (0.147)	-0.017 (0.190)	-0.166** (0.064)
Size	0.594* (0.252)	0.279 (0.295)	0.360 (0.236)	0.595* (0.261)	0.569* (0.263)	0.458 (0.281)	0.653* (0.258)	0.061 (0.382)	0.867 (0.501)	0.353 (0.341)
ROA	-0.627 (1.059)	-1.320 (1.610)	0.252 (0.923)	0.472 (1.340)	0.038 (0.821)	-0.832 (1.117)	-0.933 (0.879)	-2.346 (1.825)	-1.453 (1.818)	-1.132 (1.351)
Leverage	-0.209 (0.646)	-0.629 (1.144)	0.113 (0.662)	0.861 (0.986)	0.485 (0.748)	0.536 (0.675)	-0.896 (0.526)	-0.643 (0.751)	0.683 (1.602)	-0.311 (0.703)
R&D/TA	-1.400 (3.100)	-14.280 (9.168)	-0.376 (4.461)	-0.850 (4.266)	-1.630 (4.031)	4.406 (5.369)	-5.623 (5.556)	12.984 (10.887)	-10.963 (5.768)	13.821 (9.420)
R&D (dummy)	-0.004 (0.066)	0.150 (0.178)	-0.005 (0.093)	-0.122 (0.085)	-0.042 (0.114)	-0.039 (0.107)	0.088 (0.116)	0.100 (0.187)	0.139 (0.103)	-0.320 (0.189)
CAPEX/TA	1.424 (1.720)	-1.102 (1.642)	-0.446 (1.645)	2.682* (1.279)	1.466 (1.821)	1.024 (1.624)	0.854 (1.281)	3.072 (2.513)	1.050 (1.777)	-2.151 (1.329)
WFC	0.570 (0.588)	0.793 (1.073)	0.257 (0.566)	0.288 (0.538)	0.332 (0.663)	-0.113 (0.514)	-0.243 (0.564)	-0.347 (1.227)	-0.085 (1.198)	0.575 (0.589)
Constant	0.424 (2.597)	1.098 (3.025)	0.585 (2.305)	-0.322 (2.742)	0.349 (2.713)	1.269 (2.896)	-1.069 (2.661)	1.713 (3.794)	-4.035 (4.973)	2.257 (3.472)
N	16639	13359	14884	16165	16517	16559	15449	11767	14568	16336
Pseudo R ²	0.930	0.821	0.849	0.926	0.915	0.924	0.903	0.644	0.873	0.898

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix K: Additional Robustness Tests

In this section, we perform additional robustness tests. First, we aim to account for the potential correlation of the unobserved components across our dependent variables. To address this, we adopt an approach inspired by the framework of seemingly unrelated regressions (SUR), which traditionally controls for correlation in the error terms across multiple equations. However, because classical SUR methods such as `sureg` and `suest` are not applicable to Poisson models with high-dimensional fixed effects, we restructure our data into a stacked format and estimate a single Poisson model that mimics the SUR structure. This allows for outcome-specific treatment effects while controlling for firm and time fixed effects. Columns (1) and (2) of Table K1 replicate the core specifications using this approach. In Columns 3-6, we varied the clustering granularity from company to company and skill, and company $\times$ skill. Results remain consistent apart from Exception Management (conflict).

Second, while our main analysis disaggregates the effect of $\text{PostGPT} \times \text{Treated}$ across the specific dimensions of organizational problems, Tables K2 and K3 present the aggregate effects across the five areas: Task Division, Task Allocation, Information Provision, Reward Distribution, and Exception Management. We do so by averaging hiring demand across areas at the firm-year-month level (using sums yields comparable results). While the results for Task Division, Task Allocation, and Information Provision remain unaltered, Reward Distribution and Exception Management negative coefficients mask the differential effect existing on the underlying dimensions.

Third, we replicate our analysis using a simple OLS specification with the canonical log transformation, $\ln(y+1)$, of the dependent variables (Tables K4 and K5). Results are broadly consistent with our main findings but come with important caveats. Coefficients are negative and statistically significant for most variables, with the largest magnitudes observed for Task Division, Information Provision (coordination, synchronous, and asynchronous), Reward Distribution (monitoring), and Exception Management (operational). In contrast to our main specification, Task Allocation (both staffing and mapping) and Exception Management (conflict) also appear affected, although their coefficients are smaller in magnitude. This inflation in effect sizes likely stems from the fact that the log transformation does not normalize the distribution of the dependent variables; their shape remains more consistent with a Poisson process, making PPML a better-suited estimator (see Figure K1).

Additionally, in Tables K6 and K7, we replicated our main findings using the traditional DiD specification described in Angrist and Pischke (2009), estimated both with Poisson and Negative Binomial (NB) estimators (see Appendix K). Results remain consistent across the

two models. While both estimators share the same log-linear mean specification and therefore may produce similar coefficients (see specification without control variables), they differ in how they treat the variance. Poisson estimators remain consistent but can be inefficient under overdispersion, often leading to underestimated standard errors. By contrast, the NB model explicitly introduces a dispersion parameter (α) that relaxes the restrictive Poisson variance assumption, inflating the variance and typically yielding larger, more conservative standard errors. The results remain consistent.

Lastly, in the main body we estimated the differential effect of the launch of GPT-3.5 and GPT-4 in the same model. The latter relies on the assumption of additive and separable effects. In Tables K8 and K9, we relax the above assumption running separate models for each shock. Estimates remain consistent with our main analyses.

FIGURE K1
Logged variables distribution

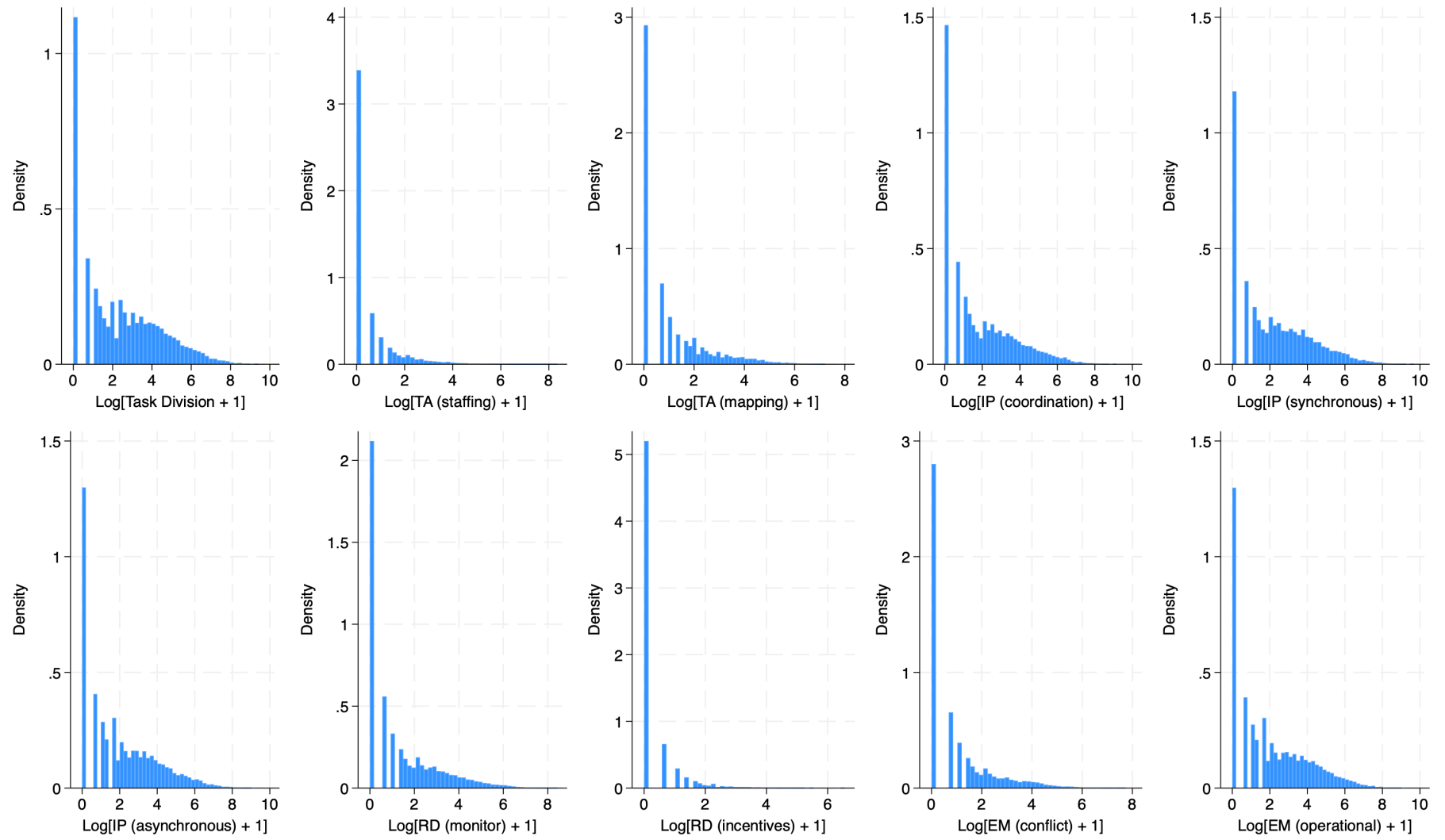


TABLE K1
Seemingly Unrelated Estimation for Skills in the aftermath of GenAI availability shock

	(1)	(2)	(3)	(4)	(5)	(6)
Task Division × PostGPT*Treated	- 0.278*** (0.080)	- 0.276*** (0.080)	-0.278*** (0.077)	-0.276*** (0.076)	-0.278*** (0.051)	-0.276*** (0.051)
Task Allocation (staffing) × PostGPT*Treated	-0.152 (0.299)	-0.150 (0.299)	-0.152 (0.085)	-0.150 (0.094)	-0.152 (0.301)	-0.150 (0.300)
Task Allocation (mapping) × PostGPT*Treated	-0.005 (0.097)	-0.003 (0.098)	-0.005 (0.067)	-0.003 (0.069)	-0.005 (0.087)	-0.003 (0.087)
Information Provision (coord) × PostGPT*Treated	-0.251* (0.101)	-0.249* (0.100)	-0.251** (0.086)	-0.249** (0.086)	-0.251*** (0.070)	-0.249*** (0.070)
Information Provision (sync) × PostGPT*Treated	-0.218* (0.095)	-0.216* (0.095)	-0.218* (0.085)	-0.216* (0.086)	-0.218** (0.067)	-0.216** (0.066)
Information Provision (async) × PostGPT*Treated	-0.235** (0.085)	-0.233** (0.086)	-0.235** (0.080)	-0.233** (0.079)	-0.235*** (0.056)	-0.233*** (0.056)
Reward Distribution (monitor) × PostGPT*Treated	- 0.321*** (0.096)	- 0.319*** (0.097)	-0.321*** (0.076)	-0.319*** (0.077)	-0.321*** (0.077)	-0.319*** (0.077)
Reward Distribution (incentive) × PostGPT*Treated	-0.128 (0.123)	-0.127 (0.123)	-0.128 (0.100)	-0.127 (0.100)	-0.128 (0.111)	-0.127 (0.111)
Exception Management (conflict) × PostGPT*Treated	-0.278* (0.128)	-0.276* (0.128)	-0.278** (0.095)	-0.276** (0.095)	-0.278** (0.102)	-0.276** (0.102)
Exception Management (operational) × PostGPT*Treated	-0.151* (0.061)	-0.149* (0.062)	-0.151*** (0.040)	-0.149*** (0.044)	-0.151* (0.061)	-0.149* (0.060)
Size		0.203 (0.207)		0.203 (0.201)		0.203* (0.090)
ROA		0.311 (0.558)		0.311 (0.530)		0.311 (0.267)
Leverage		0.117 (0.461)		0.117 (0.438)		0.117 (0.208)
R&D/TA		-3.561 (3.721)		-3.561 (3.626)		-3.561* (1.601)
R&D (dummy)		0.045 (0.071)		0.045 (0.069)		0.045 (0.033)
CAPEX/TA		-0.021 (0.886)		-0.021 (0.846)		-0.021 (0.399)
WFC		1.431**		1.431**		1.431***

		(0.449)		(0.436)		(0.200)
Str. err clustered at	Company	Company	Company and Skill	Company and Skill	Company X Skill	Company X Skill
Constant	5.770*** (0.013)	3.618 (2.139)	5.770*** (0.012)	3.618 (2.069)	5.770*** (0.015)	3.618*** (0.937)
N	394260	394260	394260	394260	394260	394260
Pseudo R ²	0.880	0.880	0.880	0.880	0.880	0.880

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. *

p<0.05, ** p<0.01, *** p<0.001

TABLE K2
Aggregated Demand for Skills in the aftermath of GenAI availability shock

	(1) Task Division	(2) Task Allocation	(3) Information Provision	(4) Reward Distribution	(5) Exception Management
PostGPT*Treated	-0.261*** (0.067)	-0.018 (0.116)	-0.228** (0.079)	-0.257*** (0.075)	-0.213** (0.075)
Constant	6.274*** (0.012)	4.079*** (0.025)	5.948*** (0.015)	4.503*** (0.013)	5.417*** (0.015)
N	38551	34888	39092	35565	38055
Pseudo R ²	0.929	0.862	0.923	0.887	0.913

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE K3
Aggregated Demand for Skills in the aftermath of GenAI availability shock with controls

	(1) Task Division	(2) Task Allocation	(3) Information Provision	(4) Reward Distribution	(5) Exception Management
PostGPT*Treated	-0.260*** (0.068)	-0.005 (0.116)	-0.227** (0.079)	-0.253*** (0.076)	-0.212** (0.076)
Size	0.334 (0.195)	0.013 (0.175)	0.183 (0.230)	0.201 (0.217)	0.148 (0.222)
ROA	-0.088 (0.586)	-0.099 (0.891)	0.533 (0.598)	-0.129 (0.720)	0.303 (0.538)
Leverage	0.120 (0.436)	-0.769 (0.565)	0.212 (0.524)	-0.231 (0.497)	0.166 (0.453)
R&D/TA	-2.886 (3.443)	-7.674 (5.447)	-4.173 (3.769)	-5.787 (3.949)	-1.635 (3.913)
R&D (dummy)	0.015 (0.065)	0.108 (0.086)	0.082 (0.073)	0.114 (0.077)	-0.024 (0.091)
CAPEX/TA	0.241 (0.945)	0.161 (1.079)	-0.039 (0.974)	0.208 (0.813)	-0.457 (0.857)
WFC	1.623*** (0.460)	1.557** (0.510)	1.329** (0.496)	1.016* (0.462)	1.643*** (0.495)
Constant	2.780 (2.014)	4.196* (1.834)	3.965 (2.371)	2.486 (2.234)	3.827 (2.322)
N	38551	34888	39092	35565	38055
Pseudo R ²	0.929	0.862	0.924	0.888	0.913

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE K4
OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
PostGPT*Treated	-0.136*** (0.026)	-0.096*** (0.019)	-0.068*** (0.020)	-0.112*** (0.025)	-0.125*** (0.026)	-0.128*** (0.026)	-0.110*** (0.022)	-0.009 (0.014)	-0.059** (0.021)	-0.154*** (0.025)
Constant	2.402*** (0.007)	0.642*** (0.005)	1.122*** (0.005)	1.923*** (0.007)	2.224*** (0.007)	2.126*** (0.007)	1.439*** (0.006)	0.330*** (0.004)	1.081*** (0.005)	2.178*** (0.007)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465
R ²	0.921	0.798	0.871	0.908	0.915	0.909	0.895	0.710	0.868	0.915

Notes. $\pm$ 12 Months from ChatGPT release. OLS model. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE K5
OLS estimates with controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
PostGPT*Treated	-0.132*** (0.026)	-0.096*** (0.019)	-0.067*** (0.020)	-0.110*** (0.025)	-0.121*** (0.026)	-0.125*** (0.026)	-0.108*** (0.022)	-0.009 (0.014)	-0.058** (0.021)	-0.152*** (0.025)
Size	0.249*** (0.053)	-0.002 (0.028)	0.112** (0.036)	0.181*** (0.047)	0.236*** (0.051)	0.214*** (0.050)	0.147*** (0.038)	0.012 (0.019)	0.087** (0.033)	0.189*** (0.049)
ROA	0.053 (0.076)	0.040 (0.038)	0.073 (0.050)	0.034 (0.072)	0.082 (0.076)	0.024 (0.079)	0.006 (0.063)	-0.014 (0.039)	0.063 (0.049)	0.109 (0.068)
Leverage	-0.153 (0.089)	0.004 (0.040)	-0.091 (0.058)	-0.099 (0.072)	-0.130 (0.086)	-0.140 (0.087)	-0.031 (0.054)	0.012 (0.023)	-0.053 (0.056)	-0.122 (0.081)
R&D/TA	0.340* (0.143)	0.179* (0.073)	0.359*** (0.085)	0.201 (0.126)	0.255 (0.135)	0.219 (0.143)	0.157 (0.109)	0.018 (0.075)	0.046 (0.096)	0.426*** (0.122)
R&D (dummy)	-0.017 (0.021)	0.007 (0.030)	-0.045* (0.023)	-0.022 (0.023)	-0.018 (0.023)	-0.008 (0.024)	-0.024 (0.027)	-0.006 (0.021)	0.018 (0.024)	-0.026 (0.022)
CAPEX/TA	-0.119 (0.289)	-0.154 (0.188)	-0.226 (0.209)	-0.117 (0.267)	0.016 (0.280)	-0.089 (0.292)	-0.161 (0.237)	-0.027 (0.126)	-0.067 (0.219)	-0.100 (0.277)
WFC	0.445*** (0.110)	0.116* (0.054)	0.289*** (0.072)	0.263 (0.148)	0.341* (0.158)	0.281 (0.156)	0.248** (0.090)	-0.001 (0.039)	0.211** (0.072)	0.342* (0.151)
Constant	0.492 (0.420)	0.652** (0.223)	0.283 (0.283)	0.533 (0.372)	0.408 (0.406)	0.482 (0.400)	0.299 (0.298)	0.238 (0.151)	0.400 (0.263)	0.731 (0.394)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465
R ²	0.921	0.798	0.872	0.908	0.915	0.909	0.895	0.710	0.868	0.915

Notes. $\pm$ 12 Months from ChatGPT release. OLS model. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE K6
Classic DiD with Poisson and Negative Binomial

Panel A: Poisson	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
Treated	-0.152	-0.188	0.143	-0.176	-0.092	-0.080	-0.214	0.011	-0.168	0.075
	(0.162)	(0.290)	(0.166)	(0.185)	(0.182)	(0.170)	(0.191)	(0.198)	(0.210)	(0.182)
PostGPT	-0.224***	-0.565***	-0.311***	-0.189**	-0.271***	-0.251***	-0.227***	-0.296***	-0.286*	-0.301***
	(0.049)	(0.115)	(0.057)	(0.066)	(0.069)	(0.069)	(0.056)	(0.062)	(0.118)	(0.057)
PostGPT*Treated	-0.238***	0.165	-0.080	-0.221**	-0.182*	-0.221**	-0.239**	-0.138	-0.183	-0.194*
	(0.069)	(0.312)	(0.084)	(0.085)	(0.089)	(0.083)	(0.081)	(0.104)	(0.131)	(0.076)
Constant	4.723***	1.945***	2.647***	4.192***	4.536***	4.300***	3.465***	0.526***	2.870***	4.293***
	(0.119)	(0.265)	(0.121)	(0.142)	(0.144)	(0.134)	(0.151)	(0.130)	(0.170)	(0.145)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465
Pseudo R ²	0.013	0.011	0.008	0.010	0.010	0.011	0.013	0.006	0.011	0.011
Panel B: NB	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
Treated	-0.152	-0.188	0.143	-0.176	-0.092	-0.080	-0.214	0.011	-0.168	0.075
	(0.162)	(0.290)	(0.166)	(0.185)	(0.182)	(0.170)	(0.191)	(0.198)	(0.210)	(0.182)
PostGPT	-0.224***	-0.565***	-0.311***	-0.189**	-0.271***	-0.251***	-0.227***	-0.296***	-0.286*	-0.301***
	(0.049)	(0.115)	(0.057)	(0.066)	(0.069)	(0.069)	(0.056)	(0.062)	(0.118)	(0.057)
PostGPT*Treated	-0.238***	0.165	-0.080	-0.221**	-0.182*	-0.221**	-0.239**	-0.138	-0.183	-0.194*
	(0.069)	(0.312)	(0.084)	(0.085)	(0.089)	(0.083)	(0.081)	(0.104)	(0.131)	(0.076)
Constant	4.723***	1.945***	2.647***	4.192***	4.536***	4.300***	3.465***	0.526***	2.870***	4.293***
	(0.119)	(0.265)	(0.121)	(0.142)	(0.144)	(0.134)	(0.151)	(0.130)	(0.170)	(0.145)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465
Pseudo R ²	0.001	0.002	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001

Notes. $\pm$ 12 Months from ChatGPT release. Standard errors are clustered at the firm level. Although coefficients are identical across Poisson and NB models due to their

shared log-linear mean specification, standard errors and pseudo R^2 differ because the NB model accounts for overdispersion. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE K7
Classic DiD with Poisson and Negative Binomial with controls

Panel A: Poisson	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
Treated	-0.311	-0.555	-0.198	-0.322	-0.218	-0.241	-0.427*	-0.183	-0.388*	-0.180
	(0.163)	(0.336)	(0.155)	(0.186)	(0.162)	(0.178)	(0.211)	(0.191)	(0.182)	(0.186)
PostGPT	-0.253***	-0.604***	-0.340***	-0.215**	-0.300***	-0.285***	-0.266***	-0.304***	-0.316**	-0.336***
	(0.051)	(0.126)	(0.058)	(0.068)	(0.072)	(0.072)	(0.058)	(0.062)	(0.115)	(0.065)
PostGPT*Treated	-0.247***	0.168	-0.084	-0.236**	-0.193*	-0.223**	-0.239**	-0.158	-0.193	-0.196*
	(0.070)	(0.314)	(0.084)	(0.086)	(0.089)	(0.084)	(0.081)	(0.103)	(0.130)	(0.078)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	-0.549	-3.978***	-3.354***	-1.488***	-0.797*	-0.816*	-2.137***	-4.004***	-2.607***	-1.283*
	(0.337)	(0.495)	(0.368)	(0.345)	(0.338)	(0.364)	(0.380)	(0.391)	(0.506)	(0.513)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465
Pseudo R ²	0.387	0.325	0.429	0.383	0.368	0.363	0.367	0.235	0.351	0.407
Panel B: NB	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(staffing)	(mapping)	(coord)
Treated	-0.286	-0.072	-0.192	-0.234	-0.157	-0.154	-0.260	-0.145	-0.524*	-0.113
	(0.157)	(0.206)	(0.175)	(0.169)	(0.179)	(0.169)	(0.161)	(0.184)	(0.266)	(0.192)
PostGPT	-0.258***	-0.391***	-0.303***	-0.197***	-0.298***	-0.278***	-0.209***	-0.316***	-0.513*	-0.260***
	(0.045)	(0.063)	(0.042)	(0.050)	(0.080)	(0.052)	(0.047)	(0.072)	(0.212)	(0.040)
PostGPT*Treated	-0.200**	-0.460**	-0.173	-0.288**	-0.311*	-0.213*	-0.290***	-0.197	-0.049	-0.295**
	(0.065)	(0.172)	(0.110)	(0.098)	(0.138)	(0.083)	(0.067)	(0.123)	(0.220)	(0.094)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	-1.424**	-4.604***	-3.921***	-2.314***	-1.486**	-1.875***	-2.843***	-4.929***	-2.632***	-1.680**
	(0.517)	(0.645)	(0.582)	(0.512)	(0.492)	(0.529)	(0.537)	(0.500)	(0.609)	(0.645)
N	40465	40465	40465	40465	40465	40465	40465	40465	40465	40465

Pseudo R ²	0.057	0.086	0.079	0.064	0.055	0.061	0.064	0.075	0.069	0.056
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Notes. ± 12 Months from ChatGPT release. Standard errors are clustered at the firm level. Although coefficients are identical across Poisson and NB models due to their shared log-linear mean specification, standard errors and pseudo R² differ because the NB model accounts for overdispersion. * p<0.05, ** p<0.01, *** p<0.001

TABLE K8
Separate regressions for GPT-3.5 and GPT-4

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Task Division		TA (staffing)		TA (mapping)		IP (coord)		IP (sync)		IP (async)		RD (monitor)		RD (incentives)		EM (conflict)		EM (operational)	
GPT-3.5*Treated	- 0.173 *		- 0.368 *		-0.072		- 0.195 *		-0.133		-0.131		-0.067		-0.100		-0.142		-0.071	
	(0.082)		(0.186)		(0.080)		(0.093)		(0.099)		(0.089)		(0.072)		(0.124)		(0.097)		(0.083)	
GPT-4*Treated		- 0.219 ***		0.310		-0.078		- 0.182 *		- 0.173 *		- 0.217 ***		- 0.270 ***		-0.126		-0.192		- 0.210 ***
		(0.060)		(0.364)		(0.079)		(0.075)		(0.074)		(0.066)		(0.073)		(0.106)		(0.117)		(0.062)
Const.	6.233 ***	6.255 ***	4.021 ***	3.958 ***	4.374 ***	4.383 ***	5.888 ***	5.904 ***	6.182 ***	6.200 ***	5.873 ***	5.898 ***	5.128 ***	5.162 ***	2.361 ***	2.375 ***	4.710 ***	4.730 ***	5.884 ***	5.912 ***
	(0.004)	(0.008)	(0.006)	(0.061)	(0.005)	(0.013)	(0.004)	(0.010)	(0.005)	(0.010)	(0.004)	(0.009)	(0.003)	(0.009)	(0.007)	(0.016)	(0.005)	(0.016)	(0.004)	(0.009)
N	38551	38551	30302	30302	33997	33997	37368	37368	38336	38336	38204	38204	35373	35373	26344	26344	33501	33501	37905	37905
Pseudo R ²	0.928	0.929	0.818	0.819	0.865	0.865	0.919	0.919	0.920	0.920	0.918	0.918	0.901	0.902	0.684	0.685	0.881	0.881	0.917	0.918

Notes. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE K9

Separate regressions for GPT-3.5 and GPT-4 with controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
	Task Division		TA (staffing)		TA (mapping)		IP (coord)		IP (sync)		IP (async)		RD (monitor)		RD (incentives)		EM (conflict)		EM (operational)	
GPT-3.5*Treated	-0.172*		-		-0.068		-		-0.133		-		-		-		-		-0.072	
	(0.080)		0.367		(0.079)		0.191*		(0.095)		0.134		(0.073)		(0.122)		(0.096)		(0.083)	
GPT-4*Treated		-		0.330		-0.068		-		-		-		-		-		-		-
		0.218**					0.180*		0.171*		0.216**		0.265**		0.129		0.186		0.208**	
		(0.061)		(0.359)		(0.078)		(0.074)		(0.074)		(0.067)		(0.073)		(0.105)		(0.116)		(0.062)
Size	0.293	0.321	0.014	-	0.027	0.031	0.046	0.061	0.198	0.219	0.175	0.196	0.141	0.186	0.294	0.323	0.410	0.408	0.077	0.098
	(0.183)	(0.191)	(0.259)	(0.211)	(0.175)	(0.179)	(0.231)	(0.237)	(0.234)	(0.244)	(0.206)	(0.213)	(0.212)	(0.221)	(0.331)	(0.336)	(0.301)	(0.294)	(0.216)	(0.228)
ROA	-0.087	-0.100	-	-	0.348	0.373	0.222	0.203	0.610	0.624	0.421	0.439	-	-0.125	-	-	0.173	0.229	0.308	0.300
	(0.599)	(0.603)	1.588	1.473	(0.664)	(0.674)	(0.708)	(0.720)	(0.610)	(0.609)	(0.618)	(0.613)	0.108	(0.741)	0.396	0.402	(0.677)	(0.679)	(0.563)	(0.558)
Leverage	0.103	0.128	-	-	-0.507	-0.458	0.439	0.509	0.192	0.235	-	0.045	-	-0.210	-	-	0.136	0.166	0.068	0.159
	(0.459)	(0.442)	1.559	1.581	(0.475)	(0.459)	(0.627)	(0.597)	(0.584)	(0.566)	0.020	(0.510)	0.292	(0.508)	0.504	0.483	(0.767)	(0.741)	(0.484)	(0.475)
R&D/TA	-3.272	-3.087	-	-	-5.545	-5.492	-5.177	-5.019	-6.566	-6.305	-	-1.749	-	-5.961	-	-	-	-	-1.498	-1.357
	(3.457)	(3.453)	13.917	15.031	(4.590)	(4.585)	(3.903)	(3.884)	(4.764)	(4.692)	1.990	(2.983)	(4.224)	(3.992)	8.465	8.191	5.258	4.900	(4.129)	(3.981)
R&D (dummy)	0.024	0.021	0.279	0.303	0.062	0.061	0.070	0.067	0.104	0.099	0.103	0.096	0.118	0.109	0.315*	0.315*	0.063	0.057	-0.027	-0.027
	(0.068)	(0.066)	(0.145)	(0.156)	(0.073)	(0.073)	(0.076)	(0.075)	(0.094)	(0.091)	(0.067)	(0.066)	(0.084)	(0.078)	(0.125)	(0.125)	(0.117)	(0.117)	(0.097)	(0.093)

CAPEX/ TA	0.352	0.394	- 0.669	- 0.218	0.524	0.499	0.538	0.488	-0.001	-0.029	0.033	0.014	0.374	0.316	0.827	0.742	0.466	0.482	-0.593	-0.612
	(0.872)	(0.953)	(1.64 7)	(1.34 8)	(1.059)	(1.088)	(1.038)	(1.112)	(1.053)	(1.143)	(0.82 7)	(0.906)	(0.77 9)	(0.833)	(1.19 8)	(1.24 2)	(0.85 7)	(0.88 0)	(0.836)	(0.893)
WFC	1.783* **	1.665* **	2.057	2.420 *	1.375 **	1.350 **	1.430 **	1.381 **	1.587 **	1.526 **	1.190 *	1.117 *	1.201 *	1.068*	- 0.075	- 0.133	1.307	1.198	1.796* **	1.729* **
	(0.466)	(0.461)	(1.44 0)	(1.18 1)	(0.432)	(0.429)	(0.525)	(0.513)	(0.543)	(0.530)	(0.53 0)	(0.518)	(0.49 1)	(0.482)	(1.34 2)	(1.34 1)	(0.72 8)	(0.68 9)	(0.500)	(0.492)
Constant	3.165	2.882	4.388	5.524 *	4.245 *	4.194 *	5.223 *	5.059 *	4.057	3.839	4.045	3.829	3.748	3.293	- 0.518	- 0.809	0.339	0.374	5.078*	4.851*
	(1.901)	(1.968)	(2.66 8)	(2.27 8)	(1.836)	(1.882)	(2.423)	(2.472)	(2.429)	(2.517)	(2.14 5)	(2.207)	(2.19 6)	(2.276)	(3.39 4)	(3.43 2)	(3.25 1)	(3.15 3)	(2.263)	(2.377)
N	37405	37405	2966 7	2966 7	33193	33193	36397	36397	37236	37236	3711 5	37115	3454 0	34540	2574 0	2574 0	3268 3	3268 3	36780	36780
Pseudo R ²	0.928	0.929	0.819	0.820	0.865	0.865	0.919	0.919	0.920	0.920	0.918	0.919	0.902	0.903	0.686	0.686	0.882	0.882	0.917	0.918

Appendix L: Exploratory Analysis

L.1 Relative shares of skill demand

In this section, we examine relative shares of skill demand. Although using ratio-based dependent variables may appear to be the ‘go-to’ approach, prior research warns that statistical models using ratios can suffer from measurement error (Bartlett and Partnoy 2020a, 2020b, Certo et al 2020, Villadsen and Wulff 2021, Wiseman 2009, Wulff et al 2023). To address these concerns, we follow the suggestion of Certo et al (2020) and Wulff et al (2023, p. 4): *“avoid using ratios in statistical models; instead use the numerator and control for the denominator.”* Accordingly, in Tables L1 and L2, we adjust the main estimates for the total demand of a company in each month:

$$\begin{aligned} Skill\ Demand_{it} = & \beta_0 + \beta_1 PostChatGPT_t \times Treated_i + \\ & \beta_2 Total\ Demand_{it} + \gamma X_{it} + \delta_i + \delta_t + \varepsilon_{it} \end{aligned}$$

Tables L1 and L2 results remain consistent to those included in the main body. Overall, the above analyses provide initial evidence of changes in the relative share of skill demands, beyond levels.

TABLE L1
Demand for Skills in the aftermath of GenAI availability shock discounted for Total Hiring Demand

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.251*** (0.050)	0.137 (0.351)	-0.129 (0.068)	-0.223*** (0.064)	-0.202** (0.063)	-0.260*** (0.051)	-0.288*** (0.058)	-0.110 (0.118)	-0.206 (0.119)	-0.271*** (0.065)
Total Demand	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)
Constant	5.891*** (0.068)	3.861*** (0.112)	4.096*** (0.100)	5.524*** (0.084)	5.784*** (0.072)	5.550*** (0.069)	4.882*** (0.103)	2.162*** (0.060)	4.466*** (0.098)	5.624*** (0.111)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.944	0.819	0.874	0.934	0.940	0.933	0.910	0.689	0.889	0.929

Notes. ± 12 Months from ChatGPT release. PPML model. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE L2
Demand for Skills in the aftermath of GenAI availability shock discounted for Total Hiring Demand with Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.253*** (0.049)	0.155 (0.344)	-0.119 (0.067)	-0.222*** (0.063)	-0.206*** (0.061)	-0.264*** (0.050)	-0.285*** (0.058)	-0.114 (0.116)	-0.203 (0.120)	-0.272*** (0.063)
Total Demand	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Size	0.352* (0.147)	-0.027 (0.203)	0.075 (0.165)	0.117 (0.204)	0.256 (0.209)	0.246 (0.166)	0.218 (0.197)	0.369 (0.335)	0.390 (0.256)	0.250 (0.209)
ROA	0.328 (0.463)	-1.303 (2.256)	0.646 (0.549)	0.353 (0.538)	0.642 (0.443)	0.618 (0.478)	0.349 (0.657)	-0.374 (1.109)	0.424 (0.632)	0.809 (0.484)
Leverage	-0.118 (0.294)	-1.556 (1.032)	-0.565 (0.383)	0.090 (0.403)	-0.230 (0.402)	-0.230 (0.378)	-0.226 (0.396)	-0.719 (0.632)	-0.151 (0.651)	-0.175 (0.385)
R&D/TA	-0.704 (1.942)	-14.089 (10.405)	-3.362 (4.298)	-2.690 (2.759)	-3.579 (3.856)	0.572 (1.211)	-3.969 (3.296)	-6.625 (6.010)	-2.444 (3.347)	1.602 (1.784)
R&D (dummy)	-0.028 (0.053)	0.280 (0.166)	0.028 (0.082)	0.013 (0.069)	0.037 (0.086)	0.040 (0.057)	0.065 (0.072)	0.279* (0.126)	0.024 (0.099)	-0.081 (0.069)
CAPEX/TA	0.160 (0.760)	0.017 (1.487)	0.841 (1.004)	-0.186 (0.845)	-0.252 (0.906)	-0.159 (0.758)	0.380 (0.730)	0.644 (1.202)	0.164 (1.077)	-0.315 (0.740)
WFC	1.213** (0.372)	2.310* (1.147)	1.120** (0.383)	1.044* (0.422)	1.088* (0.425)	0.722 (0.417)	0.885* (0.436)	-0.406 (1.372)	0.791 (0.624)	1.244** (0.435)
Constant	2.293 (1.489)	4.648* (2.235)	3.466* (1.732)	4.279* (2.081)	3.223 (2.121)	3.064 (1.681)	2.676 (2.011)	-1.410 (3.424)	0.414 (2.686)	3.079 (2.156)
N	38551	30302	33997	37368	38336	38204	35373	26344	33501	37905
Pseudo R ²	0.944	0.820	0.874	0.934	0.940	0.933	0.910	0.690	0.889	0.929

Notes. ± 12 Months from ChatGPT release. PPML model. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

L.2 Demand for Managerial Intensity

This section examines how demand for managerial roles changes relative to non-managerial ones. Using the Lightcast title taxonomy (version 4.47), we classify manager, director, vice president, and executive as managerial positions, and professional and support as non-managerial. For each company in each year-month, we count job postings for both categories. Following the approach of the previous section (Certo et al 2020, Wulff et al 2023), we use the numerator as the dependent variable while the denominator as a control:

$$\text{Managerial Demand}_{it} = \beta_0 + \beta_1 \text{PostChatGPT}_t \times \text{Treated}_i + \beta_2 \text{Non Managerial Demand}_{it} + \gamma X_{it} + \delta_i + \delta_t + \varepsilon_{it}$$

In Tables N3 and N4, we find a significant decline in managerial roles relative to non-managerial ones. This pattern offers initial evidence of increased span of control within managerial units.

Next, we examine whether firms reducing hiring demand for task-division roles (Tables L3 and L4, column 2) or coordination roles (columns 3) experience larger declines in managerial roles relative to non-managerial ones. We focus on companies with above-mean declines in demand for Task Division and Information Provision (coordination) skills and re-estimate our DiD specification comparing these firms to those with low GenAI exposure. In both cases, the decline in managerial roles is larger than in the baseline results reported in column 1 of Tables L3 and L4.

Overall, this exploratory analysis offers initial evidence that firms are reducing managerial intensity, potentially requiring managers to oversee a larger pool of non-managerial employees.

TABLE L3
Demand for managerial roles changes *vis-à-vis* non-managerial ones

	(1)	(2)	(3)
	Managerial Demand		
	Full-sample	(task division)	(coordination)
PostGPT*Treated	-0.295*** (0.058)	-0.390*** (0.062)	-0.386*** (0.061)
Non-Managers	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Constant	5.461*** (0.059)	5.523*** (0.057)	5.506*** (0.056)
N	32851	28514	28633
Pseudo R ²	0.930	0.932	0.933

Notes. ± 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE L4
Demand for managerial roles changes *vis-à-vis* non-managerial ones with controls

	(1)	(2)	(3)
	Managerial Demand		
	Full-sample	(task division)	(coordination)
PostGPT*Treated	-0.296*** (0.056)	-0.393*** (0.058)	-0.393*** (0.057)
Non-Managers	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Size	0.107 (0.121)	0.131 (0.179)	0.258 (0.170)
ROA	0.852 (0.491)	0.566 (0.498)	0.218 (0.401)
Leverage	0.072 (0.344)	0.120 (0.338)	-0.079 (0.305)
R&D/TA	3.403 (4.474)	5.680 (4.246)	5.367 (4.322)
R&D (dummy)	-0.087 (0.088)	-0.126 (0.088)	-0.114 (0.090)
CAPEX/TA	-0.671 (0.858)	-0.796 (0.860)	-0.933 (0.857)
WFC	1.567** (0.489)	2.084*** (0.631)	2.029** (0.618)
Constant	4.322*** (1.244)	4.114* (1.833)	2.858 (1.781)
N	32851	28514	28633
Pseudo R ²	0.931	0.933	0.933

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

L3. GitHub Copilot as an exogenous shock

Our theory is that the launch of ChatGPT provided organizational decision-makers with a salient opportunity to form priors about the scope of GenAI. Because GenAI enables individual agents to perform information-processing and decision-making tasks that were previously infeasible, we expect organizations to adjust their demand for organizational skills accordingly.

In this section, we compare our main results to the introduction of a different tool: GitHub Copilot. Released on 21 June 2022, Copilot provides an LLM-based code completion service for developers. We expect Copilot to have different effects on skill demand for three reasons. First, its scope of applicability is far narrower than ChatGPT's. While Copilot focuses on code generation, GenAI-based chatbots can assist individuals without technical expertise across a wide range of tasks, from writing to mathematics (see Anthropic report: Handa et al 2025). Second, Copilot's narrower audience and scope limit its potential to shape broad organizational priors about how GenAI may substitute for or complement human effort in solving coordination problems. Third, as Hoffman et al (2024) find, Copilot tends to increase developers' independence and encourage exploration rather than exploitation, whereas Brynjolfsson et al (2025) document productivity effects of chatbots like ChatGPT even for workers without substantive domain knowledge.

Given the above differences, we expect Copilot to have different influence on executive expectations on how to solve the canonical problems of organizing. In other words, we perform a falsification test, as we would expect divergent results.

To test this, we treat the introduction of Copilot as an exogenous shock, with tech-sector firms designated as treated. We restrict the sample to a ± 12 -month window around Copilot's launch, taking July 2022 as month 0. We then use CEM on our control variables—Size, ROA, Leverage, R&D/TA, an R&D dummy, Capex/TA, and Workforce Change (coarsened manually, see section J)—to create balanced treatment and control groups. The k-to-k matching procedure yields 91 matched strata, resulting in a balanced sample of 261 treated and 261 control firms (522 in total).

Results are reported in Tables L5 and L6. As expected, the patterns differ substantially from both our main ChatGPT analysis and the CEM estimates in Appendix L. Copilot launch is mainly associated with changes in Reward Distribution (incentives), with no significant effects in other categories.

TABLE L5
Demand for Skills in the aftermath of Co-pilot

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
Copilot X Tech	0.002 (0.115)	-0.272 (0.242)	-0.035 (0.149)	-0.024 (0.124)	-0.038 (0.139)	0.017 (0.144)	-0.173 (0.139)	-0.308* (0.141)	-0.164 (0.157)	-0.035 (0.121)
CEM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	5.651*** (0.028)	3.523*** (0.042)	3.775*** (0.034)	5.156*** (0.031)	5.471*** (0.034)	5.258*** (0.039)	4.414*** (0.029)	2.049*** (0.030)	3.829*** (0.039)	5.543*** (0.028)
N	11493	8982	9957	11220	11496	11406	10632	7539	9843	11337
Pseudo R ²	0.902	0.789	0.812	0.889	0.892	0.874	0.846	0.625	0.806	0.892

Notes. ± 12 Months from GitHub Copilot release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

TABLE L6

Demand for Skills in the aftermath of Co-pilot with controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
Copilot X Tech	-0.023 (0.107)	-0.335 (0.205)	-0.051 (0.141)	-0.042 (0.115)	-0.065 (0.127)	0.023 (0.134)	-0.193 (0.135)	-0.437** (0.143)	-0.188 (0.156)	-0.007 (0.105)
Size	0.325* (0.128)	-0.112 (0.220)	0.201 (0.138)	0.255 (0.145)	0.275* (0.109)	-0.008 (0.296)	0.342* (0.148)	0.688 (0.390)	0.232 (0.181)	-0.137 (0.359)
ROA	1.325** (0.458)	3.846* (1.529)	1.785** (0.586)	1.300** (0.475)	1.292* (0.521)	1.244 (0.861)	2.283* (0.982)	1.986 (2.074)	2.254 (1.251)	0.495 (0.962)
Leverage	0.690 (0.509)	1.289 (0.906)	0.462 (0.627)	0.930 (0.561)	0.999 (0.552)	-0.114 (0.993)	0.597 (0.593)	1.829* (0.930)	0.950 (0.732)	-0.600 (1.267)
R&D/TA	1.450 (0.771)	-8.413 (4.410)	-2.061 (6.498)	-2.995 (4.566)	-3.045 (3.111)	3.609 (3.994)	2.333 (1.208)	-20.875* (8.234)	-1.514 (2.014)	6.645 (6.116)
R&D (dummy)	0.110 (0.065)	-0.005 (0.175)	0.224 (0.118)	0.260 (0.143)	0.274* (0.116)	0.215* (0.107)	0.151 (0.112)	0.402 (0.352)	0.097 (0.091)	0.064 (0.141)
CAPEX/TA	0.264 (1.598)	5.291 (4.475)	0.436 (2.297)	2.249 (2.377)	2.138 (2.636)	-3.801 (3.017)	-0.302 (1.319)	-2.281 (5.468)	0.835 (2.958)	-4.110 (3.894)
WFC	0.529 (0.937)	2.719* (1.321)	0.827 (0.934)	1.016 (0.879)	0.707 (0.848)	0.397 (1.152)	1.477 (0.919)	-0.798 (0.937)	0.269 (0.942)	0.994 (0.656)
CEM	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	2.463* (1.185)	4.196* (2.011)	1.730 (1.277)	2.488 (1.334)	2.607* (1.037)	5.294 (2.935)	1.118 (1.360)	-4.362 (3.403)	1.380 (1.747)	6.888 (3.564)
N	11493	8982	9957	11220	11496	11406	10632	7539	9843	11337
Pseudo R ²	0.903	0.791	0.813	0.890	0.893	0.875	0.848	0.630	0.807	0.893

Notes. $\pm$ 12 Months from GitHub Copilot release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * p<0.05, ** p<0.01, *** p<0.001

L4. Exposure to Artificial Intelligence

Following the logic of Section N3, we run an additional falsification test that varies how treated units are identified. Instead of focusing on ChatGPT or a single GenAI tool, we use the AI-Exposure measure from Felten et al (2021), which captures firm-level exposure to a range of AI domains—abstract strategy games, real-time video games, image recognition, visual question answering, image generation, reading comprehension, language modeling, translation, speech recognition, and instrumental track recognition. This broader scope includes many domains unrelated to the ‘*language modeling*’ capabilities central to ChatGPT. We therefore expect different results, since firms exposed primarily to other AI domains may have less scope to integrate GenAI into solving organizational problems in the same way as firms exposed to LLMs.

Empirically, we replicate the specifications from the main paper, setting December 2022 as month 0, but redefine treated firms as those with an AI-Exposure score above the sample mean. Tables L7 and L8 present the results. Compared with the main analysis, the estimated effect on Task Division is smaller in magnitude and only significant in Table N8, and none of the Information Provision dimensions are affected. This latter finding is notable: given the strong relevance of chatbot-based LLMs to writing-related tasks (see Anthropic report: Handa et al 2025), the absence of such effects in the broader AI measure is consistent with our expectation. Information Provision (asynchronous) is also one of the most robust categories in our main results (see sensitivity tests in Appendix F).

Overall, these findings suggest that exposure to ‘*language modeling*’ within the broader AI landscape produces substantially different effects on firms’ skill demand than exposure to other AI domains. This, in turn, reinforces the value of using the Felten et al (2023) measure for isolating the specific effects of LLMs like ChatGPT.

TABLE L7

Skill Demand after ChatGPT for AI Exposed Companies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.144 (0.077)	0.261 (0.448)	-0.259** (0.092)	-0.141 (0.098)	-0.071 (0.104)	-0.115 (0.083)	-0.272** (0.093)	0.036 (0.111)	-0.261 (0.160)	-0.190* (0.075)
Constant	6.033*** (0.012)	3.558*** (0.101)	4.221*** (0.013)	5.681*** (0.015)	5.966*** (0.017)	5.580*** (0.014)	4.775*** (0.013)	2.445*** (0.023)	4.178*** (0.022)	5.717*** (0.012)
N	26709	21063	23918	26081	26551	26599	24697	18148	23244	26318
Pseudo R ²	0.924	0.768	0.851	0.910	0.918	0.910	0.881	0.713	0.839	0.914

Notes. $\pm$ 12 Months from ChatGPT release. All specifications include firm and year-month fixed effects. Standard errors are clustered at the firm level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

TABLE L8
Skill Demand after ChatGPT for AI Exposed Companies with controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Task Division	Task Allocation		Information Provision			Reward Distribution		Exception Management	
		(staffing)	(mapping)	(coord)	(sync)	(async)	(monitor)	(incentive)	(conflict)	(operational)
PostGPT*Treated	-0.160*	0.286	-0.273**	-0.150	-0.085	-0.127	-0.281**	0.015	-0.268	-0.198**
	(0.078)	(0.438)	(0.090)	(0.092)	(0.099)	(0.086)	(0.094)	(0.108)	(0.158)	(0.071)
Size	0.432*	-0.056	0.425*	0.301	0.419	0.251	0.359	0.659	0.375	0.319
	(0.198)	(0.251)	(0.197)	(0.230)	(0.245)	(0.234)	(0.207)	(0.337)	(0.230)	(0.246)
ROA	-0.160	0.022	0.498	0.454	0.201	-0.371	-0.257	-1.190	-0.082	0.359
	(0.607)	(2.274)	(0.761)	(0.818)	(0.526)	(0.571)	(0.755)	(0.900)	(0.734)	(0.531)
Leverage	0.061	-0.792	-0.274	0.368	0.166	0.073	-0.201	-0.351	-0.678	0.186
	(0.365)	(0.952)	(0.489)	(0.453)	(0.463)	(0.397)	(0.454)	(0.607)	(0.742)	(0.430)
R&D/TA	-1.649	-15.385	-2.887	-2.709	-5.482	-1.063	-3.668	-7.984	-3.378	-0.958
	(2.844)	(14.169)	(4.803)	(3.810)	(4.995)	(1.987)	(4.118)	(7.507)	(3.391)	(3.942)
R&D (dummy)	0.079	0.395	0.027	0.059	0.170	0.105	0.142	0.379*	0.129	0.069
	(0.071)	(0.247)	(0.082)	(0.103)	(0.114)	(0.078)	(0.094)	(0.167)	(0.092)	(0.086)
CAPEX/TA	-0.143	-0.962	-0.260	-0.139	-1.095	-0.762	0.426	0.265	1.108	-0.829
	(0.948)	(2.358)	(1.590)	(1.354)	(1.037)	(0.788)	(1.006)	(1.812)	(1.489)	(1.301)
WFC	1.434*	1.836	1.265*	1.021	1.113	0.672	1.252*	-0.795	0.103	1.725**
	(0.562)	(1.645)	(0.515)	(0.606)	(0.641)	(0.580)	(0.585)	(1.453)	(0.822)	(0.587)
Constant	1.691	4.347	0.000	2.508	1.727	3.061	1.231	-4.084	0.696	2.471
	(2.006)	(2.678)	(2.000)	(2.332)	(2.489)	(2.359)	(2.119)	(3.385)	(2.259)	(2.540)
N	26709	21063	23918	26081	26551	26599	24697	18148	23244	26318
Pseudo R ²	0.924	0.769	0.852	0.910	0.918	0.910	0.881	0.714	0.840	0.914

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