

Education and Skills Trends

Workforce and talent challenges for the Pittsburgh region against peer and competitive benchmark MSAs¹

2010-2014 | 2015-2019

Post-Great Recession

2020-2023

COVID-19 Pandemic

2023-2024

Post-Pandemic

¹ Peer benchmark MSAs: Detroit, Milwaukee, St. Louis, Cleveland, and Cincinnati

Competitive benchmark MSAs: Philadelphia, Indianapolis, Charlotte, Baltimore, and Nashville

Introduction

Persistent and severe worker shortages threaten the economic competitiveness of Pennsylvania and the Pittsburgh region¹ – now and into the future.

Compared with peer and competitive benchmarks, the economic performance of the 10-county Pittsburgh MSA continues to lag, and achieving growth will become even more difficult as demographic headwinds persist in driving the region’s economic stagnation.

With recent employment growth coming largely from a shrinking pool of the unemployed, **the Pittsburgh region’s economic competitiveness may require resolving education and skills mismatches** for both incumbent and existing workers.

Across the Commonwealth, **all counties in southwestern Pennsylvania except Lawrence had a 52.0% unfilled demand in 2023,** i.e., workforce credential gaps.² The Pittsburgh region also lags peer and competitive benchmarks in closing supply-demand and skills gaps prior to and after the pandemic.

Education and skills mismatches have broad implications for the region’s economy. If left unaddressed, gaps will likely widen, fueling greater 1.) Undersupply of less educated workers and 2.) Net out-migration of more highly educated workers for MSAs with more fitting employment options.

(1) “Pittsburgh region” used to denote 10-County Pittsburgh MSA comprised of Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Washington, and Westmoreland counties. Throughout this report, “Pittsburgh region,” “Pittsburgh MSA,” “10-county region,” and “Southwestern Pennsylvania” are all used interchangeably to designate the 10-county Pittsburgh MSA.

(2) Commonwealth of Pennsylvania, Higher Education Plan and Workforce Development Virtual Conversation (accessed 2024.4)

Methodology and Key Takeaways

- Data for this report were retrieved from Lightcast:
 - Educational attainment data: Demographic data and American Community Survey (ACS)¹
 - Job postings data: Proprietary data
 - Skills data: Dataset of online resumes and profiles
- **The Pittsburgh region has become more educated over time, even as fewer jobs today require a Bachelor's or above (oversupply of highly educated workers).** In addition:
 - **Greater mismatch in regional production of talent** with the educational attainment required by in-demand jobs may further widen supply-demand gaps.
 - **More new job growth for mid- and high-wage occupations in peer and competitive regions** since 2018.
 - **More persistent foundational (common) skills gaps** across Pittsburgh and benchmark regions.
 - **More persistent specialized (occupational) skills gaps for regional workers** in sectors of energy, healthcare and life sciences, and technology and robotics.

(1) Self-reported educational attainment data; data limitations should be considered when interpreting results.

Note: Internship postings were excluded from analysis; only those postings for full-, part-time, and flexible work were included.

Outlook

- **The Pittsburgh region is running out of workers**, and **job growth** is driven more by **talent attrition** than new net jobs.¹
- Only **four out of the 10** counties in the Pittsburgh region have a **higher educational attainment rate** than the national average of 46.0%.²
- **Between 2021 and 2031**, **new net jobs** in the commonwealth **requiring some form of postsecondary education and training** will **grow faster** than new net jobs for workers with a high school education.³
- **The percentage of jobs** in the commonwealth **requiring a bachelor's or above will decline by 2031** – more jobs of the future in Pennsylvania will require **post-secondary education (36.0%)**, a **high school diploma or less (16.0%)**, or an **associate's degree or some college (42.0%)**.³
- **Workers skilled through alternative routes (STARS)** make up **half the workforce nationally** and two-thirds of workers essential during the pandemic; however, most high-wage jobs are less accessible to STAR workers.⁴
- **Closing opportunity gaps** for sidelined, disadvantaged, and less educated workers may require more than reskilling or upskilling interventions.

(1) Insights on Demographics and Workforce Report (Jan-Apr 2024) (accessed 2024.5)

(2) Commonwealth of Pennsylvania, Higher Education Plan and Workforce Development Virtual Conversation (accessed 2024.4)

(3) Georgetown University, Center on Education and Workforce, After Everything: Projections of jobs, education, and training requirements through 2031 (accessed 2024.5)

(4) Opportunity@Work, Navigating with the STARS: Reimagining Equitable Pathways to Mobility (accessed 2024.5)

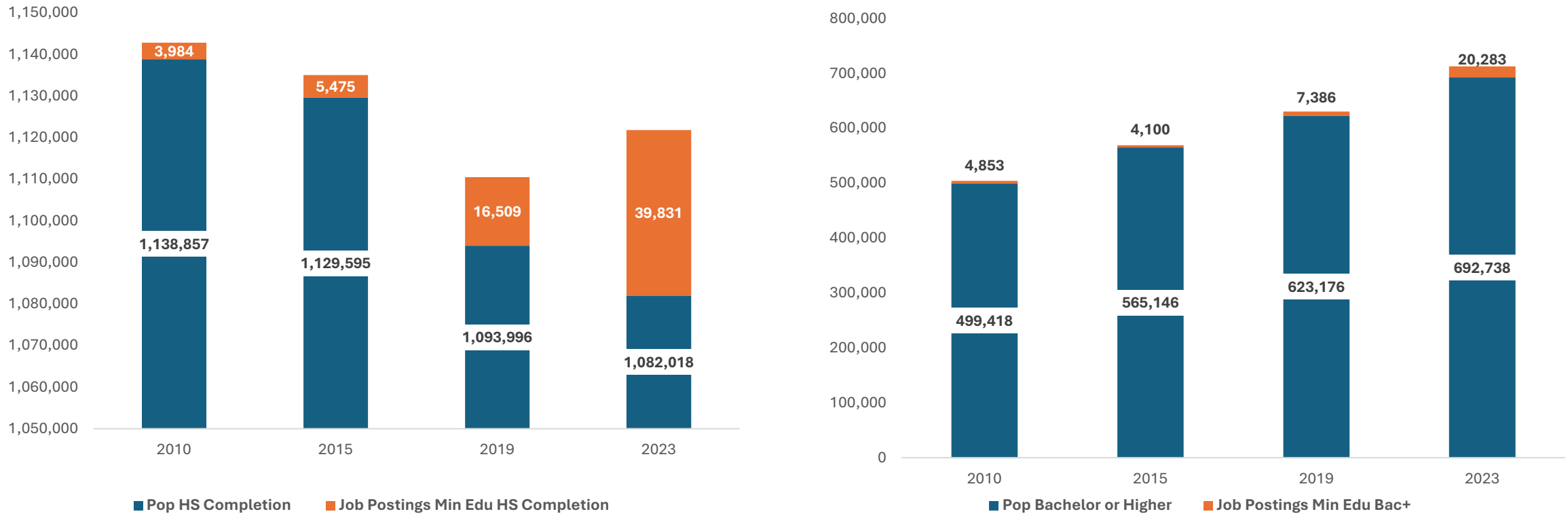
Education Mismatches

Differences in jobs requiring minimum education and the educational attainment of a region

Posting Requirements and Educational Attainment

Educational attainment has grown in the Pittsburgh region, even as job posting minimum education requirements have eased:

Job postings with minimum education requirements and educational attainment of population at same level (#)



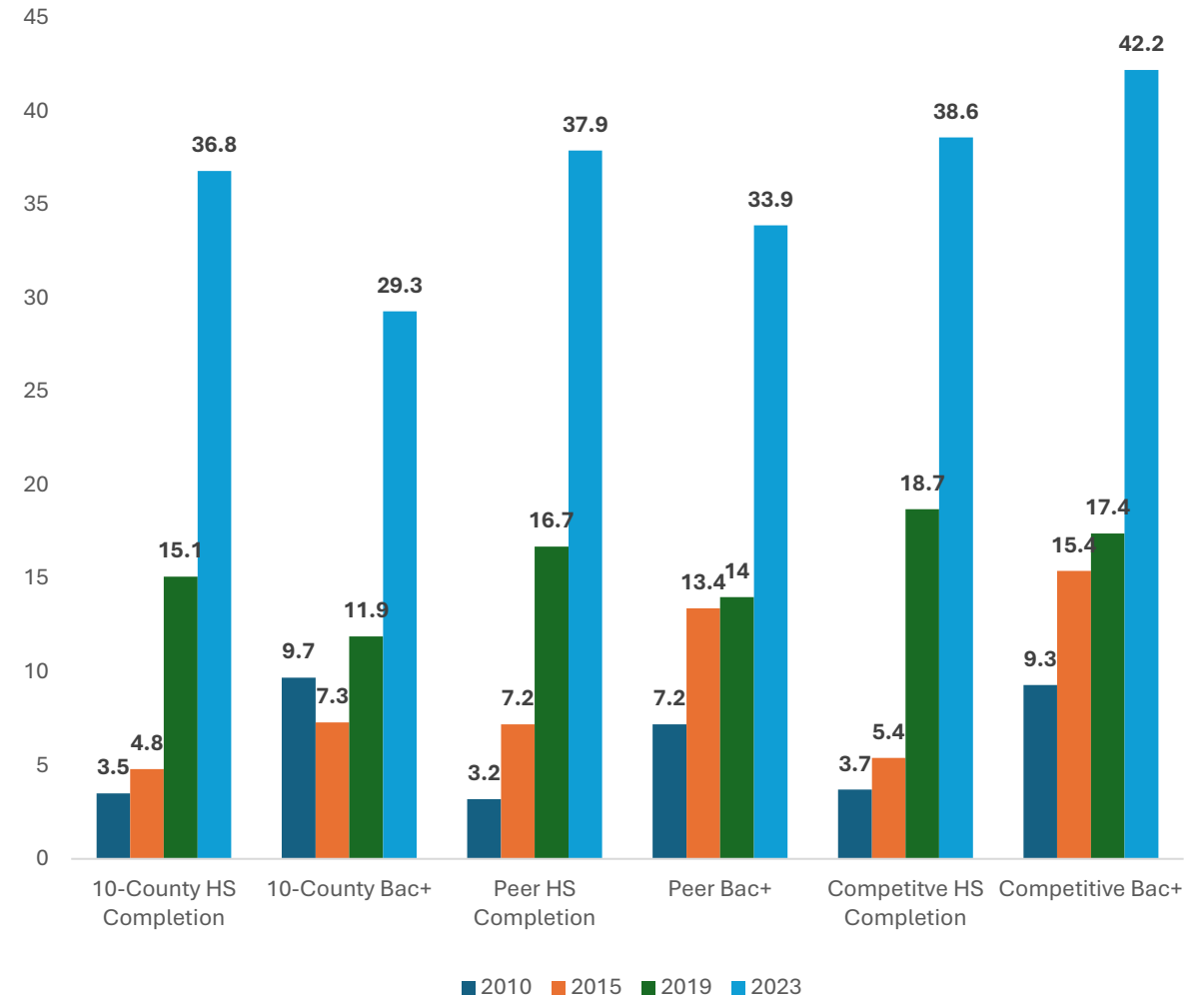
Source: Pittsburgh MSA, Lightcast (datarun 2024.6)

Note: Educational attainment data based on population size (hundreds of thousands). Posting data based on unique minimum postings for a given year (thousands). “HS Completion” designates HS Diploma or equivalency, as well as “Some College” and “Associate’s”

Benchmark Comparisons

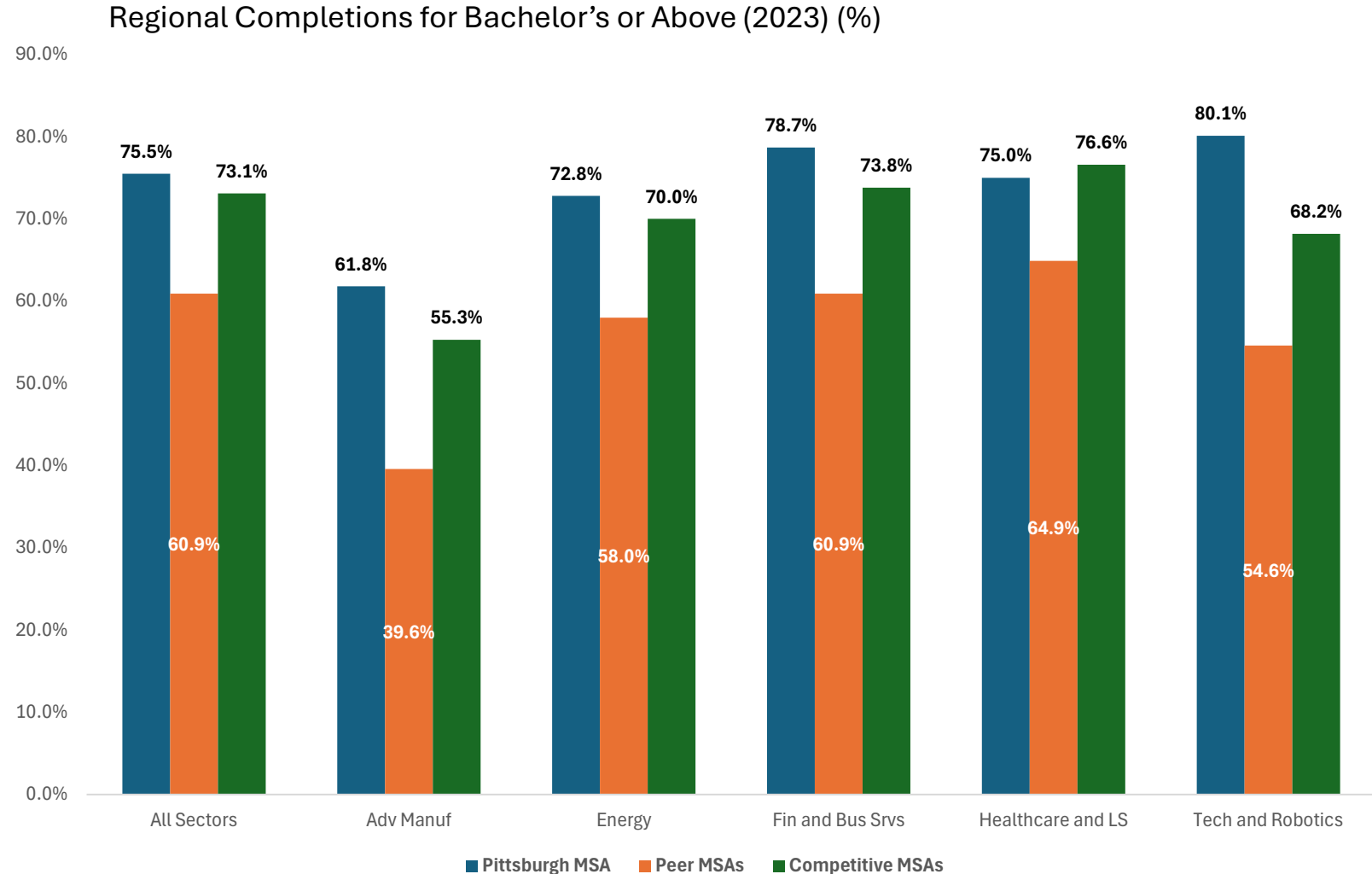
- **Persistent mismatches in job minimum education requirements and the educational attainment** of the region’s population
- **Greater demand for but persistent undersupply of less educated workers in Pittsburgh region**
 - Undersupply of less educated workers in peer regions post-pandemic only
 - Greater demand for and supply of less educated workers in competitive regions
- **Continued demand for more educated workers in Pittsburgh and benchmark regions**
 - Fewer jobs available than supply of workers in Pittsburgh region in 2015
 - Less supply of more educated workers in competitive regions in 2015 and 2023

Trends in Job Demand-to-Worker Supply Ratios (1000:XXX) (#)



Regional Talent Production

- **Greater regional production** of talent with a **Bachelor's or above** for all industry sectors and many priority industry sector clusters in particular
- **Regional overproduction of talent with higher levels of educational attainment** may further fuel oversupply of more educated workers
- **Supply-demand gaps** likely to widen with regional over- or underproduction of qualified talent



Skills Mismatches

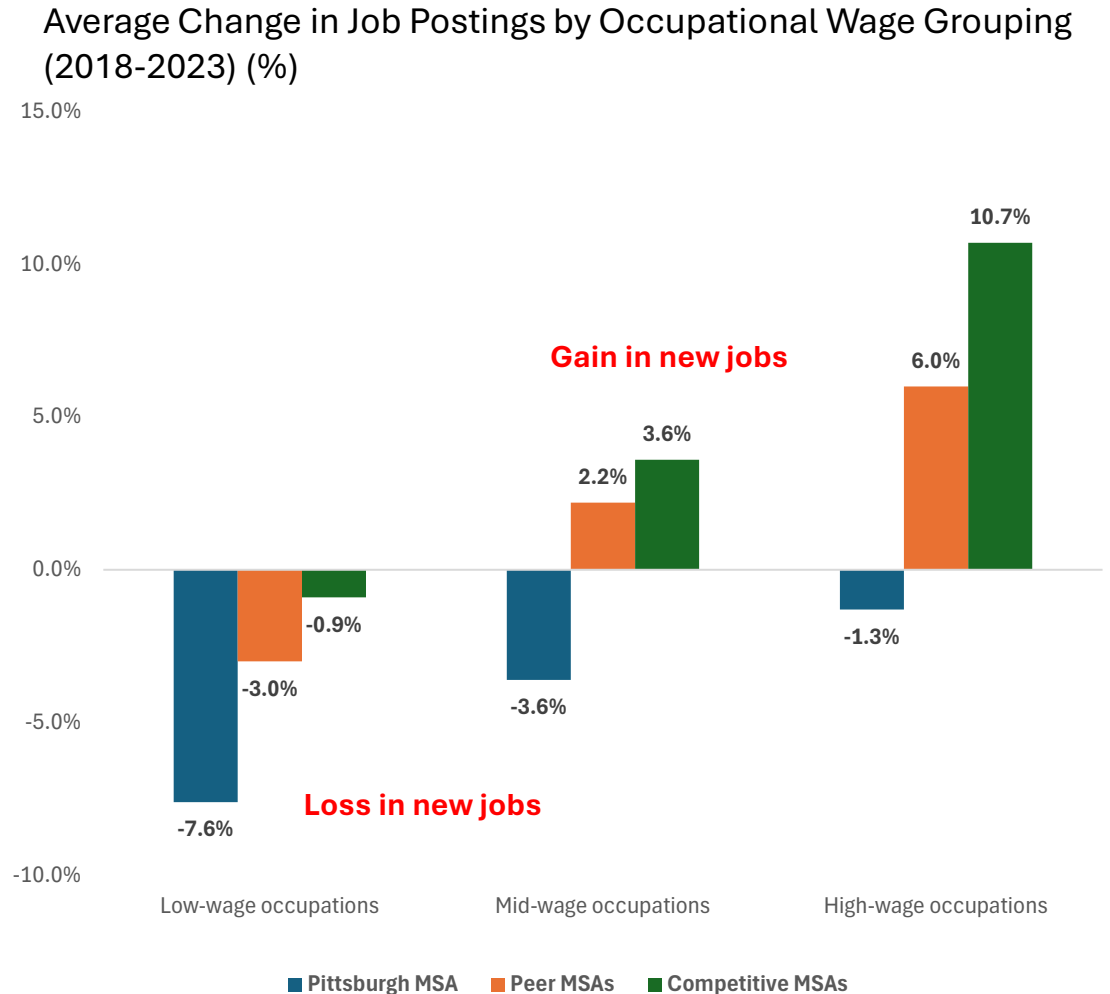
Differences in the frequency of skills present in job postings and skills present in region's workforce

Job Availability and Occupational Wages

Job opportunities and wages in some occupations can vary by region and may impact a worker's choice of where to live. Since the pandemic:

- **Workers in low-wage occupations hit hardest by job losses**
 - Greater losses in Pittsburgh region for Personal Care and Service, Office and Admin Support, and Sales and Related occupations
- **More new jobs for workers in mid- and high-wage occupations in benchmark regions**
 - Greater gains in high-wage occupations of Legal; Life, Physical, and Social Science; and Healthcare Practitioners and Technical in both peer and competitive regions

Source: Pittsburgh, peer, and competitive benchmark MSAs, Lightcast (datarun 2024.5)
Note: Low-wage occupation: Average median salary of under \$50K; Mid-wage occupation: Average median salary between \$50-69K; High-wage occupation: Average median salary of \$70K+



In-Demand Specialized Skills Postings

Many jobs have foundational and occupational skill requirements.

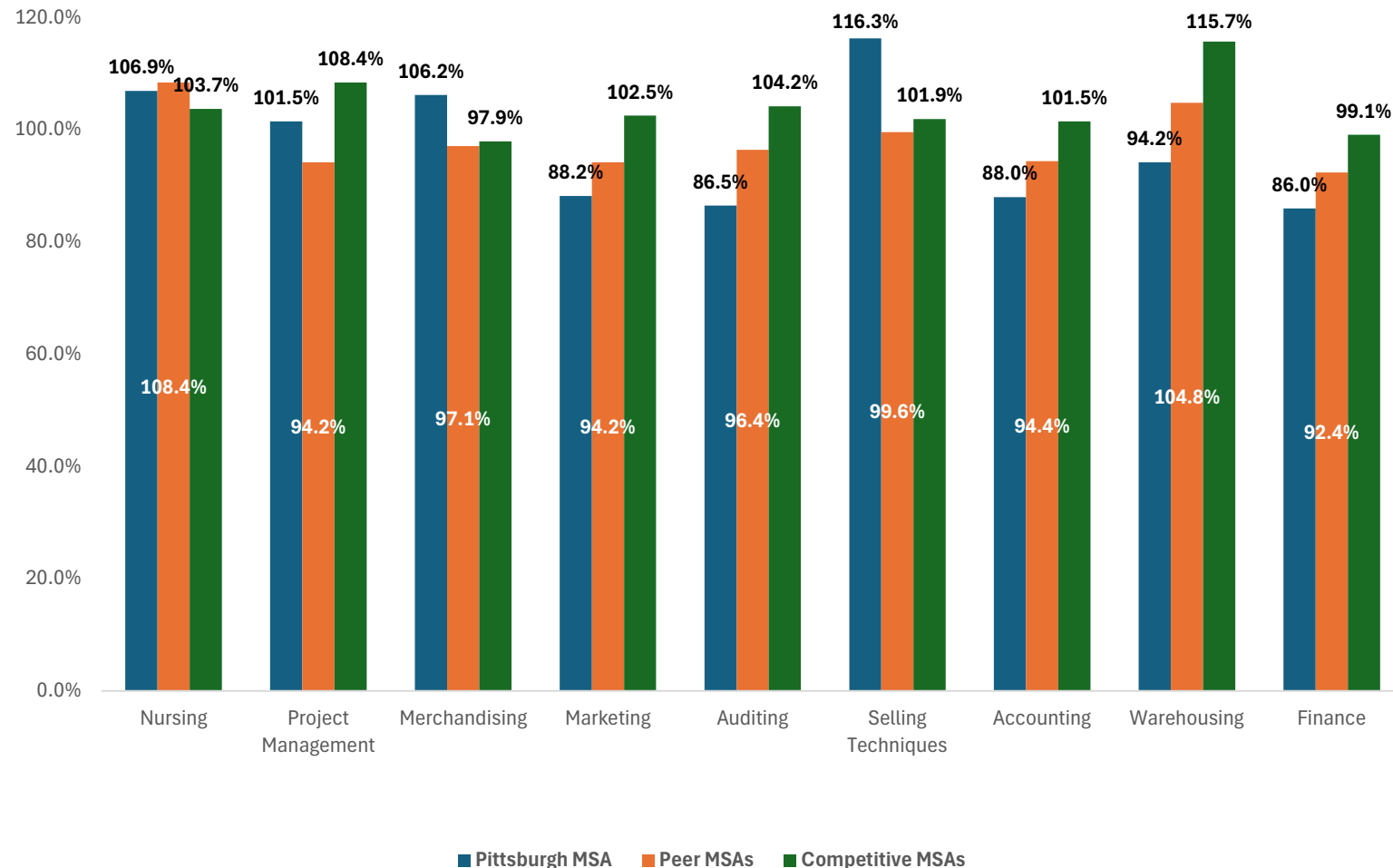
Foundational skills: Personal or learned skills (“soft skills”) like communication or problem-solving

Occupational skills: Technical or job-specific skills like project management or Microsoft Excel

- Specialized skills: Occupation-specific skills to perform a task
- Software skills: Software tool or programming component to help complete a job

There is higher than national demand in the Pittsburgh region for workers with top specialized skills including Nursing, Project Management, Merchandising, and Selling Techniques

Posting frequency for skill against national average (Apr 2022-Apr 2024) (%)



Priority Industry Sector Clusters

Differences in the frequency of skills present in job postings and skills present in region's workforce for each priority industry sector cluster

Sample Job Posting

Many **job postings** list **wage** or **salary*** and any **education, experience, skills,** and/or **certifications/credentials** required for job performance (**posting example**).

The **next set of slides (14-41)** present **job posting analytics** for Pittsburgh and benchmark regions across each of the **five priority industry sector clusters**.

An **introductory slide** summarizing advertised median salaries, job supply, and worker demand is included **alongside more detailed slides** for foundational, specialized, and software skills mismatches.

Source: Pittsburgh MSAs, Lightcast (datarun 2024.5)

*Wage denotes hourly amount paid to the worker; salary is paid in fixed amounts throughout the year. For the purposes of this report, wage is a proxy for skill level i.e. high-wage, high-skill

Payroll Tax Specialist – High-wage occupation

Advertised annual salary (range): \$80-95K

Basic Qualifications:

- Bachelor's Degree from an accredited institution **Education requirement - Bachelor's**
- Minimum three (3) years of payroll-related experience in a corporate environment
- Minimum three (3) years of payroll tax withholding & filing experience **Experience requirements - 1-3 years**
- Minimum three (3) years of account reconciliation experience
- Minimum one (1) year of experience with a payroll application in a corporate environment
- Employees must be legally authorized to work in the United States. Verification of employment eligibility will be required at the time of hire. Visa sponsorship is not available for this position **Credentials – Proof of legal work authorization**

Preferred Qualifications:

- Strong knowledge of accounting acumen with an ability to apply this knowledge to the payroll process **Specialized skill - Accounting**
- Demonstrated capability working with Microsoft Office suite of products; extremely proficient in Excel formulas, look-ups and pivot tables **Software skills – Microsoft Office**
- Demonstrated effective verbal and written communication skills **Foundational skill - Communication**
- Demonstrated strong interpersonal skills and be able to interact with internal and external customers, vendors and other analysts, management, and other departments
- Strong analytical, organizational and time management skills

Advanced Manufacturing

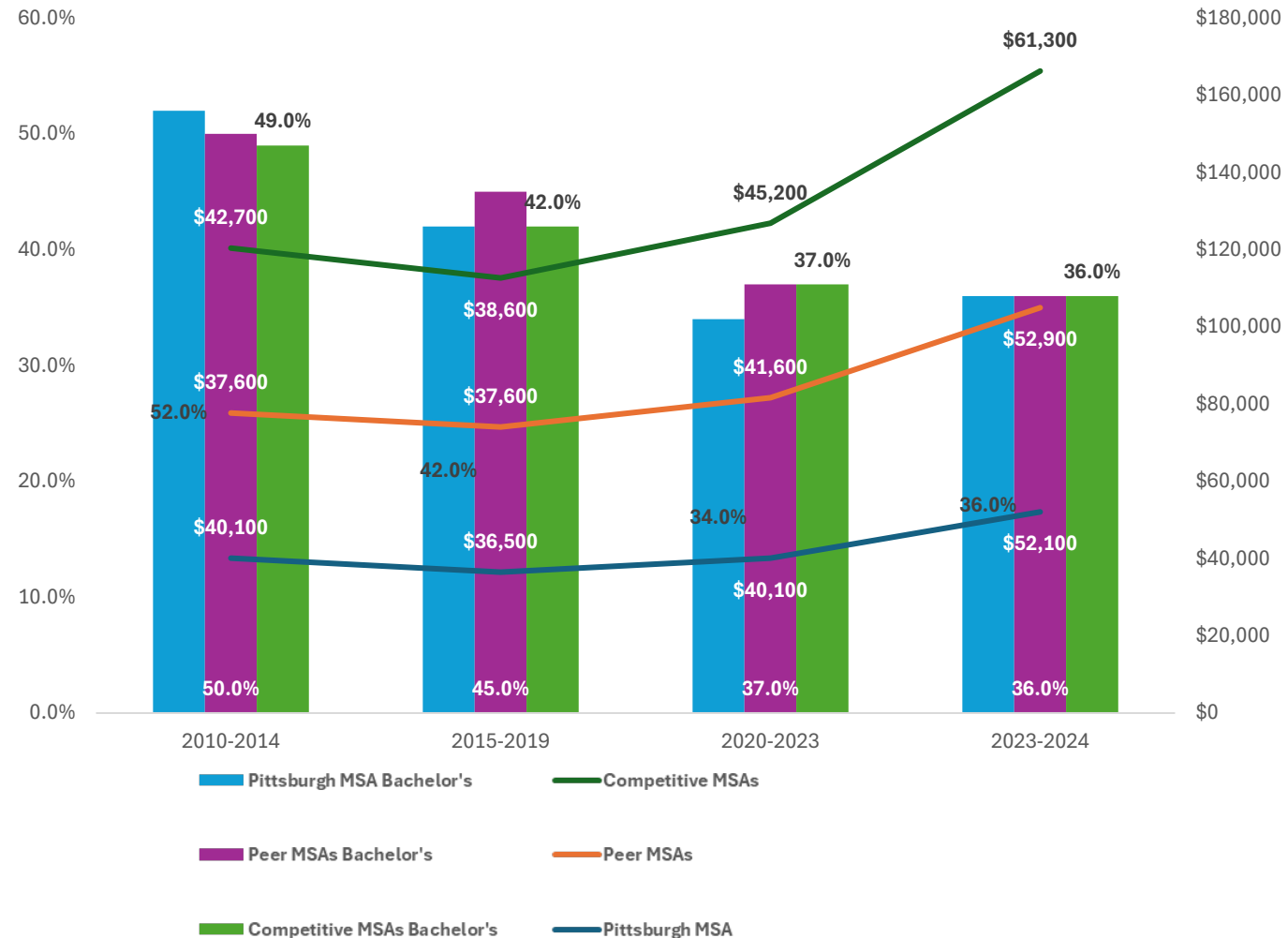
Traditionally equated with manufacturing as a whole, as nearly all manufacturing firms employ some sort of advanced methods or technologies as necessary to remain competitive

Regional Contexts

Post-Pandemic:

- **Higher advertised median salaries in benchmark regions**
- **Less job market diversity** (mix of low-, mid, and high-wage occupations)
 - More supply of low-wage occupations in Pittsburgh region
 - More supply of high-wage occupations in peer regions
 - More supply of low-wage occupations in competitive regions (except Computer)
- **Greater demand for more educated and experienced workers in Pittsburgh region**
- **Less demand for more educated and experienced workers in benchmark regions**
 - Slight uptick in postings for workers with 4-6 years of experience in peer regions

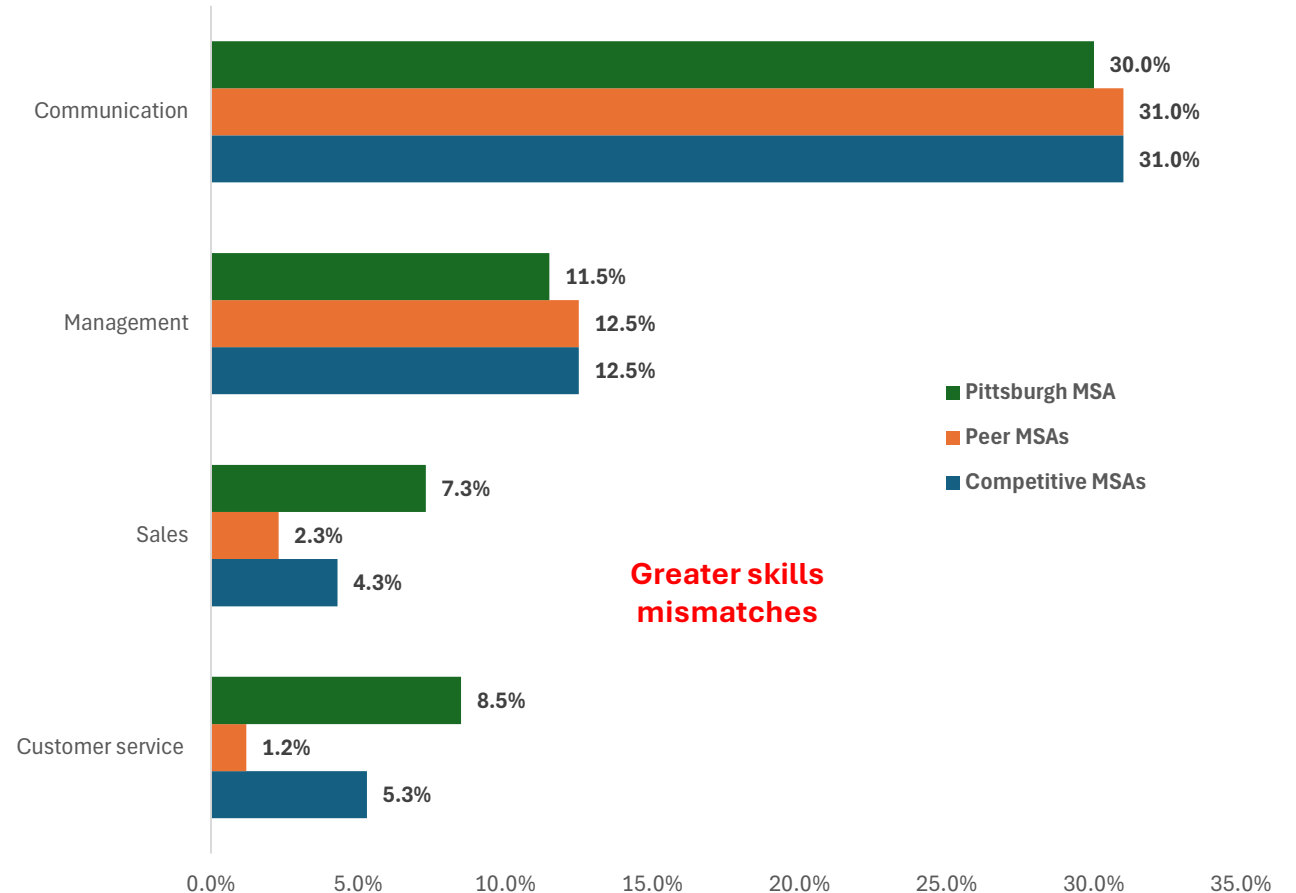
Frequency of advertised median salary (\$) and minimum education requirement of Bachelor's (%)



In-Demand Foundational Skills Mismatches

- **Fewer workers** with **Communications** skills than jobs posting for this in-demand skill
- **More workers** with **Communication** and **Management** skills in Pittsburgh region
- **More workers** with **Sales** and **Customer Service** skills in benchmark regions
- **Leadership** an **in-demand skill** for benchmark regions pre- and post-pandemic
- **Fewer workers** with in-demand **Problem Solving** skills across all regions

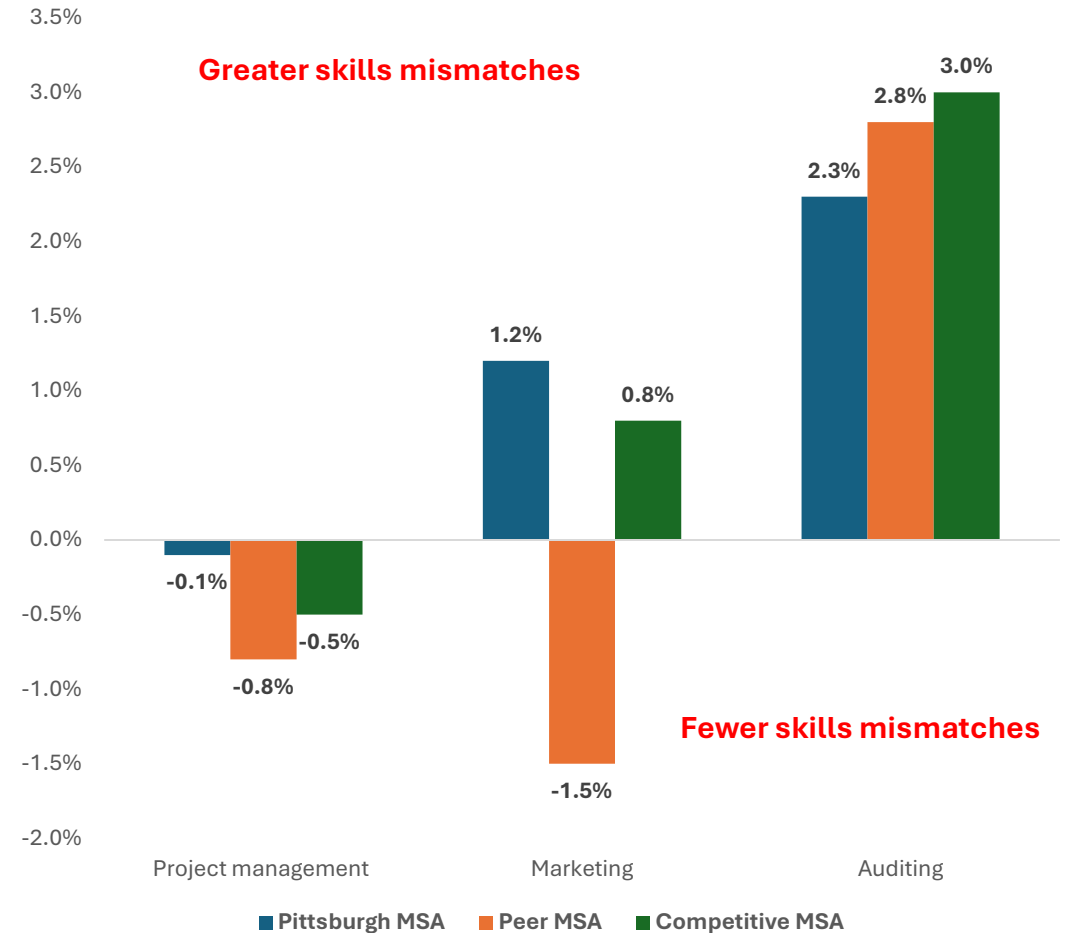
Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



In-Demand Specialized Skills Mismatches

- **More workers** with **Project Management** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Auditing** skills than jobs posting for this in-demand skill
- **More workers** with **Project Management** and **Marketing** skills in **peer regions**
- **Greater demand** for **Warehousing** in **benchmark** regions **post-pandemic**
- **Greater demand** for **Computer science** in **peer** regions **until 2023-2024** (demand greatest in competitive regions only in 2010-2014)
- **Oversupply** of workers with **New Product Development** and **Process Improvement** skills in **benchmark** regions

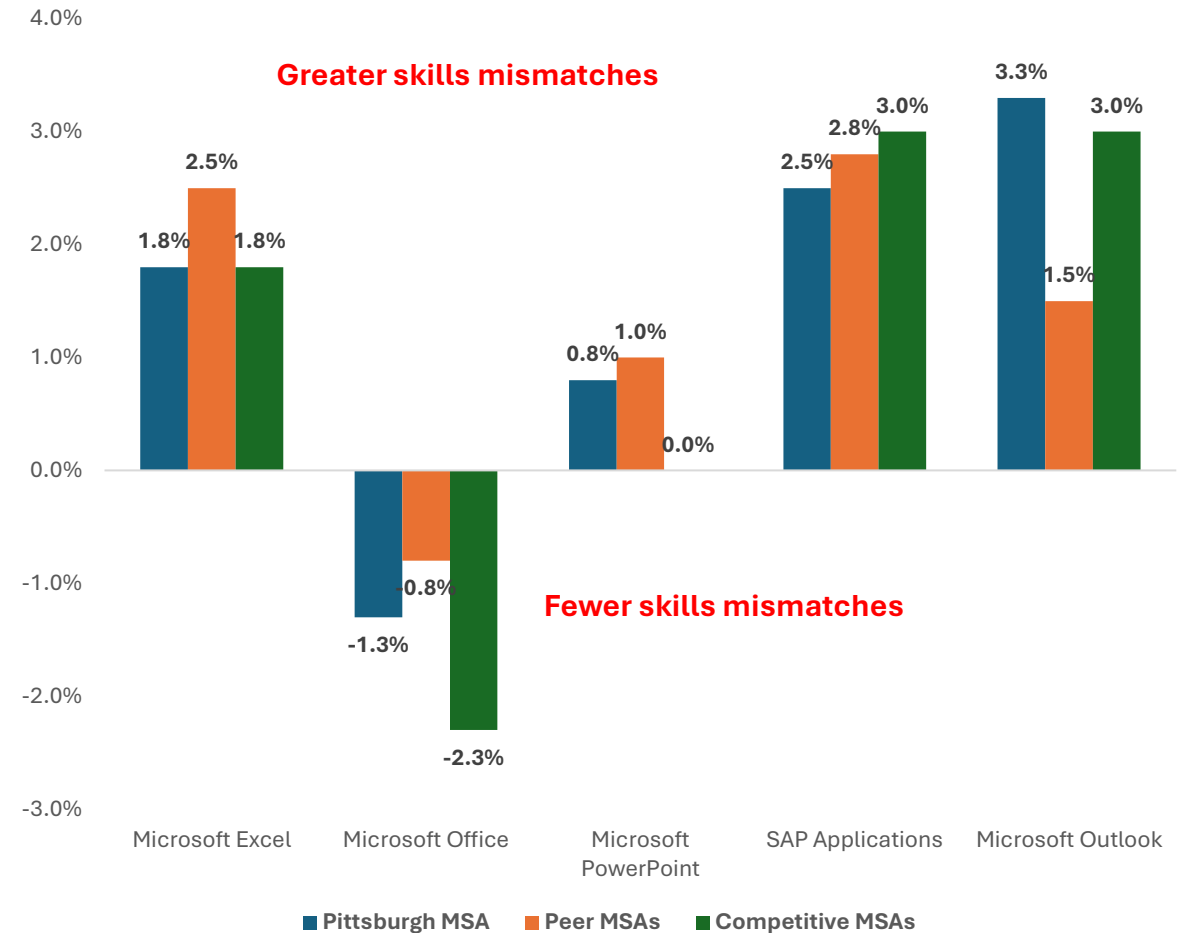
Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



In-Demand Software Skills Mismatches

- **More workers** with **Microsoft Office** skills than jobs posting for this in-demand skill
- **More workers** with **SAP applications** skills in Pittsburgh region
- **More workers** with **Microsoft Outlook** skills in peer regions
- **More workers** with **Microsoft Excel** and **Microsoft PowerPoint** skills in Pittsburgh and competitive regions
- **More workers** with **programming language** skills in Pittsburgh but more rapidly growing programming skills in-demand for benchmark regions i.e. Python

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



Energy

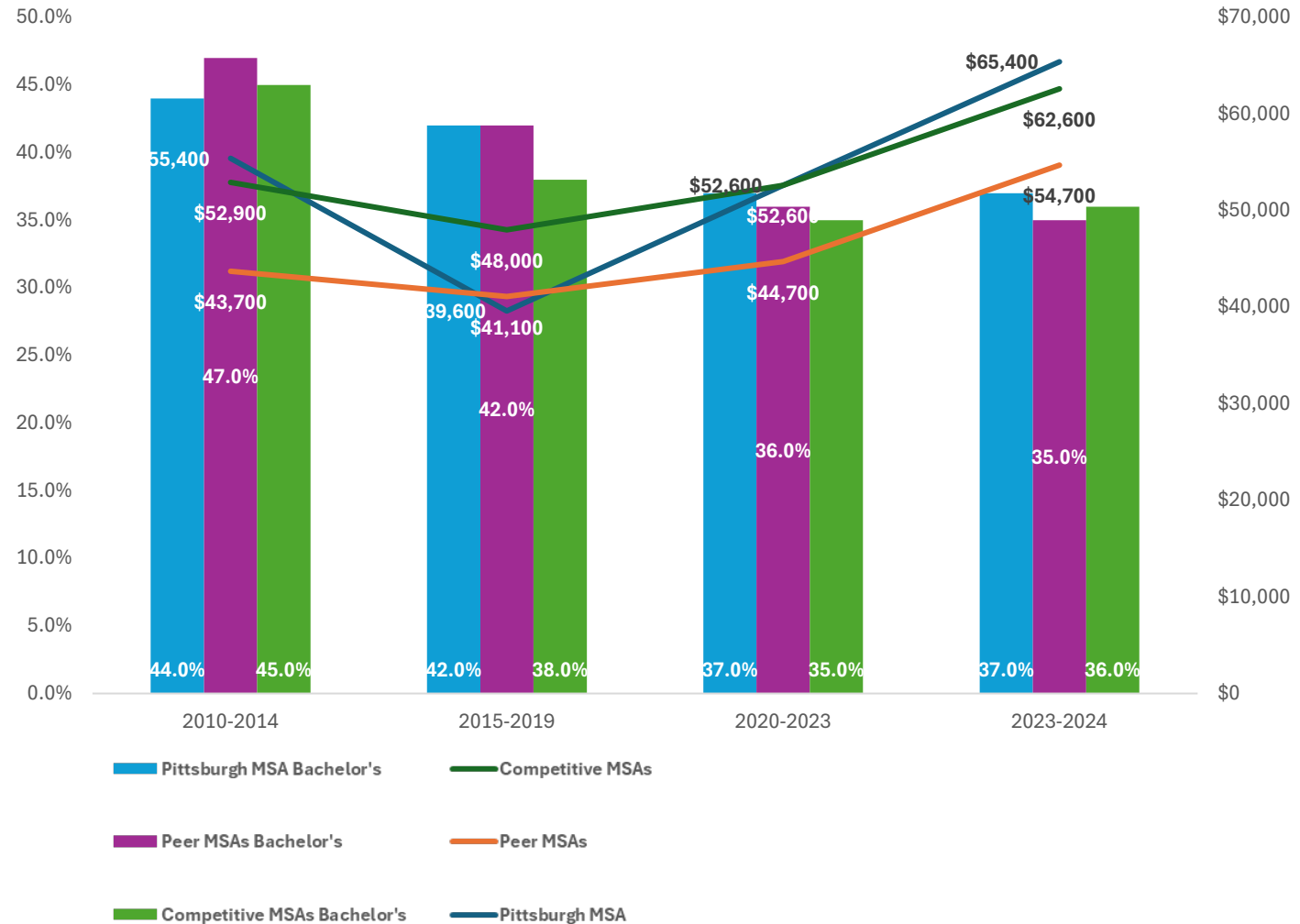
Comprised of those industries most directly involved with capturing natural resources, transforming them into energy, and delivering resources to the final end-user

Regional Contexts

Post-Pandemic:

- **Higher advertised median salaries in Pittsburgh region**
- **Greater job market diversity in competitive regions**
 - More supply of high-wage occupations in Pittsburgh region
 - More supply of low-wage occupations in peer regions
- **Greater demand for more educated and experienced workers in Pittsburgh and competitive regions**
 - Bachelor's or above and 4-6 and 7-10+ years of experience in Pittsburgh region
 - HS/Associate's and Bachelor's and 2-3 and 4-6 years of experience in competitive regions
- **Greater demand for less educated workers and workers with 4-6 and 7-10+ years of experience in peer regions**

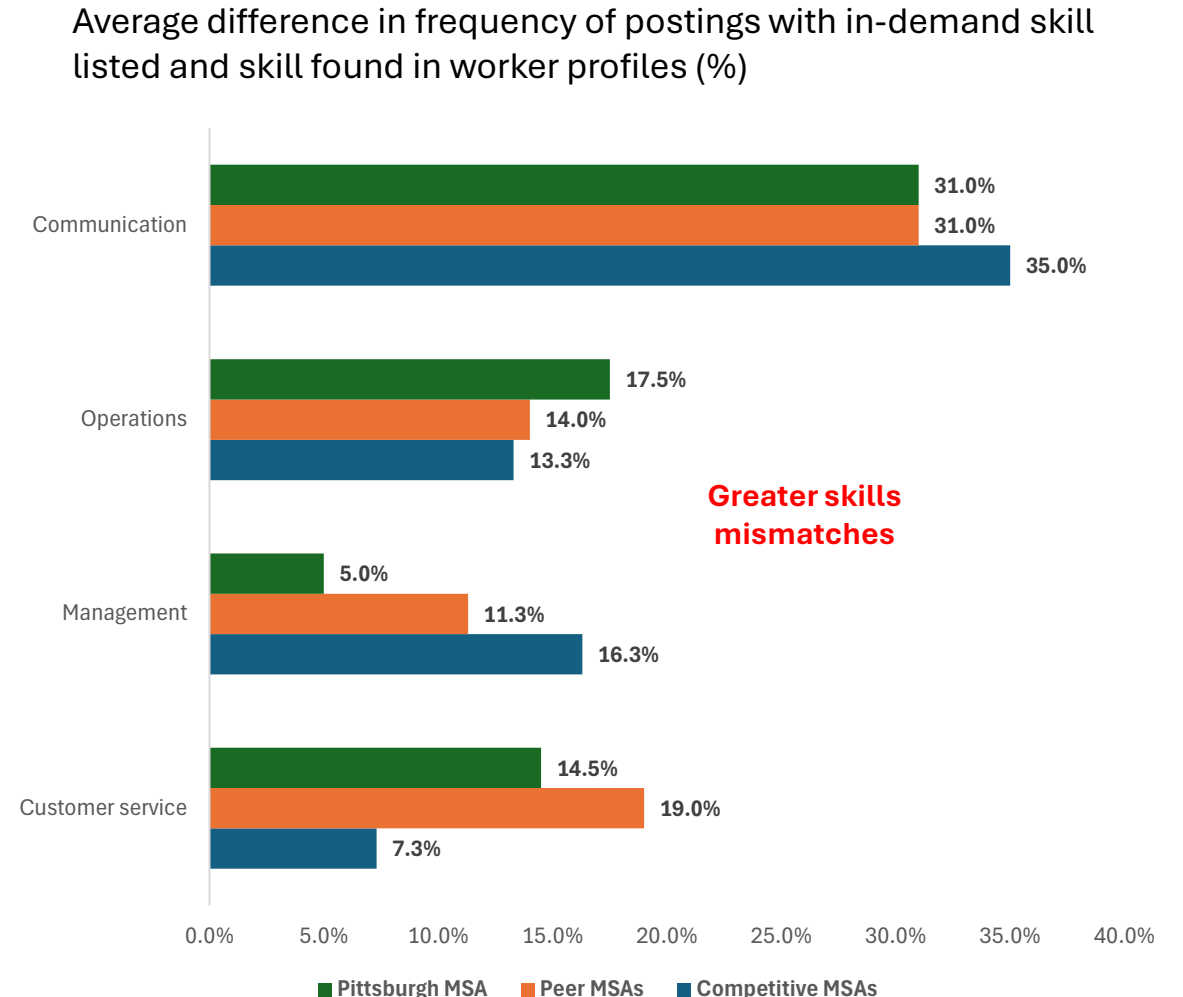
Frequency of advertised median salary (\$) and minimum education requirement of Bachelor's (%)



Source: Pittsburgh, peer, and competitive benchmark MSAs, Lightcast (datarun 2024.5)

In-Demand Foundational Skills Mismatches

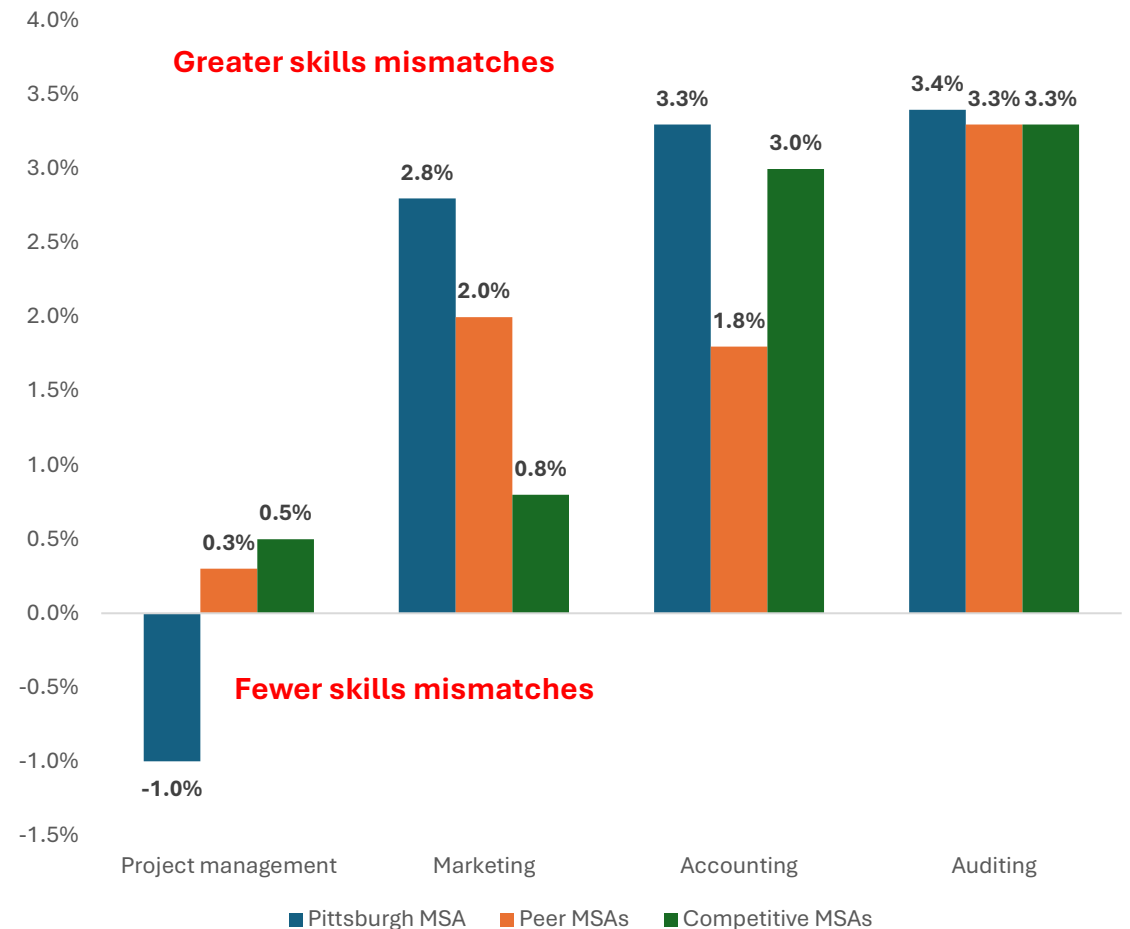
- **Fewer workers** with **Communication** skills than jobs posting for this in-demand skill
- **More workers** with **Management** skills in the **Pittsburgh** region
- **More workers** with **Customer Service** skills in **competitive** regions
- **More workers** with **Operations** skills in **peer** regions
- **Greater mismatches** for **Pittsburgh** region **post-pandemic** (greater mismatches for benchmark regions during and post-pandemic)
- **Persistent gaps** in **Planning** and **Problem solving** across **all regions**



In-Demand Specialized Skills Mismatches

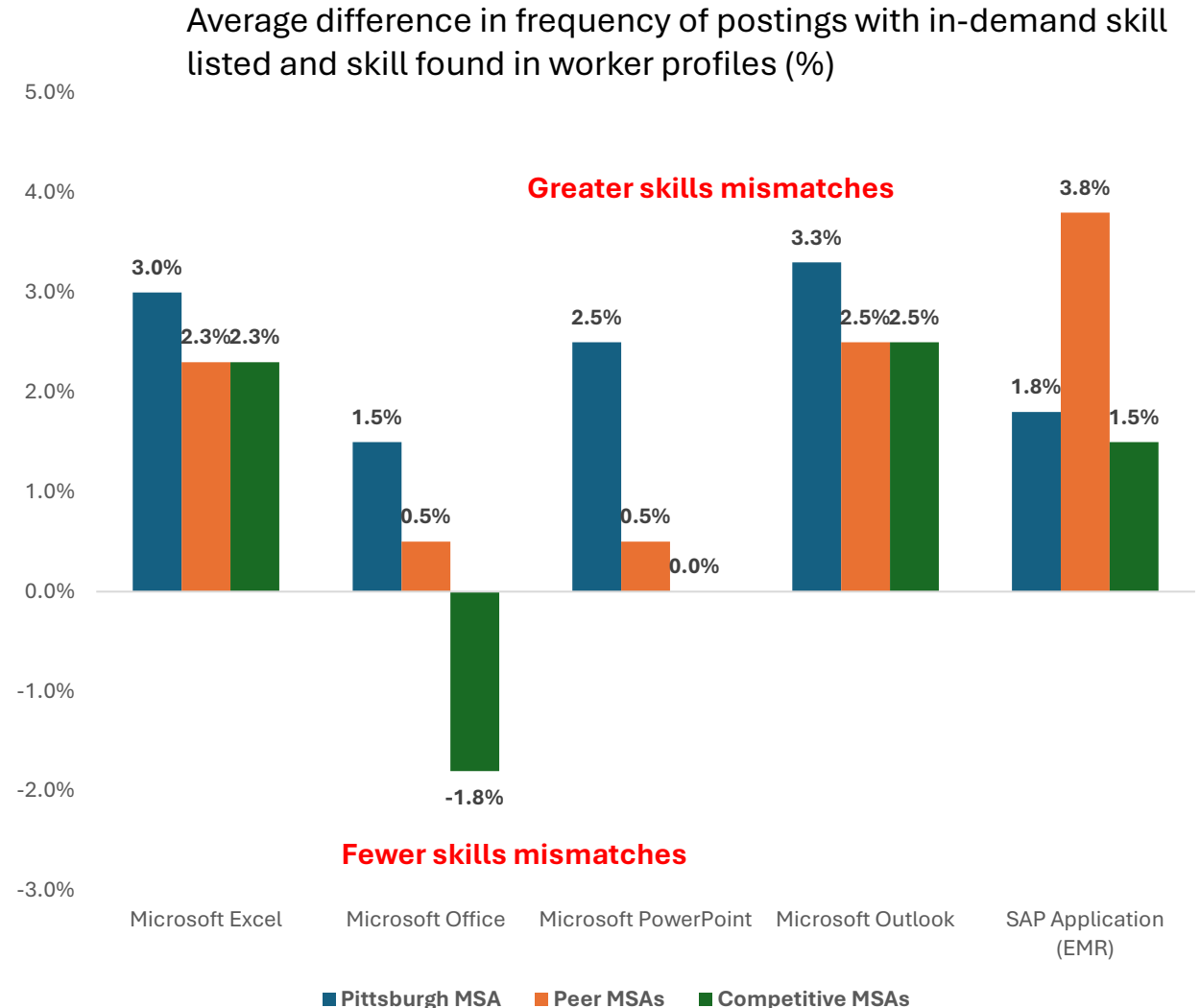
- **More workers** with **Project Management** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Auditing** skills than jobs posting for this in-demand skill
- **More workers** with **Project Management** skills in Pittsburgh region but slight uptick in mismatches post-pandemic
- **More workers** with **Accounting** and **Auditing** skills in benchmark regions
- **Warehousing, New Product Development, Automation,** and resource and programming skills **in-demand** for benchmark regions

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



In-Demand Software Skills Mismatches

- **More workers** with **Microsoft Office** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Microsoft applications** skills, particularly for the Pittsburgh region
- **More workers** with **Microsoft Office, Microsoft PowerPoint, and SAP Applications** skills in competitive regions
- **Slight oversupply** of workers with **AutoCAD** skills in competitive regions post-pandemic



Financial & Business Services

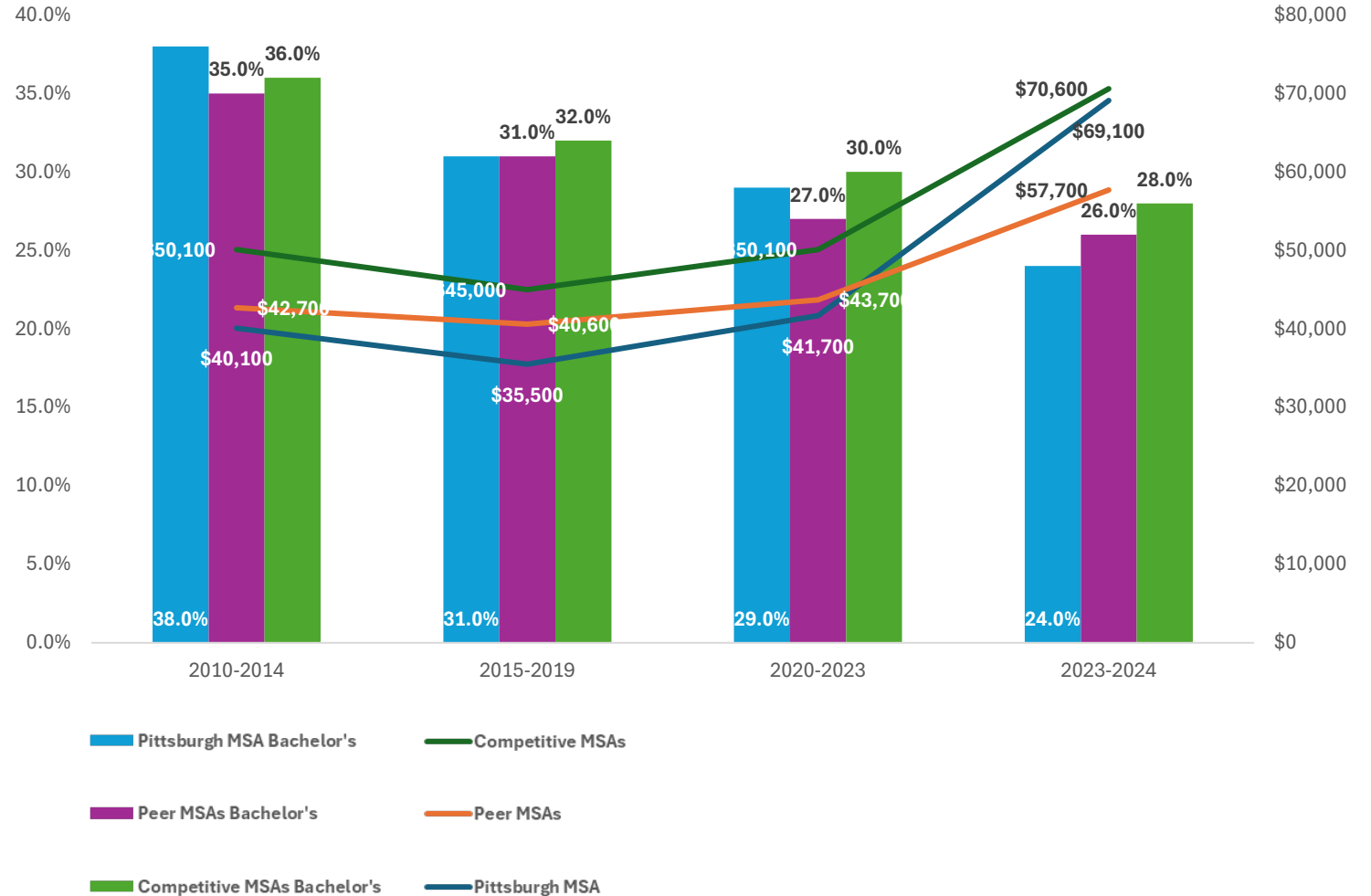
Inclusive of professional support industries including real estate, administrative services, banking, and management

Regional Contexts

Post-Pandemic:

- **Higher advertised median salaries in competitive regions**
- **Less job market diversity** (mix of low-, mid-, and high-wage occupations)
 - More supply of low- and high-wage occupations in Pittsburgh region
 - More supply of low- and high-wage occupations in peer regions
 - More supply of high-wage occupations in competitive regions
- **Less demand for more educated and experienced workers** than jobs posting for higher levels of education and experience

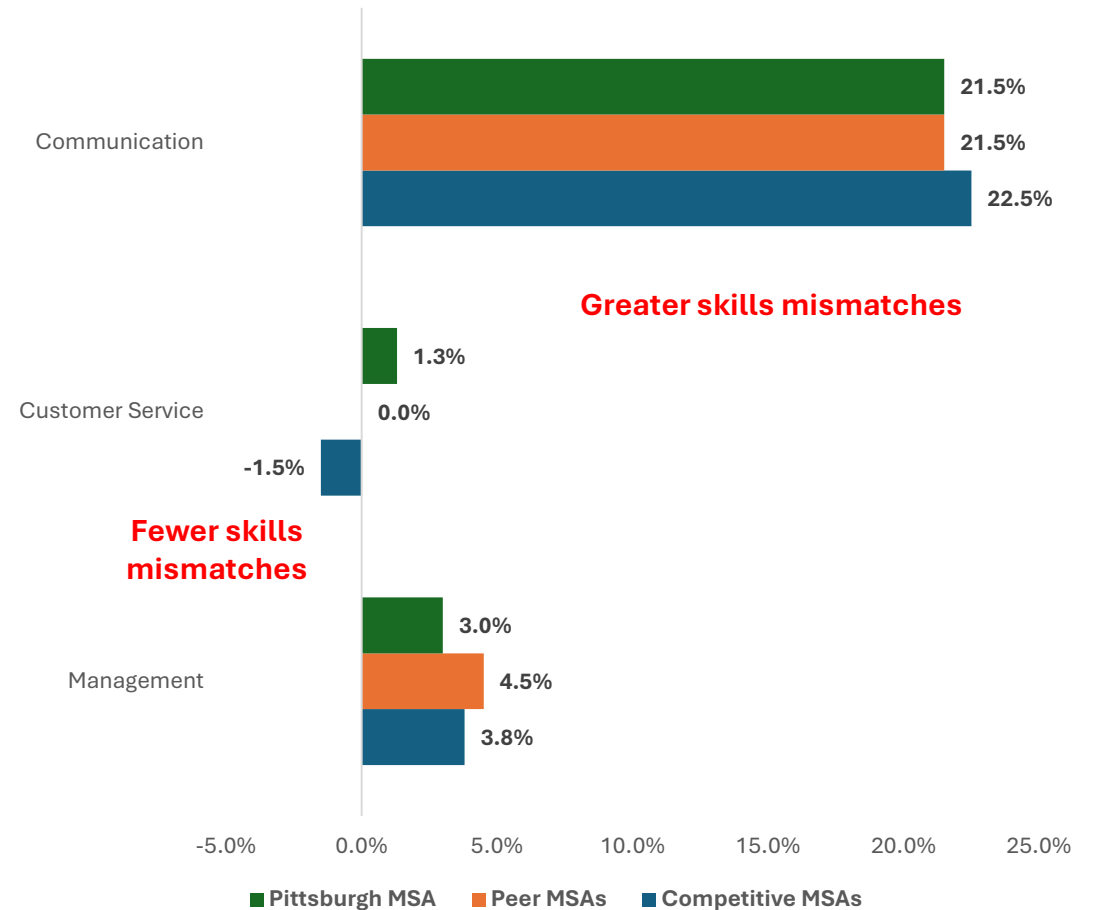
Frequency of advertised median salary (\$) and minimum education requirement of Bachelor's (%)



In-Demand Foundational Skills Mismatches

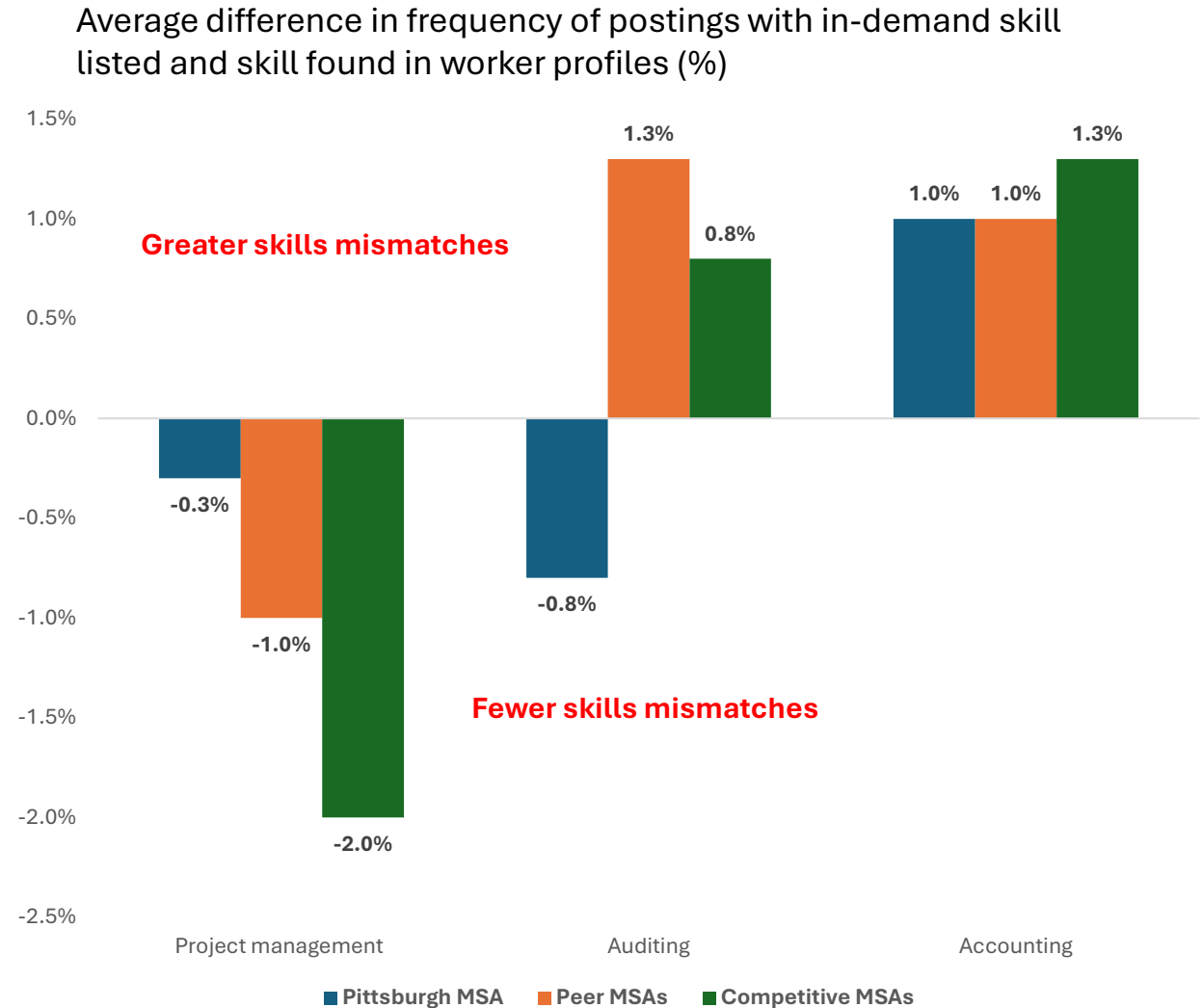
- **Fewer workers** with **Communication** skills than jobs posting for this in-demand skill
- **More workers** with **Customer Service** skills than jobs posting for this in-demand skill
- **More workers** with **Management** skills in Pittsburgh region
- **More workers** with **Customer Service** skills in benchmark regions
- **More workers** with **Communication** skills in Pittsburgh and peer regions
- **Problem solving** top in-demand skill for benchmark regions

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



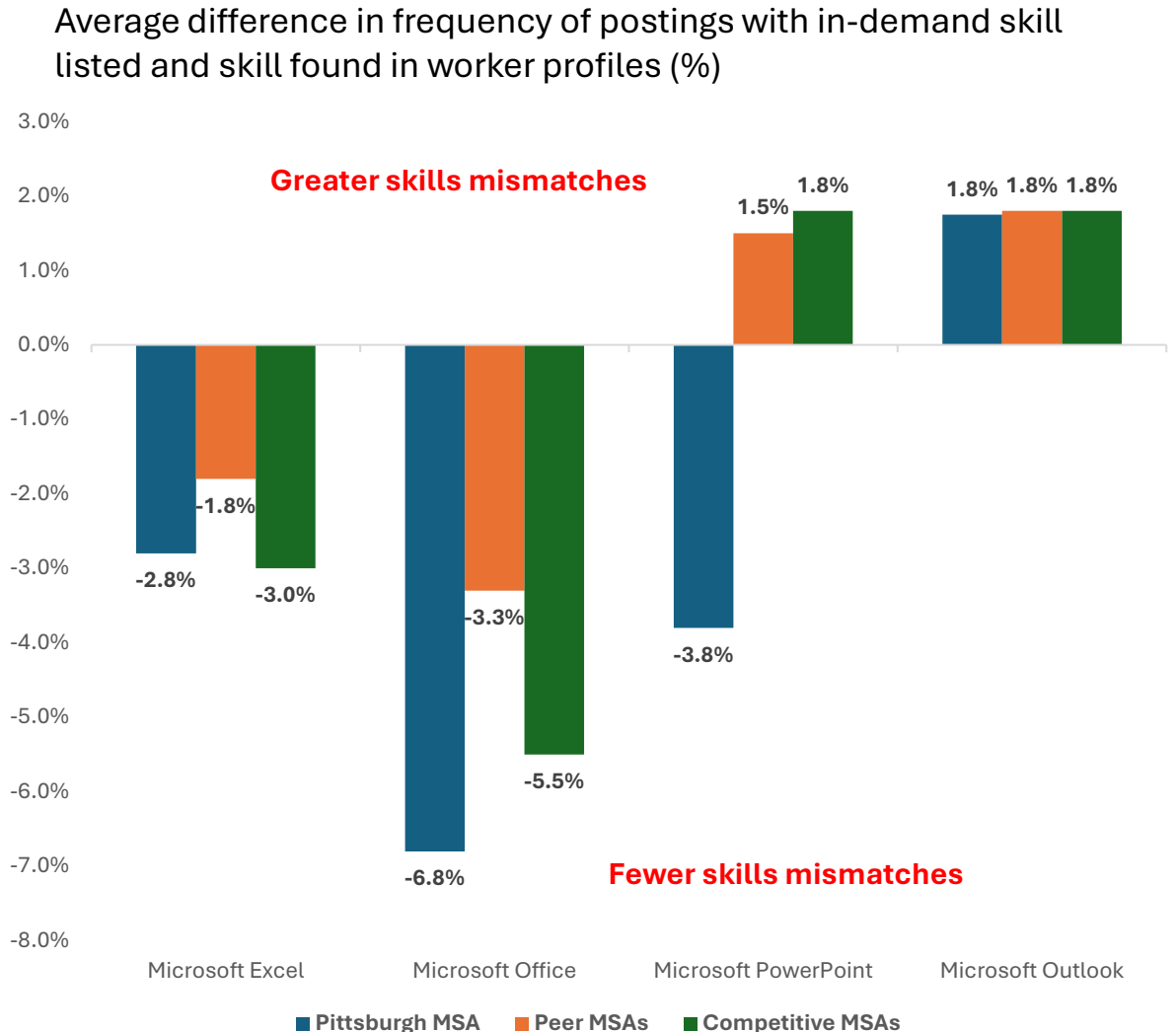
In-Demand Specialized Skills Mismatches

- **More workers** with **Project Management** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Accounting** skills than jobs posting for this in-demand skill
- **More workers** with **Auditing** skills in Pittsburgh region
- **More workers** with **Project Management** skills in competitive regions
- **SQL** (programming language) and **Computer science** in-demand skills for Pittsburgh region until 2023-2024
- **Computer science, Agile Methodology,** and **Warehousing** in-demand skills for benchmark regions pre- and post-pandemic



In-Demand Software Skills Mismatches

- **More workers** with **Microsoft Office** and **Microsoft Excel** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Microsoft Outlook** skills than jobs posting for this in-demand skill
- **More workers** with **Microsoft PowerPoint** and **Microsoft Office** skills in Pittsburgh region
- **More workers** with **Microsoft Excel** skills in Pittsburgh and competitive regions
- **Python** an in-demand skill for the Pittsburgh region post-pandemic
- **More programming languages** in-demand for benchmark regions



Healthcare & Life Sciences

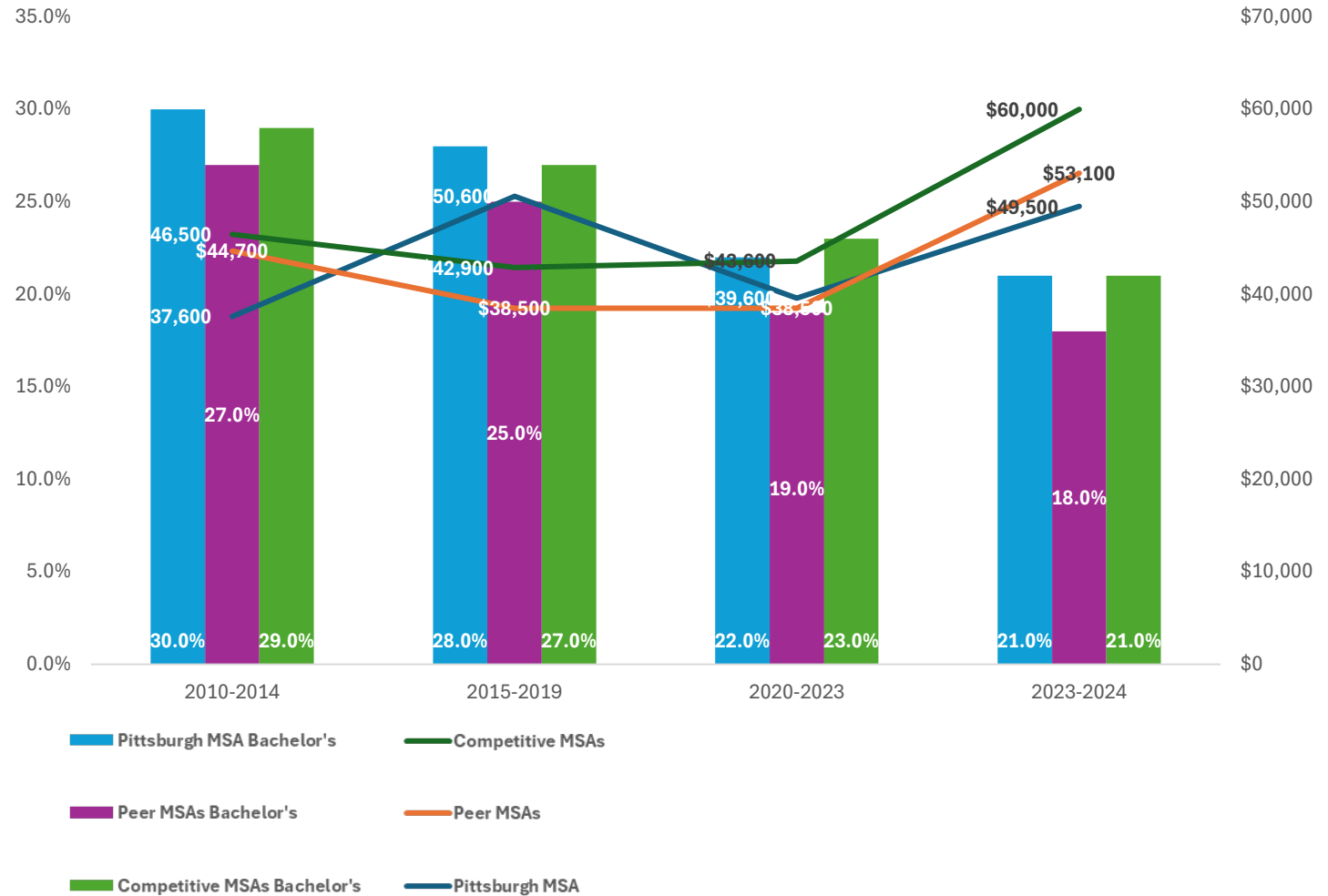
Inclusive of key subsectors Healthcare, Life Sciences and Medical
Devices

Regional Contexts

Post-Pandemic:

- **Higher advertised median salaries in competitive regions**
- **Less job market diversity** (mix of low-, mid-, and high-wage occupations)
 - More supply of jobs in low- and mid-wage occupations in Pittsburgh region with exception of Registered Nurses
 - Mixed supply of jobs but greater availability of jobs in mid- and high-wage occupations in benchmark regions
- **Less demand for more educated and experienced workers** than jobs posting for higher levels of education and experience

Frequency of advertised median salary (\$) and minimum education requirement of Bachelor's (%)

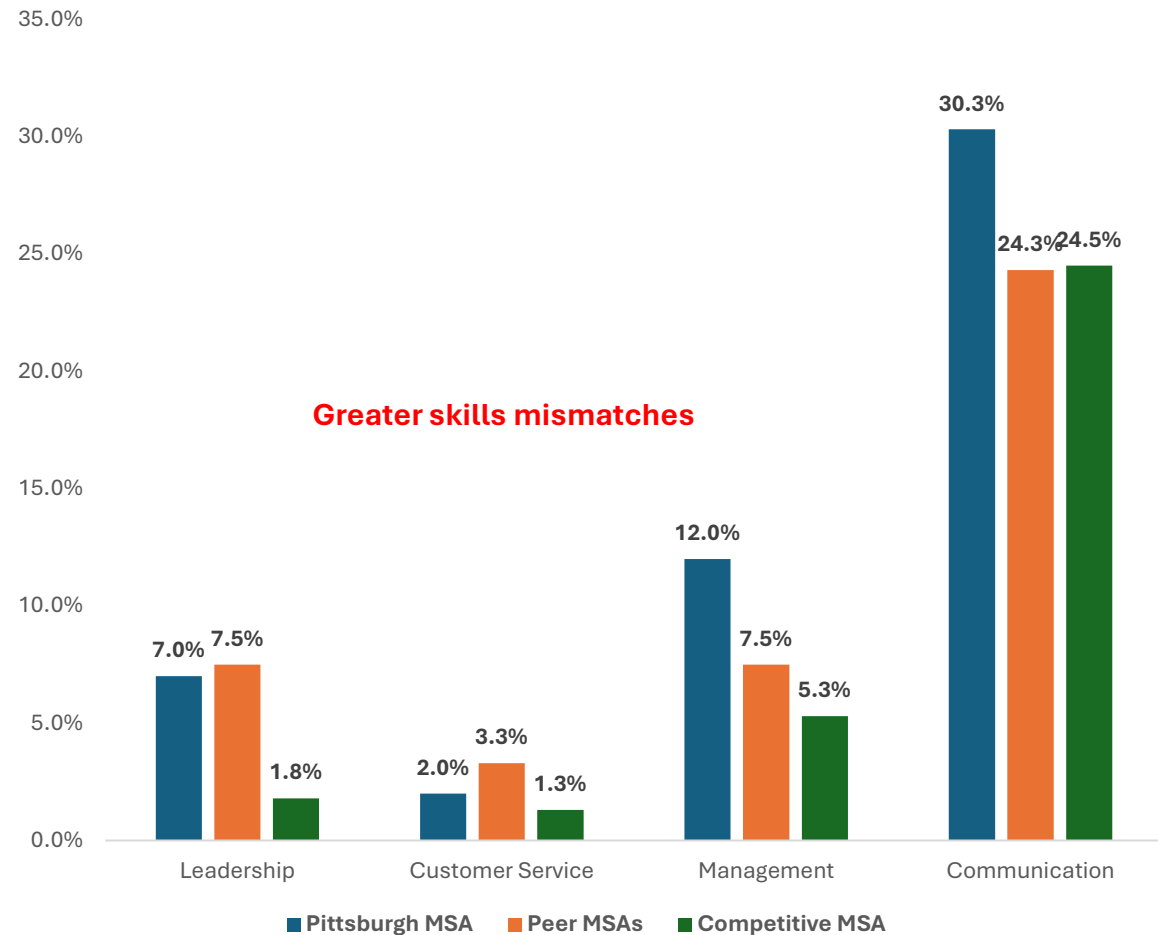


Source: Pittsburgh, peer, and competitive benchmark MSAs, Lightcast (datarun 2024.5)

In-Demand Foundational Skills Mismatches

- **More workers** with **Customer Service** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Communication** skills than jobs posting for this in-demand skill
- **More workers** with **Leadership** and **Customer Service** skills in Pittsburgh region
- **More workers** with **Leadership, Customer Service, and Management** skills in competitive regions
- **Accountability** an in-demand skill for Pittsburgh but not benchmark regions
- **Coordinating** and **Interpersonal Communications** in-demand skills for benchmark regions

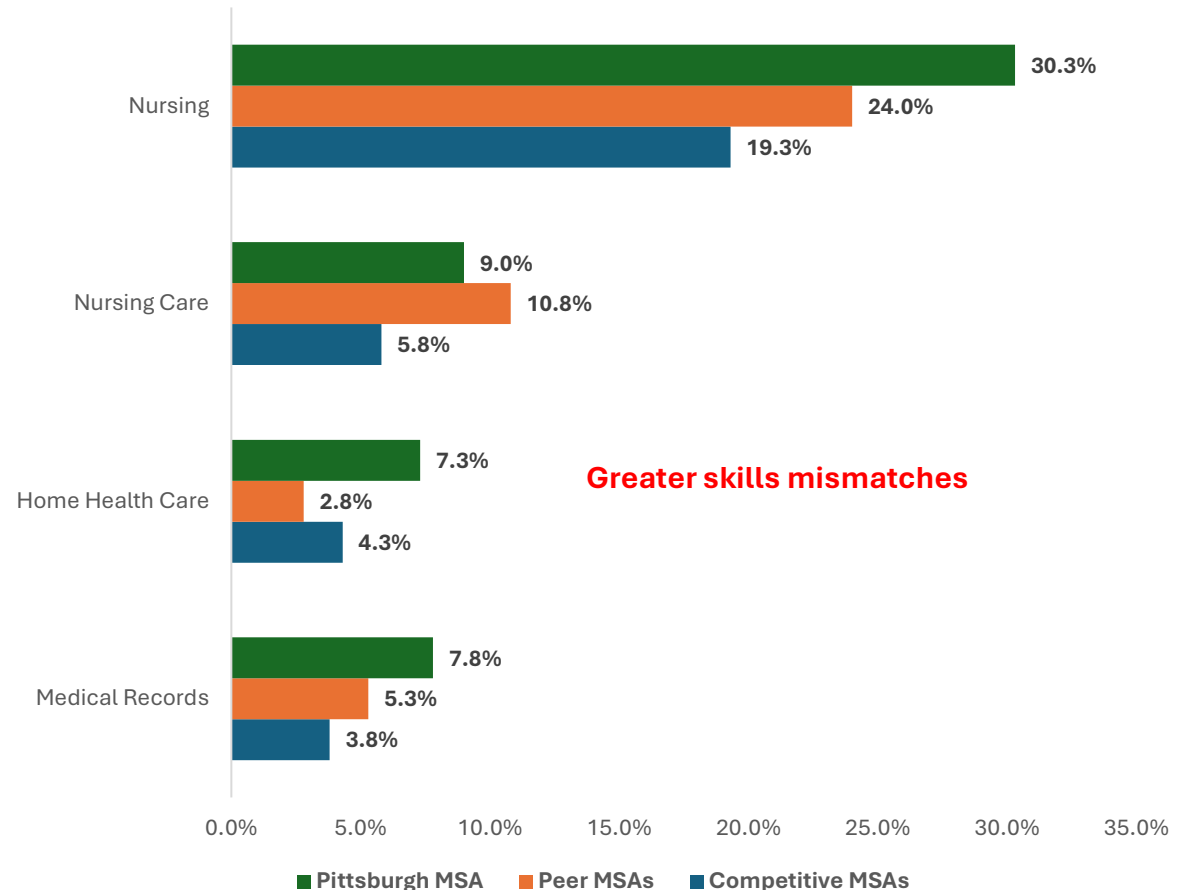
Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



In-Demand Specialized Skills Mismatches

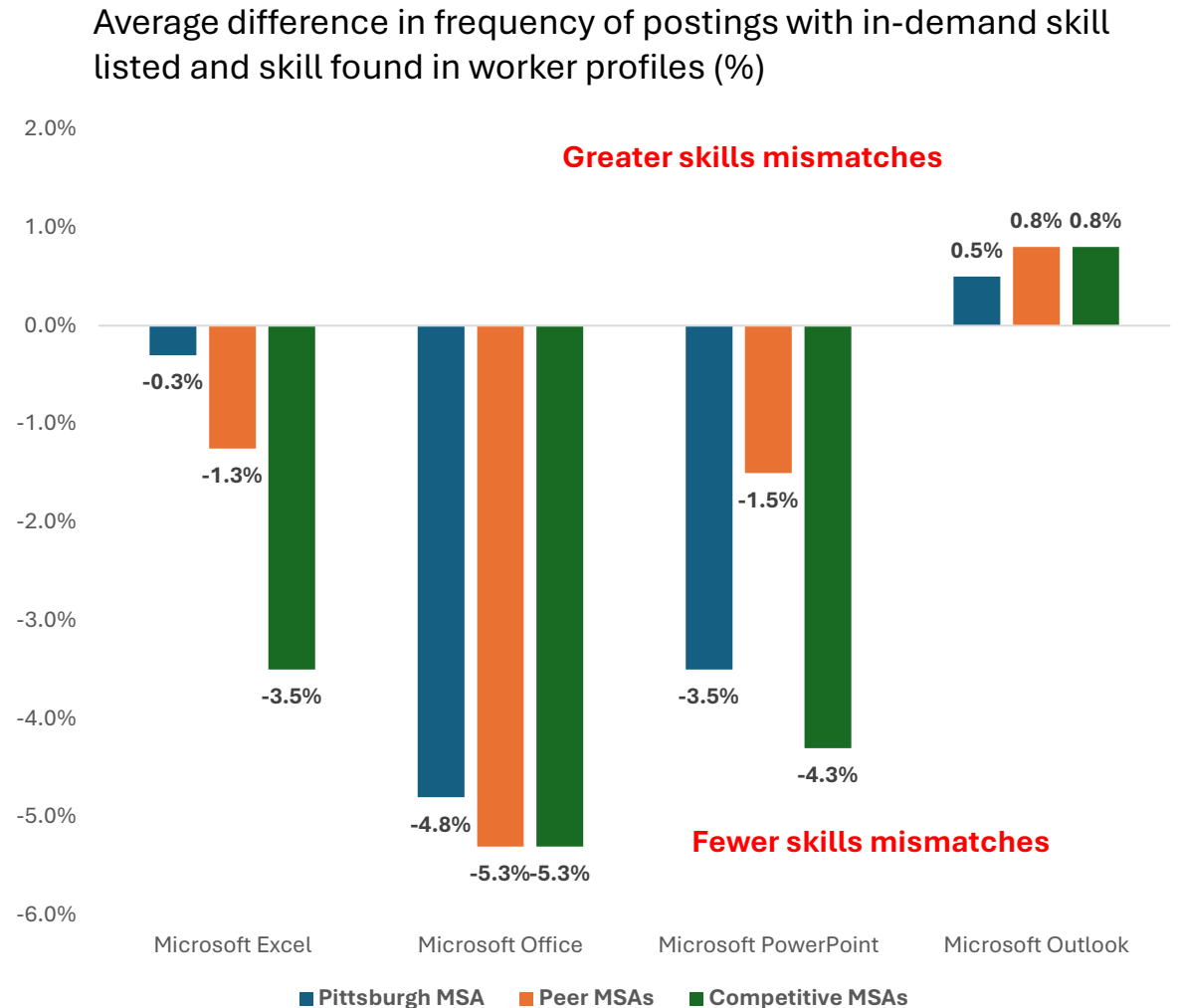
- **More workers** with **Home Health Care** and **Medical Records** skills than jobs posting for this in-demand skill
- **Fewer workers** with **Nursing** skills than jobs posting for this in-demand skill
- **More workers** with **Nursing, Nursing Care,** and **Medical Records** in Pittsburgh region
- **More workers** with **Home Health Care** skills in peer regions
- **Uptick** in posting frequency for **Patient Safety** in the Pittsburgh region during and post-pandemic
- **Vital Signs** and **Billing** in-demand skills for peer and competitive regions respectively post-pandemic

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)



In-Demand Software Skills Mismatches

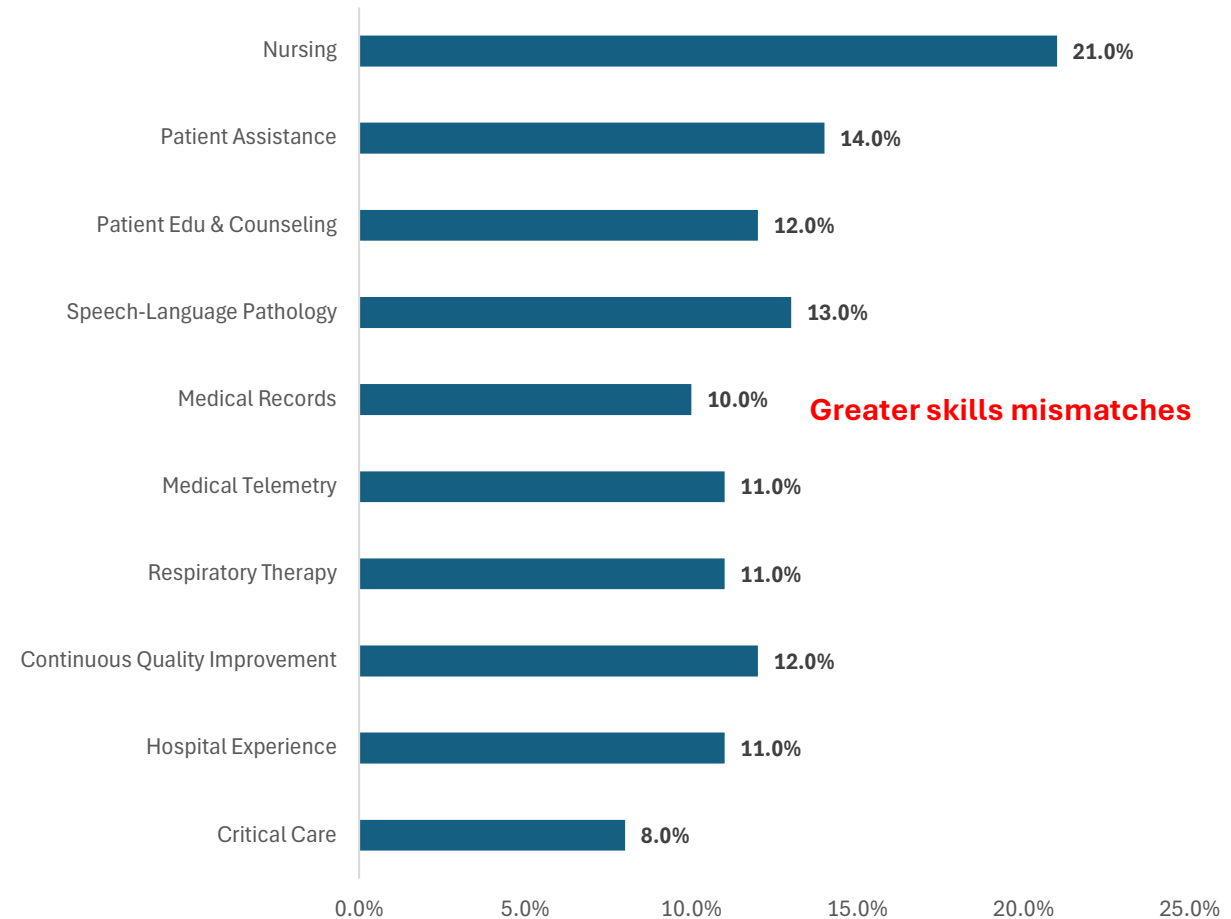
- **Less overall mismatch** in jobs posting for software skills and workers with top in-demand skills
 - More workers with top in-demand skills in benchmark regions
- **Fewer workers** with **Microsoft Outlook** skills than jobs posting for this in-demand skill
- **More workers** with **Microsoft PowerPoint** and **Microsoft Outlook** skills in Pittsburgh but not peer regions
- **Uptick** in posting for **EPIC EMR** (software application) for the Pittsburgh region post-pandemic
 - Oversupply of workers with EPIC EMR skills in profile for benchmark regions



Business Case Study: UPMC

- **More postings for less educated workers** and workers with **no or limited years of experience**
- **More postings for Registered Nurses** and **Nursing Assistants**
- **Greater posting frequency** for occupations within **Nursing Care Facilities** (Skilled Nursing Facilities)
- **Greater frequency** of postings for **Overcoming Obstacles** and **Resourcefulness** among top foundational in-demand skills
- **Fewer workers** with top in-demand specialized skills than jobs posting for this skill
- **Fewer workers** with all top **software** in-demand skills except for Microsoft Excel
- **Diploma in nursing** listed **certification** for peer but not Pittsburgh regions

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (Apr2022-Apr2024) (%)



Technology & Robotics

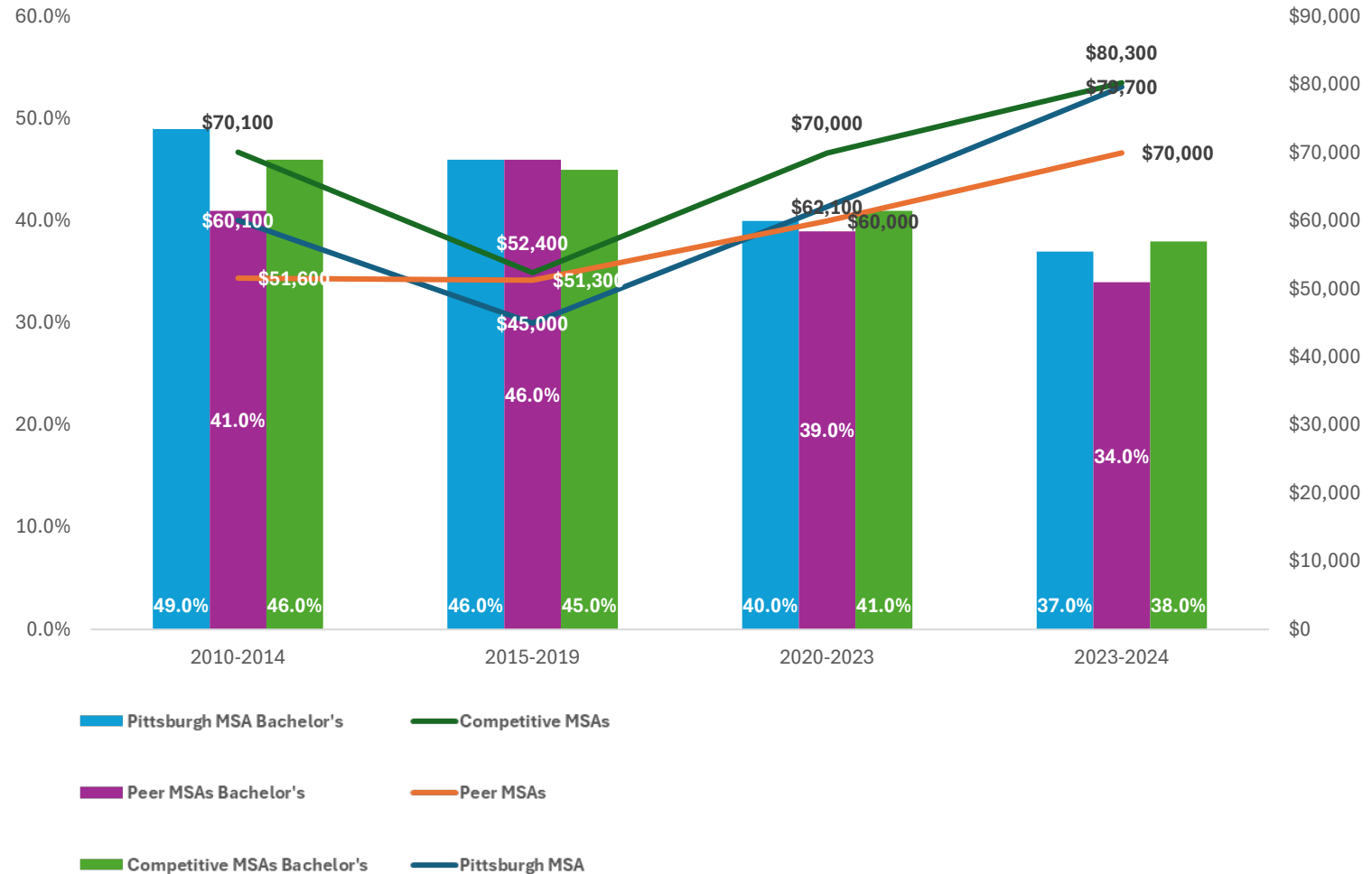
Comprised of key sectors Broadcasting and Content Providers;
Telecommunications; and subsector Hardware, Software, and
Services

Regional Contexts

Post-Pandemic:

- **Higher advertised median salaries in competitive regions**
- **Greater job market polarization** (mix of low-, mid-, and high-wage occupations)
 - More supply of jobs in either low- or high-wage occupations in Pittsburgh region
 - Fewer high-wage jobs available in benchmark regions since the pandemic with posting frequency for jobs in low- or high-wage occupations
- **Greater demand for workers with either HS Diploma/Associate's and no or limited experience or advanced degree and 7-10+ years**

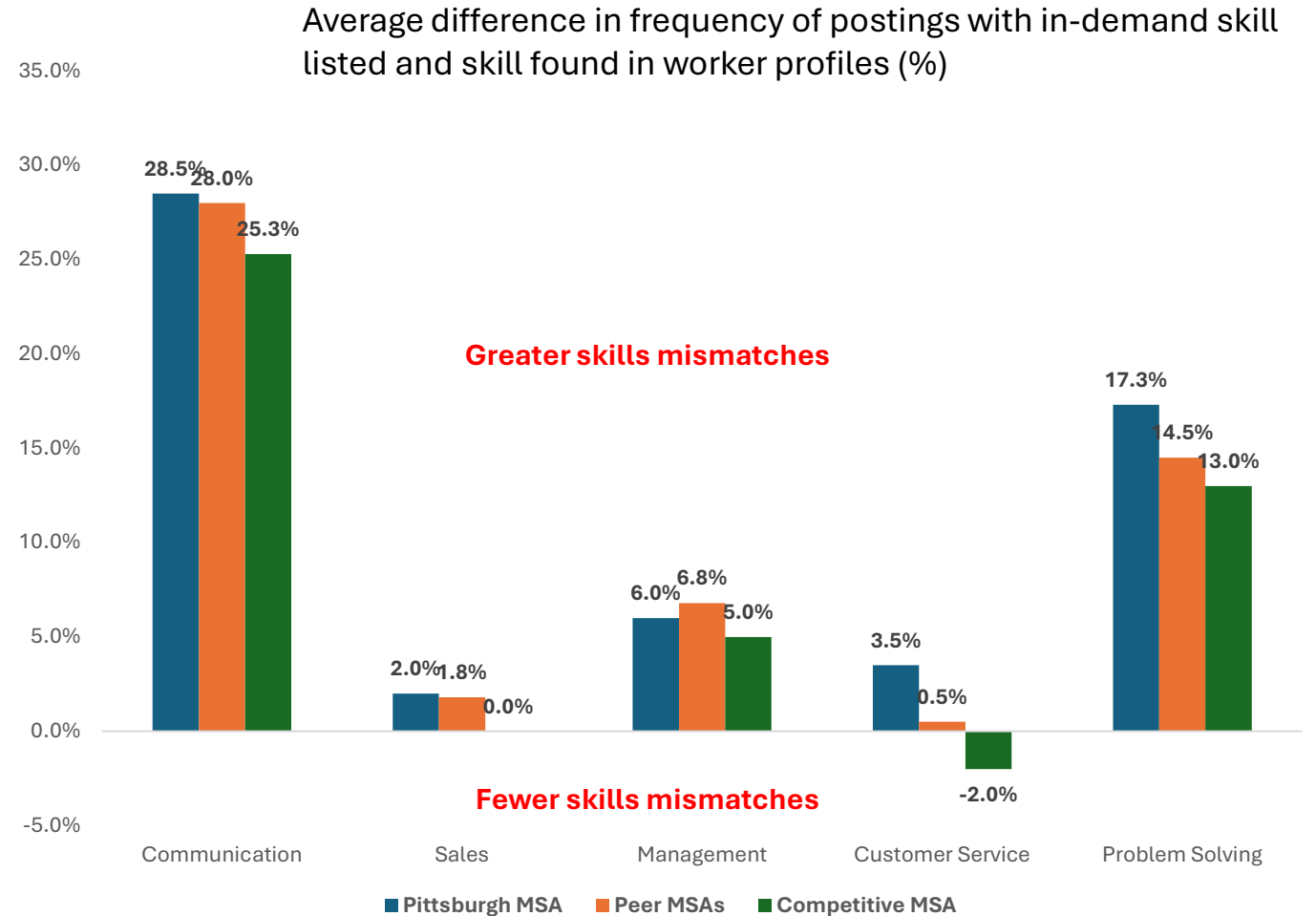
Frequency of advertised median salary (\$) and minimum education requirement of Bachelor's (%)



Source: Pittsburgh, peer, and competitive benchmark MSAs, Lightcast (datarun 2024.5)

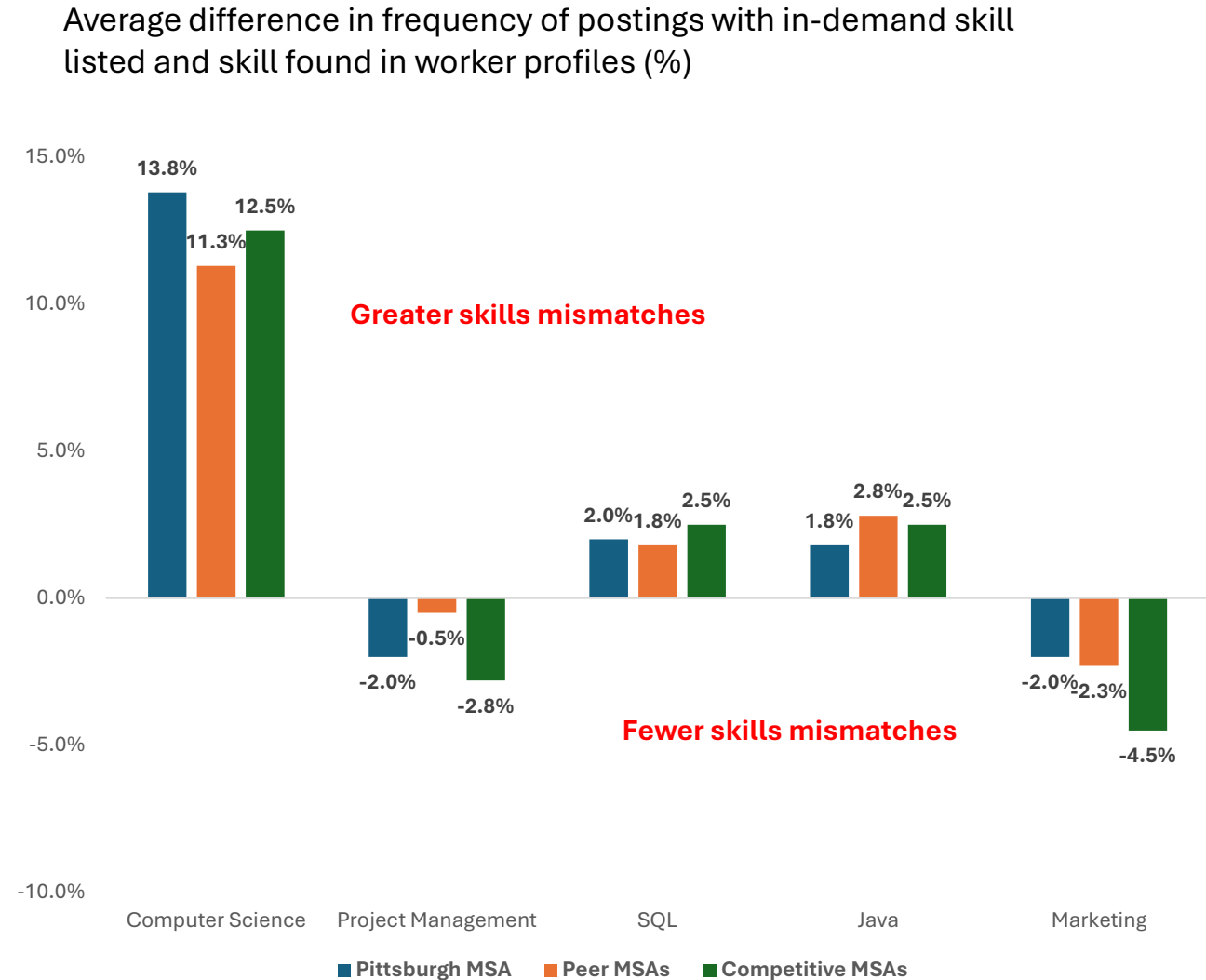
In-Demand Foundational Skills Mismatches

- **More workers with Customer Service and Sales** skills than jobs posting for this in-demand skill
- **Fewer workers with Communication and Problem-Solving** skills than jobs posting for these in-demand skills
- **Less overall mismatch** in jobs posting for top in-demand foundational skills and workers with top in-demand skills in competitive regions
- **Troubleshooting (Problem solving) persistent gap** across all regions



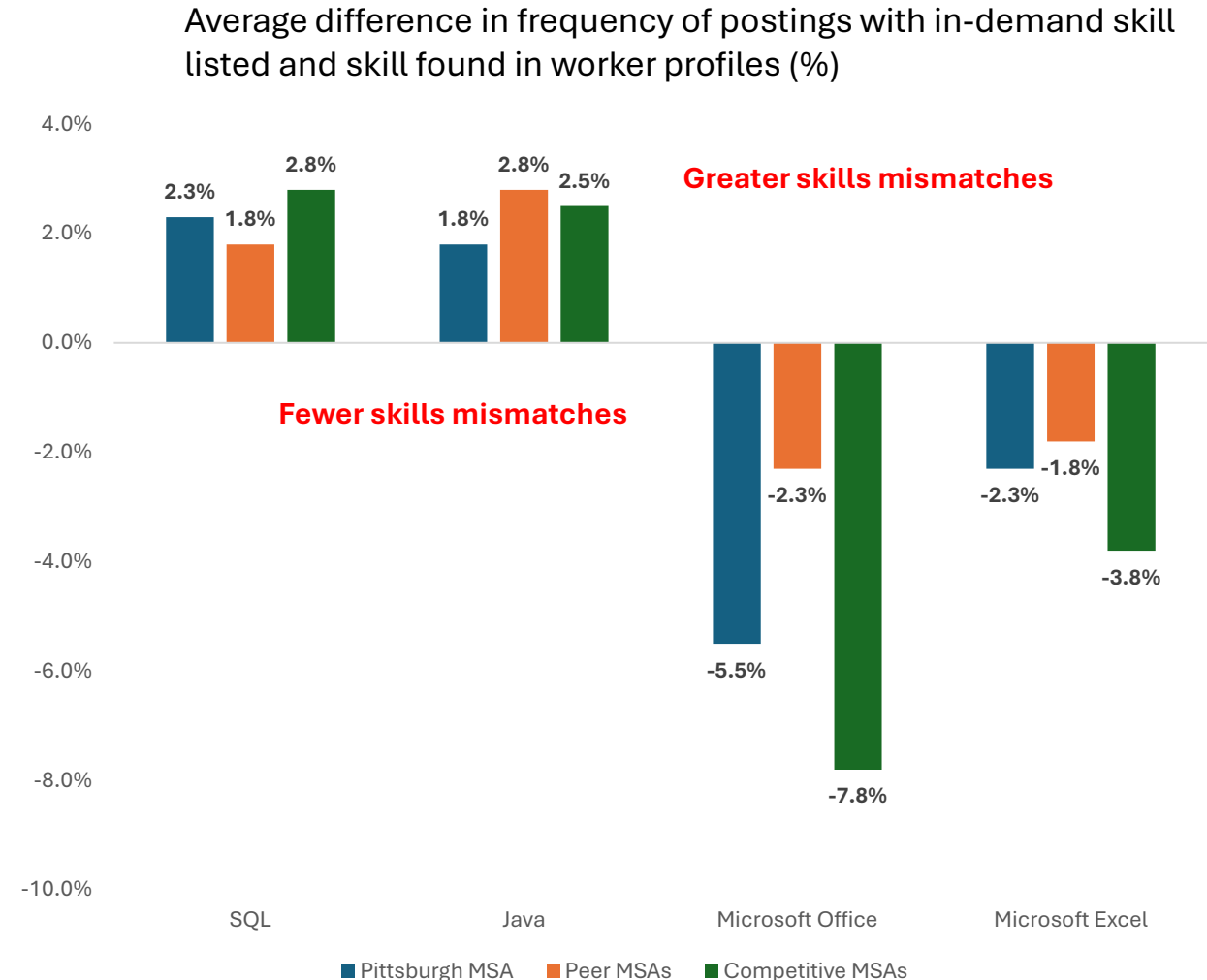
In-Demand Specialized Skills Mismatches

- **More workers** with **Project Management** and **Marketing** skills than jobs posting for these in-demand skills
- **Fewer workers** with **Computer Science** skills than jobs posting for this in-demand skill
- **More workers** with **Java** skills in Pittsburgh region
- **More workers** with **Computer Science** and **SQL** skills in peer regions
- **More workers** with **Project Management** and **Marketing** skills in competitive regions
- **More persistent skill mismatches** for **Agile Methodology** and **Automation** for Pittsburgh region only



In-Demand Software Skills Mismatches

- **More workers** with **Microsoft Office** and **Microsoft Excel** skills than jobs posting for these in-demand skills
- **Fewer workers** with **programming language skills** of SQL and Java than jobs posting for these in-demand skills
 - More workers with Java skills in Pittsburgh region
 - More workers with SQL skills in peer regions
- **More workers** with **Microsoft Office** and **Microsoft Excel** skills in competitive regions



Business Case Study: Duolingo

- **More postings** for workers with a **Bachelor's degree or above**
- **More postings** for workers **without experience** or between **2-3** and **4-6 years** of experience
- **More postings** for **Marketing Managers, Software Developers, and Human Resource Specialists and Managers**
- **English Language** number one top foundational in-demand skill (53.0% gap)
- **Greatest mismatches** in specialized top in-demand skills for **Computer Science, Product Design, and Scalability**
- **Greater mismatches** in software top in-demand skills for **R and Google Workspace**

Average difference in frequency of postings with in-demand skill listed and skill found in worker profiles (%)

