What's Driving Office Job Growth?

Computer and Math Occupations

July 2018

EXECUTIVE SUMMARY

- Office-using job growth creates demand for commercial office space
- Computer/mathematic-related occupations have been the number one driver of office-using job growth this cycle
- Absorption rates are positively correlated to growth in computer/math occupations—greater growth in computer/math occupations is associated with higher relative demand

Since 2010, the technology industry has played an increasingly important role in office leasing. Currently, about 20-25% of all new leasing is coming from technology firms. What has become apparent, however, is that STEM-related occupations—those related to science, technology, engineering and mathematics—are being created at much higher rates than are jobs in all office-using industries. The emergence of computational power is at the epicenter of these technically oriented disciplines: seven out of the top 10 largest STEM occupations are related to computers and information systems.[1]

There are 4.1 million computer and 167,000 mathematics occupations in the U.S. at present. When combined, this category added one million new jobs between 2010 and 2017.[2] Of those new computer/math jobs, 85.4% were in office-using industries, making it the largest occupational category driving the growth of new office-using jobs in the current expansion. Indeed, one-fifth of the 4.3 million jobs added by office-using industries between 2010 and 2017 were either computer-related or mathematics occupations. Employment in computer/math occupations grew by 29.8% between 2010 and 2017, more than double the 12.2% national rate for all occupations. This is a stark contrast to the previous expansion during which new financial/business analyst occupations across all industries outpaced new computer/math occupations three-to-one. During this cycle, that gap has closed—and possibly even reversed— within office-using industries.

Industries versus Occupations

This report distinguishes between industries and occupations. Industry categories are of the North American Industrial Classification System (NAICS); there are 20 primary (or two digit) industry categories. Occupations are defined using the Standard Occupational Classification system (SOC); there are 23 major occupational groups. The language in the report is precise as it refers to both industries and occupations throughout. For example, 'STEM' refers to a group of occupations that are related to science, technology, engineering and mathematics. These occupations exist in multiple industries.

1 STEM Occupations: Past, Present, And Future. U.S. Bureau of Labor Statistics, 2017.
2 These statistics are calculated using occupational employment data from the OES Survey, rather than CES and CPS survey data data (see the Appendix).

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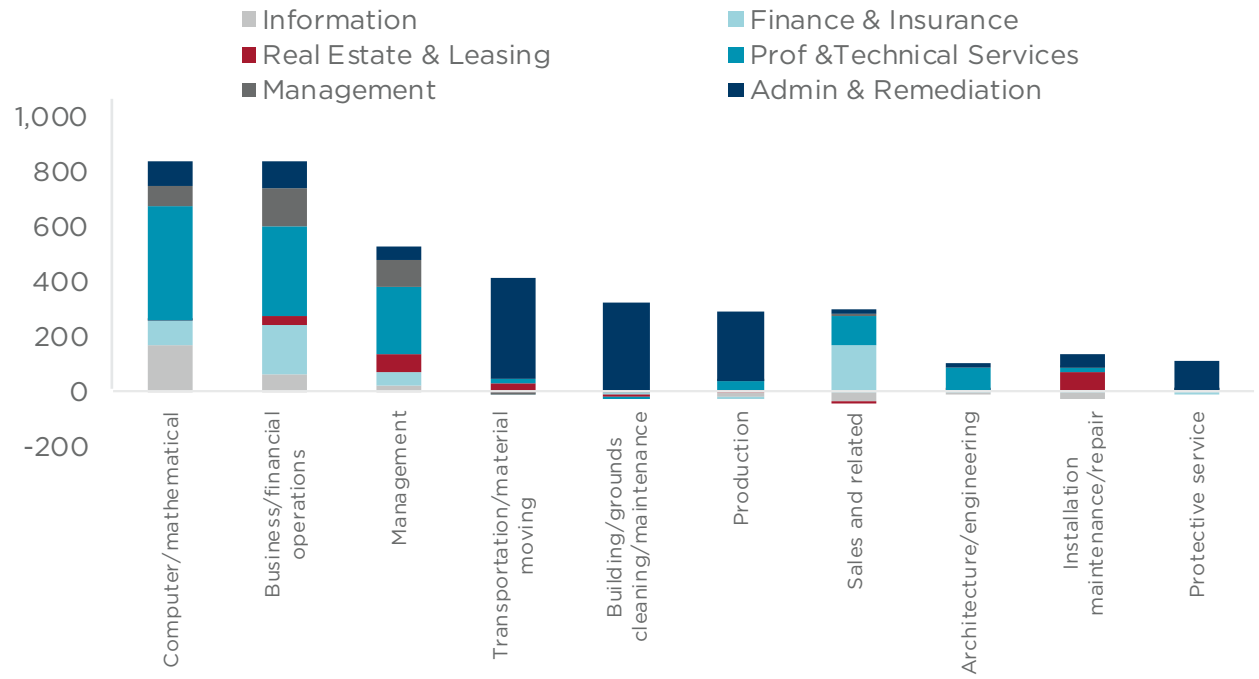
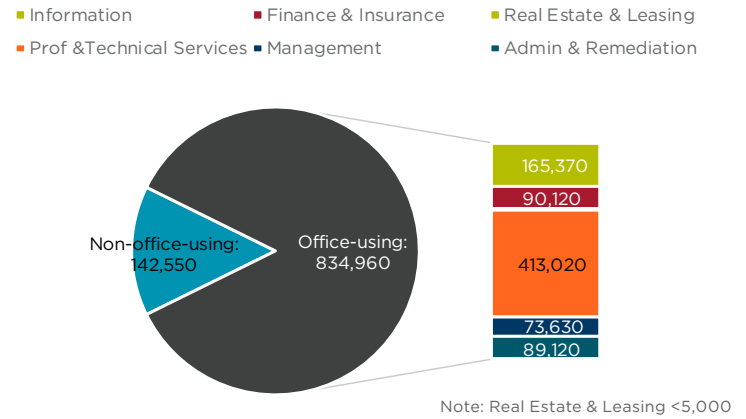
Occupations with Largest Growth in Office-using Industries (2010-2017, 000s)



Note: Color grades denote the industry in which jobs for each occupational group were created.
Source: U.S. Bureau of Labor Statistics

However, the growth in computer/math occupations is not limited to traditional technology companies. The information industry—which includes such companies as Facebook, Google and Microsoft—is expected to add the second highest number of computer and math jobs (84,600) from 2016 to 2026. But these figures are dwarfed by the number expected to be added by the professional and technical services industry, which will generate more than four times the number of jobs than the information industry (351,200). The financial services industry ranks third, and is forecast to create more than 50,000 jobs. Overall, office-using industries will account for almost 90% of computer/math occupational employment growth between 2016 and 2026.

Computer/Math Occupations Created (2010-2017)



Note: Real Estate & Leasing <5,000
Source: U.S. Bureau of Labor Statistics

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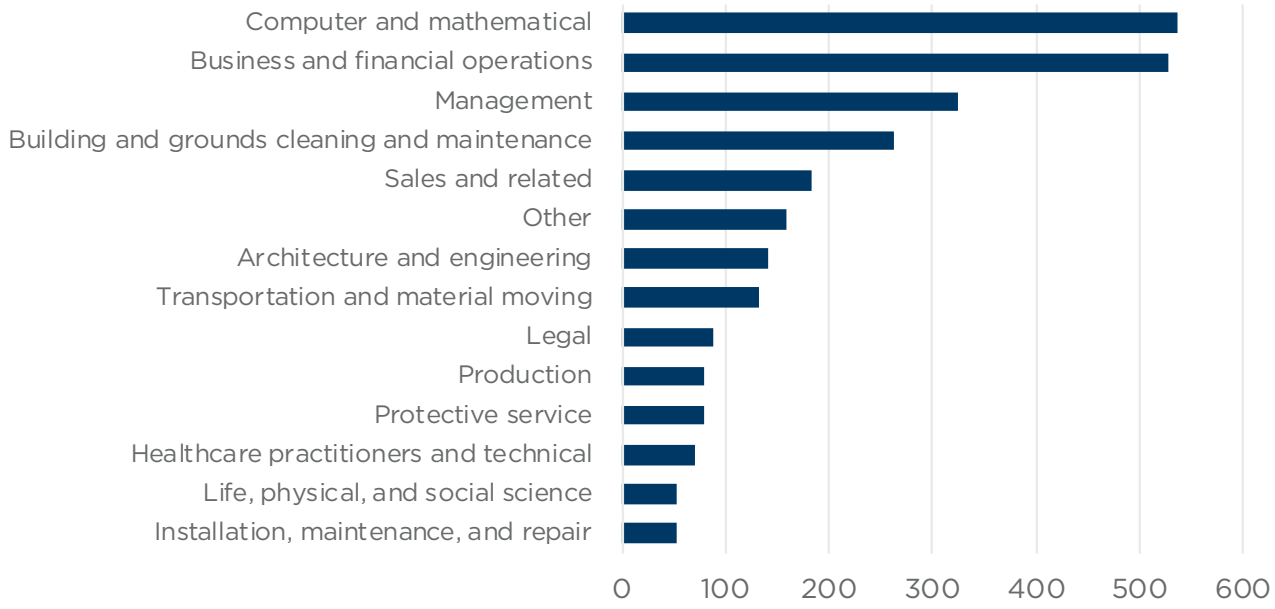
Computer and Math Occupations
July 2018

Office-using Employment Growth (2016-2026, 000s) By Major Occupation Category



Source: U.S. Bureau of Labor Statistics

With computer/math occupations assuming an increasing role among all industries that generate office-using employment and the likelihood of such jobs outpacing growth in the overall job market going forward, demand for office space will be strong in those markets that garner an outsized share of such jobs in the future.

STEM Supports Budding Office Demand

Twenty-one markets accounted for 50% of all computer/math occupations in the U.S. in 2017: those markets also captured more than 65% of all office absorption during this expansion (2010-2017) while accounting for only 50% of national inventory. Although many of these markets boast clusters of STEM and services industries as well as close access to knowledge centers—confounding factors that impact demand for commercial office space—it is clear that there is a positive relationship between the growth in computer/math occupations and office absorption rates. An analysis reveals that growth in computer/math occupations accounts for one-third of the increase in office absorption rates this cycle despite representing only one-fifth of office-using job growth.

Traditional "tech" markets—such as San Jose, San Francisco and Seattle—tend to have a higher relative concentration of computer/math occupations. However, the amount of demand for office space varies widely among those markets. This variance appears to be related to market size, with the smaller markets getting a "greater bang for the buck" in terms of office space demand. (Washington, DC has faced leasing headwinds this cycle related to the presence of the federal government and reductions in federal spending, thus affecting its vertical position on the chart on the next page; job losses related to those headwinds this cycle have offset the growth in computer/mathematics occupations.)

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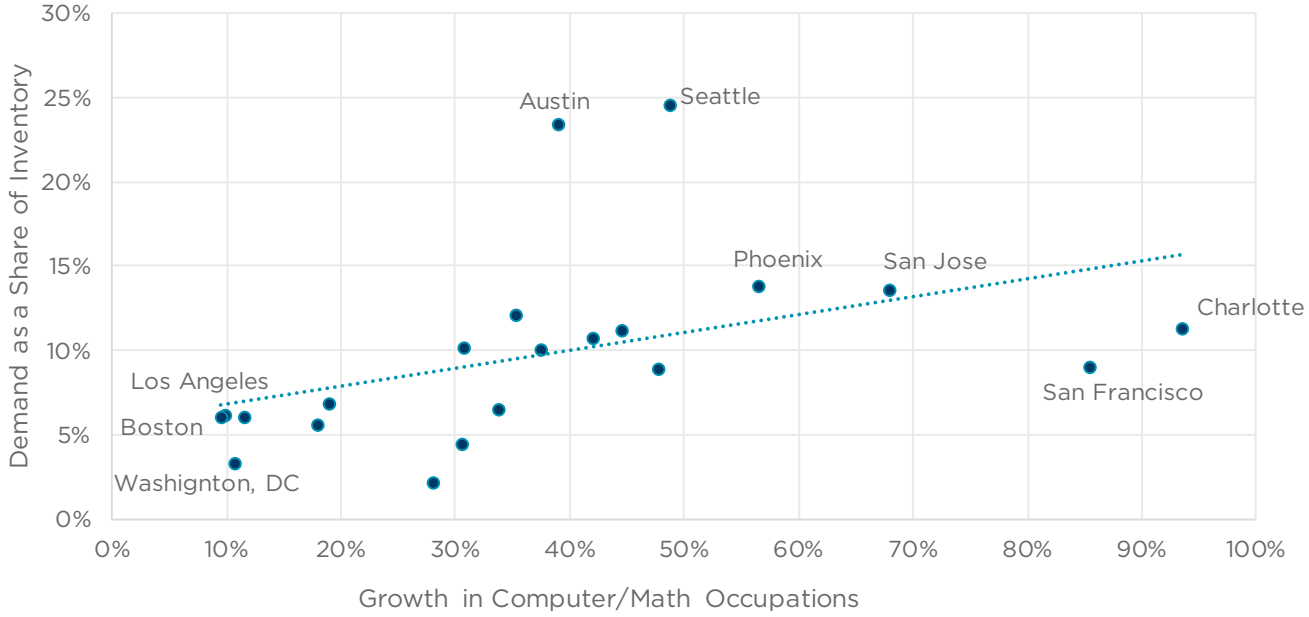
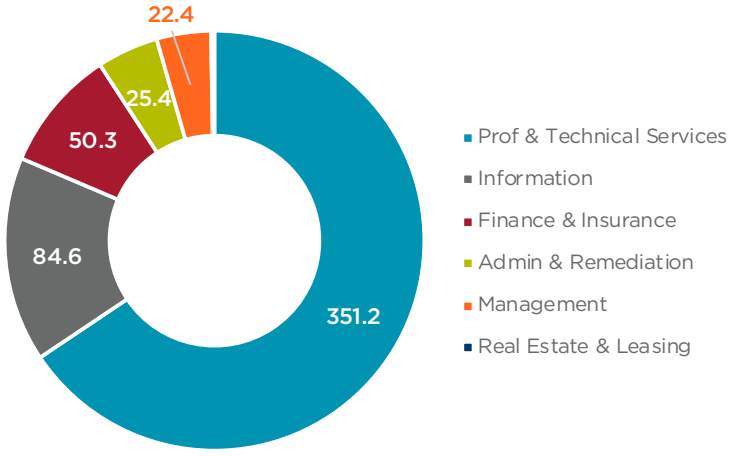
Growth in Computer/Math Occupations vs. Office Absorption Rates (2010-2017)



Source: U.S. Bureau of Labor Statistics, Cushman & Wakefield Research

Which Office-using Industries Will Create Computer/ Math Occupations (2016-2026, 000s)



Note: Real Estate & Leasing Industry will add <1,500
Source: U.S. Bureau of Labor Statistics

An increasing share of demand for office space is correlated with a higher rate of growth in computer/math occupations. Over the last seven years, Charlotte and San Francisco had unprecedented growth in such occupations, with compound annual growth rates of 9.9% and 9.2%, respectively. In contrast, St. Louis's growth rate averaged only 1.3% annually, followed by Los Angeles (1.4%), Washington, DC (1.5%) and Boston-Cambridge (1.6%). Again, the shares of office demand were highest in the comparatively smaller markets of Seattle, Austin and, to a lesser degree, Phoenix. Absorption in all markets with a 35% growth rate in computer/math occupations outperformed the national absorption rate from 2010-2017.

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Computer and Math Occupations
July 2018

These 21 Markets Comprised 50% of U.S. Computer/Math Occupations (2017)

MARKET	COMPUTER/ MATH JOBS	CUMULATIVE SHARE OF U.S.	LOCATION QUOTIENT	SHARE OF MARKET'S OFFICE EMPLOYMENT	OFFICE DEMAND (MSF, 2010-2017)	OFFICE DEMAND AS A SHARE OF INVENTORY (2010-2017)	MEDIAN ANNUAL SALARY
New York City	225,610	5.6%	1.13	11.3%	27.4	6.9%	$97,780
Washington, DC	193,830	10.4%	2.57	24.3%	9.8	3.3%	$105,360
San Jose	132,140	13.6%	4.06	37.9%	29.9	13.8%	$120,120
Seattle	128,040	16.8%	2.60	28.5%	16.1	24.5%	$112,450
Chicago	123,580	19.8%	1.13	12.0%	15.1	6.4%	$84,880
Dallas	121,240	22.8%	1.63	15.4%	24.9	11.2%	$90,950
Atlanta	115,940	25.7%	1.48	15.1%	12.5	8.9%	$85,060
Los Angeles	110,160	28.4%	0.83	10.5%	10.6	6.1%	$89,630
Boston	97,910	30.8%	1.78	12.8%	9.7	6.0%	$93,160
San Francisco	93,670	33.1%	2.81	21.7%	7.0	9.0%	$120,050
Houston	80,600	35.1%	0.92	12.0%	8.1	4.4%	$89,290
Minneapolis	79,230	37.1%	1.37	15.7%	4.1	5.6%	$84,730
Phoenix	76,010	39.0%	1.28	13.4%	13.9	13.6%	$80,750
Denver	71,000	40.7%	1.65	16.9%	11.5	10.1%	$94,210
Baltimore	61,410	42.2%	1.51	18.6%	7.6	10.0%	$95,610
Austin	60,070	43.7%	2.02	22.6%	11.7	23.4%	$86,280
Anaheim/Santa Ana	55,490	45.1%	1.15	12.4%	9.5	10.7%	$91,220
San Diego	52,200	46.4%	1.22	15.7%	9.3	12.1%	$93,900
Charlotte	47,600	47.5%	1.34	14.8%	11.9	11.3%	$89,310
St. Louis	47,310	48.7%	1.17	14.4%	2.9	6.0%	$82,510
Suburban Philadelphia	46,470	49.9%	1.50	15.1%	2.8	2.2%	$88,240

Note: A location quotient is a metric of relative concentration. A quotient of 1.5 suggests that the density of computer/math occupations is 150% of the U.S. average.
Source: U.S. Bureau of Labor Statistics, Cushman & Wakefield Research

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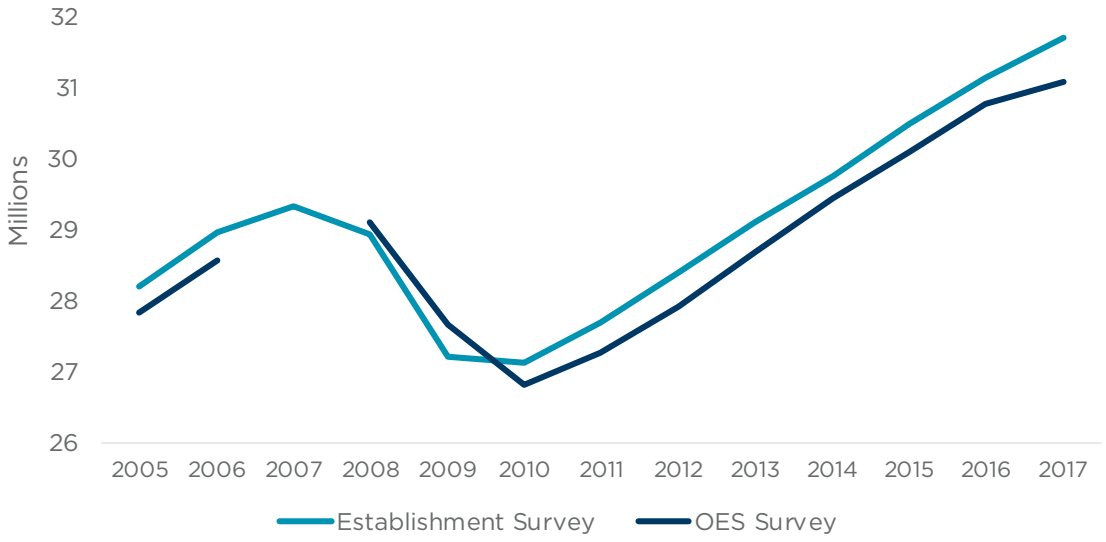
Appendix

Every year, the U.S. Bureau of Labor Statistics releases the Occupational Employment Statistics (OES). Unlike the standard monthly report on the status of the labor market, this annual report details the types of occupations that exist within industries. The OES program seeks detailed information about the level of occupations in the labor market and the wages those occupations command. Because it is created using a completely different survey design, there are implications for how the data can be used that differ from traditional employment statistics.

Here are a few key differences:

	ESTABLISHMENT SURVEY (CES)	HOUSEHOLD SURVEY (CPS)	OCCUPATIONAL EMPLOYMENT SURVEY (OES)
Key Statistic of Interest	Total employment, employment by industry	Unemployment rate(s)	Details about occupations
How often is it released?	Monthly	Monthly	Annual
Comparable across time?	Yes	Yes	Only if data are at least 3 years apart, with additional caveats
Comparable across time AND location?	Yes	Yes	(See above.) Because of changes to the MSA definitions, care should be taken when comparing markets over time.
How is employment classified?	By industry of reporting firm	NA—this is a survey of households	By industry of reporting firm
Are there details about individual occupations?	No	No	Yes, by industry and location

Comparison of CES Survey to OES Survey: Office-using Employment Jobs



Source: U.S. Bureau of Labor Statistics

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