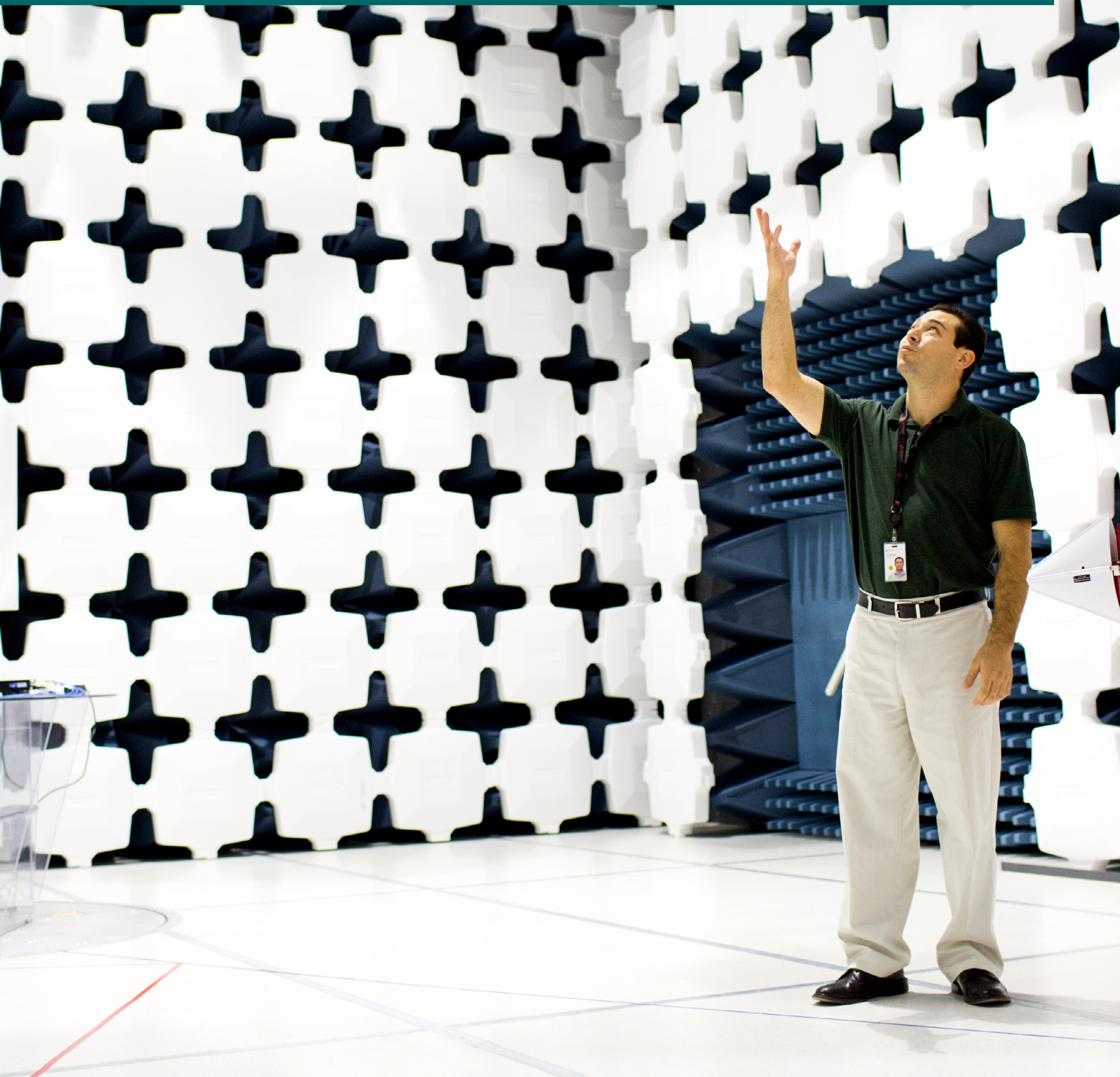
# INFORMATION TECHNOLOGY

INDUSTRY REPORT

2023



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# EXECUTIVE SUMMARY

June 2023

The Sonoma County Economic Development Board (EDB), in partnership with the Sonoma County Workforce Investment Board (WIB), is pleased to present the *2023 Information Technology Industry Insider* report. Our research partner, Moody's Analytics, provided the research for this report.

## HIGHLIGHTS

Information Technology makes up 2% of Sonoma County jobs and 6% of output. That puts Sonoma County at an average level for share of employment but at the high end for metro areas nationally in terms of output. Most of these jobs are in the telecommunications, computer systems design, and technical consulting services industries. Proximity to the Bay Area and slightly lower costs in Sonoma County have driven job creation over the past few years. However, growth has leveled off since mid-2021 due to overall weaker growth in the Bay Area, remote work, and cutting costs within the tech industry. Growth in the information technology industry overall is expected to be modest until interest rates come down and the economy stabilizes.

Tech industries are facing economic headwinds, but there are potential upsides for Sonoma County. Caution and cost-cutting nationwide will hold back investment and reduce hiring. Layoffs in the Bay Area have severely disrupted the regional industry and will cause a reduction in spillover benefits. However, the shift to remote work will benefit local electronic testing and broadband equipment makers. General demand for improved internet infrastructure, and other devices that rely on mobile connectivity will drive demand as well. Additionally, it is possible that the increase in remote work and layoffs have decentralized the workforce, which could benefit Sonoma if tech workers choose to relocate to the county.

The long term outlook calls for optimism with remaining challenges. A total of around $41 billion from the Department of Commerce is aimed towards advancing and producing semiconductor chips. While there have not been any large-scale investments into this work in Sonoma County, the region will benefit from spillover effects. Additionally, the growth of 5G technology, artificial intelligence, and autonomous driving will increase demand for advancing chips. Further, the need for connectivity was highlighted by the pandemic and many rely on remote work and school, increasing demand for technology. The largest challenge facing Sonoma is the concern around housing affordability and the decline of the working-age population.

Thank you for your interest in the Economic Development Board's research. For additional information, questions, comments, or suggestions please contact us at (707) 565-7170 or visit www.sonomaedb.org.

**Recent Performance.** Sonoma County's information technology industry is on solid ground. Though it has declined in stature since the heyday of the dot-com bubble, information technology still makes up a sizable portion of the county's workforce and output, accounting for 2% of jobs and more than 6% of the county's output. That concentration puts Sonoma at an average share of total employment but comfortably in the top half of metro areas nationally in terms of output. Employment has moved sideways over the past two years, though there has been downward pressure over the past year with the general malaise in tech-related industries following the aggressive interest rate hikes and cost-cutting measures throughout the industry.

Telecommunications, computer systems design, and technical consulting services make up most of the IT industry jobs in the county. IT consulting services have shown the most promise of late, and proximity to the dynamic Bay Area economies at a slightly lower cost has positioned this portion of the IT industry to drive the bulk of job creation over the past couple of years. However, weakness in the Bay Area, coupled with the proliferation of remote work and cost-cutting measures that are pushing firms to relocate or expand in lower-cost areas in the Mountain West, has caused growth to level off since mid-2021. Weakening investor sentiment and cooling venture capital funding have been additional tailwinds in recent months. Firms are also having difficulty raising capital. According to Pitchbook, venture capital funding distributed statewide declined in 2022, and this had knock-on effects to the IT firms that cater to startups.

**Macro drivers.** Despite stubbornly high inflation and the bank crises in recent weeks, the labor market remains resilient. The Moody's Analytics forecast for the remainder of 2023 and 2024 has not changed appreciably in the last couple of months. On a three-month moving average basis, job growth is around 220,000 on net. However, there are finally clear indications of an impending cooldown in the job market, underscoring the forecast for monthly job growth to slow to just less than 100,000 by next quarter and for the unemployment rate to rise by around 0.5 percentage point over the next year. This increase in the unemployment rate is indicative of a high probability of recession next year, but the forecast remains for a slowdown without falling into recession territory. Unemployment insurance claims are expected to peak at 350,000 by the end of 2024, indicative of falling labor demand consistent with a soft landing.

Financial markets will continue to feel the weight of the Federal Reserve's tightening of monetary policy in the near term, but the prospect of a soft landing of the economy and gradually decelerating inflation will allow the equity market to rebound over the course of 2023. The regulatory response to the bank failures in mid-March will stabilize financial markets, though the net effect will be an additional tightening of credit conditions, especially among smaller banks.

Tighter underwriting and weakening credit flows will weigh most heavily on construction activity and small-business investment and hiring. Businesses with fewer than 100 employees will be hit hardest, and they account for about one-third of private employment nationwide and one-fourth of gross output. Weaker credit will also be a headwind to consumer spending, albeit less so, and more indirectly through a softer job market and any impact on consumer confidence. Economy-wide, the banking crisis is expected to reduce real GDP in 2023 by 0.5 percentage point to near 1%, about half the economy's estimated growth potential.

Consumer spending is likewise set to downshift in tandem with the labor market. As excess savings dwindle down and the labor market cools, consumer spending will settle into a slower pace than seen over the past few years. On the plus side, drags from supply constraints will gradually lessen, inflation will slow, and jobs will remain plentiful. However, job growth is slowing, inflation remains a drag, wage growth is slowing, the excess savings drawdown will decline, and wealth is low. Real consumer spending rose 2.7% in 2022 and will grow less than 2.5% in 2023 and at an even slower pace in 2024.

**Industry drivers.** The year ahead will be categorized by slower growth given the confluence of macroeconomic headwinds. A slower growth environment in the U.S. and globally, coupled with weakness in the equity market and tech more broadly, will lead to slower net hiring and output compared with the pre-pandemic years. Firms will be more cautious in payroll and research and development spending, leading to only modest job gains in the industry until interest rates normalize and the global economy ratchets up. Weaker credit growth will especially hamper small IT firms in the county. Still, there are long-term factors that augur a more optimistic outlook for the IT industry once the dust settles.

In March, the Department of Commerce began accepting applications for subsidies under the landmark CHIPS and Science Act. The bill includes direct funding, loans and loan guarantees for the manufacturing and research of semiconductors. Around $39 billion of the funding is aimed toward advanced chips, while an additional $2 billion is designated for legacy chip production. Pandemic-induced shortages of semiconductors, coupled with growing national security concerns over production, have driven the push toward the reshoring of semiconductor manufacturing. Since the bill was introduced, more than 40 new semiconductor projects have been announced in the U.S., including the construction of new fabrication plants, expansions of existing sites, and new facilities that supply materials and equipment used for chip manufacturing. The new projects amount to around $200 billion in private investment and are expected to create more than 40,000 direct jobs within the semiconductor industry nationwide.

While there have been no announcements of these large-scale investments in Sonoma, the push toward reshoring semiconductor manufacturing will lead to further spillover growth in related IT goods production. Global demand for semiconductors will rise in the long term as an increasing number of products are connected to the internet. The global smart-home and cloud-computing markets continue to grow exponentially. Future catalysts, including the rollout of 5G technology, artificial intelligence, and autonomous driving, will ensure sufficient demand for more advanced chips.

Consumer demand is on the rise as technology becomes more integrated into our daily lives. The need for connectivity and communication, convenience and efficiency, and the development of new technologies such as virtual and augmented reality was accelerated by the pandemic, as more people have shifted to remote work and online learning.

Rising smartphone penetration globally as well as the incorporation of additional computer and electronic components into automobiles, airplanes and other vehicles will amplify sales of top employer Keysight's next-generation signal analyzers and oscilloscopes. Yet automation will limit the need for new labor, holding back employment growth compared with the pre-pandemic years.

Cloud computing continues to be a disruptive influence as enterprises shed their in-house hardware-based architecture in favor of cloud-based systems. As cloud-based systems take hold, the software and hardware along with related services provided by information technology firms will grow. One of the key advantages of cloud computing is the ability to tap into AI and machine learning. The modern digital economy generates vast quantities of data every day, and AI/ML can help businesses to organize and make sense of that data, a need that could only grow in the years ahead.

Sonoma County's technology firms are facing some near-term economic headwinds. While consumers are pessimistic, they are still spending at a solid pace, but the same cannot be said of tech firms nationwide. A significant equity market correction and rising interest rates have tech firms acting with significant caution, and a slew of tech firms are implementing cost-cutting measures as valuations decrease. Decreased business investment will hold back hiring in the county's tech base. On a positive note, persistent remote work will benefit local electronic testing and broadband equipment makers, along with ongoing modification efforts of the internet infrastructure and demand for smart-home and other household devices that rely on mobile connectivity.

Spillover growth from the Bay Area in the near term will be muted. Layoffs across Silicon Valley and the broader Bay Area have led to significant disruption and flipped the script following a multidecade boom. Cuts span both services and goods, although the former has borne the brunt. Most major firms have pared payrolls, with Google, Cisco, PayPal and Meta among the most aggressive in doing so. A diminished startup scene only adds to the woes, with PitchBook reporting that the Bay Area experienced the nation's sharpest decline in funding last year. With muted growth in tech in the Bay Area, Sonoma will benefit less from any spillover and agglomeration effects that it had in years past. On the other hand, remote work has made these layoffs more diffuse, and a more decentralized workforce may benefit Sonoma if tech workers choose to locate in the county.

**Pricing.** Tech firms will mostly hold on to their pricing power. The global semiconductor shortage has garnered headlines over the past year, but supply-chain bottlenecks are easing. The global smart-home and cloud-computing markets continue to grow rapidly, and future catalysts, including the rollout of 5G technology and autonomous vehicles, will ensure sufficient demand for more-advanced chips. Still, semiconductor prices have hardly budged since their low in December 2020, and large-scale U.S. investment to reshore production will lift supply concerns and ensure that prices stay depressed.

Information technology firms beyond semiconductors will likely lose some pricing power. A pullback in business-to-business spending and research and development associated with general tech malaise will keep a lid on demand through this year. Rising costs of capital amid higher interest rates may suppress adoption and investment into cloud computing as businesses grow more cost-conscious. As the economy regains momentum, the long-term structural shift toward digitalization will lead to improved pricing power.

**Operating expenses.** A cooling labor market will help alleviate wage pressures, which had grown rapidly over the past few years as firms competed for a small pool of talented tech workers. Average weekly wages across the information technology industry were up around 10% on an annual basis through the third quarter of 2022. Though wage growth is still strong, with the employment cost index rising more strongly than expected in the first quarter, job growth is beginning to slow. Less labor demand will ease labor market tightness through the end of this year. Labor costs are the highest share of operating expenses across the county's various information technology firms, and this will provide respite for operating expenses.

The future of commodity prices, which are important inputs for high-tech manufacturers, will likely follow a similar path. Increases in the price of metals used among tech manufacturers, including copper and lithium, have slowed but are still elevated by historical standards. The impacts of the Russa-Ukraine war are beginning to wane and slowing global demand will provide less upward pressure on commodity prices.

Industrial and office vacancy rates are ticking higher, which bodes well for information technology firms looking to expand their production or office space. Office vacancy rates through the first quarter are up 2 percentage points in the last year, and rental costs are ticking lower as a result. The industrial market is faring slightly better, but vacancy rates are still about a half percentage point higher than a year ago and could entice more firms to expand or locate in the county as cost pressures ease.

**Long-term outlook.** The long-term outlook for Sonoma's information cluster is one of guarded optimism. Technological advancements, the push to digitalization and the cloud, and the surge in remote work since the onset of the pandemic offer favorable tailwinds once the U.S. and global economies regain momentum, but challenges remain. Chief among these challenges is rising housing affordability concerns that have severely hampered population growth. The working-age population is already down about 8% compared with its high-water mark in 2010. With the runup in house prices over the past few years, affordability has deteriorated. While house prices will cool and the housing market will begin to rebalance over the next few years, demographic trends will remain headwinds. According to Equifax data, the net outflow of residents is slowing, but the county is still losing more residents than before the pandemic. Slower population growth, particularly among young adults, will weigh on labor force growth, making it more difficult for the county to attract new business investment and could push existing firms to expand in faster-growing areas.

Greater automation, and in general a push toward labor-saving technologies, will slow the pace of job additions even as county producers grow their operations. Thus, information technology's contribution to countywide job and income growth will be contingent on entrepreneurs' ability to innovate across product lines and to pioneer new product segments.

A high quality of life and proximity to the tech powerhouses in the Bay Area confer significant structural advantages and give Sonoma a leg up. Even despite the challenges faced by tech over the past year, the Bay Area remains the preeminent destination for tech firms and employs the largest share of tech workers nationally by a comfortable margin. These agglomeration and spillover effects thanks to the proximity to Sonoma will benefit the county and provide ample growth opportunities for Sonoma's information technology's new and established firms.

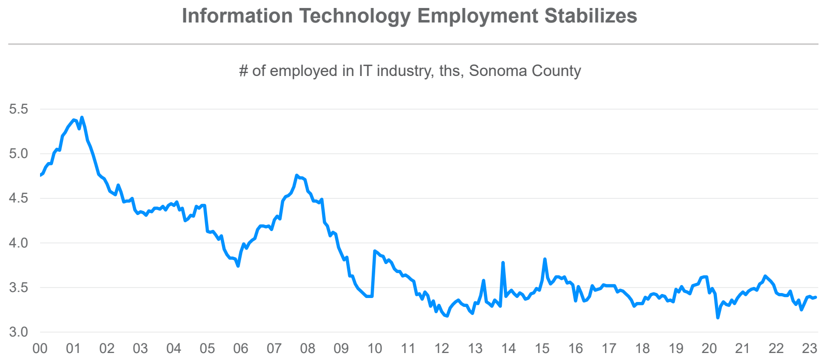
Global demand for information technology's software and hardware solutions is expected to grow rapidly over the next decade, and the county's IT cluster is forecast to grow at a slightly above-average rate in the long term. While demographic trends will apply restraint, a highly skilled workforce, high quality of life, and proximity to the Bay Area will prove to be lasting advantages for the county and enough to outmuscle these labor supply challenges.

**Upside risks.** Consumer spending could exceed expectations and drive faster growth. The labor market is loosening but remains tight, keeping job and income growth elevated. Businesses, correctly, are calculating that the labor-supply issues in the aftermath of the pandemic are here to stay. This is leading them to retain staff despite slowing demand. This dynamic could push household income up faster than expected. As much of the income is spent, the economy would grow above expectations. More flush consumers would benefit Sonoma's cluster of IT firms, which cater to the consumer goods market, and an economy growing above potential would lead business investment to grow at a faster than anticipated rate.

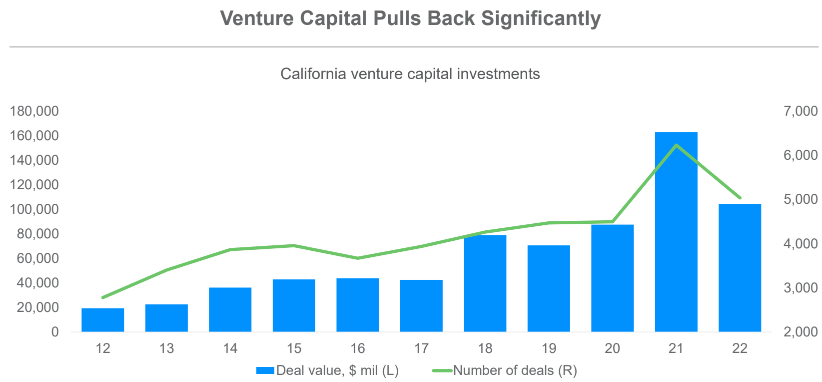
**Downside risks.** The Federal Open Market Committee's job has become more difficult, and the chances of a misstep have risen. Fed officials, stressing faith in the banking sector, again elected to raise rates at May's meeting. Moody's Analytics expects this was the last rate hike of this tightening cycle and that the Fed now pauses to evaluate the U.S. economy's reaction to its restrictive policy. The financial system is stabilizing, but the Fed's tightening could expose vulnerable financial institutions to insurmountable stress, worsen lending conditions, and create a credit crunch. If banks continue to tighten, business investment and consumer spending will turn sharply downward, weighing heavily on Sonoma's information technology cluster.

*Colin Seitz*
*May 2023*

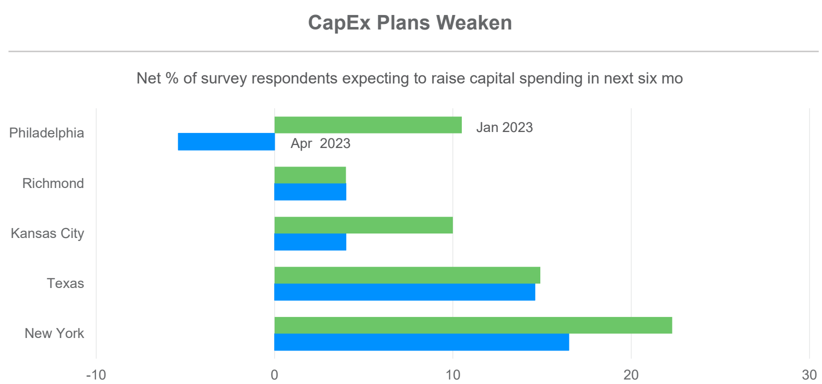
Employment in Sonoma County's information technology industry has moved sideways for the better part of a decade. After some upward momentum following the pandemic-induced recession, aggressive interest rate hikes and financial market uncertainty have led to a slight pullback in net hiring since early 2022. With the economy set to enter a period of slower growth but avoid outright recession, information technology employment will tick only modestly higher in the short run.



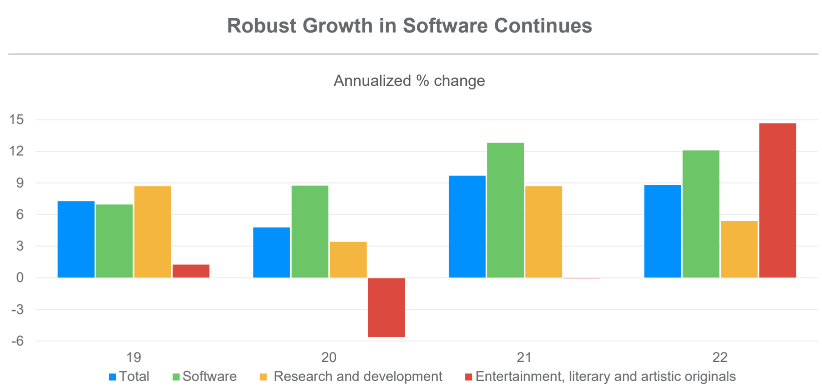

Venture capital funding dropped significantly after a record-setting year in 2021. Venture capital disbursements to California declined about 35% in 2022, as recession fears gave investors pause and rising interest rates have led to sizable jump in the cost of capital. A slowing venture capital spigot will hold back hiring and spillover growth from the Bay Area. Early returns in 2023 suggest that this trend is continuing, but with the Fed likely pausing its interest rate hikes, there is some optimism for the second half of the year.




Anticipated business investment has been down in recent months. In April, four of the five regional Federal Reserve banks that survey planned capital expenditures reported a decline since January in the share of companies expecting to spend more in six months than they do now. This mirrors the trend in venture capital funding. Reduced business spending on information technology goods and services will put a speed limit on growth in Sonoma's IT industry.




Intellectual property product investment has been the bedrock of business investment spending in the aftermath of the pandemic, but the headwinds caused by tighter bank lending standards, high interest rates, and shrinking profits will force businesses to drastically scale back spending on intangible products this year. Since 2019, intellectual property products investment has increased by more than 20%, with the software segment seeing robust growth. While this will slow in 2023, strong software spending will provide stability for the IT industry.




Sources: BEA, Moody's Analytics

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