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Regional Economic Outlook

Sonoma County CA

Summary

Sonoma County is thriving. More than six years into the local recovery, the labor market is buoyant, housing demand is firming, balance sheets are sturdy, and incomes are rising. Not only has the unemployment rate reached its lowest point since the height of the tech boom in the late 1990s, but the ratio of total employment to the working-age population, which includes workers who are not actively seeking employment, is nearing a record high. Job market slack is dissipating, and greater competition for workers is boosting wage and salary income growth.

Sonoma County's key industry clusters—tourism and hospitality, wine-making and craft beverages, and speciality manufacturing and lifestyle products—are fully engaged. Technology-producing firms also lend support. Over the next few years, the strong U.S. economy and the accompanying rise in disposable incomes across the West and nationwide will drive stronger demand for Sonoma County's goods and services. Moreover, county producers will benefit from evolving consumer preferences—in particular, growing enthusiasm for artisanal and ethically sourced goods. This will play to the county's comparative advantages in sustainable agriculture, wellness-oriented travel experiences, and wine and craft beverage production.

Despite the positive near-term outlook, Sonoma County's economy faces considerable challenges in the long run. Chief among them is an aging population and declining net migration, which will restrain labor force growth into the next decade. As older workers begin to exit the labor force and fewer prime-age workers step in to take their place, the labor force will increase more slowly, lowering the county's long-run potential growth rate. Moreover, flat growth in the prime-age cohort will weigh on productivity since these workers are more likely to start a new business or migrate in search of better job opportunities.

The supply-constrained housing market presents a further barrier to long-run growth, especially if rapid house price gains continue to price out potential residents. Housing affordability has deteriorated markedly in the past five years as house price appreciation has outstripped income growth. If unchecked, the shortage of affordable housing will dampen efforts to bolster the labor force.

Efforts to promote entrepreneurship and to train a new generation of skilled workers will be equally important to the county's long-term success. Over the long run, population gains will increasingly rely on the ability to attract new residents. As younger cohorts age into the labor force, it will be critical to ensure that they obtain the education and training necessary to fully participate in Sonoma's key industry clusters and the broader economy.

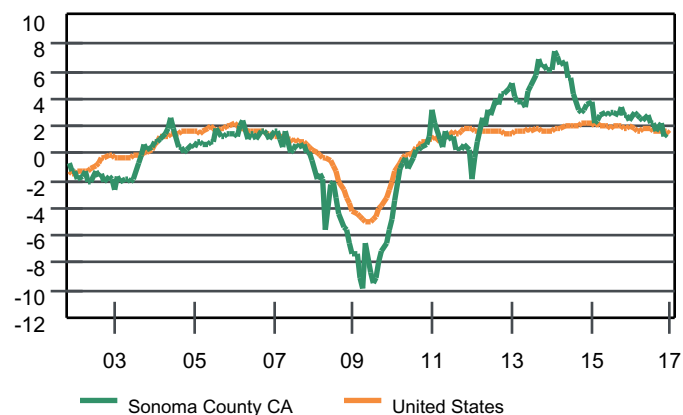
Though significant, these challenges are not insurmountable. To bolster the economy's momentum, the county will have to ensure an ample supply of housing, attract younger households and new migrants, and ensure that all workers are equipped with the skills vital to success in the county's leading industries. If these challenges are met, Sonoma County's economy will advance on the path toward long-run expansion.

Recent Performance

After leading the U.S. and California's other midsize metro areas in job growth for much of the past four years, Sonoma County is settling into a more modest pace of growth as the local labor market nears full employment. Still, job growth is keeping pace with the U.S. average, pushing the unemployment rate lower, even amid strong labor force growth. The tightening labor market is lifting wage income and total personal income growth.

Employment Growth

% change yr ago

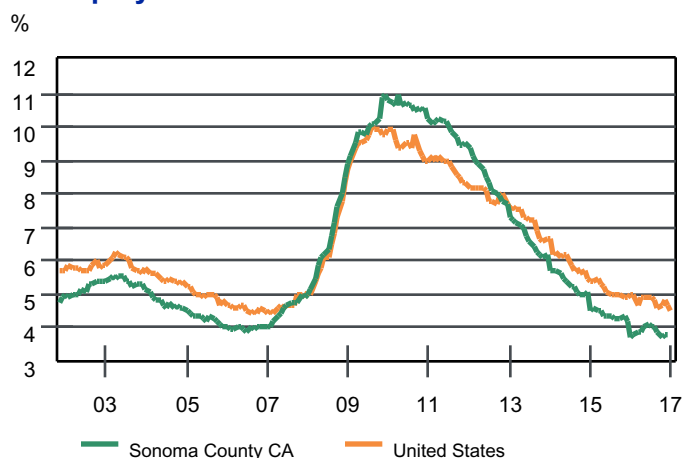


Sources: BLS, Moody's Analytics

Going the Distance: An Economic Outlook for Sonoma County

Robust job growth has pushed the jobless rate close to a two-decade low. Not only is the unemployment rate falling, but the ratio of total employment to the working-age population, which includes workers who are not actively seeking employment, is at a record high, a sign that labor market slack is quickly dissipating.

Unemployment Rate



Sources: BLS, Moody's Analytics

The jobless rate has fallen more quickly than the U.S. rate since 2013. At its peak, the local jobless rate was 1 percentage point above the national rate. But as of February, Sonoma County's rate sits 0.9 percentage point below the national average.

Hiring in Sonoma's primary industry clusters has cooled over the past year as hospitality operators and food and beverage

manufacturers run up against capacity constraints. Still, more than half of private sector industries are adding to payrolls, led by business/professional services, construction, and healthcare. Secondary drivers such as financial and real estate services have been slower to engage but are making a small but positive contribution to job growth.

The hospitality industry is generating increased visitor traffic through Charles M. Schulz-Sonoma County Airport. As of March, air passenger traffic at the airport was up 24% from a year earlier. Greater demand for business and leisure travel has spurred major carriers to extend service to the hub, including American Airlines and United, the latter of which will offer daily flights from Sonoma County to San Francisco later this year. Sonoma County has also benefited directly from rising tourist traffic through San Francisco International Airport.

Rising tourist visits are pushing hotel occupancy and room rates to new highs. According to Smith Travel Research, hotel occupancy rates in Sonoma County reached a record 77.6% in 2016, up nearly 2 percentage points from the prior year. Meanwhile, the average daily rate surged 7% from 2015 to \$159, indicative of firming pricing power.

The housing market is strong in Sonoma County, but there is an imbalance between supply and demand. Despite the near-complete recovery in house prices, relatively few homes are making their way onto the market, and the resulting tight inventory of existing homes for sale limits options for potential buyers. As a result, multifamily units have absorbed the bulk of newly formed households, while prices for existing single-family homes appreciate at nearly twice the national rate. Construction of new, single-family homes has turned up for the first time since the housing

Employment, Recent Performance

Feb 2017

	Annualized growth rate				
	3-mo	6-mo	12-mo	5 yr	10 yr
Total	3.2	0.6	1.4	3.7	0.7
Construction	-8.8	2.7	4.0	8.5	-1.4
Manufacturing	-9.3	-13.1	-7.0	1.4	-0.6
Wholesale Trade	2.3	2.9	-1.5	3.0	-0.0
Retail Trade	-1.0	-3.8	-1.0	2.0	0.3
Transportation and Utilities	22.3	8.8	7.3	3.1	-0.2
Information	-2.0	-1.4	-3.8	1.5	-1.2
Financial Activities	-5.0	1.4	-0.2	2.8	-1.3
Professional and Business Services	13.7	13.4	9.8	4.9	0.1
Education and Health Services	18.7	3.2	3.1	5.7	4.2
Leisure and Hospitality	8.0	0.7	0.2	3.3	1.8
Government	-3.3	0.2	2.5	3.4	0.6
	%				
Unemployment rate	3.8	3.9	3.9	5.8	7.0

Sources: BLS, Moody's Analytics

market bottomed in 2010. However, newly built homes have done little to alleviate the supply shortage, as household formations outpace single-family completions.

Household balance sheets are sturdy, and consumer credit quality continues to improve across loan categories. Mortgage, bankcard and automobile delinquencies have fallen back to their prerecession rates, according to Equifax. Though consumer lending is once again on the rise, growth has been concentrated in bankcard and auto lending. In contrast, while mortgage lending may be rising, it is doing so only moderately.

Near-term outlook

Sonoma County's economy will strengthen over the next few years. Though job growth will decelerate as the labor market reaches full employment and the pool of idle workers thins, the ensuing competition for workers will boost wages. As a result, each additional job will carry more weight. Despite lukewarm economic growth at the national level, household balance sheets are sturdy and will support additional spending. As U.S. consumer confidence firms and wage growth strengthens regionally and at the national level, Sonoma County's leisure, hospitality and wine industries will build momentum. Improving business investment spending should also support local technology-producing industries.

Travel and Tourism. Tourism in Sonoma County reached new highs in 2016, and the industry is poised for an encore performance this year. Tourist visits to the county have fully recovered from their post-recession nadir, and both hotel occupancy rates and per-room revenues are setting new records. Job growth in leisure/hospitality has cooled over the past year, but industry payrolls rest nearly one-fifth above their previous peak in 2008. A bevy of new hotel and lodging projects throughout the county will add to capacity and enable the industry to keep pace with the state and national averages in the long run.

The positive near-term outlook for tourism is anchored by low gasoline prices, firming consumer confidence, and stronger wage growth that will raise household disposable incomes across the West and nationwide as the economy reaches full employment. Most visitors—including out of state and international tourists—arrive by car, and gasoline prices, while now up from cyclical lows early last year, will remain affordable. This will clear space in visitors' budgets for more spending on local attractions and accommodations.

World-class wineries will remain the primary draw for high-income tourism, but the increasing prominence of craft breweries and distilleries, coupled with a sophisticated dining and art scene, will draw a new generation of tourists to wine country. As restaurants and brewpubs in the county and the broader Bay Area feature county ales and spirits, greater visibility of craft beverage producers will draw increased tourist visits to county taprooms, breweries and distilleries.

Vacationers' search for holistic health and wellness experiences offers another avenue for growth. Destination spending on wellness treatments has outpaced overall travel spending in recent years as health-conscious travelers seek out unique spa, outdoor recreation and culinary experiences. As health and restorative treatments figure more prominently in vacationers' priorities, the county's natural beauty, reputation for holistic health treatments, and cutting-edge spa and wellness centers will draw additional visitors.

Sonoma County's prestige as a premier international destination for wine-making, craft breweries and distilleries, and innovative cuisine has helped to draw increasing numbers of international tourists over the past two decades. However, with slower growth in China and emerging markets and the appreciation of the U.S. dollar, Sonoma's tourism will rely less on international tourists for near-term growth. Fortunately, a rise in domestic tourists will more than make up for any shortfall in international arrivals. According to the Conference Board, the share of Americans planning a vacation in the next six months is close to a two-year high. Rising incomes will unleash pent-up demand for travel among high-income and budget-conscious travelers alike.

Sonoma County tourism will also benefit from local tailwinds. Rapidly rising incomes for high-tech workers in the Bay Area are driving an increase in day trips to Sonoma's wine country, and this trend will strengthen as incomes rise for workers in a variety of industries in the Bay Area.

Despite the rapid rise in labor costs, Sonoma County's leisure services will retain pricing power in the near term. According to the Quarterly Census of Employment and Wages, average weekly pay for leisure and hospitality workers has risen by nearly 4% over the past year, but per-room revenues for hotels have increased even faster. Pricing power will be more prevalent at higher-end accommodations than among lodgings that cater to budget-conscious travelers, but spending constraints for middle-income visitors will begin to ease this year as wage growth accelerates.

Wine and Craft Beverages. Sonoma County vintners and craft beverage makers are staking out gains in the increasingly competitive marketplace for adult beverages. Vintners are seizing on consumers' thirst for more sophisticated wines, which has elevated sales of high-end bottles produced in Sonoma County. Meanwhile, local craft breweries are growing in sales and prestige as more beer enthusiasts make their way to county taprooms. Sonoma brewers are pushing ahead with plans for expansion both nationally and within the county. Craft spirits represent a small share of county beverage production, but local distillers are growing quickly and gaining recognition at the national level.

Total domestic wine consumption resumed its upward climb in 2016. Even though wine drinkers are trading up to higher-priced bottles, they are both drinking better and drinking more. While

sales of wines priced \$9 and below are sliding, bottles priced \$15 and above are chalking up double-digit gains.

The shift to quality has paid large dividends for Sonoma's small and medium-size wineries, which rely more on direct-to-consumer purchases. Sonoma vintners, which account for almost a quarter of sales in the direct shipping channel, outpaced all other U.S. wine-growing regions in both sales and volume growth last year. More states are permitting direct shipments, creating opportunities for county vintners to grow sales beyond visits to local tasting rooms.

The larger 2016 wine grape harvest will bring welcome relief to county vintners following the light 2015 crop. Meanwhile, mild weather during the critical period of bud break should bring the size of this year's vintage in line with historical averages. Given surging demand for North Coast grapes, another light crop could push larger winemakers to top off offerings with inland appellations, diluting the quality and reputation of county wines.

Sonoma's craft breweries are booming as more beer drinkers opt for craft ales over mass-market offerings. Total craft beer sales rose a solid 10% in 2016 and, at \$24 billion, now account for more than one-fifth of overall U.S. beer sales. Not only does the county boast several of the largest craft brewers nationwide, but smaller players are expanding as well: The number of craft breweries in the county has increased by one-third in the past three years alone. Abundant warehouse space, an increasingly diverse dining scene, and rising tourist interest in craft beers have fostered growth, but proximity to artisanal food producers provides additional advantages by supplying rare ingredients vital to crafting distinct tastes.

County craft spirits producers are coming into their own as local whiskey, vodka and gin makers gain national acclaim. Although most production is destined for local taprooms, the number of distilleries has more than doubled in the last three years and is among the highest among California metro areas. Gains in direct-to-consumer shipments will enable county distilleries to increase their share of the \$2.4 billion market for craft spirits.

The strengthening economy and consumers' increasing preference for higher-end adult beverages shape the upbeat outlook for Sonoma vintners, craft brewers and distillers. Though total wine consumption will rise more slowly as millennials gradually overtake baby boomers as the largest sales demographic for wine, the ascent of Sonoma's craft breweries and distilleries will enable the county to weather changing consumption patterns.

Ever stronger competition from Washington and Oregon wine and craft beverage producers is a prominent risk, given that beverage makers in the Pacific Northwest already enjoy lower labor and input costs. Vintners in the Pacific Northwest are producing more top-quality wines and command a small but growing share of the lucrative direct-to-consumer sales channel. Second, while greater snowpack in the Sierra Nevada has eased

drought concerns, a return of severe dry weather could curb the quality and quantity of future harvests. Finally, the strong dollar will increase the purchasing power of U.S. wine drinkers vis-à-vis European wines, increasing the cost competitiveness of high-end French and Italian wines that compete more closely with Sonoma varietals.

Technology, manufacturing and lifestyle products. The performance of Sonoma County's high-tech and specialty manufacturing industries has hit a fork in the road. While specialty food, beverage and lifestyle products manufacturers are expanding swiftly, high-tech manufacturing and tech-related professional services are flagging. Total manufacturing employment and output have staged a modest comeback as artisanal food and beverage makers grow their footprint both locally and nationally, but employment in high-tech industries has not appreciably grown in the past six years.

County technology firms are thriving financially, but rising domestic and international sales have translated into few new manufacturing jobs in the county itself. Though locally based firms are adding research and development staff, most new positions are located in lower-cost centers in the U.S. and overseas. Similarly, Sonoma County's smaller telecommunications and biotech companies are faring well financially, but improved margins have not led to a sustained increase in hiring.

By contrast, consumers are embracing organic and artisanal food products with growing enthusiasm, helping to drive expansion at county food and beverage producers. Sonoma County farms, dairies, organic meats and food processors have been quick to seize on this trend and are grabbing shelf space at both local and national supermarkets. Industry expansion has spurred local hiring: Employment in food and beverage manufacturing has increased by a third over the past four years.

Greater spending on outdoor recreation is lifting sales of outdoor sports equipment and accessories designed in Sonoma County. Meanwhile, increased awareness of ethically sourced products and fair trade practices has bolstered local cosmetics and apparel producers. Though a small share of total employment, apparel manufacturers are expanding quickly, lifting apparel manufacturing payrolls to their highest point in three decades.

Despite the declining prominence of technology manufacturing industries in Sonoma County, many firms and entrepreneurs from the 2000 tech boom have survived and still call Sonoma County home. There is an indication of remaining comparative advantage for tech-producing industries in terms of its skilled labor pool, installed base in the county, and proximity to tech-producing areas elsewhere in the Bay Area.

Still, while Sonoma County's technology-producing industries will support the economy, they will contribute only modestly to job growth over the next few years. An aging population globally will up demand for medical devices designed in the county, and

the increasing affordability of smart technologies will increase sales of county-made electronic testing equipment. However, high business costs and a shortage of new engineering graduates will curtail growth in high-tech manufacturing and R&D. As developing countries scale the value-added chain, R&D operations are increasingly cost-competitive. The globalization of local research operations could put additional jobs in peril.

Efforts by local tech firms to cultivate engineering talent at Sonoma State University could help alleviate the shortage of younger engineers and software developers in the medium term. However, the shortage of homegrown talent will make it more difficult to compete with emerging tech hubs such as Atlanta, San Diego and Provo UT for jobs and investment.

Consumers across the income spectrum are exhibiting a growing awareness of the environmental and ethical practices of the food, beverage and lifestyle products they purchase, all of which confer a positive outlook for county producers. However, balancing the needs of growing food, beverage and lifestyle products industries will prove increasingly critical as smaller and midsize firms expand domestically and internationally. The market for industrial space has tightened considerably in the past three years, and larger manufacturing facilities are in short supply. County stakeholders will need to work closely with local businesses to balance demands for new industrial space with sustainable practices that preserve the county's natural bounty.

Creative professional services. Moody's Analytics defines creative professional services as those that play a primary role in the transformation of an idea into a commercial product. These may include, on the one hand, a broad range of scientific researchers, software developers, and engineers whose output is measured by patents. The second component of the cluster is composed of the creative arts, which corresponds to the copyright-protected industries: journalism, advertising, media, arts and entertainment. Together, the two components make up 4.6% of the county's total payroll employment, or approximately 9,100 jobs.

The outlook for the creative cluster of industries has grown more cautious in light of the prolonged stagnation in tech-related professional services. While Sonoma County is quickly emerging as an important design hub for athletic apparel, outdoor sports equipment, and ethically sourced consumer goods, employment in high-paying software publishing, computer systems design, and biomedical research has barely budged over the past five years, in contrast to the swift resurgence elsewhere in the San Francisco Bay Area.

These industries, which make up more than half of total cluster employment and wages, will add few new workers over the coming years as Sonoma's top tech and medical device firms favor lower-cost locations in the U.S. and overseas. As a result, the creative cluster's share of total employment will trail that of the rest of the Bay Area and the broader U.S.

The relocation of apparel giant Athleta to San Francisco this year casts further doubt on the creative cluster's ability to drive long-run employment and income gains. However, some of the blow will be offset by growth in other local apparel manufacturers such as Indigenous and Farm Fresh Clothing. Meanwhile, outdoor equipment firm Camelbak's decision to remain in Sonoma County after its acquisition by Vista Outdoor late last year will place a floor under demand for design professionals.

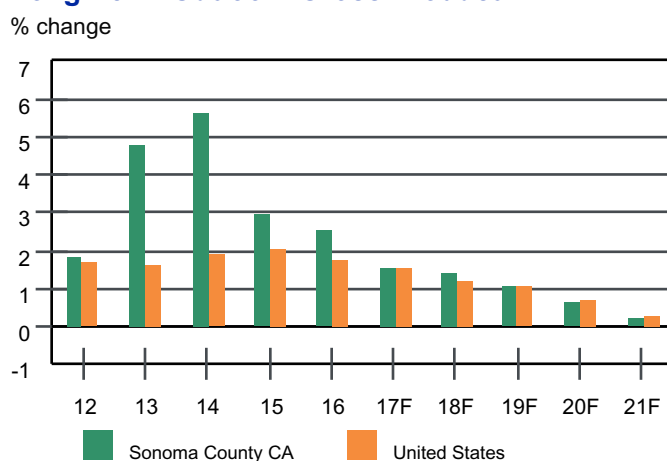
Despite the sober outlook for total cluster employment and wages, the creative arts share of the cluster will continue to thrive. Sonoma boasts a thriving arts community, and its share of total employment in the creative arts is among the highest of midsize counties. As labor markets tighten locally and nationally and wage growth firms, artists and performing arts companies will benefit from increased discretionary spending on arts and entertainment by visitors and residents alike.

Longer term, rising visits to Sonoma County lend upside potential to the creative arts. As consumer sentiment strengthens nationally and visitors to Sonoma County wineries and craft breweries extend their stays, local art galleries and performing arts companies stand to benefit. Though wineries, craft breweries, outdoor recreation and restaurants will remain the primary draw for tourists, visitors to the wine country are seeking broader options for leisure. Efforts by local arts councils to integrate galleries and performing arts companies into the visitor experience could broaden local artists' exposure, fostering a virtuous cycle that attracts more visitors to local art galleries and performance spaces.

Long-term outlook: Positive factors

Sonoma County's prestige in wine-making, craft beverage production, artisanal food and beverage products, and high-tech research and design endow it with considerable long-run growth

Long-Term Outlook: Gross Product



Sources: BEA, Moody's Analytics

potential. These industries build on the comparative advantages that are inherent in the county's resources—its workforce, its natural resources, and its capital.

These resources are abundant. For example, educational attainment is relatively high among the county's workforce. According to the 2015 American Community Survey, 33% of the adult population has a college degree, which is above the U.S. rate of 31% and slightly ahead of the California average of 32%. Its natural resources are bountiful, as evidenced by its rich soil, mild climate, extensive shoreline, and forests and parklands. The county has built up local capital through entrepreneurship over the last three decades, and its capacity for innovation, as measured by utility patents per capita, is among the highest of midsize U.S. counties.

The long-term outlook for Sonoma County winemakers is particularly favorable given the industry's deep roots in the county, its moderate growing climate, and rising demand for more sophisticated wines in domestic and global markets. Total wine consumption in the U.S. surpassed that of France in 2010 and has plenty of room to rise, given that U.S. wine consumption on a per capita basis is just one-third that of Europe. Longer term, emerging markets will also provide an avenue for growth as incomes rise and consumers develop a taste for wine. Growth in direct sales will boost the county's small and medium-size wineries and distilleries, which rely more on direct-to-consumer shipments than large-run producers.

Sonoma's numerous craft breweries and distilleries will serve as a growth driver in their own right. With several of the country's largest craft brewers calling the county home, the expansion of craft brewers and distilleries will create additional jobs in beverage manufacturing and generate spillover growth in transportation and warehousing. Craft breweries have also drawn an increasing number of visitors to the county in recent years, helping to boost direct tourism spending.

Sonoma County's prestige in wine-making and the increasing renown of local craft breweries confer a positive long-term outlook for tourism. The region is gaining recognition among domestic and international visitors not only for the quality of its wines, but also for its natural beauty, abundant outdoor recreational opportunities, and high-end dining, wellness, and hospitality offerings. The increasing prominence of local craft breweries as well as the expansion of the visitor experience toward spa and wellness programs adds further long-term potential. As the global economy gathers steam once again, Sonoma's reputation will help attract a greater number of international visitors, which tend to spend more on travel and accommodations than U.S. tourists.

As consumers grow increasingly health-conscious, Sonoma's status as a haven for artisanal food and beverage products will be an additional source of strength. Though organic produce, dairy, meat and snack foods tend to be more expensive than conventional offerings, organic purchases are on the rise across income levels. Conventional supermarkets, big-box stores, and buyers

clubs now account for a greater share of organic food sales than do natural food stores. While such a distribution channel will bring greater competition from mass-market offerings and store brands, it also presents an opportunity for county producers to capitalize on a growing consumer base.

Although Sonoma County's top tech employers have greatly reduced their manufacturing presence in the county, high-tech research and development holds potential for growth, provided that local engineering and entrepreneurial talent can be cultivated. Research and development positions create fewer direct linkages with other industries than do manufacturing jobs, but given high salaries for biotech and IT workers, R&D jobs hold the potential to drive indirect job growth in housing, construction, and consumer-related industries through large spillover effects.

Long-term outlook: Negative factors

Sonoma County is tethered tightly to the U.S. and global economies, and its high degree of sensitivity to external shocks is its greatest source of vulnerability. Its principal economic drivers—viticulture and wineries, tourism, food manufacturing, and high-tech R&D—are all highly sensitive to the ebbs and flows of the business cycle. This creates the potential for more volatile swings in output and employment over the long run. Sonoma's sensitivity to swings in the business cycle is underscored by its employment volatility index score of 201, which places it in the 95th percentile of U.S. metro areas.

The high degree of specialization of Sonoma's economy is another source of weakness. The county's industrial base is highly concentrated, as evidenced by its low industrial diversity index score of 0.42, which ranks in the bottom third of metro areas. Despite recent growth in food and beverage manufacturing, Sonoma County has made less progress in diversifying its economy over the past decade. Should the U.S. or global economy falter on its path toward long-term expansion, Sonoma's reliance on consumer-driven industries and volatile tech services could result in another sharp downturn.

Though business costs compare favorably to the nine-county Bay Area, labor, rent and energy costs are high relative to emerging tech hubs such as Provo UT, Boulder CO and Atlanta. Coupled with a shortage of newly minted engineering graduates, higher business costs will present a hurdle to the expansion of high-tech R&D.

tepid population gains will slow the economy's growth potential in the long run. Absent higher birthrates or an influx of new migrants, labor force growth will slow through the end of the decade, pulling down the economy's potential growth rate. Over the next decade, fewer prime-age workers will fill the shoes of older workers exiting the labor force. Flat growth in prime-age workers is also a concern for productivity growth, given their greater propensity to form new establishments.

Going the Distance: An Economic Outlook for Sonoma County

A shortage of high-wage jobs is a concern. Although hiring in high-paying occupations is gathering steam, Sonoma has yet to recover all of the high-wage jobs lost in the Great Recession,

in contrast to a strong rebound at the state and national levels. Meanwhile, the share of employment in high-paying positions has contracted over the past two business cycles and has fallen slight-

Index of Relative Business Costs

	Labor Cost		Tax Burden		Energy Cost		Office Space		Overall Index	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
Santa Rosa-Petaluma	96	165	99	334	179	374	80	327	101	359
San Francisco-Redwood City-South San Francisco, CA	126	400	97	301	179	374	104	389	124	400
San Jose-Sunnyvale-Santa Clara	119	396	96	288	179	374	114	394	123	399
Oakland-Hayward-Berkeley, CA	105	320	98	315	179	374	87	358	108	383
Santa Barbara-Santa Maria-Goleta	100	242	99	346	179	374	86	352	105	376
Santa Cruz-Watsonville	94	142	99	341	179	374	80	324	100	347
Portland-Vancouver-Beaverton	96	171	85	206	87	106	101	383	96	308
Sacramento-Arden Arcade-Roseville	99	229	99	336	179	374	79	320	103	366
Salinas	92	127	99	343	179	374	84	344	101	352
Boulder	114	389	65	43	96	174	86	353	99	336
Provo-Orem	97	187	84	165	81	74	60	125	82	81
Atlanta-Sandy Springs-Marietta	103	296	76	103	94	158	61	145	88	196

Notes:

1. Rank is out of 419 metro areas.
2. U.S. average=100.
3. Labor costs are measured by total earnings per employee at the 3-digit NAICS level.
4. Tax burdens are measured by all taxes excluding severance, education, and hospital taxes relative to personal income.
5. Energy costs are measured by cents per kWh for industrial and commercial users.
6. Office costs are measured by rent per square foot.
7. In the overall index, labor costs have 65% weight, energy costs have 15% weight, and office costs and taxes have 10% weight.

Source: Moody's Analytics

Employment Diversity and Volatility

	Diversity ¹	Volatility 2016			Beta ⁴
	2016	Total ²	Systematic ³	Nonsystematic ³	
Santa Rosa, CA	0.42	201	92	8	1.85
San Francisco-Redwood City-South San Francisco, CA	0.48	150	95	5	1.43
Oakland-Hayward-Berkeley, CA	0.76	144	96	4	1.38
Vallejo-Fairfield, CA	0.54	130	79	21	1.03
Portland-Vancouver-Hillsboro, OR-WA	0.73	140	99	1	1.38
United States	1.00	100	100	0	1.00
Median	0.49	190	97	68	1.64

Notes:

- 1) Diversity is defined as the extent to which a state's industrial structure approximates that of the nation. The more closely the state's economy resembles the national economy, the higher the value. The diversity measure is bounded between 0 and 1. 1 means the state has the same industrial structure as the U.S., 0 means it has a totally different industrial structure than the U.S. Diversity is estimated.
- 2) Total volatility is the standard deviation of a state's employment growth. This relative deviation has been indexed to the United States = 100. Volatility is estimated.
- 3) Systematic fluctuation is that portion of an area's economy that is associated with national economic fluctuations. Nonsystematic volatility is that portion of an area's volatility not associated with national economic fluctuations.
- 4) Beta measures the magnitude of an area's sensitivity to national economic conditions. The U.S. average, by definition, is 1. A one percentage point increase in national employment will cause that portion of a metro area's employment base to rise by the percentage value of beta.

Going the Distance: An Economic Outlook for Sonoma County

ly below the U.S. average. The relative shortage of high-wage jobs will curtail the county's ability to attract new residents and will be a weight on in-migration and population growth.

Low housing affordability and high living costs will also contribute to slower population expansion. Although housing affordability spiked in the wake of the housing bust, reaching a two-decade high in 2012, affordability has since returned to its long-run average and will decline further over the next two years as house price gains outpace growth in median household incomes. Low housing affordability will price many lower-income families out of the county's housing market and could result in a shortage of workers necessary for the expansion of Sonoma County's labor force.

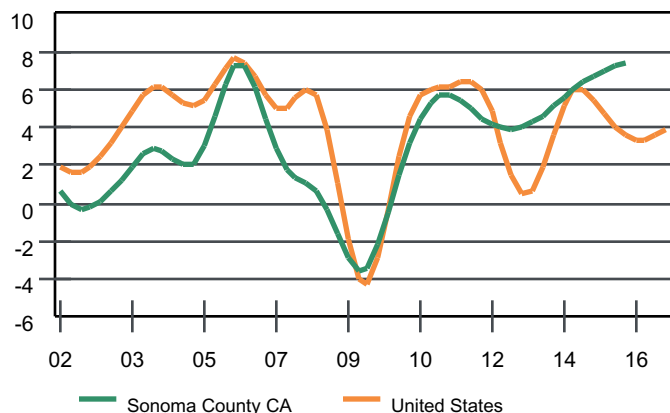
Congestion and the need for infrastructure improvements may also limit long-term growth potential. Despite recent highway improvements, access to San Francisco and Oakland is confined to roads that are increasingly crowded. While the start of commuter rail service between Santa Rosa and Marin counties this year will bring some relief, road transport will remain the primary means of linking goods and visitors to major ports and airports in the Bay Area. The improvement of Highway 101 is a long-term project that will eventually speed travel times to Marin County and San Francisco, but higher traffic volumes will increase transportation costs in the meantime.

Income

Personal income growth has surged in recent years after tumbling in the wake of the Great Recession. Total nominal personal income shot up 13% in the most recent two-year period, notching the fifth-best gain among metro areas. Although dividend, interest and proprietor's income has traditionally accounted for an outside share of personal income growth, wage and salary income gains have accelerated noticeably in recent years.

Personal Income

% change yr ago



Sources: BEA, Moody's Analytics

Real per capita income has fully recovered after plunging in the Great Recession and has risen faster than the U.S. and California averages since the middle of 2013. Though the county's better-paying industries were hit hard by the recession, growth in high-end tourism, wine-making, and craft beer has bolstered income growth. High-tech R&D has made a small but positive contribution.

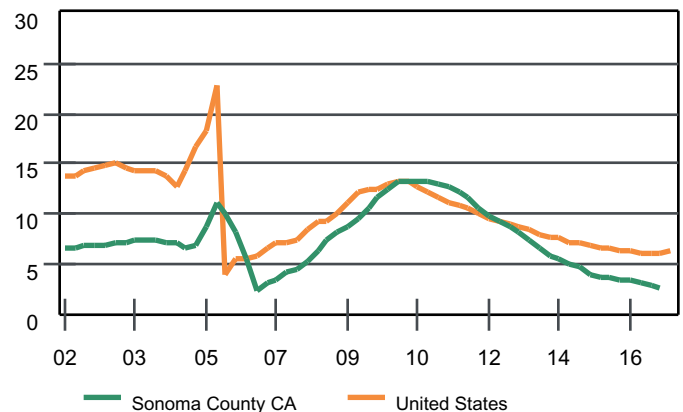
Robust job and personal income gains point to a tightening labor market. With the economy nearing full employment, personal income gains will accelerate over the next few years. The unemployment rate is expected to remain below 4% in the near term as the labor market tightens.

Balance sheets

Consumer credit quality in Sonoma County has improved tremendously over the past four years, and the post-recession period of deleveraging is fading in the rearview mirror. The personal bankruptcy rate exceeded the U.S. average as late as 2012. However, it has since fallen back below the U.S. average and has opened a sizable gap with respect to the U.S. rate, reflecting better credit conditions among Sonoma households.

Personal Bankruptcy Filings

Filings per 1,000 households



Sources: Administrative Office of U.S. District Courts, Moody's Analytics

Better job and income gains have facilitated balance sheet repair. Delinquency rates across all consumer loan categories are at or near their prerecession rates, according to credit bureau Equifax. Delinquency rates for auto, credit card and first mortgage loans have fallen well below the state and U.S. rates. After climbing steeply in 2011 and 2012, delinquency rates for student loans have fallen back to their long-run average, in line with the trend at the national level. Distress sales are no longer a drag on house prices, although with home values still slightly below prerecession peaks, some homeowners may still face reduced liquidity.

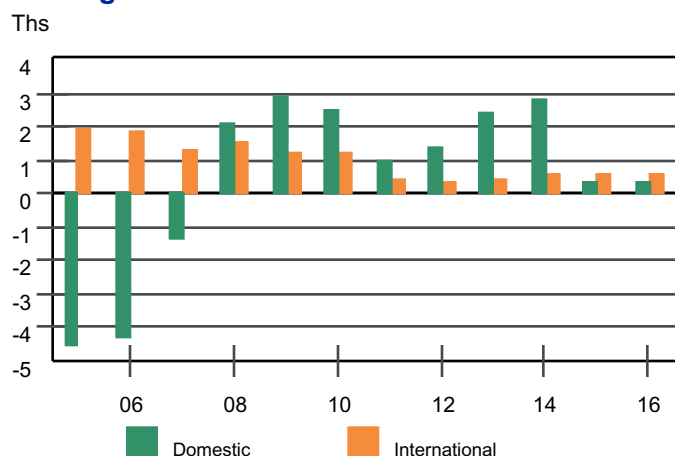
While delinquency rates are much improved, households are only beginning to take on new debt. The dollar volume of total consumer balances has recovered just two-thirds of its average before the housing boom, according to Equifax. Though consumers are taking advantage of lower interest rates to spend more, improvement in consumer lending has been confined to credit card and auto lenders; county mortgage lending has been less robust, keeping the recovery in home sales at a simmer.

Demographic trends

The distribution of Sonoma County's population is aging more rapidly than California's other midsize metro areas as birthrates fall and net migration slows, particularly among younger cohorts. Overall population growth has moderated in the past few decades as the loss of high-tech jobs and declining housing affordability price out potential residents; population gains in recent years have been especially meager. After a brief acceleration in the wake of the housing crisis, population growth has waned. The county's average annual growth of 0.6% in the past five years ranks well below the state average and is among the lowest of California's midsize counties. Its 0.3% rate for the year ending mid-2016 was the lowest in 10 years.

Despite robust job gains and better wage growth, a shortage of affordable housing has hurt potential residents' ability to settle in the county. Net migration has slowed substantially in recent years as surging house prices and rents limit housing options. Though rapid house price gains have taken hold in most coastal California counties, the decline in housing affordability in Sonoma County has been especially acute. According to the Moody's Analytics Housing Affordability Index, the share of median family income required to purchase a median-priced home has increased by a third in the past four years alone and now ranks among the highest statewide.

Net Migration



Sources: Census Bureau, Moody's Analytics

Sonoma County's population is expected to increase by just 0.5% per year through the end of the decade—just half of the state rate—and to wane thereafter. This rate of increase is consistent with long-term trend in housing affordability, which is expected to decrease over the next few years as house price gains outstrip income growth and land constraints limit new building.

Barring a significant increase in net migration, Sonoma County will struggle to maintain adequate labor force growth into the next decade. Over the next few years, the baby boom cohort, comprised of residents aged about 55 to 64, will begin to retire and exit the labor force. However, in contrast to previous generations, there are fewer prime-age workers available to step in and take their place. The prime-age cohort, comprised of workers aged 25 to 54, has stabilized after an outright decline in the wake of the tech bust. However, the ranks of prime-age workers have not noticeably increased in the past 15 years.

If unchecked, the shortage of prime-age workers will limit labor force growth, and ultimately, the county's long-run potential growth rate. Slower growth in the prime-age cohort could also curb productivity gains. On average, prime-age workers are more likely to start a business, to migrate in search of better job opportunities, and to work longer hours than other cohorts. To bolster population gains and long-run growth prospects, the county will have to build more affordable housing, attract new migrants, and ensure that younger workers receive the proper training to fully participate in the county's workforce.

Workforce readiness

The modest outlook for population growth will make efforts to train a new generation of workers even more important. According to occupational employment figures from the Bureau of Labor Statistics, the educational attainment of Sonoma County's workforce is broadly aligned with the level of education required by the county's major industries. For example, about one-third of county jobs require a bachelor's degree or higher, while nearly the same share of Sonoma's adult population holds a bachelor's or graduate degree.

Given shifting demographics and the growing diversity of Sonoma County's workforce, boosting the educational attainment, vocational skills and work experience of job seekers countywide will prove increasingly critical. Though the county's growing Hispanic community has made large strides in boosting secondary attainment over the past decade, lower rates of post-secondary attainment illustrate the role of training and workforce development as a gateway to better-paying opportunities. While 40% of Sonoma County jobs require an associate's degree or higher, just 15% of Hispanic adults have reached this milestone.

Building on the success and extending the reach of current workforce development programs will be critically important to

hone the skills and capabilities of all job seekers. As more county employers prioritize post-secondary degrees and workplace experience, and as the labor market grows increasingly tight, efforts to build human capital through internships and vocational training as well as adult education and other post-secondary educational opportunities will bear fruit.

In the long run, bolstering the workforce readiness, skills and educational attainment of Sonoma's labor force will be necessary to boost labor productivity. Because the cohort of prime-age workers is expected to remain roughly flat into the next decade, efforts to pair workers to Sonoma's leading industries will prove critical. County initiatives to support young entrepreneurs will also pay dividends and will help drive direct job growth in Sonoma as new businesses expand locally and nationally.

Migration Flows

INTO SANTA ROSA CA	NUMBER OF MIGRANTS
San Rafael CA	1,886
San Francisco CA	1,435
Oakland CA	1,303
Sacramento CA	796
Los Angeles CA	599
San Jose CA	544
Napa CA	487
Vallejo CA	440
San Diego CA	362
Riverside CA	294
<i>Total in-migration</i>	<i>15,868</i>

FROM SANTA ROSA CA	NUMBER OF MIGRANTS
San Rafael CA	1,167
Oakland CA	1,009
Sacramento CA	899
San Francisco CA	762
Vallejo CA	533
Napa CA	509
Los Angeles CA	382
San Diego CA	326
San Jose CA	312
Portland OR	226
<i>Total out-migration</i>	<i>13,809</i>
Net migration	2,059

Source: IRS, 2014

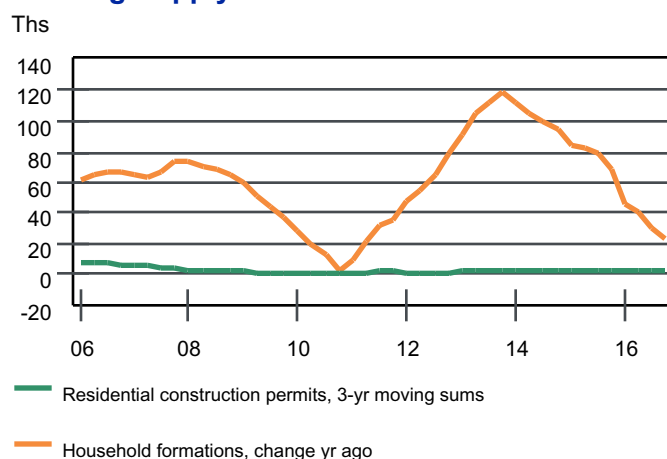
Population Profile

	% of total population, 2015	
	Santa Rosa, CA	U.S.
Age 5-19	17.7	19.4
Age 25-44	25.2	26.4
Age 45-64	28.3	26.2
Over age 65	17.5	14.9
Birthrate, (# of births per 1000)	10.2	12.4
Death rate, (# of deaths per 1000)	8.4	8.4

Residential real estate

Despite rapid house price gains, Sonoma County's housing market is still in the early stages of recovery. House prices have regained nearly all of the ground ceded in the Great Recession, according to the Federal Housing Finance Agency and Case-Shiller indexes, and are rising at almost twice the national rate. However, sales of existing single-family homes were approximately flat over the past two years and remain well below the trend prior to the housing boom. Flagging sales of existing single-family homes are keeping homebuilders on the sidelines, and subdued purchase demand has kept a stronger recovery in residential construction from taking hold.

Housing Supply-Demand Balance



Sources: Census Bureau, Moody's Analytics

Demand continues to outstrip supply. In the single-family market, the sparse supply of existing homes for sale has slowed buyer activity over the past year. However, as house prices crest their prerecession peak, more households will recover remaining equity lost in the housing bust. The uptick in homeowner confidence will encourage more owners to list, alleviating the current shortage of existing homes for sale.

As the local labor market reaches full employment, better wage gains will unleash pent-up demand for single-family homes. However, the increase in home sales and new construction will fall short of prior expansions because of slower population gains and the erosion of housing affordability in the county. Moreover, while single-family construction has trended higher since the middle of last year, it will still take several quarters before new construction is able to absorb the increase in household formation.

Housing affordability will be the watchword for Sonoma's residential real estate market. After improving in the wake of the housing bust, housing affordability has deteriorated noticeably in recent years as the increase in the median sales price outstripped the rise in median family income.

The residential and commercial real estate markets share an optimistic long-run outlook, but worsening housing affordability will loom large. Net migration slowed substantially in the past few years, a period coinciding with deteriorating affordability. Should housing costs increase further, fewer potential residents and entrepreneurs will be able to purchase a home in the county. Even lower in-migration would put a damper on housing demand.

The changing of the demographic guard is at hand, and millennials' tendency to postpone homeownership will also apply restraint. Still, better income gains and improved job prospects will stir more young households to take the plunge into homeownership. This would boost home sales and new construction.

Commercial real estate

The commercial real estate market is stretching its wings as lower vacancy rates and firming demand spark new construction. Strong growth in food manufacturing, retail and office-using industries has increased net absorption and pushed vacancy rates to their lowest levels in more than a decade, according to Keegan & Coppin Co. Nonresidential builders have responded in kind: The dollar volume of nonresidential permits increased by a quarter in 2016 and is chasing its long-run average.

As Sonoma County food manufacturers, wineries, craft breweries and hospitality operators push ahead with plans for expansion, competition for space will intensify. In particular, the market for industrial space is approaching critical tightness: The industrial vacancy rate has fallen from more than 16% in 2012 to 5.8% in the fourth quarter of 2016. Demand for new industrial space will push fast-growing food and beverage makers to invest in new facilities.

Demand for new office space is improving, but the balance of the market still tilts toward oversupply. Construction of new office buildings will proceed at a more modest pace as office-using industries expand into existing space. The swift expansion of Sonoma's healthcare industry has helped offset the departure of several large office-using employers in recent years, pushing the office vacancy rate down to 14.7% as of the fourth quarter of 2016. While much improved, this is still above lows at the height of the tech boom, when competition for new office space pushed vacancies below 10%.

In contrast to the struggles of retailers nationwide, retail space remains the best-performing sector of Sonoma County's commercial real estate market. Intensifying competition will prompt new construction. The vacancy rate has held firm at 4% over the past year as greater absorption is countered by additions to supply. The bustling tourism industry will keep vacancy rates for retail space low. New shopping centers such as the Deer Creek complex are filling quickly, and the revival of downtown Healdsburg and Santa Rosa will pave the way for new restaurants, hotels, and other hospitality establishments to fill vacant space.

Forecast risks

Given the cautious outlook for the global economy and the potential for a range of economic headwinds to stall growth domestically, the balance of risks for Sonoma County's economy tilts to the downside. Chief among them is a retrenchment in consumer confidence. The economy is near full employment and wage growth is finally picking up. However, any blow to consumers' psyches—whether from volatility in financial markets or from political turmoil domestically or overseas—could prevent consumers from spending the windfall. A large fallback in consumer confidence would darken the near-term outlook for Sonoma County's tourism and wine-making industries and would also drag on spending by Sonoma County residents locally.

Restrictive immigration policies proposed by the Trump administration create substantial downside risk for Sonoma County wineries, food manufacturers, and hospitality establishments, all of which rely heavily on immigrant labor. Any measure to restrict new immigration or to step up deportations of undocumented immigrants would deal a setback to these industries while striking at the heart of residential and commercial builders. Given existing shortages of experienced construction workers, more restrictive immigration policies would further restrain the supply-constrained residential real estate market.

The outlook for the global economy is much improved, and faster growth in Europe and Southeast Asia will boost prospects for Sonoma County's export industries despite the strong dollar. However, rising leverage in China presents a significant risk to global financial stability. Should Chinese officials prove incapable of engineering a soft landing for industrial and residential developers, fallout could spread to the U.S. economy, casting a pall on consumer and business sentiment and on spending in discretionary categories such as high-end wines and travel.

Slower than expected population gains could cause Sonoma County's economy to overheat, given the already-tight labor market. Though labor force growth will be adequate to support expansion over the next few years, if population growth underperforms, the economy will run up against labor force constraints more quickly than expected. Employers could face a potential shortage of workers as a result of the looming retirement of the baby-boomer cohort and the relative shortage of prime-age workers ready to take their place. Further declines in the prime-age cohort would hamper labor productivity.

Finally, slower growth in Sonoma's youngest cohorts will make workforce readiness an increasingly critical priority. The population share of the age 15 to 35 cohort is at a peak, and it will be imperative to provide high school and college graduates with training, internships and the mentoring necessary to succeed in Sonoma County's growth industries. Without this support, the county would struggle to retain its highly skilled workforce, a considerable factor in its long-term growth.

On the upside, better than expected income gains would boost demand for the goods and services produced by Sonoma County's leading industry clusters. As disposable incomes rise and visitors plan longer stays, increased tourist traffic to local wineries, restaurants and tasting rooms creates upside risk for the county's food, beverage and lifestyle products producers. In particular, partnerships with local restaurants and tour operators could cultivate new customers while increasing brand recognition and goodwill.

The county's recent vote to join the nation's largest GMO-free agricultural zone could drive additional sales of local food and beverage products should consumers embrace GMO-free products with the same fervor they have organic and artisanal foods. Greater recognition of the county as an international hub for local and organic foods could stimulate manufacturing jobs and greater subsequent demand for travel, wine and recreational services.

While Sonoma County has been slow to latch on to the broader Bay Area tech boom, many smaller tech and financial firms are relocating from San Francisco to Oakland and Marin County. The search for more affordable office space creates opportunity to attract high-tech firms, especially in biotech, which shares synergies with firms in neighboring Marin County.

As disposable incomes rise and visitors plan longer stays, there is potential to integrate the creative arts into the broader tourist experience. In particular, local art galleries and performing arts companies could benefit as visitors seek additional options for leisure and entertainment. Though wineries, craft breweries and restaurants will remain the primary draw for tourists, visitors to wine country are seeking broader options for leisure. Efforts by local arts councils to integrate galleries and performing arts companies into the visitor experience could broaden local artists' exposure, fostering a virtuous cycle that attracts more visitors to county galleries and performance spaces.

Major employers

Major Employers: Santa Rosa, CA Metropolitan Statistical Area

Rank	Employer	Industry	Employee
1	Kaiser Permanente	Education or Health Service	2,640
2	Graton Resort & Casino	Leisure and Hospitality	2,000
3	St. Joseph Health System	Education or Health Service	1,578
4	Keysight Technologies	Manufacturing	1,300
5	Safeway Inc.	Retail Trade	1,200
6	Sutter Santa Rosa Regional Hospital	Education or Health Service	936
7	Amy's Kitchen	Manufacturing	870
8	Medtronic CardioVascular	Manufacturing	840
9	Jackson Family Wine	Manufacturing	800
10	Cyan	Information	700
11	Wal-Mart Stores Inc.	Retail Trade	650
12	Hansel Auto Group	Retail Trade	605
13	AT&T	Information	600
14	Lucky	Retail Trade	550
15	River Rock Casino	Leisure and Hospitality	500
16	Pacific Gas and Electric Co.	Trans./Warehouse/Utilities	500
17	Petaluma Acquisitions	Manufacturing	455
18	Ghilotti Construction Co.	Construction	425
19	Exchange Bank	Financial Activities	400
20	The Home Depot U.S.A. Inc.	Retail Trade	390
21	Redwood Credit Union	Financial Activities	382
22	Sonoma Media Investments	Information	335
23	G&G Supermarket	Retail Trade	300
24	Mary's Pizza Shack	Leisure and Hospitality	300
25	Korbel	Manufacturing	297

Sources:
 North Bay Business Journal: Book of Lists, January 2016
 North Bay Business Journal: Book of Lists, February 2015
 North Bay Business Journal: Book of Lists, February 2014
 North Bay Business Journal: Book of Lists, January 2013
 North Bay Business Journal: Book of Lists, January 2012

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Demographic profile

Indicator	Units	Santa Rosa CA	U.S.	Rank	Year
Households					
Households, % change (2011-2016)	Ann. % change	0.9	1.0	206	2015
Population w/ B.A. degree or higher	% of adult population	32.8	30.6	108	2015
Median household income	\$	66,674	55,775	38	2015
% change year ago		2.9	4.0	202	2015
Population					
Per capita income	\$	53,520	48,190	43	2015
% change year ago		6.7	3.7	7	2015
Population	thousands	503	323,128	124	2016
% change year ago		0.3	0.7	237	2016
White	%	87.4	77.2	155	2015
Black or African American	%	2.0	13.3	342	2015
Hispanic	%	26.4	17.6	58	2015
Asian	%	4.4	5.6	86	2015
Net domestic migration, rate	Persons/th. pop.	0.6	0.0	174	2016
International migration, rate	Persons/th. pop.	1.2	3.2	268	2016
Poverty rate	%	11.1	14.7	60	2015
Household Cost Indexes					
Housing affordability index		78.7	184.0	391	2016
Median existing home price	\$ ths	577.4	237.4	13	2016
% change year ago		8.4	6.1	49	2016
Cost of living	Index: U.S.=100	126.1	na	389	2014

U.S. Economic Outlook

Short-Term Executive Summary

Recent Performance

As with much of the public discourse, debate regarding the economy's recent performance appears colored by one's politics. Those who voted for President Trump seem to believe that the economy has lifted off since the election. They point to the surge in sentiment evident in surveys of consumers and businesses. The renewed bull market in stocks is also evidence, if not proof, to Trump supporters that the economy has been unshackled. The Standard & Poor's 500 stock index is up about 10% since Election Day.

Those who did not vote for Trump are focused on other things when judging the economy. They point to the so-called hard economic data, which show an economy that has, if anything, throttled back a notch in recent months. First quarter real GDP growth is set to be pedestrian, at close to 1%. Notably, consumer spending appears to have cooled, which is incongruous with the strong sentiment surveys.

Economic reality

The reality regarding the economy's performance is not nearly as good as Trump supporters believe nor as bad as claimed by Trump detractors. Nothing much has changed for the economy since the election. It is growing at the same pace as it has through its nearly eight years of expansion—real GDP growth of 2% and job gains of about 200,000 per month.

The upbeat surveys appear to overstate any optimism. According to a recent New York Federal Reserve study, surveys that canvass new respondents each time they are conducted are overly influenced by those happy with the election results and thus more likely to respond to the survey. The enthusiasm of stock and bond investors likely reflects prospects for lower tax rates and less regulation—things the new president has promised—and not a stronger economy.

At the same time, the weak economic data have more to do with residual seasonality, a measurement problem that has plagued the Bureau of Economic Analysis, the source of the GDP numbers, in recent years. It is typical for first quarter GDP to be weak, offset by stronger growth in the second and third quarters.

Full-employment constraint

It will be difficult for Trump supporters to get their wish of stronger sustained economic growth, particularly because the

economy is at full employment. The 4.5% unemployment rate is well below most estimates of the natural rate. The so-called underemployment rate, which includes part-timers who want more hours and those who are not looking for work but say they want a job if they could find a suitable one, has also dipped below the 9% threshold thought to signal full employment.

With no slack left in the economy, if growth is much above potential for long, it will eventually be reined in as wage and price pressures develop and interest rates rise. Currently, the economy's growth potential—which equals the sum of the growth in the labor force and the productivity of those workers—is probably no more than 1.5%. To even maintain the economy's 2% growth rate for much longer, potential growth must pick up. But there is a problem: With labor force growth set to slow as baby boomers retire en masse and foreign immigration set to weaken under the Trump administration, the only way for this to occur is for productivity growth to revive.

Productivity growth, meanwhile, is at a virtual standstill. This reflects many factors, the long dark shadow of the Great Recession likely key among them. The downturn severely undermined investment, risk-taking and labor mobility, and it is taking time for them to revive.

Recession-free

Trump detractors who believe the president will quickly drive the economy into a ditch are overly pessimistic. There are two necessary conditions for recession, and neither is apparent. First, the economy must be overheating. That is, the economy must be operating beyond full employment, with wage and price pressures boiling over and the Federal Reserve quickly jacking up interest rates to cool things off.

That does not describe today's economy. The economy has just now achieved full employment, wage and price pressures are nascent, and the Fed is normalizing monetary policy slowly. A second necessary condition for recession is a significant fault line in the economy that is mirrored in the financial system.

There are budding imbalances today, of which we should be watchful. There is worry over the growing mountain of student loan debt, aggressive vehicle lending, and robust multifamily mortgage lending. Liquidity in the shadow financial system

may also be a problem. Fortunately, these are still modest figures that regulators appear well aware of and willing to address using macro prudential tools—at least they were under the Obama administration.

Political compromise

Stronger sustained economic growth is possible but will require that Trump supporters and detractors find a way to work together. That is not as hopeless as it sounds, since the budget calendar will likely force political compromises.

Most immediately, Congress has an April 28 deadline to renew expiring government spending authority through the end of the current fiscal year. Failure to do so would result in a government shutdown. Then there is the budget for fiscal 2018, which begins October 1. The budget must be settled about the same time as the Treasury debt limit must be increased. The president and Congress need to come to terms or the government will default on its obligations.

Since a fair share of congressional Republicans will not vote for a debt-limit increase or any budget without deep nonmilitary spending cuts, Trump will need Democrats' support. This is the basis for a deal that includes economic policies that might be a plus for growth. Most likely are a modest version of corporate tax reform, which Republicans have long wanted, and more infrastructure spending, a priority for Democrats.

Tax reform and infrastructure

Corporate tax reform will involve lower marginal tax rates for businesses and—to help pay for the lower rates—reduction of preferences in the tax code and a tax holiday for repatriated corporate earnings. But each percentage-point reduction in the

corporate tax rate costs the Treasury about \$120 billion over a 10-year period on a static basis.

Thus, reducing the top rate from its current 35% to 20%, as House Republicans have proposed, would cost \$1.8 trillion. The lower marginal rates will boost the economy over the decade, and thus on a dynamic basis the cost will be closer to an estimated \$1.5 trillion, but that is still a big number and too heavy a lift for policymakers.

Our expectation, therefore, is that policymakers will coalesce around a top corporate rate of 28%, 15% on overseas earnings, and a temporary 10% on repatriated earnings currently overseas. This will add about \$500 billion to the nation's debt load over the next decade, on a dynamic basis. The anticipated increase in infrastructure spending will add approximately \$50 billion per annum over the next four years. This is small compared with the need, but it represents a significant boost from the typical \$100 billion per annum the federal government spends on infrastructure.

Not a game changer

Of course, while these are the key fiscal policy changes assumed in the Moody's Analytics baseline outlook, they are far from certain. Indeed, they represent a significant scaling back of our previous assumption that tax reform would also include a meaningful reworking of the personal income tax code.

Even if, as we assume policymakers get it together sufficiently to pass corporate tax reform and more infrastructure spending, those will not be game changers for economic growth. It means something close to 2.2% per annum over the next decade. And even that will not happen if the president follows through on his anti-globalization rhetoric and limits foreign immigration and trade.

Forecast Assumptions

Monetary policy

The Federal Reserve is expected to steadily normalize interest rates over the next three years. This will entail three or four 25-basis point rate hikes each year, with the federal funds rate peaking just below 4% by the end of the decade. This is just above the Moody's Analytics 3.5% estimate of the long-run equilibrium funds rate.

Driving the expected normalization in monetary policy is an economy that is currently at full employment and is expected to be operating beyond full employment by this time next year. Inflation is also expected to steadily accelerate, from just under its 2% target to a high near 3% by early 2019. Fueling the stronger inflation will be the tight labor market, strong rent growth, and greater medical care inflation as the constraints created by the implementation of the Affordable Care Act fade. Higher oil and

other commodity prices will also offset any impacts on inflation of an anticipated stronger U.S. dollar.

There is a consensus that the federal funds rate consistent with normalization—the long-run equilibrium rate—has fallen since the crisis, but there is little consensus on how far. Moody's Analytics estimates the long-run equilibrium rate to be 3.5%, down from more than 4% before the crisis. Recent forecasts provided by Fed officials suggest they estimate the equilibrium rate to be lower, at no more than 3%. The equilibrium rate is approximately equal to the sum of the Fed's 2% inflation target and the economy's potential productivity growth rate.

However, the equilibrium rate can vary substantially from its long-run value, depending on the state of the business and credit cycle. We estimate the current equilibrium rate to be closer to 2%, because of temporary headwinds, including the significant in-

crease in the required capitalization and liquidity of the post-crisis banking system.

Normalization also means the Fed will allow its balance sheet of \$4.5 trillion in Treasury and mortgage securities to diminish. In a full-employment economy, the balance sheet should be closer to \$3 trillion. The economic outlook is based on a steady but orderly rise in long-term rates, with 10-year Treasury yields rising to more than 4% by late 2019. Long-term yields will not fully normalize until global central banks end their quantitative easing programs, and the Fed's balance sheet shrinks—not likely until early in the next decade.

Fiscal policy

The federal government's fiscal situation is good but has begun to weaken. The budget deficit rose to \$587 billion in fiscal 2016, equal to more than 3% of GDP. This is up from 2015's \$439 billion deficit, equal to 2.4% of GDP. Lawmakers will be busy as the Trump administration pushes forward its fiscal policy agenda. Though this agenda is uncertain, we are assuming that there will be corporate tax cuts costing more than \$500 billion over the next decade on a static basis. We also assume no significant changes to the personal income tax code.

More government spending on veterans' benefits and the military is expected, but more infrastructure spending is not as sure. There is also the sequester—the across-the-board spending cuts that were suspended as part of the 2013 budget deal. Unless lawmakers make a change, it is set to kick back in at the start of fiscal 2018. The sequester cuts to defense and mandatory entitlement programs likely will be suspended again or eliminated, but Republican policymakers will allow the cuts to most nondefense discretionary programs to take effect. Even so, spending seems set to increase by almost \$500 billion over the next decade.

Trump's tax and spending policies are assumed to be largely deficit-financed, and thus even on a dynamic basis—after accounting for the effects of the tax and spending policies on the economy—they will add approximately \$1 trillion to the govern-

ment's cumulative budget deficits over the next decade. The nation's debt-to-GDP ratio will be more than 2 percentage points higher by the end of Trump's term and almost 5 percentage points higher a decade from now.

U.S. dollar

The U.S. dollar has appreciated substantially, up more than 15% on a real broad trade-weighted basis over the past three years. Further appreciation is likely, particularly vis-à-vis the euro. Behind this outlook is the expectation that the Fed will steadily normalize monetary policy, but the European Central Bank will continue its extraordinary policy actions, including quantitative easing and negative interest rates, into 2019.

The dollar should also appreciate against the Japanese yen and the British pound. It is expected to remain strong against the currencies of most emerging economies as the Fed normalizes but depreciate slowly and unevenly against these currencies over the long run. Despite the surge in its value on a real broad trade-weighted basis, the dollar is still not much above its average value since it began to freely float in the early 1970s. Its resilience will ensure that it remains the global economy's principal reserve currency for the foreseeable future.

Energy prices

Oil prices have pushed over \$50 per barrel but are only about half the \$100 per barrel price that prevailed before their collapse in summer 2014. Oil prices will remain volatile but rise slowly. Underlying this outlook is the sharp pullback in investment in North American shale oil production. Rig counts have risen in recent months, but remain well below the number in operation before the break in oil prices.

OPEC has also moved to curtail production, and higher cost non-OPEC producers in the North Sea and Arctic are also curtailing investment plans. The long-run price for oil is estimated to be between \$60 and \$65 per barrel. Natural gas prices will remain low, particularly compared with oil prices, for the next decade.

Forecast Risks

Trade and immigration

Donald Trump's upset victory has increased uncertainty both in the U.S. and abroad. Since taking office, the president has held firm to his campaign promise of a strong protectionist stance on immigration and trade. The tenacity with which he pursues these options will have important consequences for the U.S. and its trading partners. Trump's anti-China and anti-Mexico trade rhetoric and expressed desire to renegotiate key trade agreements, including NAFTA, pose a direct threat to growth.

Though the baseline forecast does not assume a trade war, it would not be surprising if foreign countries retaliated in kind against U.S. tariffs. Should this scenario play out, growth in the U.S. would fall short of expectations. Immigration adds to uncertainty as undocumented workers leave the country, leading to a contraction in the labor force. In a worst-case scenario, deportations could reduce the labor force by an estimated 2.16 million or 1.4%. Tighter immigration policies will also slow foreign immigrants into the U.S., further dampening popula-

tion growth, which is already at its slowest rate since the Great Depression.

Geopolitical tensions

Geopolitical tensions outside the U.S. pose an indirect threat to the U.S. economy, transmitted through international trade, consumer sentiment and financial markets. Last month, the U.K. began the formal process of withdrawing from the European Union. The U.K.'s decision to leave the EU has elevated uncertainty not only about the U.K.-EU relationship but also about the future of Europe itself. Although the dire predictions of a Brexit scenario have yet to materialize, much depends on what kind of agreement the U.K. and EU are able to negotiate. Less than cordial terms of U.K. withdrawal from the European single market would not only disrupt financial markets but also lower the growth outlook in both the U.K. and EU.

The rise of Eurosceptic political parties and anti-immigrant populist sentiment could usher in major changes. Elections later this year in France and Germany will be the bellwether for the cohesion of the EU bloc. A win by far-right parties would be a destabilizing political shock that could push the region back into crisis, just as growth begins to gain traction across the continent.

China

A hard landing for China would deal a serious blow to the global economy. China's slowdown is already weighing on its trading partners in Asia and Latin America and has fanned financial market volatility. Although conditions have mostly stabilized, the global recovery remains fragile and could suffer a setback should growth in China stumble. The Chinese economy expanded at 6.7% in 2016, and only slightly slower gains are expected for this year. Growth will decelerate over the medium term as the government attempts to rebalance the Chinese economy toward more domestic consumption.

The uncertainty lies in China's ability to maintain sturdy growth and the impact of its interventions in the foreign exchange market on other global markets. China's expansion has been supported by a massive buildup in credit that poured into property investments and other projects. This has led to overcapacity in some industries and a frothy housing market. Should property prices tumble, the resulting sharp drop in asset quality in China's banks could heighten stress in the domestic financial sector with significant spillover effects on global financial markets.

Strong dollar

U.S. dollar appreciation poses downside risks to U.S. and global growth. Since 2014, the real trade-weighted dollar has risen by nearly 20%. A strengthening U.S. dollar would further weigh on exports by making domestically produced goods more expensive overseas. A strong dollar also poses downside risks to the global economy through its impact on emerging markets.

Many emerging market governments and businesses issue debt denominated in U.S. dollars. A significantly stronger U.S. currency increases not only their debt burden in local currency terms but also their risk of default. A wave of emerging market defaults would certainly destabilize global financial markets.

Productivity

Productivity growth has been lackluster in the aftermath of the financial crisis. Since the recession, nonfarm business productivity has averaged a disappointing 1% per annum. The decline in productivity that stems from pullback in business investment is especially concerning.

Restrictions on legal immigration and the accelerated deportation of undocumented workers could affect long-run productivity, as immigrants have historically been a key driver of business creation and have played an important role in increasing productivity and in tech industry growth. With the U.S. nearly at full employment, unless productivity gains begin to improve, the economy will not deliver on GDP, income, profits, tax revenue and asset returns.

Monetary policy

The Federal Reserve is engaged in normalizing monetary policy. A misstep by the Fed in carrying out this delicate process could derail the U.S. expansion. The baseline forecast assumes that the Fed will increase its benchmark interest rate two more times this year. Markets have so far reacted well to rising short-term interest rates. However, the Fed and markets will both be tested as a strengthening U.S. economy will likely warrant more aggressive tightening in the coming years.

Another concern is the Fed's balance sheet, which has grown to \$4.5 trillion. Fed officials are discussing plans to unwind the portfolio. As the Fed is a major player in the Treasury and agency mortgage-backed-securities markets, changes in its policy could have significant impact on financial markets.

Table 1: Sonoma County Clusters

Industries within clusters are listed by their North American Industry Classification System codes

Composition of Economic Clusters	
1. Wine and Craft Beverages	
111,112	Farming
3121	Beverage Manufacturing
2. Technology, Manufacturing, and Lifestyle Products	
311	Food Manufacturing
313	Textile Mills
314	Textile Product Mills
3254	Pharmaceutical and Medicine Manufacturing
3341	Computer and Peripheral Equipment Manufacturing
3342	Communications Equipment Manufacturing
3344	Semiconductor and Other Electronic Component Manufacturing
3345	Navigational, Measuring, Electromedical and Control Instruments Manufacturing
3391	Medical Equipment and Supplies Manufacturing
5112	Software Publishers
5171	Wired Telecommunications Carriers
5172	Wireless Telecommunications Carriers (except Satellite)
5174	Satellite Telecommunications
5179	Other Telecommunications
5191	Other Information Services
5182	Data Processing, Hosting and Related Services
5415	Computer Systems Design and Related Services
5417	Scientific Research and Development Services
5419	Other Professional, Scientific and Technical Services
6215	Medical and Diagnostic Laboratories
3. Finance, Real Estate, and Wealth Management	
5211	Monetary Authorities - Central Bank
5222	Nondepository Credit Intermediation
5223	Activities Related to Credit Intermediation
5231	Securities and Commodity Contracts Intermediation and Brokerage
5232	Securities and Commodity Exchanges
5239	Other Financial Investment Activities
5251	Insurance and Employee Benefit Funds
5312	Offices of Real Estate Agents and Brokers
4. Tourism and Hospitality	
4811	Scheduled Air Transportation
4812	Nonscheduled Air Transportation
4851	Urban Transit Systems
4853	Taxi and Limousine Services
4855	Charter Bus Industry
4881	Support Activities for Air Transportation
4884	Support Activities for Road Transportation
7112	Spectator Sports
7121	Museums, Historical Sites and Similar Institutions
7131	Amusement Parks and Arcades
7132	Gambling Industries
7139	Other Amusement and Recreation Industries
7211	Traveler Accommodation
7212	RV (Recreational Vehicle) Parks and Recreational Camps
7213	Rooming and Boarding Houses
722	Food Services and Drinking Places

Table 1: Sonoma County Clusters (Cont.)

Industries within clusters are listed by their North American Industry Classification System codes

621	Ambulatory Healthcare Services
622	Hospitals
623	Nursing and Residential Facilities
8121	Personal Care Services
5111	Newspaper, Periodical, Book and Directory Publishers
5151	Radio and Television Broadcasting
5152	Cable and Other Subscription Programming
5418	Advertising, Public Relations and Related Services
5112	Software Publishing
5415	Computer Systems Design and Related Services
5417	Scientific research and development services
5416	Management, Scientific and Technical Consulting Services
5419	Other Professional, Scientific and Technical Services
5413	Architectural, Engineering and Related Services
5414	Specialized Design Services
7111	Performing Arts Companies
7113	Promoters of Performing Arts, Sports and Similar Events
7114	Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures
7115	Independent Artists, Writers and Performers
512	Motion Picture and Sound Recording
23	Construction
327	Nonmetallic Minerals (clay, cement, concrete products)
5617	Services to Buildings and Dwellings
5621	Waste Collection
5629	Remediation and Other Waste Management Services
2211	Electric Power Generation, Transmission and Distribution
RT	Retail Trade
42	Wholesale Trade

Going the Distance: An Economic Outlook for Sonoma County

Table 2: Sonoma County Historical Summary Indicators

	2011	2012	2013	2014	2015	2016	Annual Growth 2011-2016
Gross Metro Product (2009\$ bil)	22.1	22.1	22.6	23.7	25.1	26.1	3.4
% annual change	2.5	0.1	2.3	5.0	5.7	3.8	
Gross Metro Product (\$ bil)	22.7	23.3	24.4	26.2	28.1	29.6	5.4
% annual change	4.4	2.6	4.6	7.2	7.5	5.4	
Nonfarm Employment (ths)	169.5	172.6	180.9	191.1	196.8	201.7	3.5
% annual change	1.2	1.8	4.8	5.6	3.0	2.5	
Mining and Natural Resources	0.2	0.2	0.2	0.3	0.2	0.2	0.0
Construction	8.6	8.7	9.9	10.5	11.6	12.5	7.8
Manufacturing	20.2	19.7	20.1	20.7	22.0	22.3	2.0
Trade, Transportation and Utilities	32.4	33.6	35.1	36.1	36.5	36.7	2.5
Wholesale Trade	6.6	6.9	7.4	7.5	7.5	7.7	3.0
Retail Trade	22.0	22.7	23.7	24.3	24.7	24.8	2.5
Transportation and Utilities	3.8	3.9	4.1	4.3	4.3	4.2	1.8
Information	2.5	2.6	2.6	2.7	2.7	2.7	2.0
Financial Activities	7.6	7.4	7.4	7.7	8.1	8.5	2.1
Professional and Business Services	18.1	18.2	19.3	20.1	20.4	21.1	3.1
Education and Health Services	25.0	26.2	27.9	31.3	32.1	33.1	5.8
Leisure and Hospitality	20.5	21.8	22.8	23.8	24.6	25.0	4.1
Other Services	6.1	6.3	6.6	6.8	7.0	7.3	3.7
Government	28.4	28.0	28.9	31.2	31.8	32.4	2.7
Labor Force (ths)	245.6	246.1	250.2	257.2	260.0	262.7	1.4
% annual change	0.6	0.2	1.7	2.8	1.1	1.0	
Number of Employed (ths)	220.8	224.6	232.8	243.0	248.3	252.2	2.7
Number of Unemployed (ths)	24.8	21.5	17.4	14.2	11.7	10.4	-15.9
Unemployment Rate (%)	10.1	8.8	6.9	5.5	4.5	4.0	Avg 6.6
Personal Income (\$ mil)	21,766.9	22,727.5	23,692.4	25,073.9	26,874.7	28,304.9	5.4
% annual change	5.5	4.4	4.2	5.8	7.2	5.3	
Real Personal Income (2000\$ mil)	20,900.3	21,414.1	22,031.9	22,971.0	24,534.6	25,564.7	4.1
Per Capita Income (\$)	44,623.4	46,320.0	47,901.1	50,291.7	53,702.5	56,375.8	4.8
Median Household Income (\$)	61,239.4	61,786.3	63,628.5	64,794.0	66,674.0	68,915.7	2.4
Personal Bankruptcy Filings	2,296.0	1,776.0	1,258.0	930.0	688.0	538.0	-25.2
Consumer Price Index	266.7	274.1	277.9	282.0	282.3	284.7	1.3
Population (ths)	487.5	490.2	494.0	498.2	500.2	501.8	0.6
% annual change	0.6	0.6	0.8	0.9	0.4	0.3	
Age <4	27.9	27.0	26.6	26.3	25.9	25.8	-1.5
Age 5-19	90.8	90.2	89.5	89.0	88.3	87.5	-0.8
Age 20-24	32.7	33.0	32.8	32.1	30.7	29.9	-1.8
Age 25-44	122.2	122.7	123.8	125.5	126.2	127.1	0.8
Age 45-64	143.7	142.5	142.3	142.4	141.7	141.6	-0.3
Age >65	70.3	74.8	78.8	83.0	87.4	89.9	5.0
Households (ths)	187.6	189.1	191.0	193.0	193.7	196.1	0.9
% annual change	0.6	0.8	1.0	1.0	0.4	1.2	
Net Migration (ths)	1.3	1.5	2.5	2.9	0.7	0.7	-10.3

Table 2: Sonoma County Historical Summary Indicators (Cont.)

	2011	2012	2013	2014	2015	2016	Avg
Total Housing Permits	632	560	1,046	663	621	892	736
% annual change	32.5	-11.4	86.8	-36.6	-6.3	43.7	
Single-Family Permits	449	312	453	419	431	578	440
Multifamily Permits	183	248	593	244	190	315	295
Median Exist.-Home Price (SA, \$ ths)	408.2	390.8	436.6	490.9	532.5	577.4	473
% annual change							
Existing-Home Sales (ths)	6.0	6.7	6.3	5.7	5.9	5.9	-0.3
Mortgage Originations (\$ mil)	4.1	6.1	5.9	4.0	5.4	5.0	4.3
Affordability Index	90.8	104.7	92.8	88.1	82.2	78.7	89.6
Nonres. Building Permits (\$ mil)							
Total	94.2	109.3	103.2	126.4	143.6	168.8	12.4
Office Buildings	0.0	33.2	3.6	4.8	1.1	1.1	543.9
Retail Space	1.9	5.6	41.5	20.3	31.5	68.0	104.8
Industrial	0.0	0.1	0.0	0.0	2.5	0.2	335.4

Going the Distance: An Economic Outlook for Sonoma County

Table 3: Sonoma County Forecast Summary Indicators

	2017	2018	2019	2020	2021	2022	Annual Growth 2017-2022
Gross Metro Product (2009\$ bil)	26.8	27.5	28.1	28.6	29.3	30.0	2.3
% annual change	2.8	2.8	2.1	1.7	2.3	2.5	
Gross Metro Product (\$ bil)	31.1	32.8	34.3	35.7	37.3	39.0	4.6
% annual change	4.8	5.5	4.7	4.2	4.4	4.4	
Nonfarm Employment (ths)	204.9	207.8	210.0	211.3	211.8	212.8	0.8
% annual change	1.6	1.4	1.1	0.6	0.2	0.5	
Mining and Natural Resources	0.2	0.2	0.2	0.2	0.2	0.2	0.7
Construction	13.2	13.7	14.1	14.2	14.2	14.3	1.6
Manufacturing	22.0	22.1	22.0	21.8	21.5	21.3	-0.7
Trade, Transportation and Utilities	36.7	37.1	37.2	37.3	37.2	37.1	0.2
Wholesale Trade	7.7	7.8	7.9	7.9	7.9	7.9	0.5
Retail Trade	24.8	25.0	25.1	25.1	25.0	25.0	0.2
Transportation and Utilities	4.2	4.2	4.2	4.2	4.2	4.2	-0.1
Information	2.7	2.7	2.7	2.7	2.7	2.7	0.0
Financial Activities	8.7	8.7	8.8	8.8	8.9	9.0	0.7
Professional and Business Services	22.4	23.1	23.6	23.9	24.0	24.2	1.6
Education and Health Services	33.5	34.1	34.7	35.2	35.6	35.9	1.4
Leisure and Hospitality	25.0	25.4	25.8	26.1	26.3	26.6	1.2
Other Services	7.4	7.5	7.5	7.5	7.5	7.6	0.4
Government	33.0	33.2	33.3	33.5	33.7	34.0	0.5
Labor Force (ths)	264.0	265.5	267.4	268.8	270.1	271.5	0.6
% annual change	0.5	0.6	0.7	0.5	0.5	0.5	
Number of Employed (ths)	253.9	256.2	258.3	258.9	259.1	259.8	0.5
Number of Unemployed (ths)	10.1	9.3	9.1	10.0	11.0	11.6	2.8
Unemployment Rate (%)	3.8	3.5	3.4	3.7	4.1	4.3	Avg 3.8
Personal Income (\$ mil)	29,591.6	30,983.1	32,438.6	33,983.8	35,417.6	36,952.6	4.5
% annual change	4.5	4.7	4.7	4.8	4.2	4.3	
Real Personal Income (2000\$ mil)	26,107.6	26,576.8	27,040.1	27,650.6	28,225.2	28,907.9	2.1
Per Capita Income (\$)	58,693.3	61,147.9	63,694.2	66,387.7	68,838.0	71,460.3	4.0
Median Household Income (\$)	71,004.1	73,382.5	75,729.6	78,102.7	80,340.8	82,727.4	3.1
Personal Bankruptcy Filings	505.8	454.7	415.5	495.2	653.7	858.6	11.2
Consumer Price Index	292.0	299.9	308.9	317.9	326.6	335.1	2.8
Population (ths)	503.9	506.4	508.9	511.6	514.2	516.8	0.5
% annual change	0.4	0.5	0.5	0.5	0.5	0.5	
Age <4	25.8	25.8	25.8	25.8	25.7	25.5	-0.2
Age 5-19	86.9	86.6	86.5	86.3	86.2	86.2	-0.2
Age 20-24	29.0	28.3	27.4	26.8	26.4	26.1	-2.1
Age 25-44	128.5	130.0	131.6	132.8	134.2	135.4	1.0
Age 45-64	141.2	140.5	139.6	138.6	137.5	136.3	-0.7
Age >65	92.4	95.2	98.1	101.2	104.2	107.3	3.0
Households (ths)	197.8	199.8	201.9	204.1	206.2	208.3	1.0
% annual change	0.9	1.0	1.1	1.1	1.0	1.0	
Net Migration (ths)	1.1	1.6	1.6	1.6	1.6	1.6	

Table 3: Sonoma County Forecast Summary Indicators (Cont.)

	2017	2018	2019	2020	2021	2022	
							Avg
Total Housing Permits	1,339	1,459	1,556	1,408	1,402	1,501	1,444
% annual change	50.0	9.0	6.6	-9.5	-0.4	7.1	
Single-Family Permits	959	1,106	1,248	1,165	1,151	1,219	1,141
Multifamily Permits	380	353	308	243	251	281	303
Median Exist.-Home Price (SA, \$ ths)	614.2	628.1	641.8	661.5	694.8	738.6	663.2
% annual change							
Existing-Home Sales (ths)	7.5	8.1	6.7	6.0	5.8	5.7	-5.3
Mortgage Originations (\$ mil)	3.0	2.0	1.9	1.8	2.2	2.7	-2.5
Affordability Index	71.8	67.3	61.9	61.3	61.3	59.6	63.9
Nonres. Building Permits (\$ mil)							
Total	158.8	164.0	168.8	171.8	174.9	179.2	169.6
Office Buildings	0.9	1.0	1.1	1.1	1.2	1.3	1.1
Retail Space	29.5	32.4	34.5	35.8	36.6	37.8	34.4
Industrial	0.7	0.6	0.6	0.5	0.5	0.4	0.6

Table 4: Sonoma County Historical Employment by Cluster

Ths

	2011	2012	2013	2014	2015	2016	Compound ann. growth rate 2011-2016	% share of employment 2016
Total	179.1	182.3	191.0	201.4	207.0	211.8	3.4	100.0
% change	1.2	1.8	4.7	5.5	2.8	2.3		
1. Wine and Craft Beverages	12.5	12.5	12.8	13.6	14.1	14.2	2.6	6.7
% change	-1.2	0.5	2.5	5.7	3.9	0.4		
2. Technology, Manufacturing, and Lifestyle Products	11.5	11.2	11.7	11.9	12.3	12.5	1.7	5.9
% change	0.7	-3.0	4.7	1.6	3.5	1.7		
3. Finance, Real Estate, and Wealth Management	1.8	1.8	1.9	1.9	2.0	2.1	3.8	1.0
% change	0.7	-0.1	7.2	0.8	3.2	8.4		
4. Tourism and Hospitality	20.8	22.2	23.3	24.3	25.0	25.4	4.0	12.0
% change	1.9	6.6	4.9	4.3	2.8	1.6		
5. Health and Wellness	19.2	20.1	20.8	21.1	21.9	22.6	3.4	10.7
% change	-1.1	5.0	3.5	1.3	3.9	3.2		
6. Creative Professional Services	8.5	8.1	8.2	8.6	8.7	8.6	0.3	4.1
% change	-8.4	-4.3	1.8	3.9	1.3	-0.9		
7. Construction and Related Services	12.5	12.9	14.5	15.1	16.5	17.8	7.2	8.4
% change	-2.2	2.7	12.2	4.5	9.2	7.8		
8. Retail Trade	22.0	22.7	23.7	24.3	24.7	24.8	2.5	11.7
% change	2.2	3.2	4.2	2.8	1.6	0.5		
9. Wholesale Trade	6.6	6.9	7.4	7.5	7.5	7.7	3.0	3.6
% change	0.4	5.0	6.0	1.7	0.1	2.4		
Sum of Clusters	115.3	118.4	124.3	128.3	132.7	135.7	3.3	64.1
% change	-0.4	2.7	5.0	3.2	3.4	2.3		
Other	63.8	63.9	66.7	73.2	74.3	76.1	3.6	35.9
% change	4.1	0.2	4.4	9.7	1.5	2.4		

Table 5: Sonoma County Forecast Employment by Cluster

Ths

	2017	2018	2019	2020	2021	2022	Compound ann. growth rate 2017-2022	% share of employment 2022
Total	215.0	217.9	220.1	221.4	221.8	222.9	0.7	100.0
% change	1.5	1.3	1.0	0.6	0.2	0.5		
1. Wine and Craft Beverages	14.2	14.3	14.3	14.3	14.2	14.1	-0.1	6.3
% change	0.3	0.6	0.0	-0.2	-0.4	-0.5		
2. Technology, Manufacturing, and Lifestyle Products	12.7	12.8	12.9	12.9	12.9	12.8	0.2	5.8
% change	1.4	1.1	0.6	0.1	-0.4	-0.3		
3. Finance, Real Estate, and Wealth Management	2.2	2.2	2.2	2.2	2.2	2.2	0.0	1.0
% change	1.5	0.0	-0.2	0.0	-0.2	0.4		
4. Tourism and Hospitality	25.4	25.8	26.1	26.4	26.6	26.9	1.2	12.1
% change	-0.2	1.7	1.4	1.1	0.7	0.9		
5. Health and Wellness	23.0	23.4	23.7	24.1	24.2	24.4	1.2	11.0
% change	1.7	1.6	1.5	1.3	0.7	0.8		
6. Creative Professional Services	9.0	9.1	9.3	9.3	9.3	9.3	0.8	4.2
% change	4.7	1.7	1.3	0.6	0.0	0.3		
7. Construction and Related Services	18.8	19.6	20.2	20.4	20.5	20.7	1.9	9.3
% change	6.0	4.0	3.1	1.1	0.1	1.2		
8. Retail Trade	24.8	25.0	25.1	25.1	25.0	25.0	0.2	11.2
% change	-0.2	1.0	0.4	0.0	-0.4	0.0		
9. Wholesale Trade	7.7	7.8	7.9	7.9	7.9	7.9	0.5	3.5
% change	0.6	1.0	0.9	0.5	-0.1	0.1		
Sum of Clusters	137.8	140.0	141.7	142.6	142.8	143.4	0.8	64.4
% change	1.5	1.7	1.2	0.6	0.1	0.4		
Other	77.3	77.9	78.4	78.8	79.0	79.4	0.6	35.6
% change	1.5	0.8	0.6	0.5	0.3	0.5		

Table 6: Sonoma County Historical Gross Regional Product (Output) by Cluster

\$ mil

	2011	2012	2013	2014	2015	2016	Compound ann. growth rate 2010-2016	% share of total output 2016
Total	22,740.8	23,324.0	24,405.1	26,153.9	28,110.9	29,631.1	5.4	100.0
% change	4.4	2.6	4.6	7.2	7.5	5.4		
1. Wine and Craft Beverages	1,469.1	1,540.8	1,609.0	1,705.2	1,806.2	1,771.9	3.8	6.0
% change	2.4	4.9	4.4	6.0	5.9	-1.9		
2. Technology, Manufacturing, and Lifestyle Products	2,203.4	2,338.8	2,504.4	2,704.5	2,956.1	3,096.9	7.0	10.5
% change	5.1	6.1	7.1	8.0	9.3	4.8		
3. Finance, Real Estate, and Wealth Management	1,201.3	1,285.7	1,354.7	1,527.0	1,560.6	1,685.1	7.0	5.7
% change	7.0	7.0	5.4	12.7	2.2	8.0		
4. Tourism and Hospitality	1,050.4	1,107.4	1,176.8	1,234.2	1,316.3	1,414.7	6.1	4.8
% change	7.4	5.4	6.3	4.9	6.7	7.5		
5. Health and Wellness	1,578.4	1,661.0	1,733.2	1,831.5	1,965.0	2,076.3	5.6	7.0
% change	5.0	5.2	4.3	5.7	7.3	5.7		
6. Creative Professional Services	1,752.7	1,778.6	1,767.9	1,890.7	2,066.0	2,180.6	4.5	7.4
% change	-4.9	1.5	-0.6	6.9	9.3	5.5		
7. Construction and Related Services	1,343.1	1,383.2	1,567.3	1,620.8	1,842.8	1,989.1	8.2	6.7
% change	-1.1	3.0	13.3	3.4	13.7	7.9		
8. Retail Trade	1,670.3	1,757.7	1,882.1	1,937.4	2,003.3	2,023.6	3.9	6.8
% change	2.2	5.2	7.1	2.9	3.4	1.0		
9. Wholesale Trade	1,262.7	1,302.1	1,405.4	1,473.5	1,540.9	1,621.6	5.1	5.5
% change	9.4	3.1	7.9	4.8	4.6	5.2		
Sum of Clusters	13,531.4	14,155.3	15,000.8	15,924.7	17,057.3	17,859.8	5.7	60.3
% change	3.1	4.6	6.0	6.2	7.1	4.7		
Other	9,209.4	9,168.7	9,404.2	10,229.2	11,053.6	11,771.3	5.0	39.7
% change	6.5	-0.4	2.6	8.8	8.1	6.5		

Table 7: Sonoma County Forecast Gross Regional Product (Output) by Cluster

\$ mil

	2017	2018	2019	2020	2021	2022	Compound ann. growth rate 2017-2022	% share of total output 2022
Total	31,061.6	32,757.9	34,299.2	35,737.0	37,315.9	38,957.2	4.6	100.0
% change	4.8	5.5	4.7	4.2	4.4	4.4		
1. Wine and Craft Beverages	1,763.6	1,810.4	1,860.5	1,918.5	1,982.4	2,034.8	2.9	5.2
% change	(0.5)	2.7	2.8	3.1	3.3	2.6		
2. Technology, Manufacturing, and Lifestyle Products	3,394.3	3,666.5	3,906.0	4,140.9	4,399.1	4,660.3	6.5	12.0
% change	9.6	8.0	6.5	6.0	6.2	5.9		
3. Finance, Real Estate, and Wealth Management	1,711.0	1,752.4	1,785.8	1,817.8	1,859.8	1,901.9	2.1	4.9
% change	1.5	2.4	1.9	1.8	2.3	2.3		
4. Tourism and Hospitality	1,447.7	1,534.4	1,614.5	1,687.3	1,766.3	1,849.6	5.0	4.7
% change	2.3	6.0	5.2	4.5	4.7	4.7		
5. Health and Wellness	2,168.2	2,277.4	2,381.7	2,485.0	2,594.5	2,706.4	4.5	6.9
% change	4.4	5.0	4.6	4.3	4.4	4.3		
6. Creative Professional Services	2,358.8	2,522.9	2,670.2	2,799.9	2,938.7	3,085.2	5.5	7.9
% change	8.2	7.0	5.8	4.9	5.0	5.0		
7. Construction and Related Services	2,133.3	2,286.7	2,419.0	2,503.4	2,580.3	2,687.1	4.7	6.9
% change	7.2	7.2	5.8	3.5	3.1	4.1		
8. Retail Trade	2,083.8	2,197.2	2,306.0	2,415.1	2,533.8	2,662.5	5.0	6.8
% change	3.0	5.4	5.0	4.7	4.9	5.1		
9. Wholesale Trade	1,701.2	1,836.6	1,963.7	2,080.2	2,212.9	2,349.1	6.7	6.0
% change	4.9	8.0	6.9	5.9	6.4	6.2		
Sum of Clusters	18,761.9	19,884.5	20,907.4	21,848.1	22,867.8	23,937.0	5.0	61.4
% change	5.1	6.0	5.1	4.5	4.7	4.7		
Other	12,299.6	12,873.4	13,391.8	13,888.9	14,448.1	15,020.2	4.1	38.6
% change	4.5	4.7	4.0	3.7	4.0	4.0		

Table 8: Sonoma County Historical Gross Regional Product (Output) by Cluster

2009\$ mil

	2011	2012	2013	2014	2015	2016	Compound ann. growth rate 2011-2016	% share of total output 2016
Total	22,076.5	22,106.4	22,612.9	23,736.8	25,087.8	26,050.8	3.4	100.0
% change	2.5	0.1	2.3	5.0	5.7	3.8		
1. Wine and Craft Beverages	1,304.2	1,301.0	1,307.7	1,384.0	1,503.3	1,540.8	3.4	5.9
% change	(5.7)	(0.2)	0.5	5.8	8.6	2.5		
2. Technology, Manufacturing, and Lifestyle Products	2,262.2	2,364.4	2,500.2	2,666.4	2,862.1	2,978.7	5.7	11.4
% change	6.5	4.5	5.7	6.6	7.3	4.1		
3. Finance, Real Estate, and Wealth Management	1,177.8	1,222.3	1,243.0	1,355.5	1,329.3	1,388.6	3.3	5.3
% change	5.8	3.8	1.7	9.1	(1.9)	4.5		
4. Tourism and Hospitality	1,048.6	1,064.3	1,099.8	1,124.4	1,147.3	1,172.3	2.3	4.5
% change	7.2	1.5	3.3	2.2	2.0	2.2		
5. Health and Wellness	1,527.7	1,580.7	1,637.0	1,715.3	1,820.8	1,879.8	4.2	7.2
% change	3.9	3.5	3.6	4.8	6.2	3.2		
6. Creative Professional Services	1,743.2	1,751.2	1,723.2	1,823.3	1,952.1	2,032.3	3.1	7.8
% change	(5.2)	0.5	(1.6)	5.8	7.1	4.1		
7. Construction and Related Services	1,353.7	1,364.7	1,496.8	1,461.5	1,610.5	1,686.8	4.5	6.5
% change	(2.0)	0.8	9.7	(2.4)	10.2	4.7		
8. Retail Trade	1,609.1	1,629.9	1,733.3	1,759.0	1,780.7	1,750.3	1.7	6.7
% change	(0.7)	1.3	6.3	1.5	1.2	(1.7)		
9. Wholesale Trade	1,206.3	1,206.3	1,290.0	1,341.1	1,397.1	1,465.5	4.0	5.6
% change	7.0	(0.0)	6.9	4.0	4.2	4.9		
Sum of Clusters	13,232.8	13,484.8	14,031.0	14,630.5	15,403.3	15,895.2	3.7	61.0
% change	1.5	1.9	4.1	4.3	5.3	3.2		
Other	8,843.6	8,621.6	8,581.9	9,106.3	9,684.4	10,155.6	2.8	39.0
% change	4.0	(2.5)	(0.5)	6.1	6.3	4.9		

Table 9: Sonoma County Forecast Gross Regional Product (Output) by Cluster

2009\$ mil

	2017	2018	2019	2020	2021	2022	Compound ann. growth rate 2017-2022	% share of total output 2022
Total	26,783.7	27,546.7	28,116.1	28,607.3	29,255.4	29,972.9	2.3	100.0
% change	2.8	2.8	2.1	1.7	2.3	2.5		
1. Wine and Craft Beverages	1,470.6	1,470.2	1,471.7	1,480.9	1,497.7	1,507.6	0.5	5.0
% change	(4.6)	(0.0)	0.1	0.6	1.1	0.7		
2. Technology, Manufacturing, and Lifestyle Products	3,207.8	3,378.5	3,507.8	3,630.4	3,776.4	3,925.7	4.1	13.1
% change	7.7	5.3	3.8	3.5	4.0	4.0		
3. Finance, Real Estate, and Wealth Management	1,376.9	1,374.2	1,364.7	1,355.8	1,357.5	1,361.6	-0.2	4.5
% change	(0.8)	(0.2)	(0.7)	(0.7)	0.1	0.3		
4. Tourism and Hospitality	1,171.2	1,210.1	1,240.6	1,265.5	1,296.9	1,332.4	2.6	4.4
% change	(0.1)	3.3	2.5	2.0	2.5	2.7		
5. Health and Wellness	1,924.0	1,970.4	2,008.3	2,045.8	2,091.5	2,140.9	2.2	7.1
% change	2.3	2.4	1.9	1.9	2.2	2.4		
6. Creative Professional Services	2,159.8	2,251.5	2,321.6	2,375.7	2,440.7	2,513.5	3.1	8.4
% change	6.3	4.2	3.1	2.3	2.7	3.0		
7. Construction and Related Services	1,771.3	1,851.3	1,908.7	1,928.7	1,947.1	1,989.9	2.4	6.6
% change	5.0	4.5	3.1	1.0	1.0	2.2		
8. Retail Trade	1,768.7	1,818.4	1,860.1	1,901.8	1,953.8	2,014.6	2.6	6.7
% change	1.0	2.8	2.3	2.2	2.7	3.1		
9. Wholesale Trade	1,519.2	1,599.1	1,666.5	1,723.4	1,795.2	1,870.1	4.2	6.2
% change	3.7	5.3	4.2	3.4	4.2	4.2		
Sum of Clusters	16,369.4	16,923.7	17,350.0	17,708.0	18,156.7	18,656.3	2.6	62.2
% change	3.0	3.4	2.5	2.1	2.5	2.8		
Other	10,414.3	10,623.0	10,766.1	10,899.3	11,098.6	11,316.5	1.7	37.8
% change	2.5	2.0	1.3	1.2	1.8	2.0		

Table 10: Sonoma County Historical Productivity (Output per Worker)

\$ths

	2011	2012	2013	2014	2015	2016	Compound ann. growth rate 2011-2016
Total	126.9	127.9	127.8	129.8	135.8	139.9	2.0
% change	3.2	0.8	-0.1	1.6	4.6	3.0	
1. Wine and Craft Beverages	117.8	122.9	125.2	125.5	127.9	125.0	1.2
% change	3.6	4.3	1.9	0.2	1.9	-2.3	
2. Technology, Manufacturing, and Lifestyle Products	191.4	209.4	214.1	227.6	240.4	247.6	5.3
% change	4.3	9.4	2.2	6.3	5.6	3.0	
3. Finance, Real Estate, and Wealth Management	677.5	725.7	713.6	798.1	790.5	787.2	3.0
% change	6.3	7.1	-1.7	11.8	-1.0	-0.4	
4. Tourism and Hospitality	50.4	49.9	50.5	50.8	52.7	55.7	2.0
% change	5.4	-1.1	1.3	0.6	3.7	5.8	
5. Health and Wellness	82.4	82.5	83.1	86.8	89.6	91.7	2.2
% change	6.1	0.2	0.8	4.4	3.3	2.4	
6. Creative Professional Services	207.3	219.9	214.7	221.0	238.3	253.9	4.1
% change	3.8	6.1	-2.4	2.9	7.9	6.5	
7. Construction and Related Services	107.1	107.4	108.4	107.3	111.7	111.9	0.9
% change	1.2	0.2	1.0	-1.1	4.1	0.2	
8. Retail Trade	76.0	77.4	79.5	79.6	81.0	81.5	1.4
% change	0.0	1.9	2.7	0.1	1.8	0.6	
9. Wholesale Trade	191.2	187.7	191.1	197.0	205.9	211.6	2.1
% change	9.0	-1.8	1.8	3.1	4.5	2.8	
Sum of Clusters	117.3	119.5	120.7	124.2	128.6	131.6	2.3
% change	3.5	1.9	1.0	2.9	3.5	2.4	
Other	144.3	143.5	141.0	139.8	148.8	154.7	1.4
% change	2.3	-0.6	-1.7	-0.9	6.4	4.0	

Table 11: Sonoma County Forecast Productivity (Output per Worker)

\$ths

	2017	2018	2019	2020	2021	2022	Compound ann. growth rate 2017-2022
Total	144.5	150.3	155.8	161.4	168.2	174.8	3.9
% change	3.3	4.1	3.7	3.6	4.2	3.9	
1. Wine and Craft Beverages	124.1	126.6	130.1	134.4	139.5	144.0	3.0
% change	(0.8)	2.0	2.8	3.3	3.8	3.2	
2. Technology, Manufacturing, and Lifestyle Products	267.6	285.9	302.8	320.5	341.7	363.1	6.3
% change	8.1	6.8	5.9	5.9	6.6	6.3	
3. Finance, Real Estate, and Wealth Management	787.6	806.5	823.4	838.6	859.3	875.3	2.1
% change	0.0	2.4	2.1	1.8	2.5	1.9	
4. Tourism and Hospitality	57.1	59.5	61.7	63.8	66.3	68.8	3.8
% change	2.5	4.2	3.8	3.4	3.9	3.7	
5. Health and Wellness	94.2	97.3	100.3	103.3	107.1	110.8	3.3
% change	2.6	3.3	3.1	3.0	3.7	3.4	
6. Creative Professional Services	262.4	276.1	288.6	300.8	315.7	330.6	4.7
% change	3.3	5.2	4.5	4.2	5.0	4.7	
7. Construction and Related Services	113.2	116.7	119.7	122.5	126.1	129.8	2.8
% change	1.2	3.1	2.6	2.4	2.9	2.9	
8. Retail Trade	84.1	87.8	91.8	96.1	101.2	106.3	4.8
% change	3.2	4.4	4.5	4.7	5.3	5.1	
9. Wholesale Trade	220.8	236.0	250.1	263.7	280.7	297.7	6.2
% change	4.3	6.9	6.0	5.4	6.4	6.1	
Sum of Clusters	136.2	142.0	147.5	153.2	160.1	166.9	4.2
% change	3.5	4.3	3.9	3.8	4.5	4.2	
Other	159.2	165.3	170.9	176.4	182.8	189.1	3.5
% change	2.9	3.8	3.4	3.2	3.7	3.4	

Table 12: Sonoma County Historical Productivity (Output per Worker)

2009\$ ths

	2011	2012	2013	2014	2015	2016	Compound ann. growth rate 2011-2016
Total	123.2	121.3	118.4	117.8	121.2	123.0	0.0
% change	1.3	-1.6	-2.3	-0.5	2.9	1.5	
1. Wine and Craft Beverages	104.6	103.8	101.8	101.9	106.5	108.7	0.8
% change	-4.6	-0.8	-1.9	0.1	4.5	2.1	
2. Technology, Manufacturing, and Lifestyle Products	196.5	211.7	213.7	224.4	232.7	238.1	3.9
% change	5.7	7.7	1.0	5.0	3.7	2.3	
3. Finance, Real Estate, and Wealth Management	664.3	689.9	654.8	708.5	673.4	648.7	-0.5
% change	5.1	3.9	-5.1	8.2	-5.0	-3.7	
4. Tourism and Hospitality	50.4	47.9	47.2	46.3	45.9	46.2	-1.7
% change	5.2	-4.8	-1.5	-2.0	-0.8	0.5	
5. Health and Wellness	79.7	78.5	78.5	81.3	83.0	83.1	0.8
% change	5.1	-1.5	0.0	3.5	2.2	0.0	
6. Creative Professional Services	206.2	216.5	209.3	213.1	225.2	236.7	2.8
% change	3.5	5.0	-3.4	1.9	5.7	5.1	
7. Construction and Related Services	108.0	106.0	103.6	96.7	97.6	94.9	-2.6
% change	0.2	-1.9	-2.3	-6.6	0.9	-2.8	
8. Retail Trade	73.2	71.8	73.3	72.3	72.0	70.5	-0.8
% change	-2.9	-1.9	2.0	-1.3	-0.4	-2.1	
9. Wholesale Trade	182.6	173.9	175.4	179.3	186.7	191.3	0.9
% change	6.6	-4.8	0.9	2.2	4.1	2.5	
Sum of Clusters	114.7	113.9	112.9	114.1	116.1	117.1	0.4
% change	1.9	-0.8	-0.9	1.0	1.8	0.9	
Other	138.6	134.9	128.7	124.5	130.4	133.4	-0.8
% change	-0.1	-2.7	-4.6	-3.3	4.7	2.4	

Table 13: Sonoma County Forecast Productivity (Output per Worker)

2009\$ ths

	2017	2018	2019	2020	2021	2022	Compound ann. growth rate 2017-2022
Total	124.6	126.4	127.8	129.2	131.9	134.5	1.5
% change	1.3	1.5	1.1	1.2	2.1	2.0	
1. Wine and Craft Beverages	103.4	102.8	102.9	103.8	105.4	106.7	0.6
% change	-4.8	-0.6	0.1	0.8	1.6	1.2	
2. Technology, Manufacturing, and Lifestyle Products	252.9	263.4	271.9	281.0	293.4	305.9	3.9
% change	6.2	4.1	3.2	3.3	4.4	4.3	
3. Finance, Real Estate, and Wealth Management	633.7	632.4	629.2	625.4	627.2	626.6	-0.2
% change	-2.3	-0.2	-0.5	-0.6	0.3	-0.1	
4. Tourism and Hospitality	46.2	46.9	47.4	47.9	48.7	49.6	1.4
% change	0.1	1.6	1.1	0.9	1.7	1.8	
5. Health and Wellness	83.6	84.2	84.6	85.1	86.3	87.6	1.0
% change	0.6	0.8	0.5	0.6	1.5	1.5	
6. Creative Professional Services	240.3	246.4	250.9	255.2	262.2	269.3	2.3
% change	1.5	2.6	1.8	1.7	2.7	2.7	
7. Construction and Related Services	94.0	94.5	94.4	94.4	95.2	96.2	0.5
% change	-0.9	0.5	0.0	0.0	0.8	1.0	
8. Retail Trade	71.4	72.7	74.0	75.7	78.0	80.5	2.4
% change	1.3	1.8	1.9	2.2	3.1	3.1	
9. Wholesale Trade	197.2	205.5	212.2	218.5	227.7	237.0	3.8
% change	3.1	4.2	3.3	2.9	4.2	4.1	
Sum of Clusters	118.8	120.9	122.4	124.2	127.2	130.1	1.8
% change	1.4	1.7	1.3	1.4	2.4	2.3	
Other	134.8	136.4	137.4	138.4	140.4	142.4	1.1
% change	1.0	1.2	0.7	0.8	1.5	1.4	

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