SONOMA COUNTY EDB ECONOMIC DEVELOPMENT BOARD

SPRING
LOCAL ECONOMIC REPORT

FORECAST REPORT

2022

ECONOMIC DEVELOPMENT BOARD

BOARD OF DIRECTORS

KATHRYN HECHT, CHAIR **JORGE ALCAZAR** **SKIP BRAND** **BETZY CHÁVEZ**
LINDA KACHIU **JORDAN KIVELSTADT** **WAYNE LEACH** **REGINA MAHIRI**
RICHARD MARZO **MICHAEL NICHOLLS**
ETHAN BROWN, Interim Executive Director

EDB FOUNDATION SPONSORS

FOUNDATIONAL LEVEL

Luther Burbank® Savings

PRESENTING LEVEL

City of Santa Rosa

Exchange Bank Member FDIC Invested in you.

KAISER PERMANENTE®

PG&E Pacific Gas and Electric Company®

Redwood Credit Union

PREMIERE LEVEL

Bank of Marin

Providence Santa Rosa Memorial Hospital

Sonoma Clean Power

SONOMA COUNTY • CALIFORNIA • LIFE OPENS UP® SONOMA COUNTY TOURISM SONOMACOUNTY.COM

Sutter Health

EXECUTIVE LEVEL

- COMCAST
- PISENTI & BRINKER LLP
- NORTH BAY ASSOCIATION OF REALTORS
- SUMMIT STATE BANK

SONOMA COUNTY BOARD OF SUPERVISORS

CONTENTS

EXECUTIVE SUMMARY

September 2022

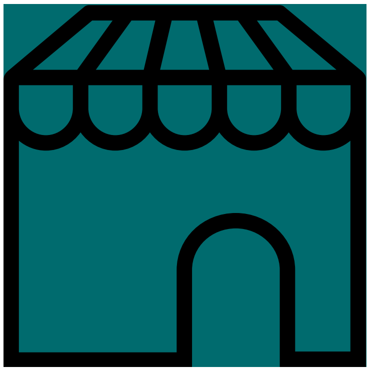
The Sonoma County Economic Development Board (EDB) is pleased to present the Spring 2022 Local Economic Report. Our research partner, Moody's Analytics, provided the data for this report. For additional information, questions, comments, or suggestions, please contact (707) 565-7170 or visit www.sonomaedb.org.

Disclaimer to the Reader: *The forthcoming details in this report reflect trends sourced from data gathered during the novel Coronavirus pandemic. Figures, such as employment rates and COVID-19 case rates, have been susceptible to great variability and are ever-changing.*

HIGHLIGHTS

Sonoma County's tourism industry is crucial to the local economy. As COVID-19 contagion fears diminish and more people begin to travel, the outlook for Sonoma County tourism grows more promising. TSA data shows that throughput numbers, through April 2022, sit at around 85% of their 2019 level, a significant improvement from 2021. Morning Consult estimates that around 71% of respondents are now willing to travel. Sonoma benefits from its proximity to large population hubs, as people are more comfortable driving than flying to travel. Additionally, the Mexico and Canada borders opened in December of 2021, meaning international visitors will likely add to the influx of tourists.

A lack of housing supply and declining affordability means potential residents are being priced-out of Sonoma County. Migration out of the county has been greater than migration into the county for the past five consecutive years. Out-migration did slow in 2021, but this trend remains a problem for Sonoma. As the population ages and baby boomers move into retirement, there will be fewer prime-age workers to fill their jobs. Proximity to the Bay Area and economic powerhouses play to Sonoma County's advantage. However, costs in Sonoma County are high relative to other emerging tech hubs, making it a less desirable location for expansion.



A robust growth in goods-producing industries has led to significant job growth in Sonoma County. Sonoma has outpaced the region in terms of job growth for four of the past six months (the end of 2021 and beginning of 2022). While the unemployment rate has been falling closer to pre-pandemic levels, this is primarily because of the weak labor force. The manufacturing industry will remain strong partially due to a robust market for local and organic artisanal foods. Consumers will pay more for organic produce, meat, dairy, and snack foods. Additionally, restaurant and winery visitation continue to improve.

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


Chili Smith Family Foods
California Grown Farm Fresh Heirloom Beans
Flor de Mayo
No GMO - All Natural
Good Mother Stallard
Hidatsa Red
No GMO - All-Natural

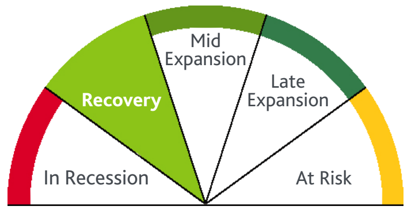

CAMPAGNE
SEMOLINA
PUMPKIN SEED


OPEN

MOODY'S ANALYTICS

SONOMA COUNTY CA

METRO COMPARISON	EMPLOYMENT GROWTH RANK 2021-2023	EMPLOYMENT GROWTH RANK 2021-2026	RELATIVE COSTS LIVING	RELATIVE COSTS BUSINESS	VITALITY RELATIVE	VITALITY RANK
	Best=1, Worst=409		U.S.=100%		U.S.=0%	Best=1, Worst=402
Sonoma County	48 (1st quintile)	83 (2nd quintile)	134%	131%	-0.21%	263
Santa Barbara County	87 (2nd quintile)	95 (2nd quintile)	133%	135%	-0.09%	210
Santa Cruz County	11 (1st quintile)	18 (1st quintile)	150%	144%	-0.19%	257
Sacramento MSA	119 (2nd quintile)	105 (2nd quintile)	114%	130%	0.22%	122
Monterey County	131 (2nd quintile)	118 (2nd quintile)	129%	130%	-0.46%	344



STRENGTHS AND WEEKNESSES

STRENGTHS

» World-class wineries and craft breweries are magnets for tourism.
» Leader in organic food production.
» Climate draws outdoor enthusiasts.
» High quality of life.

WEAKNESSES

» Limited land availability for new wineries and commercial construction.
» High costs relative to emerging tech hubs.
» Unfavorable age structure.

FORECAST RISKS

SHORT TERM ↓	LONG TERM ↑

COVID-19 EXPOSURE OCTOBER 2021	296	4th quintile	Highest=1 Lowest=403

UPSIDE

» More consumers embrace organic foods.
» Marin County biotech firms expand in Sonoma County.

DOWNSIDE

» A longer than expected period of high inflation could undermine already-fragile business and consumer confidence, causing a pullback in spending.
» Population trends fail to improve.
» More wine enthusiasts flock to the Pacific Northwest.

MOODY'S RATING

NR SANTA ROSA AS OF AUG 06, 2020

ANALYSIS

Recent Performance. Sonoma County's economy is progressing steadily. Annual benchmark revisions paint a more optimistic picture of the labor market recovery, though SON's recovery still trails the state average. On the plus side, job growth has outpaced the region's in four of the past six months largely on the back of robust growth in goods-producing industries. The crucial tourism industry is likewise pressing on the accelerator, with the county's payrolls just 6% off their pre-pandemic peak, compared with 8% for the region. The unemployment rate has been moving closer to its pre-pandemic level, but this is largely because of labor force weakness.

The housing market is in good shape. House price appreciation is strong, though still behind the state average, while permit issuance is rapidly increasing.

Tourism. SON's tourism outlook is glowing more brightly in light of reduced contagion fear and renewed confidence in traveling. Traveler volumes at the nation's airports show a broadly improving trend. TSA throughput numbers, through April of this year, are much higher compared with the same period in 2021 and sit at 85% of their 2019 figure. Consumers' professed comfort in taking vacations has followed a similar trend. According to Morning Consult, 71% of respondents are willing to travel now, the highest share since the beginning of the pandemic. Respondents also indicate that they are more comfortable traveling by car than through domestic air travel. This will likely help SON recover more quickly than other tourism-centric areas given its proximity to large population hubs and greater reliance on visitors from neighboring counties who are within driving distance. International visitors will likewise offer a boost, as the Mexico and Canada borders opened for vaccinated travelers in December.

Manufacturing. Manufacturing will build on its recent momentum in the near term. Consumers' growing preference for organically and locally sourced artisanal food products will play to the advantage of SON-based food and beverage producers. Continued improvement in on-premises spending at restaurants and bars, including more winery visitation, will provide a tailwind, and consumers are demonstrating a willingness to pay a price premium for organic produce, meat, dairy and snack foods.

Demographics. Unfavorable demographic trends will hold back the county's recovery. Though house price appreciation is behind the state average, years of underbuilding and eroding housing affordability have priced out some potential residents, who are opting for lower-cost inland counties with similar job opportunities. The county has now shed residents in five consecutive years, though the pace of out-migration did slow substantially in 2021. Fewer prime-age workers will step in to take the reins from retiring baby boomers, and lackluster labor force gains will hamstring job growth in the medium term. The county's high quality of life and proximity to traditional Bay Area economic powerhouses could support improved population trends, but only if the county's rapidly declining affordability pumps the brakes.

Sonoma County's near-term outlook is one of cautious optimism. The county's core industries are on the mend, though it will take some time for them to fully recover. Unfortunately, weak population growth will outmuscle the advantages of a high quality of life and educated workforce, relegating the county to a slightly below-average performer relative to California.

Colin Seitz *1-866-275-3266*
April 2022 *help@economy.com*

2016	2017	2018	2019	2020	2021	INDICATORS	2022	2023	2024	2025	2026	2027
28.0	29.1	29.9	30.5	28.9	30.8	Gross metro product (C12$ bil)	31.9	33.0	34.0	34.9	35.7	36.4
1.6	*3.9*	*3.0*	*1.7*	*-5.1*	*6.4*	*% change*	*3.7*	*3.3*	*3.1*	*2.6*	*2.3*	*1.9*
201.9	205.7	208.8	209.1	189.9	194.0	Total employment (ths)	204.0	207.9	210.3	211.7	212.3	212.7
2.5	*1.9*	*1.5*	*0.2*	*-9.2*	*2.2*	*% change*	*5.1*	*1.9*	*1.1*	*0.7*	*0.3*	*0.2*
4.0	3.4	2.8	2.7	8.0	5.5	Unemployment rate (%)	3.4	2.3	2.3	2.5	2.8	3.0
3.9	3.9	4.4	4.4	9.5	8.0	Personal income growth (%)	2.1	5.5	5.1	4.4	4.0	3.8
74.5	79.2	83.5	87.8	87.0	88.1	Median household income ($ ths)	89.3	92.3	95.6	98.8	102.0	105.2
502.5	502.5	498.6	494.3	493.4	493.2	Population (ths)	492.9	492.8	492.1	491.1	490.1	489.0
0.3	*-0.0*	*-0.8*	*-0.9*	*-0.2*	*-0.0*	*% change*	*-0.1*	*-0.0*	*-0.1*	*-0.2*	*-0.2*	*-0.2*
0.8	-0.7	-4.1	-4.4	-0.7	0.5	Net migration (ths)	-0.2	0.1	-0.4	-0.7	-0.6	-0.6
621	840	3,169	2,079	1,171	1,128	Single-family permits (#)	1,791	2,036	1,867	1,639	1,433	1,259
298	338	110	350	224	1,343	Multifamily permits (#)	1,117	892	848	719	576	471
281.0	303.1	327.2	329.2	334.2	365.5	FHFA house price (1995Q1=100)	398.9	408.2	420.0	434.8	449.9	466.3

ECONOMIC HEALTH CHECK

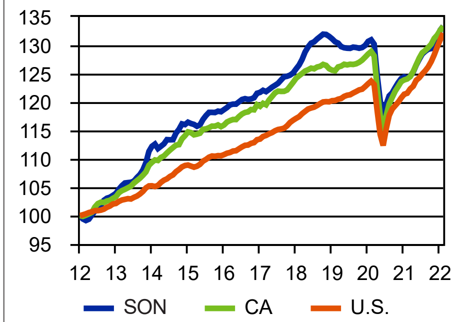
3-MO MA	Oct 21	Nov 21	Dec 21	Jan 22	Feb 22	Mar 22
Employment, change, ths	0.7	0.5	0.7	0.9	1.1	1.1
Unemployment rate, %	4.8	4.5	4.3	4.2	4.2	4.0
Labor force participation rate, %	60.4	60.3	60.1	60.2	60.6	60.9
Average weekly hours, #	32.3	32.0	31.8	31.9	32.0	32.3
Industrial production, 2012=100	104.2	104.3	104.7	105.4	105.6	106.3
Residential permits, single-family, #	1,190	1,230	1,130	1,277	1,229	1,272
Residential permits, multifamily, #	1,232	1,494	2,549	2,841	2,462	1,379
Dec/Dec	**Dec 16**	**Dec 17**	**Dec 18**	**Dec 19**	**Dec 20**	**Dec 21**
Employment, change, ths	4.3	4.0	1.9	0.8	-22.5	11.7

Better than prior 3-mo MA | Unchanged from prior 3-mo MA | Worse than prior 3-mo MA

Sources: BLS, Census Bureau, Moody's Analytics

BUSINESS CYCLE INDEX

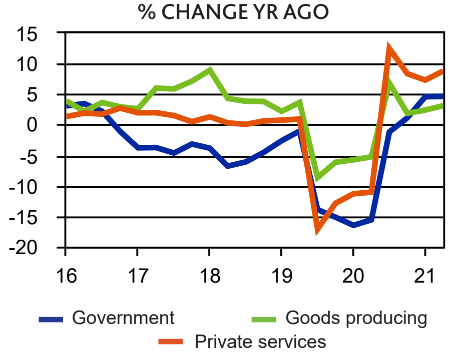
JAN 2012=100



Source: Moody's Analytics

CURRENT EMPLOYMENT TRENDS

% CHANGE YR AGO



Sources: BLS, Moody's Analytics

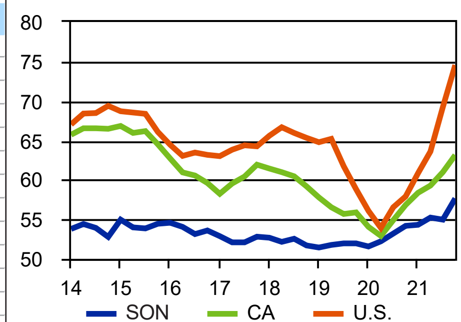
% CHANGE YR AGO, 3-MO MA

	Mar 21	Sep 21	Mar 22
Total	-10.6	6.0	6.9
Mining	0.3	0.0	-0.2
Construction	-4.6	-0.2	1.3
Manufacturing	-5.7	3.3	4.7
Trade	-2.8	2.6	0.4
Trans/Utilities	2.6	9.0	5.2
Information	-10.1	12.3	-0.2
Financial Activities	-13.8	6.9	10.5
Prof & Business Svcs.	-4.4	6.6	5.1
Edu & Health Svcs.	-6.2	0.7	0.2
Leisure & Hospitality	-33.8	31.9	42.7
Other Services	-19.5	19.0	18.4
Government	-15.7	1.2	4.6

Sources: BLS, Moody's Analytics

DIFFUSION INDEX

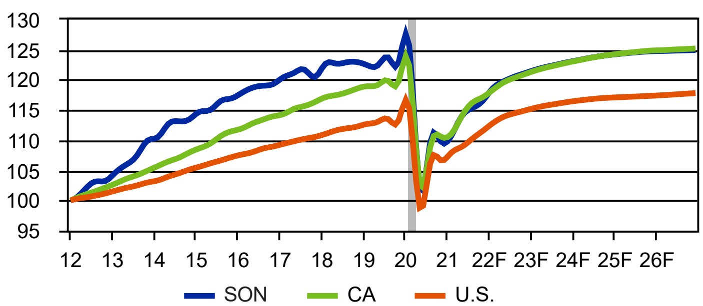
3-DIGIT NAICS LEVEL, 6-MO MA



Sources: BLS, Moody's Analytics

RELATIVE EMPLOYMENT PERFORMANCE

JAN 2012=100



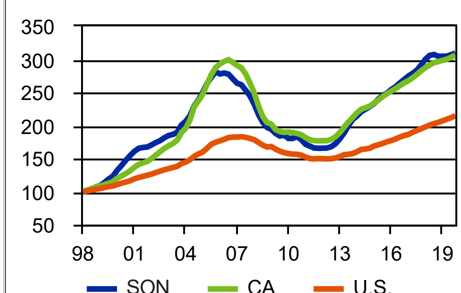
FORECAST VS. 6 MO PRIOR

2-Yr	5-Yr
⇔	⇔
⇑	⇔
⇔	⇔

Sources: BLS, Moody's Analytics

HOUSE PRICE

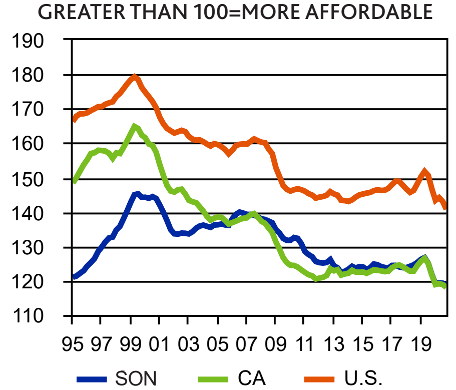
1998Q1=100, NSA



Sources: FHFA, Moody's Analytics

RENTAL AFFORDABILITY

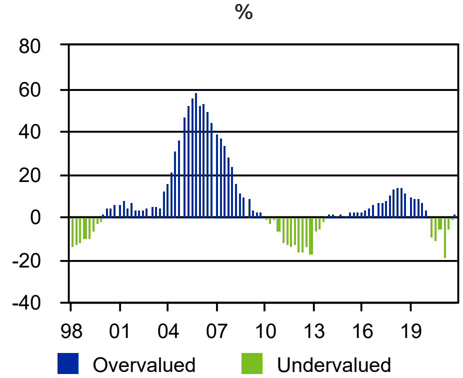
GREATER THAN 100=MORE AFFORDABLE



Sources: Census Bureau, BLS, Moody's Analytics

HOUSE PRICE TRENDS

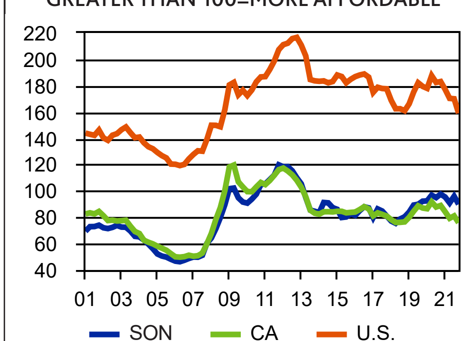
%



Sources: FHFA, Moody's Analytics

HOUSING AFFORDABILITY

GREATER THAN 100=MORE AFFORDABLE



Sources: NAR, Moody's Analytics

EMPLOYMENT AND INDUSTRY

TOP EMPLOYERS

Kaiser Permanente	3,508
Graton Resort & Casino	2,000
St. Joseph Health System	1,640
Keysight Technologies	1,300
Safeway Inc.	1,200
Sutter Santa Rosa Regional Hospital	1,050
Medtronic CardioVascular	1,000
Amy's Kitchen	988
Wells Fargo	916
Lagunitas Brewing Co.	900
Jackson Family Wine	800
Cyan	700
Walmart Inc.	650
Hansel Auto Group	600
AT&T	600
Lucky	550
Santa Rosa Community Health Centers	523
PG&E	500
Petaluma Acquisitions	455
Ghilotti Construction Co.	425

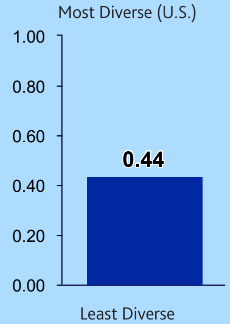
Sources: North Bay Business Journal Book of Lists, 2020, San Francisco Business Journal Book of Lists, 2017

PUBLIC

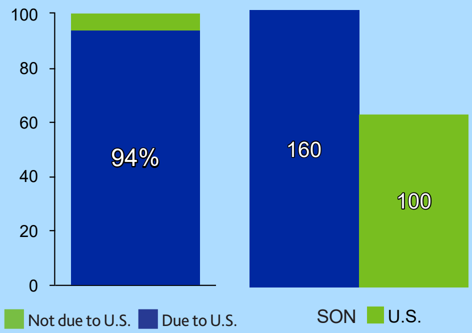
Federal	1,301
State	2,857
Local	21,045

2021

INDUSTRIAL DIVERSITY



EMPLOYMENT VOLATILITY



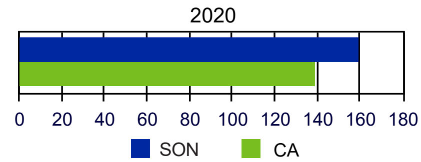
COMPARATIVE EMPLOYMENT AND INCOME

Sector	% OF TOTAL EMPLOYMENT SON	CA	U.S.	AVERAGE ANNUAL EARNINGS SON	CA	U.S.
Mining	0.1	0.1	0.4	$36,896	$85,747	$151,071
Construction	8.2	5.3	5.1	$99,412	$88,937	$76,012
Manufacturing	11.7	7.6	8.5	$105,899	$127,582	$91,702
Durable	*38.6*	*64.4*	*62.2*	*nd*	*$147,360*	*$94,522*
Nondurable	*61.4*	*35.6*	*37.8*	*nd*	*$92,357*	*$87,083*
Transportation/Utilities	2.3	4.7	4.5	$63,023	$67,400	$65,944
Wholesale Trade	3.9	3.9	3.9	$88,500	$101,370	$98,506
Retail Trade	12.0	9.6	10.5	$49,684	$50,130	$41,889
Information	1.2	3.4	1.9	$125,724	$234,963	$153,450
Financial Activities	3.9	4.9	6.0	$64,321	$80,633	$67,570
Prof. and Bus. Services	12.1	16.2	14.5	$67,266	$98,702	$82,393
Educ. and Health Services	17.5	16.8	16.2	$70,035	$64,989	$63,178
Leisure and Hosp. Services	10.8	9.8	9.6	$32,969	$41,224	$30,932
Other Services	3.3	3.0	3.7	$55,111	$45,346	$42,842
Government	13.0	14.8	15.1	$97,946	$109,531	$86,611

Sources: Percent of total employment — BLS, Moody's Analytics, 2021, Average annual earnings — BEA, Moody's Analytics, 2020

ENTREPRENEURSHIP

BROAD-BASED START-UP RATE



Sources: Census Bureau, Moody's Analytics

EXPORTS

Product	$ mil
Food and kindred products	ND
Chemicals	102.4
Primary metal manufacturing	ND
Fabricated metal products	71.6
Machinery, except electrical	265.2
Computer and electronic products	438.0
Transportation equipment	ND
Miscellaneous manufacturing	ND
Other products	284.5
Total	1,234.5

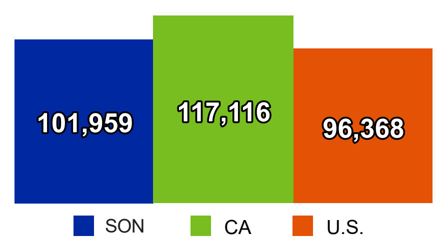
Destination	$ mil
Africa	9.0
Asia	540.0
European Union	283.6
Canada & Mexico	263.1
South America	15.0
Rest of world	123.7
Total	1,234.5

% of GDP	*3.6*
Rank among all metro areas	*223*

Sources: BEA, International Trade Administration, Moody's Analytics, 2019

PRODUCTIVITY

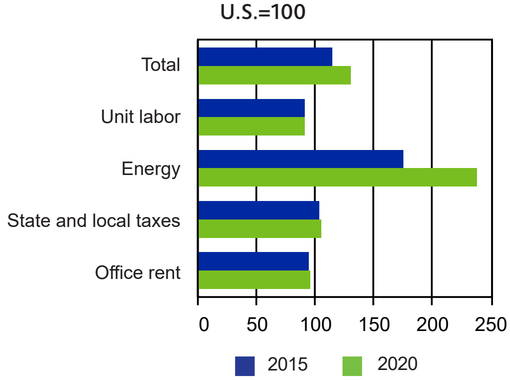
REAL OUTPUT PER WORKER, $



Sources: BEA, Moody's Analytics, 2020

BUSINESS COSTS

U.S.=100



Source: Moody's Analytics

HIGH-TECH EMPLOYMENT

	Ths	% of total
SON	8.9	4.6
U.S.	7,880.5	5.4

HOUSING-RELATED EMPLOYMENT

	Ths	% of total
SON	28.0	14.4
U.S.	14,779.4	10.1

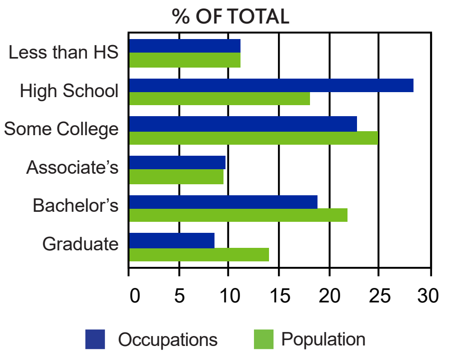
Source: Moody's Analytics, 2021

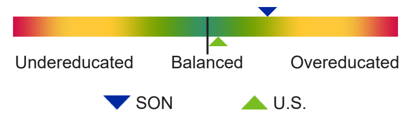
LEADING INDUSTRIES BY WAGE TIER

	NAICS	Industry	Location Quotient	Employees (ths)
HIGH	6214	Outpatient care centers	4.1	4.8
HIGH	6221	General medical and surgical hospitals	0.7	4.3
HIGH	6211	Offices of physicians	0.8	2.7
HIGH	5511	Management of companies & enterprises	0.7	2.3
MID	GVL	Local Government	1.3	25.4
MID	3121	Beverage manufacturing	24.5	7.9
MID	GVS	State Government	0.7	5.0
MID	2382	Building equipment contractors	1.1	3.0
LOW	7225	Restaurants and other eating places	1.1	16.4
LOW	6241	Individual and family services	2.5	7.7
LOW	4451	Grocery stores	1.7	6.4
LOW	FR	Farms	1.6	6.1

Source: Moody's Analytics, 2021

SKILLS MISMATCH



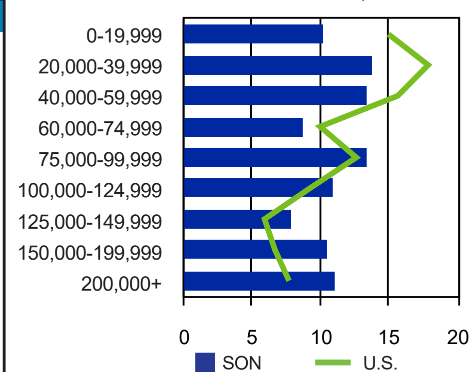


Sources: Census Bureau, ACS, Moody's Analytics, 2018

ECONOMIC DISENFRANCHISEMENT

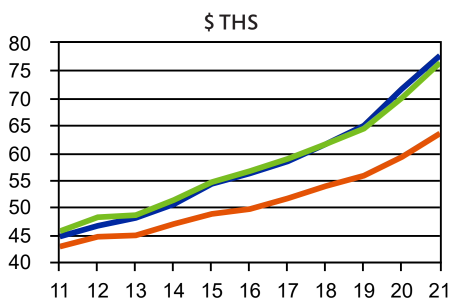
Index	2018	Rank*
Gini coefficient	0.46	203
Palma ratio	3.2	152
Poverty rate	10.1%	337

**Most unequal=1; Most equal=403*



Sources: Census Bureau, ACS, Moody's Analytics, 2018

PER CAPITA INCOME



2021	SON $77,690	CA $76,386	U.S. $63,444

Sources: BEA, Moody's Analytics

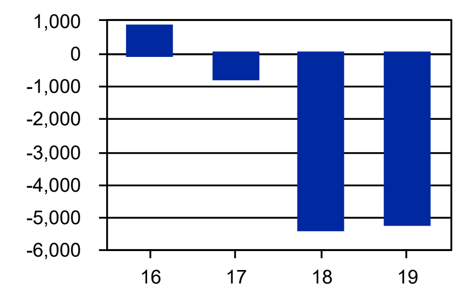
MIGRATION FLOWS

INTO SONOMA COUNTY CA

	Number of Migrants
San Rafael CA	1,811
San Francisco CA	1,413
Oakland CA	1,316
Sacramento CA	661
Los Angeles CA	581
San Jose CA	458
Napa CA	451
Vallejo CA	377
San Diego CA	292
Riverside CA	240
Total in-migration	*13,891*

FROM SONOMA COUNTY CA

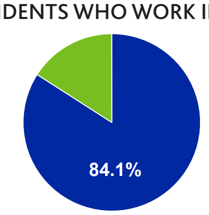
Sacramento CA	1,543
San Rafael CA	1,238
Oakland CA	1,108
San Francisco CA	834
Vallejo CA	705
Napa CA	582
Los Angeles CA	492
San Diego CA	383
Portland OR	365
San Jose CA	364
Total out-migration	*18,756*
Net migration	**-4,865**

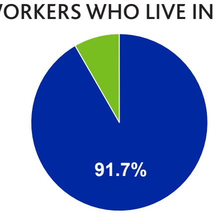


	2016	2017	2018	2019
Domestic	130	-1,061	-4,202	-4,534
Foreign	708	361	74	97
Total	838	-700	-4,128	-4,437

Sources: IRS (top), 2018, Census Bureau, Moody's Analytics

COMMUTER FLOWS





Top Outside Sources of Jobs

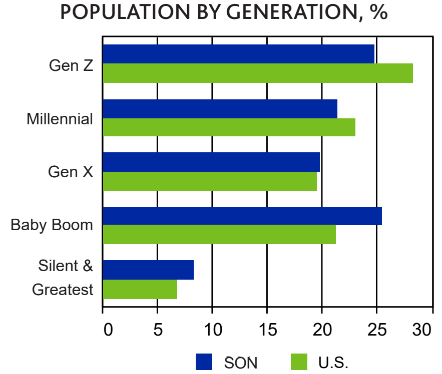
Sonoma County CA	Share
San Rafael CA	6.7
San Francisco CA	3.4
Napa CA	1.9
Oakland CA	1.5
San Jose CA	0.5

Top Outside Sources of Workers

Sonoma County CA	Share
San Rafael CA	2.0
Vallejo CA	1.3
Napa CA	1.1
Oakland CA	0.9
San Francisco CA	0.5

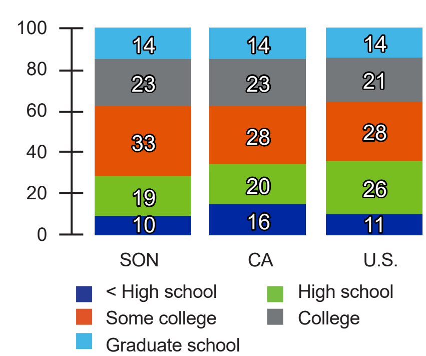
Sources: Census Bureau, Moody's Analytics, avg 2011-2015

GENERATIONAL BREAKDOWN



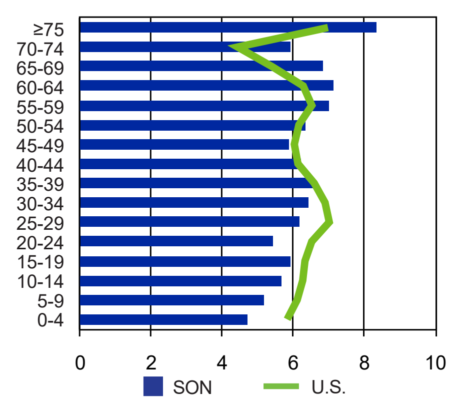
Sources: Census Bureau, Moody's Analytics, 2020

EDUCATIONAL ATTAINMENT



Sources: Census Bureau, ACS, Moody's Analytics, 2019

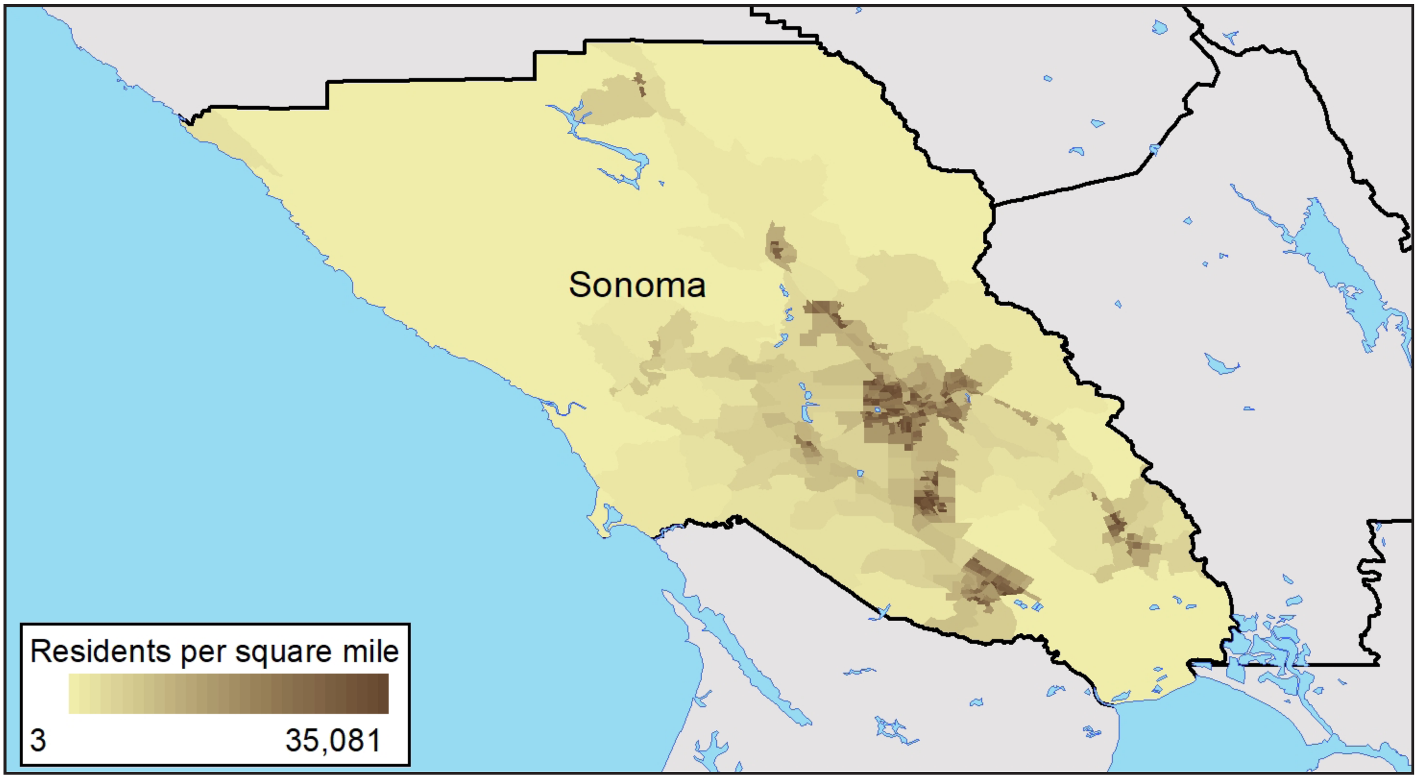
POPULATION BY AGE, %



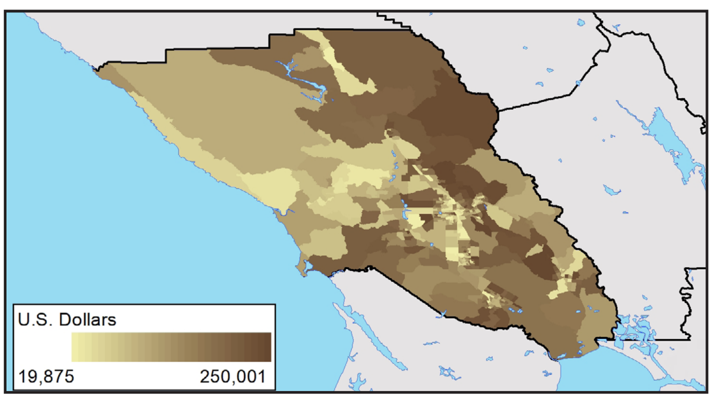
Sources: Census Bureau, Moody's Analytics, 2020

GEOGRAPHIC PROFILE

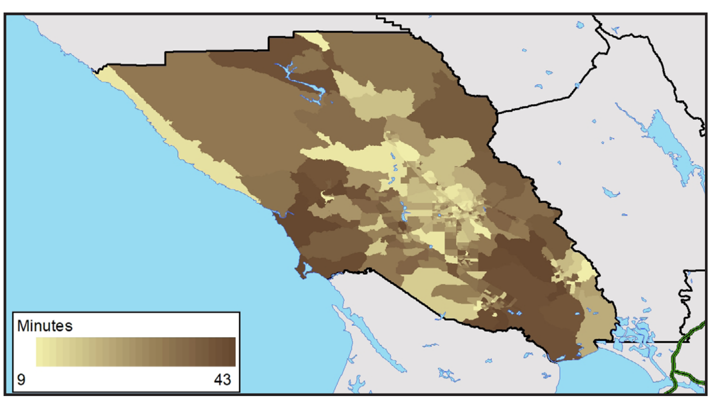
POPULATION DENSITY



MEDIAN HOUSEHOLD INCOME



AVERAGE COMMUTE TIME



Sources: ACS, Moody's Analytics

POPULATION & HOUSING CHARACTERISTICS

	Units	Value	Rank*
Total area	sq mi	1,767.9	202
Total water area	sq mi	192.1	97
Total land area	sq mi	1,575.8	211
Land area - developable	sq mi	878.2	179
Land area - undevelopable	sq mi	697.6	170
Population density	pop. to developable land	561.5	116
Total population	ths	485.9	130
U.S. citizen at birth	% of population	81.8	345
Naturalized U.S. citizen	% of population	7.1	61
Not a U.S. citizen	% of population	9.8	46
Median age		42.4	59
Total housing units	ths	205.2	130
Owner occupied	% of total	56.1	243
Renter occupied	% of total	35.2	78
Vacant	% of total	8.7	276
1-unit; detached	% of total	65.8	217
1-unit; attached	% of total	7.8	57
Multifamily	% of total	21.1	193
Median year built		1978	

** Areas & pop. density, out of 410 metro areas/divisions, including metros in Puerto Rico; all others, out of 403 metros.*

Sources: Census Bureau, Moody's Analytics, 2018 except land area 2010

Brace for Landing

BY MARK ZANDI

The heat of inflation

When Russia invaded Ukraine in late February, it was clear it would be a significant blow to a global economy still struggling to weather the COVID-19 pandemic. But we expected only modest fallout for the U.S. economy. The most significant connection between Russia's aggression and the U.S. economy is via higher oil prices, which are up about $30 per barrel to near $100. But the U.S. is more-or-less energy independent, producing and consuming close to 20 million barrels a day of oil. American consumers, particularly lower-income households, have struggled with the record-high gasoline prices, but American energy companies have benefited and are increasing production as rig counts steadily rise. We expected the net of these crosscurrents on the U.S. economy to be a small negative, reducing 2022 real GDP growth by several tenths of a percentage point.

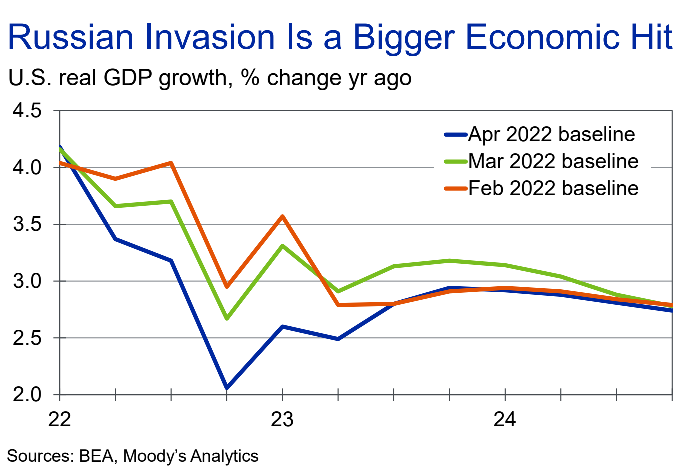
However, the fallout of the Russian invasion on the U.S. economy has become meaningfully more problematic. The surge in oil prices is having an amplified economic impact. It is fanning already-heated inflation and inflation expectations. This has forced the Federal Reserve Board to accelerate its plan to tighten monetary policy. Interest rates have jumped. We now expect Russia's aggression to reduce U.S. real GDP growth by almost a percentage point during the year ending in the fourth quarter of 2022. The risks to this diminished outlook have also decidedly shifted to the downside, with the odds of a recession beginning in the next 12 months rising to an uncomfortably high one in three (see Chart 1).

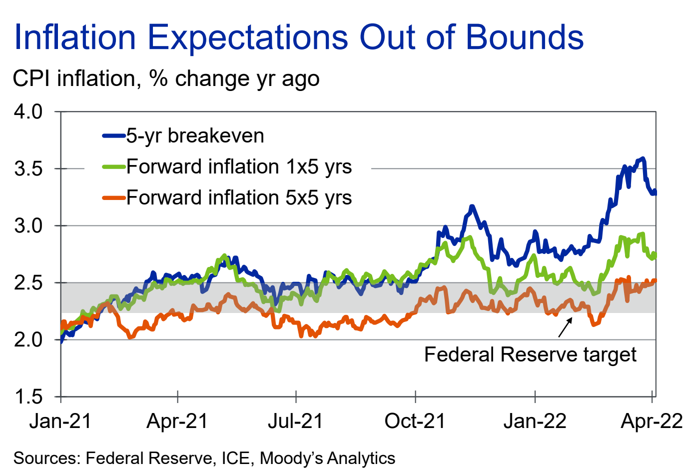
The impact of Russia's invasion on inflation became clear with the Bureau of Labor Statistics' release of March consumer price inflation. CPI inflation jumped by more than a percentage point during the month to 8.5% year over year. Prior to Russia's aggression late last year, oil prices were headed lower and overall inflation appeared to be peaking as pandemic-scrambled global supply chains were sorting themselves out. Now, with much higher oil prices, the acceleration in inflation has further to run. China's renewed problems with COVID-19 and shutdowns in large parts of the country, including Shanghai, in an effort to contain infections also threaten renewed supply-chain problems, more shortages, and higher prices. Double-digit CPI inflation later this spring is a stretch, but it cannot be ruled out.

Managing expectations

Arguably more important, at least for the conduct of monetary policy, is the increase in inflation expectations. Investors in Treasury Inflation Protected Securities, or TIPS, who put their money where their mouth is when forecasting inflation, are anticipating CPI inflation of 3.25% per annum over the next five years, up about 0.5 percentage point since the Russian invasion. Using TIPS and inflation swaps, the derivatives exchange ICE has also calculated investors' forecast of inflation a year from now over the subsequent five-year period, and it too has risen to a high 2.8%. The upper end of the Federal Reserve's target for CPI inflation is 2.5%. Oil and gasoline prices have historically played an outsize role in people's thinking about inflation and where it is headed, because it is such a visible price (see Chart 2).

Prior to Russia's invasion, the Federal Reserve was on track to steadily but slowly normalize monetary policy. This meant ending its bond-buying or quantitative easing early this year and increasing the federal funds rate by 0.25 percentage point once a quarter, more or less. The normalization would be complete by early 2024 with the funds rate back close to its estimated equilibrium rate, or r-star, of 2.5%. Normalization was necessary as the economy was strong and making its way back to full employment, but when inflation and inflation expectations were expected to moderate with the fading





pandemic, the Fed could be measured in its rate hikes.

Quantitative tightening

This all changed with Russia's aggression and the surge in oil prices, inflation and inflation expectations. Policymakers have gone on high alert, guiding investors to believe they will aggressively raise rates, pushing the funds rate up to 2.5% by this time next year, and even higher by next summer. Quantitative tightening, in which the Fed allows the Treasury and mortgage-backed securities it owns to mature and prepay, is also imminent, and active QT, in which the Fed sells its securities, is a real possibility. This would be consistent with our reaction function for the Fed, which econometrically relates the federal funds rate to factors that influence monetary policy, including unemployment, inflation, inflation expectations, financial conditions and QE/QT. It suggests the funds rate should already be about 2.5% (see Chart 3).

Long-term interest rates have jumped in response to all of this. Ten-year Treasury yields have risen a full percentage point since the Russian invasion to 2.75%, and fixed mortgage rates have risen by closer to 2 percentage points to near 5% as investors in mortgage-backed securities digest the prospect of the Fed selling MBS. The spread between fixed mortgage rates and 10-year Treasury yields rarely gets as wide save in times of severe financial stress. The impact of the higher rates on stock and housing markets, and the broader economy, has been limited so far. But one way or another growth will slow substantially as the year progresses. The Fed must make sure of this. Either the efforts it has made to date will do so, or an even more aggressive tightening in monetary policy is dead ahead. Calibrating this to sufficiently slow growth and quell the high inflation—but not so much as to push the economy into recession—will be tricky.

Yield curve signals

That is the message from the Treasury yield curve. Despite the higher long-term rates, short-term rates have risen even more, and the Treasury yield curve is flirting with inversion. That is when short-term rates rise above long-term rates. Indeed, the yield on two-year Treasury notes is only a few basis points away from the yield on 10-year Treasuries. The Treasury yield curve has been a prescient soothsayer of recessions over the past more than half century, with inversions preceding downturns by a year or two. The current shape of the yield curve suggests the probability that the economy will suffer a recession beginning sometime in the next 12 months is approximately one in three (see Chart 4).

The reason to see a Treasury curve inversion as an accurate leading indicator of recession is that short-term rates reflect what bond investors think the Fed will do in the near future, and long-term rates reflect the impact they think those Fed actions will ultimately have on the economy. If investors believe the Fed will increase rates too high too fast and cause a recession, then they push short rates above long rates. An inverted yield curve also makes it difficult for banks and other creditors to earn an acceptable return on their lending. Financial institutions generally make their money by, as they say, borrowing short and lending long. This business model works well when the curve is positively sloped but does not when the curve inverts. Creditors are forced to rein in their lending, which exposes past lending mistakes and weighs on the economy.

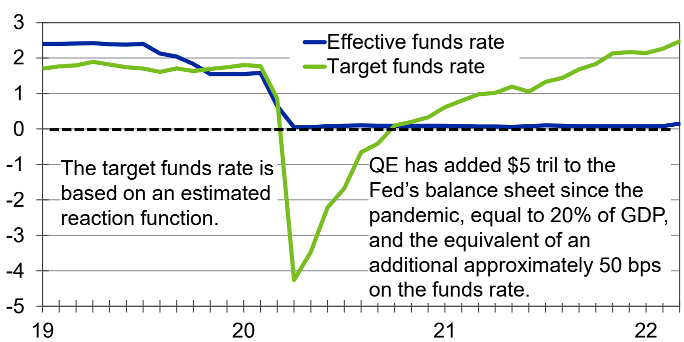
Fed at the controls

The Federal Reserve has a daunting task ahead to soft-land the proverbial economic plane on the tarmac. The plane is approaching the runway at a high rate of speed, buffeted by massive economic crosswinds stirred by the pandemic and with ineffectual controls since financial conditions have yet to tighten much. Sticking the landing is even more difficult given the dense fog of uncertainty caused by unsure fiscal policy and an array of geopolitical problems ranging from the Russian invasion of Ukraine to a potential boiling over of U.S.-China trade tensions. I have badly stretched the economic plane metaphor, but it makes clear how difficult it will be for the Fed to successfully manage monetary policy.

Odds are that the Fed will land the economic plane reasonably gracefully over the coming year, but it is prudent to carefully consider the alternative.

Fed Has Lots of Catching-Up to Do

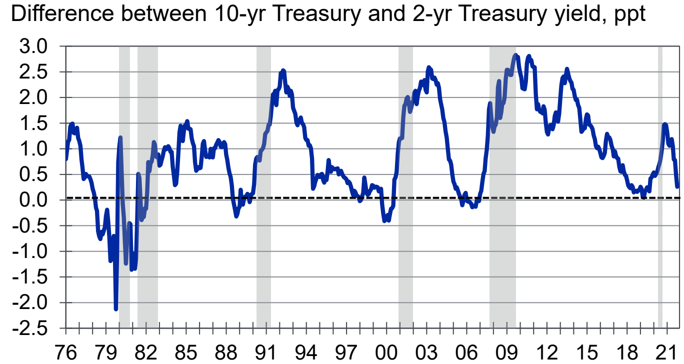
Federal funds rate, %



Sources: Federal Reserve, Moody's Analytics

Gracefully Normalizing Rates Will Be Tricky

Difference between 10-yr Treasury and 2-yr Treasury yield, ppt



Sources: Federal Reserve, Moody's Analytics

Forecast Assumptions

BY MARK ZANDI

Monetary policy

The Federal Reserve is aggressively tightening monetary policy. Policymakers are strongly signaling that there will be a series of significant rate hikes in coming months and that the Fed will soon allow its balance sheet to shrink through quantitative tightening.

We anticipate the Fed will increase the funds rate 50 basis points at the May and June meetings of the Federal Open Market Committee and follow with more rate hikes, bringing the funds rate to its long-run equilibrium, or r-star, of 2.5% by early 2023. This is a substantial acceleration in the assumed rate increases.

Prompting the Fed to take a more aggressive policy stance is Russia's invasion of Ukraine, which has caused oil prices to spike and fanned already-uncomfortably high inflation and inflation expectations. Adding to the pressure to act more quickly is the strong economy, the rapid growth in jobs, and the decline in unemployment. The economy is on track to return to full employment by this summer with unemployment in the low 3s.

We also expect the Fed to allow the assets on its balance sheet, including $9 trillion in Treasury and mortgage-backed securities, to mature and prepay beginning this June. Approximately $100 billion in securities should run off each month, although there is the increasing likelihood the Fed may begin to actively sell securities.

Ten-year Treasury yields are trading near 2.75% as bond investors digest the implications of the strong economy, high inflation, and the acceleration in the Fed's normalization of monetary policy. Ten-year yields are expected to rise to near 3% by year-end 2022 and reach their estimated long-run equilibrium of 4% by mid-decade. This is consistent with expected nominal potential GDP growth.

Fiscal policy

Federal fiscal policy, which has been highly expansionary since the pandemic hit, has recently turned into a drag on economic growth that will become more pronounced as the year progresses.

Total fiscal support to the economy throughout the pandemic, including the CARES Act passed into law in March 2020, the American Rescue Plan of March 2021, and several smaller fiscal packages, totals well over $5 trillion. This is equal to an astounding almost 25% of pre-pandemic 2019 GDP—approximately three times that provided during the global financial crisis.

However, fiscal policy is turning quickly contractionary as the pandemic support winds down. Total support in 2021 was nearly $1.9 trillion, but it will decline to $800 billion this year. The $550 billion 10-year public infrastructure package that President Biden signed in November will not have a material impact on the thrust of fiscal policy in 2022, although it will modestly support growth from 2023-2025.

We no longer assume that lawmakers will pass a version of the Build Back Better agenda. Instead, we assume that a package including many of the climate-related policies in the BBB will be passed into law later this year. This will cost $500 billion over 10 years and will be paid for with higher corporate taxes and tax enforcement.

The federal government posted a deficit of $2.8 trillion in fiscal 2021 and will post a deficit of $1.2 trillion in fiscal 2022. The publicly traded debt-to-GDP ratio has surged to near 100%. Lawmakers have appropriately not been focused on deficits during the pandemic given the need to respond to the crisis. But, as the pandemic fades, addressing the fragile fiscal situation will be critical.

U.S. dollar

The U.S. dollar is strong, receiving another boost from the flight-to-quality into U.S. assets prompted by the Russian invasion of Ukraine. On a real broad trade-weighted basis, the dollar is more than half a standard deviation above its long-run average since it began to freely float in the early 1970s. Its value is expected to remain strong as long as the Russian invasion and the pandemic remain threats to the global economy. And even when these threats recede, the dollar should remain strong given other geopolitical uncertainties, including the ongoing tensions between the U.S. and China.

The dollar's reserve currency status will remain intact for the foreseeable future.

Energy prices

Global oil prices have stabilized near $100 per barrel as the Russian invasion of Ukraine and the disruption to Russian exports due to sanctions imposed by the U.S., other countries, and private companies continue to keep prices high. We do not expect Europe or other major oil-consuming economies to impose sanctions on Russian oil or other commodities. Saudi Arabia, the United Arab Emirates, and North American oil frackers are anticipated to increase production given the much higher oil prices and resulting profits. And we also anticipate much larger oil releases from the U.S. Strategic Petroleum Reserve and the reserves held by other nations. The loss of Russian oil to global markets should thus be quickly filled.

If these assumptions hold, then oil prices are expected to average near $100 per barrel through much of this year before slowly declining to their estimated long-run equilibrium of closer to $70 per barrel by mid-2023.

COVID-19 pandemic

The pandemic appears to be slowly receding and thus becoming less disruptive to global supply chains, tourism and business travel, immigration, and labor markets. Although there are likely to be future waves of the virus, we expect each new wave to be less disruptive to the healthcare system and the economy than the preceding wave. Governments and businesses are also increasingly adept at navigating through the economic fallout from the virus.

Forecast Risks

BY LINA BAROKAS

⬇ Fed policy

The highest inflation in more than 40 years forced members of the Federal Open Market Committee to turn significantly more hawkish. The Federal Reserve has recently ended its bond-buying, or quantitative easing, program. At its March 16 meeting, the Fed announced its decision to raise short-term interest rates by 25 basis points, to be followed by a string of increases throughout this year to rein in inflation.

The Fed will need to tread cautiously to prevent derailing the economic recovery. If the Fed is too aggressive in normalizing policy, it could ignite a panic in financial markets, causing asset prices to plummet. Additionally, higher interest rates could also cut off the flow of credit, slowing growth. On the other end, if the Fed moves too slowly amid a possible wage-price spiral, it risks a further rise in inflation pressures that would also cause economic growth to slow.

⬇ Financial conditions

Rising long-term U.S. interest rates increase the odds of a costly tightening in financial market conditions. Though long-term interest rates have been suppressed in recent months, strong growth prospects and more fiscal spending will drive long-term yields higher in coming quarters. One risk is that the rise in long-term interest rates will precipitate further correction in equity markets. A prolonged slump and a tighter financial environment would weaken the economy.

Rising long-term interest rates could also create problems for corporations and the real estate market. Nonfinancial debt and loans sit near record-high shares of GDP, and higher rates will significantly increase borrowing costs for highly indebted corporations, many of which are still struggling from the pandemic, and households, taking the wind out of the housing market. A string of corporate defaults or a significant widening of corporate bond spreads could dampen investor sentiment and soften investment.

⬇ Supply-chain disruptions

An easing in U.S. supply-chain stress is critical to the outlook for moderating inflation. The combination of the fallout from Russia's invasion of Ukraine and China's zero-COVID policy magnifies the supply-chain issues. And the longer the global supply-chain issues persist, the more upside risk there is to near-term U.S. inflation.

Russia is among the top three oil producers in the world, accounting for approximately 10 million barrels of crude per day, comparable to the U.S. and Saudi Arabia. While prices have fallen from their peak of near $140 per barrel after the invasion, volatility and elevated prices are still a risk. Additionally, Ukraine and Russia supply neon, palladium and pig iron. Neon gas from Ukraine is a critical component in manufacturing semiconductors, so the risk of a chip shortage has returned.

China has implemented a lockdown in various cities to contain the spread of COVID-19, including in Guangdong province, which accounted for more than 20% of China's exports last year. Any significant disruption to China's exports could lead to higher inflation in the U.S.

⬇ COVID-19

While COVID-19 appears to be slowly receding, and thus becoming less disruptive to global supply chains, tourism and business travel, immigration, and labor markets, the risk of a resurgence remains.

Our baseline assumption may be too sanguine. We assume each new wave of the virus to be less disruptive to the health-care system and the economy than the preceding wave as the government and businesses learn to to navigate through the economic fallout.

Yet there remains a significant amount of uncertainty around the path of the pandemic if new variants of the virus elude current vaccines. Also, with a sizable unvaccinated population the risk of disruption in the labor market, retail spending and consumer confidence could soften economic growth even with progressively less virulent waves.

⬆ Consumer spending

Consumer spending could exceed expectations and drive faster growth. Last year, a fresh round of fiscal stimulus drove the U.S. saving rate above 20% and excess saving fueled consumption growth. The saving rate declined by the end of last year to close to the pre-pandemic rate and is expected to decline further this year. If baby boomers, in particular, spend like they have in the past, the saving rate could come down even more. Further, if widespread worker shortages drive wages higher than expected, consumer spending could rise even more.

Uncertainty about the spending outlook has been elevated by the pandemic, high inflation, and now the military conflict in Ukraine, and it is not clear when it will lessen. There are downside risks as well beyond the pandemic. Inflation and supply-chain constraints could be more severe than expected, especially given events in Eastern Europe, hurting spending.

⬇ Stagflation

Although the odds remain low, the numerous channels impacting inflation have increased the likelihood of a stagflation scenario, defined by a period of sustained high inflation and low economic growth. The current environment is unique in that the global economy is facing two major simultaneous inflationary shocks caused by the pandemic and Russia's invasion of Ukraine. While our baseline forecast calls for inflation pressures to begin to gradually abate over the next several years, the uncertain nature of the pandemic as well as the situation in Ukraine could result in inflation remaining higher for longer than expected. Even if inflation does not accelerate meaningfully from current levels, a longer period of high inflation could easily undermine already-fragile business and consumer confidence, causing a pull-back in spending and weaker-than-expected economic growth.

SONOMAEDB.ORG

707 - 565 - 7170

141 STONY CIRCLE, STE. 110, SANTA ROSA, CA 95401