SONOMA COUNTY ECONOMIC DEVELOPMENT BOARD

SPRING 2021
LOCAL ECONOMIC REPORT

FORECAST REPORT

2021

ECONOMIC DEVELOPMENT BOARD

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SONOMA COUNTY BOARD OF SUPERVISORS

CONTENTS

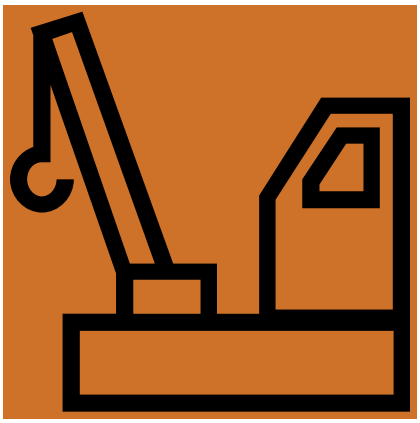
EXECUTIVE SUMMARY

August 2021

The Sonoma County Economic Development Board is pleased to present the Spring 2021 Local Economic Report. Our research partner, Moody's Analytics, provided the data for this report. For additional information, questions, comments, or suggestions, please contact us at (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



A lower number of COVID-19 cases were reported in March, allowing business restrictions to begin loosening in the spring. The unemployment rate sits slightly above its post-crisis low at 5.7%. Despite a slight drop in 2020, Sonoma County's GDP growth is projected to grow to 32.2 billion in 2021 (in 2012 inflation adjusted dollars). Demand for housing rises in Sonoma County, likely due to its high quality of life and proximity to Bay Area economies. Housing prices are rising at the fastest rate in more than two years, alongside the California average.

Rebuilding efforts following the devastating 2017 Tubbs and 2019 Kincade wildfires have led Sonoma County to regain nearly all of its housing units lost. Less building permits were issued in 2020, albeit still nearly twice as many than in 2017. Data on the more recent 2020 Glass Fire and 2020 Walbridge-Meyers Fires (LNU Lighting Complex) shows that the majority of homes destroyed in those fires have not yet attained permits for construction, let alone been rebuilt.

Sonoma County's economy relies heavily on visitor spending. Winemakers, craft-beer producers, and restaurateurs should benefit from increased spending as restrictions on many businesses and COVID-19 fears ease this summer. As vaccination rates increase, job losses will recover. The high quality of life and highly educated workforce will aid the county with job and income growth.


Horizontal
Run Control
Horiz
Search
Navigate
Run
Stop
Default Setup
Trigger
Measure
Trigger
Force Trigger
Zone
Level
Mode Coupling
Cursors
Meas
Cursors
Waveform
File
Analyze
Acquire
Display
Save Recall
Print
Tools
Clear Display
Utility
Quick Action
Touch
Wave Gen1
Wave Gen2
Push to Select
Intensity
Vertical
1
Label
2
Help
300mV/
3.50mV
100.0ms/
-298.0ms
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Acquisition
High Resolution
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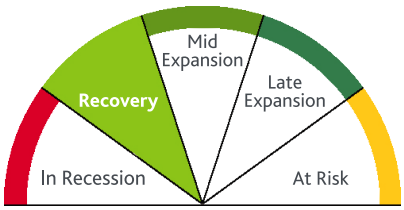
MOODY'S ANALYTICS

SONOMA COUNTY CA

METRO COMPARISON	EMPLOYMENT GROWTH RANK 2020-2022	EMPLOYMENT GROWTH RANK 2020-2025	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	395 (5th quintile)	373 (5th quintile)	137%	124%	-0.21%	263
Santa Barbara County	313 (4th quintile)	268 (4th quintile)	134%	132%	-0.09%	210
Santa Cruz County	326 (4th quintile)	194 (3rd quintile)	152%	129%	-0.19%	257
Sacramento MSA	195 (3rd quintile)	161 (2nd quintile)	113%	124%	0.22%	122
Monterey County	301 (4th quintile)	256 (4th quintile)	128%	125%	-0.46%	344

BUSINESS CYCLE STATUS



STRENGTHS & WEAKNESSES

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 MARCH 2021 **304** 4th quintile *Highest=1 Lowest=403*

UPSIDE

- Consumers embrace organic foods with even greater enthusiasm.
- Marin biotech firms expand in Sonoma.

DOWNSIDE

- COVID-19 does more economic damage.
- Population trends fail to improve.
- More wine enthusiasts flock to the Pacific Northwest.
- Weaker trade with East Asia hurts medical device and wine industries.

MOODY'S RATING

NR SANTA ROSA AS OF AUG 06, 2020

ANALYSIS

Recent Performance. Sonoma's economy has taken its foot off the gas. Following a steep drop in December, job gains through the first two months of the year have been minimal, pushing year-ago job growth further behind the California average. The chief culprit was the reimposition of business restrictions given rising COVID-19 case counts throughout the state. Sonoma remained in the state's most restrictive purple tier through the beginning of March, but case and test positivity rates have fallen sharply, allowing Sonoma to move into the less restrictive red and orange tiers in March and April, respectively. As expected, leisure/hospitality is the worst-performing industry, with payrolls down nearly 40% from year-ago levels. While still struggling, goods producers are broadly faring better than service providers. Meanwhile, the jobless rate is slightly above its post-crisis low. The residential real estate market held up remarkably well during the initial stages of the pandemic and remains in good shape. House price appreciation is advancing at its fastest pace in more than two years and sits neck and neck with the California average.

COVID-19. Sonoma has moved into the state's orange tier, and case counts are as low as they have been in nearly 10 months. Sonoma's economic exposure to the pandemic fallout, a proprietary metric that ranks Sonoma areas based on virus case counts and structural factors including demographics, commuting patterns and industrial composition, places Sonoma in the bottom one-third of areas nationwide. Nonetheless, Sonoma's economy relies heavily on visitor spending, and Sonoma will benefit from a release of pent-up demand for vacations once the U.S. reaches herd immunity by the summer.

Construction. Sonoma's housing market has proved resilient in the wake of years of devastating wildfires and the disruption caused by shelter-in-place orders amid the global pandemic. Significant rebuilding efforts following the Tubbs wildfire and to a lesser extent the Kincade fire over the past few years have eased supply concerns, and Sonoma has recouped nearly all the housing units lost to the natural disasters. Permit issuance cooled again in 2020 as these rebuilding efforts wound down but was still nearly twice as strong as in 2017. Still, demand is surging, partly because of the proliferation of remote work, which is drawing more residents to Sonoma, given its high quality of life and proximity to the Bay Area economies. Available inventory is being whittled down, with the National Association of Realtors reporting just over two months' worth of supply at the existing pace of sales, the lowest level since the post-Tubbs fire rush.

Wine. The end of business restrictions and easing contagion fears will play large roles in determining the fortunes of Sonoma vintners and spirit makers. Though they adapted well to the changing landscape, the importance of visitor spending at wineries and restaurants will help ease the pain after months of shuttered nonessential businesses. TSA traveler volumes are improving and will likely accelerate rapidly as herd immunity approaches in the summer. Data from OpenTable, which charts seated diners at restaurants, show a similar rapid improvement, growing from 60% below 2019 levels at the end of January to just less than 20% by April.

Sonoma's near-term outlook is growing more optimistic as the vaccine rollout progresses. Fortunately, most job losses will be temporary, and Sonoma will regain its footing in 2021. In the long run, a high quality of life and highly educated workforce will keep Sonoma in line with the California average in job and income growth.

Colin Seitz *1-866-275-3266*
April 2021 *help@economy.com*

2015	2016	2017	2018	2019	2020	INDICATORS	2021	2022	2023	2024	2025	2026
28.5	29.1	30.2	30.8	31.4	30.6	Gross metro product (C12$ bil)	32.2	34.3	35.2	36.1	36.9	37.6
7.0	*2.1*	*3.9*	*2.1*	*1.8*	*-2.5*	*% change*	*5.4*	*6.3*	*2.7*	*2.6*	*2.1*	*1.9*
196.9	201.9	205.6	208.7	209.1	190.3	Total employment (ths)	186.8	194.7	198.3	200.2	201.2	202.0
2.9	*2.5*	*1.9*	*1.5*	*0.2*	*-9.0*	*% change*	*-1.8*	*4.2*	*1.8*	*1.0*	*0.5*	*0.4*
4.5	4.0	3.4	2.8	2.7	7.6	Unemployment rate (%)	6.0	3.9	2.9	2.8	3.0	3.0
8.0	3.8	4.6	4.8	4.3	6.8	Personal income growth (%)	4.9	0.9	5.0	4.7	4.1	4.1
70.0	74.0	78.7	84.4	87.8	88.3	Median household income ($ ths)	89.2	89.5	92.7	96.0	99.2	102.5
500.9	502.5	502.5	498.6	494.3	494.2	Population (ths)	495.0	494.9	494.7	494.5	494.1	493.7
0.5	*0.3*	*-0.0*	*-0.8*	*-0.9*	*-0.0*	*% change*	*0.2*	*-0.0*	*-0.0*	*-0.0*	*-0.1*	*-0.1*
1.3	0.8	-0.7	-4.1	-4.4	-0.3	Net migration (ths)	0.6	-0.3	-0.3	-0.3	-0.3	-0.3
431	621	840	3,169	2,079	1,211	Single-family permits (#)	1,617	1,997	1,944	1,842	1,712	1,590
190	298	338	110	350	278	Multifamily permits (#)	586	823	906	926	864	770
260.2	281.6	304.3	328.5	331.0	335.5	FHFA house price (1995Q1=100)	353.8	367.1	375.1	388.4	401.7	414.9

ECONOMIC HEALTH CHECK

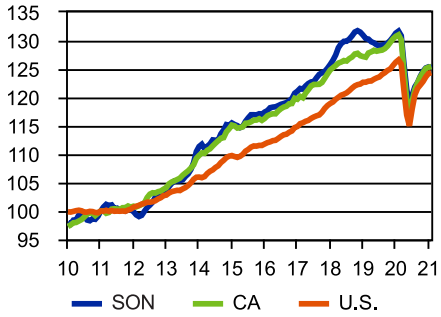
3-MO MA	Sep 20	Oct 20	Nov 20	Dec 20	Jan 21	Feb 21
Employment, change, ths	2.7	1.6	0.6	0.0	-0.7	-1.1
Unemployment rate, %	8.2	7.0	6.4	6.2	6.7	6.9
Labor force participation rate, %	61.5	61.8	61.9	62.3	60.9	59.9
Average weekly hours, #	33.7	34.0	34.0	33.8	33.8	33.4
Industrial production, 2012=100	107.4	108.4	108.7	109.6	110.7	111.0
Residential permits, single-family, #	1,048	1,204	1,458	1,383	1,170	1,049
Residential permits, multifamily, #	94	250	380	666	520	401
Dec/Dec	**Dec 15**	**Dec 16**	**Dec 17**	**Dec 18**	**Dec 19**	**Dec 20**
Employment, change, ths	6.1	4.3	3.8	1.9	0.8	-26.4

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

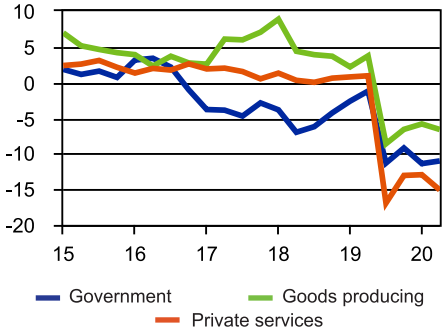
JAN 2011=100



Source: Moody's Analytics

CURRENT EMPLOYMENT TRENDS

% CHANGE YR AGO



Sources: BLS, Moody's Analytics

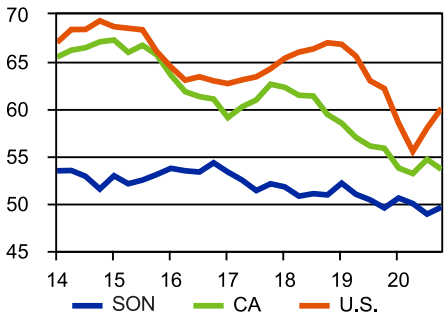
% CHANGE YR AGO, 3-MO MA

	Feb 20	Aug 20	Feb 21
Total	1.1	-11.3	-12.7
Mining	-0.3	-0.4	0.5
Construction	7.1	-5.8	-5.4
Manufacturing	0.8	-6.0	-5.2
Trade	-1.0	-7.0	-3.8
Trans/Utilities	3.7	-7.3	-3.3
Information	-0.2	-15.7	-15.0
Financial Activities	-2.5	-16.4	-14.2
Prof & Business Svcs.	2.4	-6.0	-6.8
Edu & Health Svcs.	3.8	-6.6	-11.7
Leisure & Hospitality	-0.8	-33.9	-42.5
Other Services	1.6	-20.9	-21.1
Government	-1.7	-10.0	-11.2

Sources: BLS, Moody's Analytics

DIFFUSION INDEX

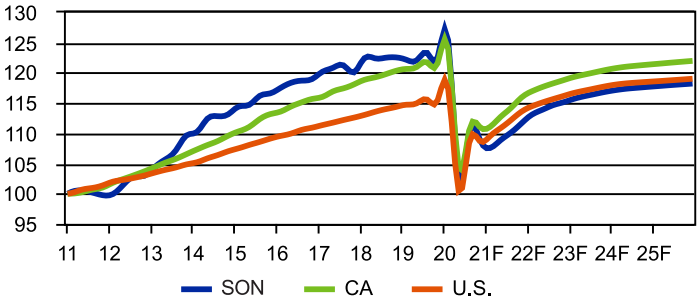
3-DIGIT NAICS LEVEL, 6-MO MA



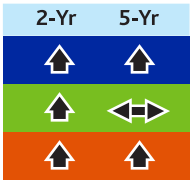
Sources: BLS, Moody's Analytics

RELATIVE EMPLOYMENT PERFORMANCE

JAN 2011=100



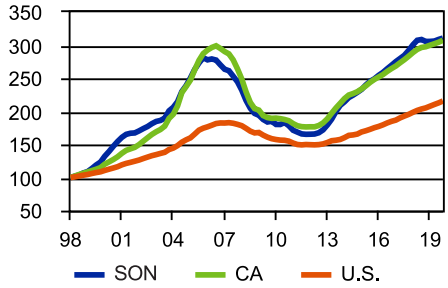
FORECAST VS. 6 MO PRIOR



Sources: BLS, Moody's Analytics

HOUSE PRICE

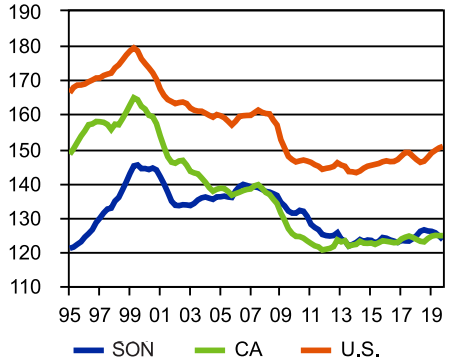
1998Q1=100, NSA



Sources: FHFA, Moody's Analytics

RENTAL AFFORDABILITY

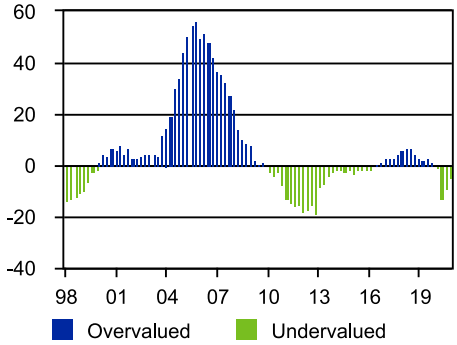
GREATER THAN 100=MORE AFFORDABLE



Sources: Census Bureau, BLS, Moody's Analytics

HOUSE PRICE TRENDS

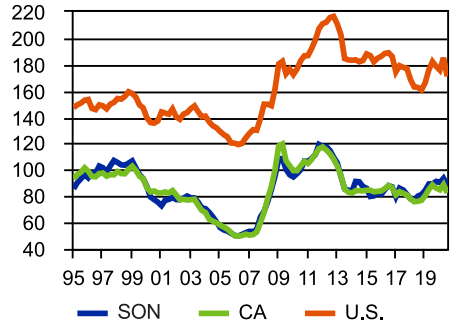
%



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

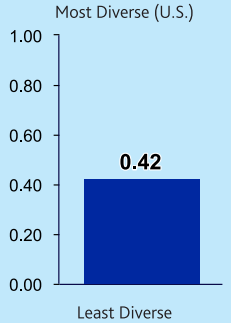
Sources: North Bay Business Journal Book of Lists, 2020, San Francisco Business Journal Book of Lists, 2017

PUBLIC

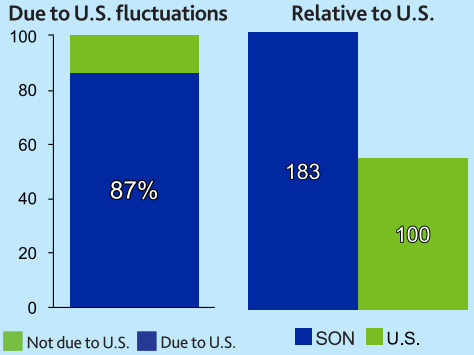
Federal	1,434
State	3,333
Local	22,293

2020

INDUSTRIAL DIVERSITY



EMPLOYMENT VOLATILITY



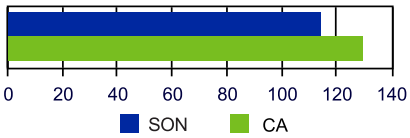
COMPARATIVE EMPLOYMENT AND INCOME

	% OF TOTAL EMPLOYMENT			AVERAGE ANNUAL EARNINGS		
Sector	**SON**	**CA**	**U.S.**	**SON**	**CA**	**U.S.**
Mining	0.1	0.1	0.4	$32,100	$97,297	$152,860
Construction	8.4	5.3	5.1	$91,624	$83,786	$71,226
Manufacturing	11.7	7.8	8.6	$95,048	$114,396	$87,452
Durable	*39.2*	*64.8*	*62.2*	*nd*	*$131,745*	*$90,347*
Nondurable	*60.8*	*35.2*	*37.8*	*nd*	*$84,387*	*$82,632*
Transportation/Utilities	2.1	4.5	4.3	$61,107	$68,520	$65,743
Wholesale Trade	3.9	4.0	4.0	$82,710	$93,385	$92,590
Retail Trade	11.9	9.4	10.4	$44,519	$45,845	$38,405
Information	1.2	3.3	1.9	$139,869	$205,480	$136,729
Financial Activities	4.0	5.1	6.1	$49,565	$68,797	$59,335
Prof. and Bus. Services	11.8	16.1	14.2	$61,582	$89,007	$76,266
Educ. and Health Services	17.9	16.9	16.3	$64,811	$60,877	$59,504
Leisure and Hosp. Services	9.7	9.2	9.4	$33,392	$39,308	$31,046
Other Services	3.1	2.9	3.8	$51,971	$42,749	$39,932
Government	14.2	15.4	15.4	$90,806	$104,490	$83,178

Sources: Percent of total employment — BLS, Moody's Analytics, 2020, Average annual earnings — BEA, Moody's Analytics, 2019

ENTREPRENEURSHIP

BROAD-BASED START-UP RATE
U.S.=100, 4-QTR MA
2018



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**

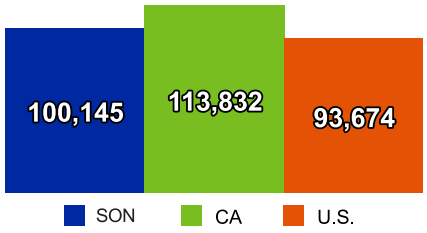
Destination	$ mil
Africa	9.0
Asia	540.0
European Union	283.6
Canada & Mexico	263.1
South America	15.0
Rest of world	123.7
Total	**1,234.5**

% of GDP	*3.5*
Rank among all metro areas	*232*

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

PRODUCTIVITY

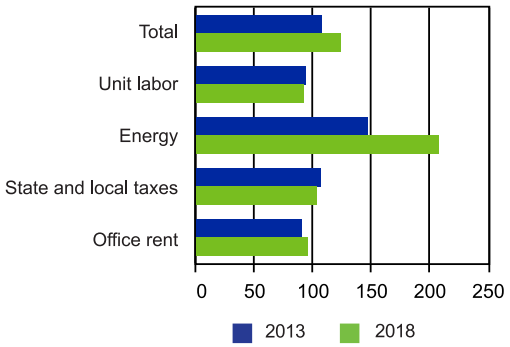
REAL OUTPUT PER WORKER, $



Sources: BEA, Moody's Analytics, 2019

BUSINESS COSTS

U.S.=100



Source: Moody's Analytics

HIGH-TECH EMPLOYMENT

	Ths	% of total
SON	8.6	4.5
U.S.	7,540.4	5.3

HOUSING-RELATED EMPLOYMENT

	Ths	% of total
SON	27.4	14.4
U.S.	14,373.7	10.1

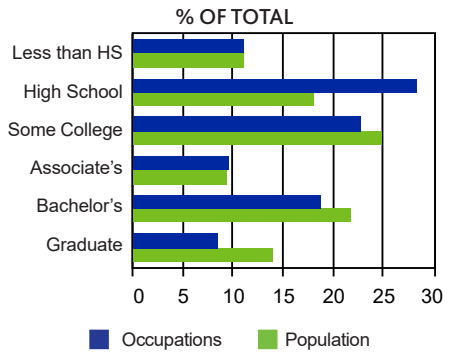
Source: Moody's Analytics, 2020

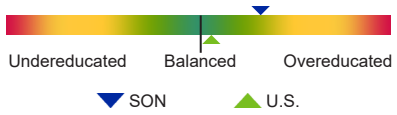
LEADING INDUSTRIES BY WAGE TIER

	NAICS	Industry	Location Quotient	Employees (ths)
HIGH	6214	Outpatient care centers	3.9	4.6
	6221	General medical and surgical hospitals	0.7	4.3
	6211	Offices of physicians	0.7	2.5
	5511	Management of companies & enterprises	0.7	2.3
MID	GVL	Local Government	1.3	25.4
	3121	Beverage manufacturing	24.6	7.9
	GVS	State Government	0.7	5.0
	2382	Building equipment contractors	1.1	3.0
LOW	7225	Restaurants and other eating places	1.1	16.4
	6241	Individual and family services	2.5	7.8
	4451	Grocery stores	1.7	6.4
	FR	Farms	1.6	6.1

Source: Moody's Analytics, 2020

SKILLS MISMATCH





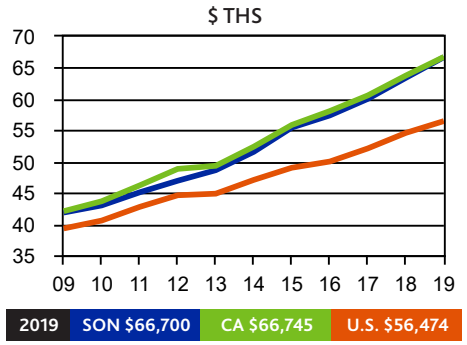
Sources: Census Bureau, ACS, Moody's Analytics, 2018

ECONOMIC DISENFRANCHISEMENT

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

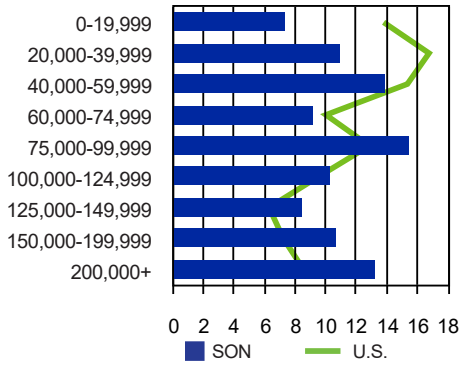
**Most unequal=1; Most equal=403*

PER CAPITA INCOME



Sources: BEA, Moody's Analytics

HOUSEHOLDS BY INCOME, %



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

MIGRATION FLOWS

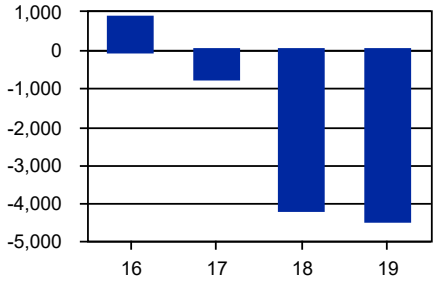
INTO SONOMA COUNTY CA

	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**

NET MIGRATION,

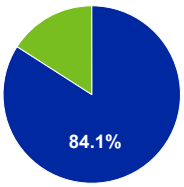


	2016	2017	2018	2019
Domestic	130	-1,061	-4,202	-4,534
Foreign	708	361	74	97
Total	838	-700	-4,128	-4,437

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

COMMUTER FLOWS

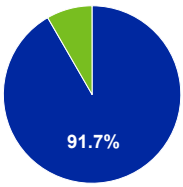
RESIDENTS WHO WORK IN SAA



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

WORKERS WHO LIVE IN SAA



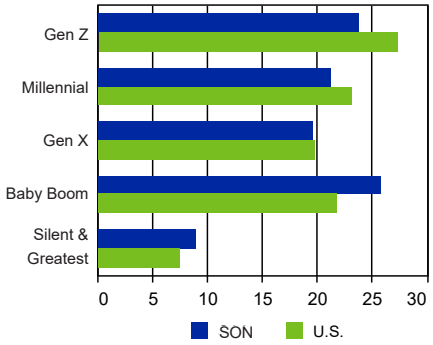
Top Outside Sources of Workers

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

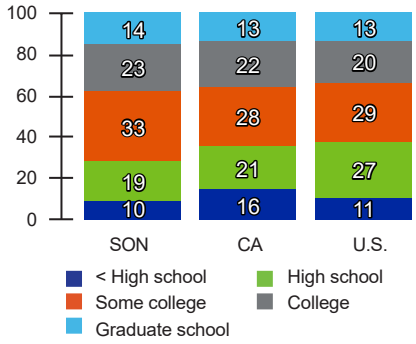
POPULATION BY GENERATION, %



Sources: Census Bureau, Moody's Analytics, 2019

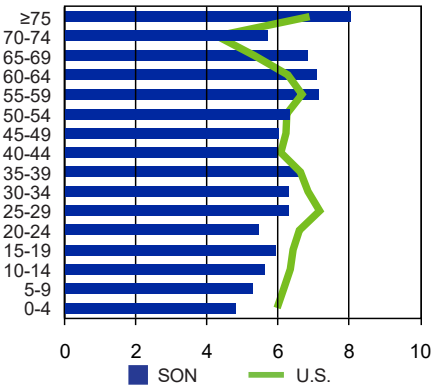
EDUCATIONAL ATTAINMENT

% OF ADULTS 25 AND OLDER



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

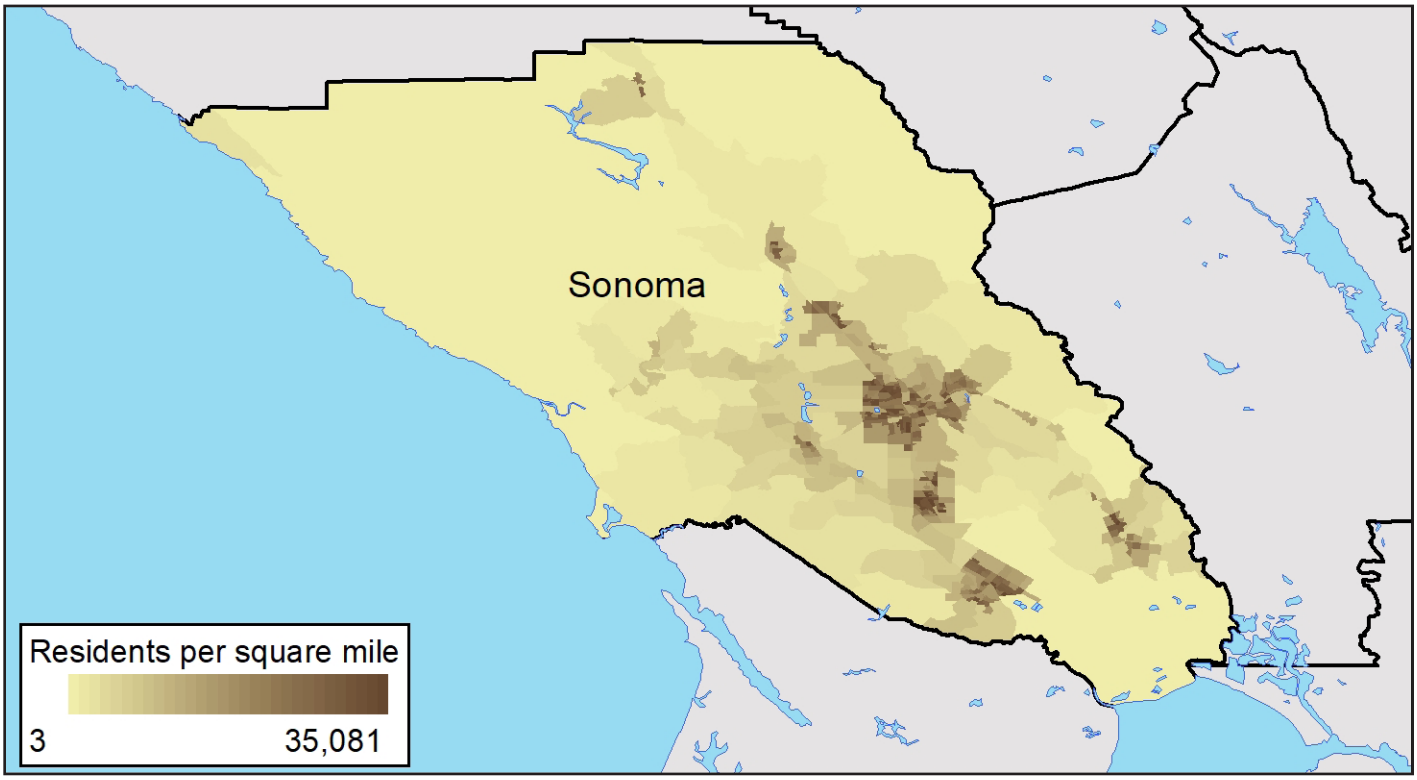
POPULATION BY AGE, %



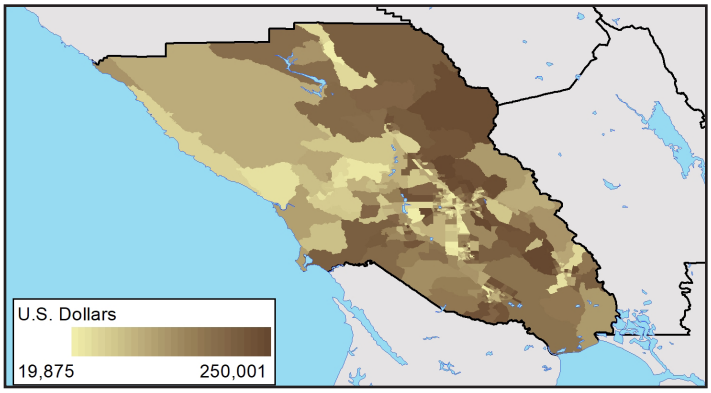
Sources: Census Bureau, Moody's Analytics, 2019

GEOGRAPHIC PROFILE

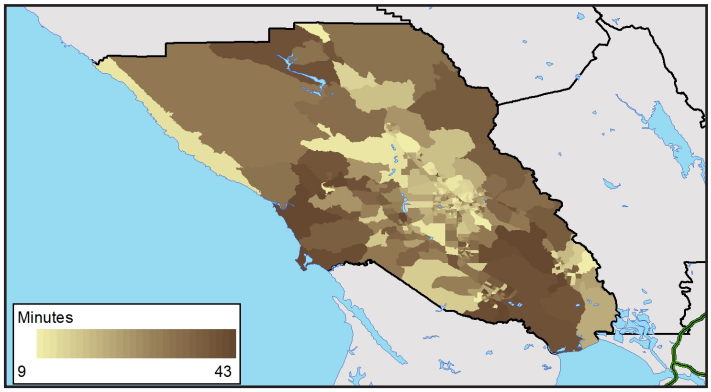
POPULATION DENSITY



MEDIAN HOUSEHOLD INCOME



AVERAGE COMMUTE TIME



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	494.3	126
U.S. citizen at birth	% of population	83.4	335
Naturalized U.S. citizen	% of population	7.2	62
Not a U.S. citizen	% of population	7.8	61
Median age		43.1	50
Total housing units	ths	208.3	131
Owner occupied	% of total	56.9	235
Renter occupied	% of total	34.6	86
Vacant	% of total	8.5	278
1-unit; detached	% of total	67.1	190
1-unit; attached	% of total	7.1	66
Multifamily	% of total	21.1	200
Median year built		1979	

** 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, 2019 except land area 2010

Sources: ACS, Moody's Analytics

Time for Infrastructure Investment

BY MARK ZANDI

I have been a professional economist for more than 30 years and have made many projections during that time. Some of those forecasts I have made with confidence, others not so much. But I cannot remember a time when I have been so sure of the U.S. economy's near-term prospects. It is going to be rip-roaring. For the next six months, probably for the next year, and perhaps even well into next year, real GDP growth and job gains will boom, and unemployment will quickly decline.

Gaining strength

The economy is already rapidly gaining strength. That is clear in the March jobs numbers. Employment increased by more than 900,000 in the month with an impressive over 70% of industries reporting job gains. Weather played a role with the rebound from awful winter storms in February, but business and school reopenings added a lot to payrolls. Unemployment fell to 6% at the same time labor force participation notched higher. The benefit from the $1.9 trillion in fiscal support provided by the American Rescue Plan did not materially impact the numbers, but it will starting in April. ARP-funded stimulus checks probably did help power the gangbuster 17.7 million new vehicles sold (at an annualized rate) in March. There are fewer than a dozen other months in history in which more vehicles were sold. No surprise then that manufacturing is booming. The ISM manufacturing survey posted its strongest reading since 1983. The other economic statistic that stood out was the quick revival in consumer confidence. According to the Conference Board, sentiment is already stronger than it has been on average in the more than 50-year history of the survey.

The pandemic's demographic blow may also begin to fade. According to microdata from the Current Population Survey, the number of households fell sharply when the pandemic hit a year ago, particularly among younger households. Households headed by someone less than 30 years old fell by close to 2.5 million between January and June of last year. Apparently, many young people chose to move back home or crash with roommates during the lockdown. But household formation rebounded with the economy's reopening last summer. Cushioning the hit to households early on during the pandemic was the increase in the number of households headed by those in their 60s and early 70s. That is tougher to explain. Is it possible that families segregated their elderly parents because they were worried about exposing them to the virus (see Chart 1)?

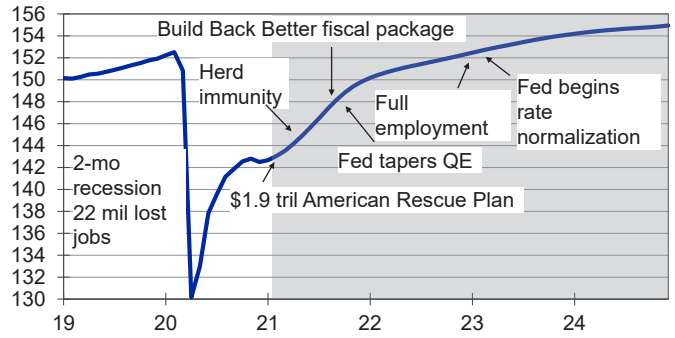
Long-term prospects

The economy's long-term prospects also brightened with President Biden's proposed American Jobs Plan, the part of his "Build Back Better" presidential campaign agenda focused on investing in the nation's infrastructure. There is no argument that the nation's infrastructure needs are great. The U.S. has underinvested in infrastructure for decades. Federal, state and local government spending on infrastructure peaked at close to 6% of GDP in the 1950s and 1960s when the Interstate Highway System was built. It fell sharply in the 1970s and again in the wake of the financial crisis in the early 2010s. Infrastructure investment as a share of GDP is well below 2% of GDP, the lowest in the data available since World War II (see Chart 2).

The result has been a steady aging of the nation's stock of public infrastructure. For example, the average age of the nation's highways is close to 30 years, double what it was in the 1960s. The average age of the nation's dams is even older. If maintained, this would not necessarily present a problem or urgent need for replacement, but maintenance has not been performed in many cases, and the need for additional spending is intensifying. Take the nation's more than 600,000 bridges. The Department of Transportation classifies more than one-fourth as structurally deficient or functionally obsolete. Many of the larger and most heavily used of these bridges were built in the same period and will reach replacement age—the

Rip-Roaring Economy

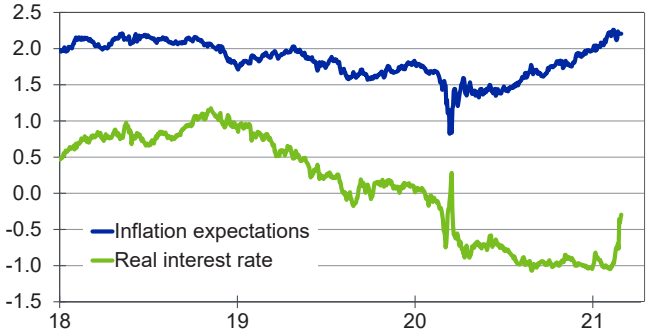
U.S. nonfarm employment, mil



Sources: BLS, Moody's Analytics

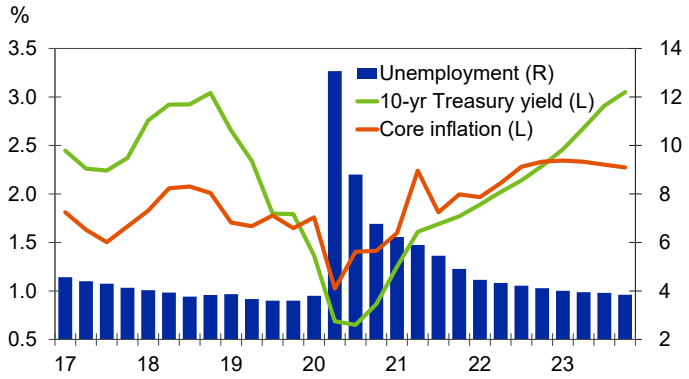
What Is Behind the Rising Rates?

Nominal 10-yr Treasury yield decomposed, %



Sources: Federal Reserve, Moody's Analytics

Steadily Rising Rates in the Baseline



Sources: Federal Reserve, BLS, Moody's Analytics

theoretical life of a bridge is approximately 50 years—around the same time.

American Jobs Plan

Biden's American Jobs Plan calls for $2.2 trillion in increased government spending over the 10-year period from 2022 to 2031, and $400 billion in tax credits. Two-thirds of the cost of the plan is paid for over the decade with $1.8 trillion in higher corporate taxes. The nation's budget deficit thus increases more than $800 billion over the decade on a static basis—that is, before accounting for the economic benefit of the plan on the government's finances. The biggest boost to spending goes to traditional infrastructure, including transportation projects such as roads, bridges and ports, and to shore up the nation's crumbling water and power infrastructure. Social infrastructure, including education, healthcare and housing, also receives substantially more financial support. To lift the nation's competitiveness, the plan allocates more funds to basic research and development, manufacturing, and broadband. Workforce development funds are also provided to fund the training needed to prepare the workforce for future jobs, including those created by the infrastructure projects. One seemingly incongruous part of the plan is $400 billion in spending on better care for the elderly and disabled. This has much more in common with Biden's next proposed fiscal package to build out the nation's social safety net.

Increasing infrastructure investment by more than 1% of GDP over the next decade as Biden has proposed has both near- and long-term benefits. Near term it has a large so-called multiplier—the increase in GDP for a dollar increase in investment. In a period of high unemployment and significant slack in the economy, like today, the one-year multiplier on traditional infrastructure spending is close to an estimated 1.5, among the highest compared with other types of federal government spending and tax policy. With close to 3 million more workers still permanently unemployed as a result of the COVID-19 pandemic, an infrastructure plan that provides new jobs in communities across the country would be particularly effective (see Chart 3).

Infrastructure benefits

Long term, economic research is in strong agreement that public infrastructure provides a significantly positive contribution to GDP and employment. It lowers business costs and thus improves competitiveness and productivity, allows workers to live closer to where they work and thus reduces commute times, improves labor participation, and reduces carbon emissions. There is more debate on whether public infrastructure spending boosts GDP by as much as private capital does. One reason for this is that, unlike private investment, federal investment is not driven solely by market forces or by maximizing economic returns of firms. Federal infrastructure also has the goal of improving quality of life, reducing inequities, supporting the work of the federal government itself, and addressing other broader social objectives that policymakers may have. The federal government also imposes various requirements that can increase the costs of the projects that it funds. We estimate the average return on private capital to be close to 10%—that is, a $1 increase in private investment, all else being equal, increases GDP by 10 cents over a year—while it is almost 7% for public infrastructure.

Still, the state of the economy makes this an especially propitious time to increase infrastructure investment, since extraordinarily low interest rates make the return on that investment substantially greater than the government's cost of financing. Thirty-year Treasury yields are just over 2%, while the return on almost any public infrastructure project is likely to be meaningfully greater than that.

The infrastructure plan results in a stronger economy over the coming decade, with higher GDP, more jobs and lower unemployment. However, the most immediate impact in early 2022 is to marginally reduce growth. That is because the higher corporate taxes take effect right away, while the increased infrastructure spending does not get going in earnest until later in the year. This changes quickly. By 2023 and throughout much of the middle of the decade the ramp-up in infrastructure spending significantly lifts growth. The apex in the boost to growth from the plan is in 2024, when real GDP is projected to increase 3.8%, compared with 2.2% if the plan fails to become law. In terms of jobs, with the infrastructure plan the economy recovers the jobs lost in the pandemic recession in the next couple of years, not much different than without the plan. But the plan does result in substantially more jobs mid-decade, with employment under Biden's term as president increasing by 13.5 million jobs. Unemployment is also meaningfully lower with the plan, falling to a low of 3.5% by the end of Biden's term in 2024, consistent with the low reached just prior to the pandemic. Labor force participation by then is also expected to fully recover from the impact of the pandemic (see Table).

Productivity, deficits, debt

Long term, the economy enjoys stronger productivity growth. The improvement is marginal through the first half of the decade but will be measurable by decade's end as the stock of public infrastructure meaningfully increases, adding as much

as 0.1 percentage point to annual real GDP growth.

The nation's deficits and debt load are higher over the 10-year budget horizon, because the infrastructure plan is not fully paid for. On a static basis, the 10-year cumulative deficit increases by nearly $850 billion. On a dynamic basis—accounting for the benefits of the stronger economy resulting from the plan on government revenues and expenditures—the 10-year cumulative deficit is expected to be close to $625 billion. It is important to note that the spending under the plan winds down after 10 years, while the increased tax revenue continues to accrue to the Treasury, so that after about 15 years the infrastructure plan is fully paid for.

There are many potential political impediments to passage of the plan, but we expect that an infrastructure plan similar in spirit and size to what the president has proposed will become law later this year via the budget reconciliation process.

Macroeconomic Impact of American Jobs Plan

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Avg annual 2021-2030
Real GDP, % change												
With AJP	-3.49	7.23	3.86	2.30	3.77	2.85	1.86	1.63	2.02	2.23	2.24	2.99
Without AJP	-3.49	7.23	3.91	1.90	2.23	1.82	1.79	2.01	2.14	2.07	2.06	2.70
Difference	0.00	0.00	-0.04	0.41	1.54	1.03	0.07	-0.38	-0.13	0.16	0.18	0.29
Nonfarm employment, mil												
With AJP	142.26	146.37	150.89	152.47	155.14	156.89	157.82	158.60	159.47	160.35	161.24	
Without AJP	142.26	146.37	150.91	152.45	153.67	154.38	155.01	155.73	156.62	157.57	158.55	
Difference (ths)	0	0	-23	19	1,472	2,514	2,818	2,869	2,843	2,780	2,690	
Unemployment rate, %												
With AJP	8.12	5.59	4.44	4.38	3.76	3.63	3.67	3.81	3.83	3.84	3.83	
Without AJP	8.12	5.59	4.44	4.39	4.31	4.36	4.51	4.52	4.47	4.44	4.43	
Difference	0.00	0.00	0.01	-0.01	-0.55	-0.73	-0.83	-0.71	-0.64	-0.60	-0.59	

Sources: BEA, BLS, Moody's Analytics

Forecast Assumptions

BY MARK ZANDI

Monetary policy

The Federal Reserve continues to maintain a highly accommodative monetary policy. Short-term rates remain firmly at the zero lower bound, and the Fed remains engaged in quantitative easing—the purchase of Treasury and agency mortgage-backed securities—to keep long-term interest rates down.

The Fed has wound down a range of credit facilities that it stood up early in the crisis to support different parts of the credit market. Those included a commercial paper facility, a facility to support money market funds, and new facilities to help the struggling corporate bond and municipal bond markets. These efforts successfully supported credit markets. Credit spreads are wider in the pandemic, and new bond issuance has been somewhat diminished, but credit remains amply available.

The Fed's efforts have insulated the financial system from the problems in the economy. This is significantly different from the financial crisis over a decade ago, when the financial system collapsed and required a government bailout. That exacerbated the downturn and was a key to the slow recovery. This time, the financial system will manage through relatively gracefully, limiting the economic damage and hastening the recovery.

Moody's Analytics expects the Fed's other emergency measures to remain in place for some time. The quantitative easing is expected to begin tapering in early 2022, while the zero-interest-rate policy will remain in place until it is clear the economy is near full employment and inflation is firmly above the Fed's 2% inflation target, which is not expected until early 2023.

Ten-year Treasury yields have risen to near 1.75% as global bond investors discount prospects for much stronger growth due to the aggressive fiscal policy response by President Biden. Rates should slowly rise, particularly after the pandemic is clearly winding down later this year and investors begin to anticipate the Fed's tapering. Ten-year yields should rise to 2% by the end of this year and reach their estimated long-run equilibrium of 3.75% by mid-decade.

Fiscal policy

Highly expansionary fiscal policy—deficit-financed discretionary fiscal policy—will provide a large boost to the economy this year. The American Rescue Plan that became law in mid-March and the COVID-19 relief package that lawmakers agreed upon in late December together will add nearly $1.9 trillion in fiscal support to the economy in calendar year 2021 and another $800 billion in 2022.

Total fiscal support to the economy throughout the pandemic, including the massive CARES Act passed into law in March 2020, and several smaller fiscal packages, will ultimately total 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, and substantially more than provided by any other country in the world.

We expect that President Biden and Congress will pass another fiscal package later this year, fashioned on his campaign's Build Back Better economic agenda. This package, which we expect will include approximately $3 trillion in new spending on infrastructure and social programs and various tax law changes including higher corporate tax rates and higher taxes on the well-to-do, will add several hundred billion dollars to the deficit over the next decade. Given the Democrats' 50-50 margin in the Senate, this plan will likely only become law using the arcane budget reconciliation process.

The federal government will have a deficit of well over $3 trillion this fiscal year, and over $2 trillion in fiscal 2022. The publicly traded debt-to-GDP ratio has surged to near 100% and will soon breach the all-time high of 106% reached briefly after World War II. Lawmakers are appropriately not focused on the red ink given the need to respond to the crisis. But, once the pandemic is clearly behind us, addressing the nation's fragile fiscal situation will be critical.

U.S. dollar

The U.S. dollar came off its early pandemic highs as the safe-haven demand for the currency abated, but it remains strong.

On a real broad trade-weighted basis, the dollar is still 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 pandemic is a threat since the virus will do more damage to the global economy than to the U.S. economy. Emerging market currencies will be especially vulnerable.

The dollar will weaken further on the other side of the pandemic, but geopolitical uncertainties including the U.S. trade war with China will ensure that any decline will be modest. The dollar's reserve currency status will remain intact for the foreseeable future.

Energy prices

Global oil prices have pushed up to $65 per barrel. Global oil demand has firmed as the worst of the pandemic-related global downturn is over, and the supply side of the global energy market has significantly reduced oil production. Further increases in oil prices post-pandemic are likely as the recovering global economy's stronger demand for oil conflates with rationalized global supplies. The potential for price spikes later this year and in 2022 is meaningful. However, given ample global reserves, oil prices should eventually settle near their estimated long-run equilibrium level of $55 to $60 per barrel.

COVID-19 pandemic

The pandemic remains a significant headwind to the global economy. The worst of the economic fallout from the virus is likely behind us, but until effective vaccines are widely adopted, travel, tourism and trade will remain impaired and the global economy will continue to struggle.

There is a high degree of uncertainty, but under our baseline outlook we anticipate the U.S. population will effectively achieve herd immunity from the virus this summer.

Forecast Risks

BY MICHAEL FERLEZ

⬇ COVID-19

The intensification of the COVID-19 crisis presents several downside risks to the U.S. forecast. Although the number of new COVID-19 cases is well below the highs from earlier this year, most state and local governments will remain cautious of reopening too quickly. Making matters worse, a new and more contagious strain of the virus threatens to worsen the health crisis. Additionally, there is still the risk that a surge in case counts could depress consumer spending, hurting small businesses and keeping the unemployment rate elevated.

The distribution of the vaccine remains another source of risk. The baseline forecast assumes that herd immunity will be reached this summer. However, there is still the risk that public mistrust of the vaccine could slow its adoption and usefulness, delaying herd immunity and causing economic growth to fall short of expectations. A more devastating risk would be if new variants of the virus become either partially or fully resistant to current vaccines. Under such a scenario, the odds of widespread lockdowns would increase, stressing the global recovery.

Longer term, the virus also carries immense risks to the economic forecast. One of the more damaging would be a permanent change in consumer behavior leading to lasting disruptions of certain industries that perpetuate job losses and income inequality.

⬆ Stimulus

Prospects for additional fiscal stimulus have greatly improved after a ruling by the Senate parliamentarian would allow Democrats to revise the current budget and pass next year's budget using the budget reconciliation process, thereby eliminating the risk of a possible Republican filibuster. The April baseline now assumes that Congress will pass $3 trillion in new fiscal stimulus this year, an increase of about $1.5 trillion from our March forecast. Although prospects have improved, Democrats' slim control of the Senate and a highly contentious political climate remain downside risks.

Longer term, the already-immense size of the stimulus carries its own risks. Moody's Analytics projects the federal budget deficit to remain elevated at 14% of GDP this year. The extraordinary costs of these programs and how they are eventually wound down will be a source of downside risk in the years ahead.

⬆ Consumer spending

Additional fiscal stimulus and a historically high saving rate raise the upside risk for a boom in consumer spending later this year.

Last year, a sharp drop in discretionary spending and an increase in fiscal stimulus drove the U.S. saving rate to a record high of 26% in the second quarter. Although the saving rate declined sharply in the second half of the year, consumers still hold billions in excess savings. With another round of fiscal stimulus further bolstering consumers' savings, the timing and the amount of savings consumers spend will have a large impact on growth. The Moody's Analytics forecast is for the saving rate to gradually decline over the coming years. However, as the effects of the pandemic fade in the coming months, there is an upside risk that consumers spend more of their savings than expected, causing economic growth to surpass expectations.

⬇ Financial conditions

Rising long-term U.S. interest rates and lofty equity valuations increase the odds of a costly tightening in financial market conditions. In recent months, expectations for stronger growth and more fiscal stimulus have pushed long-term interest rates higher, with yields on the 10-year Treasury bond reaching their highest levels since February 2020. One risk is that a continued rise in long-term interest rates will precipitate a correction in equity markets. Though a modest correction in prices can be healthy, a prolonged slump along with a tightening in financial conditions could weaken the near-term recovery. Rising long-term interest rates could also create problems for other asset classes, including real estate and corporate debt. Nonfinancial debt and loans sit near record-high shares of GDP, and higher rates could significantly increase the borrowing costs for highly indebted corporations—many of which are still struggling from the pandemic. A string of corporate defaults or a significant widening of corporate bond spreads could dampen investor sentiment and soften investment.

⬇ Sovereign debt crisis

Soaring sovereign debt loads and an uncertain economic environment could set the stage for a devastating global debt crisis. The COVID-19 pandemic has resulted in an unprecedented strain on government finances. For many countries, this strain will be compounded by failures to reform and deleverage following the Great Recession. In southern Europe, Italy and Greece are in the worst shape. If conditions fail to improve, both countries could easily burn through their remaining fiscal space. A sovereign debt crisis in either Europe or the emerging world could easily spiral out of control and ignite a broader contagion. The economic, financial and political fallout of a global sovereign debt crisis could easily precipitate a global recession.

⬇ Fed policy mistake

The Federal Reserve has played a critical role in supporting the economy during the pandemic, but its extraordinary policy response and a change in framework increase the risk of a policy error. Last year, the Federal Open Market Committee adopted average inflation targeting. The risk is that the shift in policy could cause the Fed to react too slowly in raising interest rates. If the Fed's policy response were to lag too far behind the economy, it then could be forced to tighten more aggressively, disrupting financial conditions. There will also be an increased risk of a policy mistake once the Fed begins the slow process of unwinding its enormous balance sheet.

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