THE LINNEMAN LETTER

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The COVID-19 situation is changing daily. Available data and commentary herein were updated late September 2020. We wish you and your families and colleagues good health and safety in these trying times.

> *"I am a firm believer in the people. If given the truth, they can be depended upon to meet any national crisis. The great point is to bring them the real facts."*
>
> ~ Abraham Lincoln

Business Failures in the Wake of the Shutdown

The full impact of the COVID shutdown will not be known for many years, but evolving data provide a glimpse. Quite telling is the number of companies that have filed for bankruptcy since the shutdown began in early March. Bankruptcies increased from 22,700 in the fourth quarter of 2019 to 23,100 companies in the first quarter of 2020. But this is just the tip of the iceberg. Among the largest post-shutdown bankruptcies as of June 29 were: Hertz (filed May 22), Latam Airlines Group (May 25), Frontier Communications (April 14), Chesapeake Energy (June 28), Intelsat (May 14), and J.C. Penney (May 15). The industry breakdown of the 20 largest bankruptcies is dominated by: automotive, publishing, healthcare, mining, and apparel (one each); aviation and telecommunication (two each); retail (four); and oil and gas (six).

According to a survey conducted by Yelp Inc., the online reviewer, over 80,000 businesses closed permanently between March 1 and July 25, 2020, of which more than 60,000 were local businesses with five or fewer locations. Restaurants accounted for the largest share of closures by industry group.

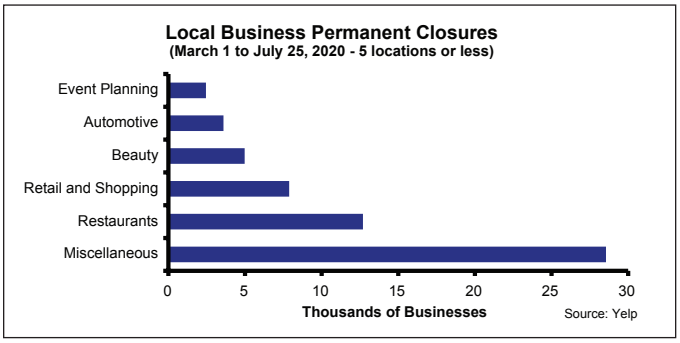

figure 1

Alexander W. Bartik, Marianne Bertrand, Zoë B. Cullen, Edward L. Glaeser, Michael Luca, and Christopher T. Stanton conducted a study on small business failures during the shutdown. In late March, they found that 41.4% of businesses were temporarily closed, and by May 9, 2.3% were permanently closed. At the time of the survey (March 28 to April 4, 2020), 72% of all businesses believed they would be operating in December if the shutdown continued for an additional month, 47% if it continued for four more months, but only 38% if it continued for six or more months. Similarly, a study conducted in April by the Society for Human Resource Management (SHRM) found that 52% of firms expected

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Percent Believing They Survive the Shutdown by Shutdown Duration			
Industry	**1 Month**	**4 Months**	**6 Months**
All retailers, except Grocery	69%	35%	33%
Arts and entertainment	65%	45%	35%
Banking/Finance	78%	63%	59%
Construction	72%	43%	45%
Health care	79%	47%	35%
Other	76%	48%	38%
Personal Services	57%	40%	22%
Professional Services	79%	63%	54%
Real Estate	74%	56%	56%
Restaurant/Bar/Catering	72%	30%	15%
Tourism/Lodging	66%	48%	27%
Total	72%	47%	38%

figure 2

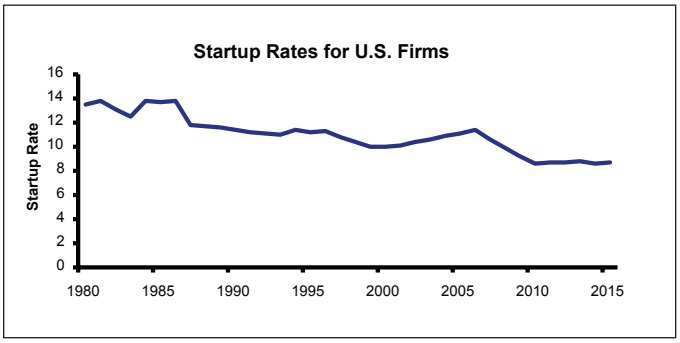


figure 3

to be out of business within six months. Given that partial shutdowns are ongoing, it is possible that as many as 50% of busi-nesses permanently closed.

The greater financial fragility of small businesses is reflected in higher levels of pessimism about remaining in business through December. Financial fragility is proxied by a firm's accessible cash (without seeking further loans from family or friends) to cover business expenses as a percent of their January 2020 monthly expenses. Roughly 25% of businesses have cash on hand totaling less than one month's worth of expenses, with about half having enough cash on hand to cover 1-2 months of expenses. The median business with under $10,000 in monthly expenses had just one month of cash on hand. For higher spending levels, businesses typically had less than 15 days of cash on hand. Sadly, government relief came too late for many small businesses, as those with limited liquidity ran out of funds before their Payroll Protection Program (PPP) loan was processed and dispersed.

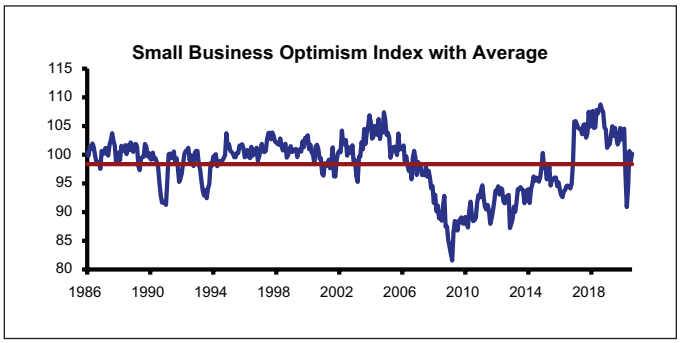
High financial fragility explains the staggering pace at which employees were laid off from small businesses during the shutdown. Among survey respondents, between January 31, 2020 and the week of March 26, full-time employees had fallen by 32%, and part-time workers fell by 56%, including both operational and temporarily closed businesses. Businesses that were operating saw full-time employment fall by 17.5% and part-time by 36%. Overall employment fell by 40%. With tighter shutdowns in the New York metro area,

In Memoriam: Gerald Hines (1925-2020)

The industry lost a true giant, and we lost a dear and long-time friend, when Gerry Hines passed away in August. Gerry had an unparalleled taste in properties, with his office developments being synonymous with the highest quality. In the nearly 30 years we knew Gerry, we found him to be a source of kindness and insight. He even set a healthy living standard that we attempt to emulate to this day.

Two memories capture Gerry for us. One was at a Wharton conference when we asked him if there were any mistakes he thought he had made in his real estate career. He replied that, at first, he thought the goal was to make a building that was 10% better than the competition. He eventually realized that the key was to not only make the building 10% better, but to do it at a cost increase of only 2%. The other memory was when we moderated a ULI panel discussion between Gerry, Bob Dedman, and Trammell Crow. Before we went on stage, Trammell saw Gerry and said, "Gerry we haven't spoken for many years; do you remember why?" And Gerry responded "No, but I am sure it isn't important."

Gerry was a great man and real estate developer who will be missed by all who knew him.



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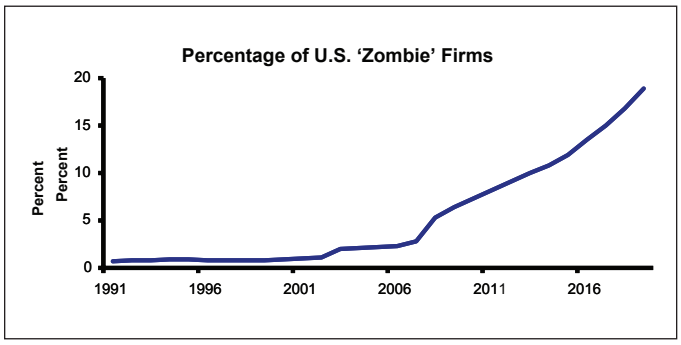
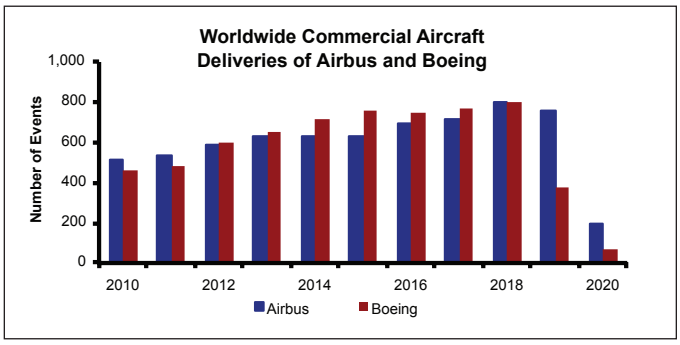


figure 5



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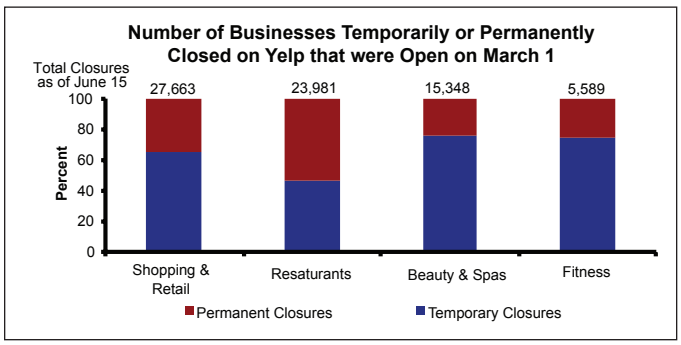


figure 6

NJ, and the Philadelphia MSA, the Mid-Atlantic region registered the sharpest decreases in employment (down by 47%) and the largest share of businesses that temporarily suspended operations (54% temporarily closed). The Mountain region was least affected at that time but still had 39% of businesses temporarily close and a 32% decline in employment.

Primary issues faced by firms include: supply chain challenges (rated as slightly disruptive), employee health (somewhat disruptive), and reductions in demand (extremely disruptive). Concerns of supply versus demand are consistent with a working study by Dylan Balla-Elliott, Zoë B. Cullen, Edward L. Glaeser, Michael Luca, and Christopher T. Stanton. The study finds that businesses were more concerned with downstream customer and revenue losses than upstream business connections as a result of the shutdown. The researchers postulate that upstream relationships are much easier to replace, as a business can shift to a new supplier, whereas losing downstream connections would almost certainly result in decreased revenue. Additionally, many businesses delayed reopening in anticipation of weak demand. Ironically, the partial opening of struggling restaurants and small businesses may have sealed their fates, as reduced demand and seating capacity meant far less revenue, while expenses were largely unchanged from pre-COVID levels.

Payroll expenses for less than fully-productive workers continue to hinder small businesses throughout the shutdown, even among those that received PPP loans. Small businesses must use 60% of the PPP loan on payroll in order for it to qualify for full forgiveness as of the Interim Rule addendum on June 14. PPP loans appear to have saved jobs, but loan restrictions undercut businesses' ability to cover overhead. Further, the PPP loan originally covered only eight weeks of expenses, and the money had to be used upon receipt, regardless of whether it was open or closed, though this has since been relaxed. As of June 30, the professional, scientific, and technical services sector received the largest share of PPP loans at 13%, followed by other services (except public administration) and health care and social assistance at 10.8% and 10.4%, respectively. As of June 30, total approved PPP loans had grown to $518.9 billion, representing nearly 4.8 million approved loans. About 66% of PPP loans were for less than $50,000, while loans of $350,000 to $1 million had the greatest share of total dollars at 22%. Based on Census Bureau data, during the first three weeks of the PPP (4/26-5/16), there was a significant gap between requested aid and aid received. The Paycheck Protection Program closed to new applicants on August 8, 2020, with roughly $130 billion remaining in the fund.

Firms were significantly more likely to apply for government loans with forgiveness than loans without forgiveness. The SHRM study found that a third of small business owners did not plan to apply for a PPP loan because there was too much bureaucracy involved (29%), it would take too long (17%), they were declined for a small business loan in the past (9%), or their

Industry Recipients of PPP Loans Through 6/30/2020

NAICS Sector Description	Number of PPP Loans	Value of PPP Loans ($ Billions)	% of Amt
Health Care and Social Assistance	506,263	67.4	12.9%
Professional, Scientific, and Technical Services	638,221	66.4	12.7%
Construction	466,221	64.6	12.4%
Manufacturing	229,591	54.0	10.4%
Accommodation and Food Services	367,502	42.1	8.1%
Retail Trade	450,181	40.4	7.7%
Other Services (except Public Administration)	531,572	31.1	6.0%
Wholesale Trade	167,237	27.7	5.3%
Remediation Services	240,947	26.5	5.1%
Transportation and Warehousing	191,609	17.1	3.3%
Real Estate and Rental and Leasing	245,697	15.6	3.0%
Finance and Insurance	168,462	12.2	2.3%
Educational Services	81,387	12.0	2.3%
Unclassified Establishments	222,096	9.9	1.9%
Information	69,106	9.3	1.8%
Arts, Entertainment, and Recreation	118,332	8.0	1.5%
Agriculture, Forestry, Fishing and Hunting	139,150	7.9	1.5%
Mining	21,570	4.5	0.9%
Public Administration	13,423	1.7	0.3%
Management of Companies and Enterprises	8,893	1.6	0.3%
Utilities	7,928	1.5	0.3%
Total	4,885,388	521.5	100%

figure 8

PPP Loan Size as of 6/30/2020

Loan Size	Loan Count	Net Value ($ Billions)	% of Count	% of Amount
$50K and Under	3,262,529	58.7	66.8%	11.2%
$50K-100K	3,262,529	48.0	13.8%	9.2%
$100K-150K	673,563	35.6	6.0%	6.8%
$150K-350K	291,091	84.5	7.7%	16.2%
$350K-1M	376,113	113.4	4.1%	21.8%
$1M-2M	199,456	73.5	1.1%	14.1%
$2M-5M	53,030	73.8	0.5%	14.2%
≥ $5M	24,838	34.0	0.1%	6.5%
Total	8,143,149	521.5	100%	100%

figure 9

business had already permanently closed (8%). The majority of the remaining 24% did not apply because they did not need the loan. Many small business owners believed the relief from the PPP loans would arrive too late or had arrived too late to help their businesses.

Balla-Elliot et al. measured the projected lag between the end of shutdown orders and when businesses expected to reopen. Accommodation and food service work had the lowest average gap among industries, with a two-week average lag, largely due to extensive regulations, followed by the arts and entertainment industry. Construction had a longer lag of about three weeks, though these businesses expected significantly less intrusive regulation because much of the work takes place outdoors. Retail trade, educational services, and health care firms all expected to have significant delays due to regulations. Professional and information services businesses had relatively high average lags, as most of these services can be delivered remotely, resulting in little to no economic impact should they choose to keep their physical locations closed. The finance sector experienced a relatively short lag, primarily due to personal choices rather than regulation. Interestingly,

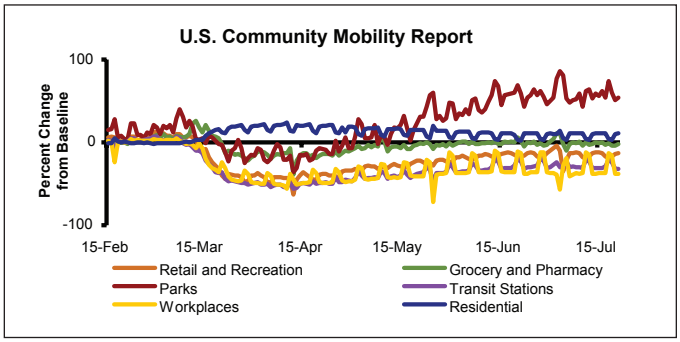


figure 10

small businesses could not open based on either COVID cases per capita or health concerns, as they were permanently closed by the time aid was available. Across industries, remember to differentiate between temporary and permanent shifts in consumer trends as we are far from any degree of sustained normalcy.

According to the National Restaurant Association (the other NRA), 3% of restaurant operators had gone out of business by May 25, and though it has not updated that figure, it predicts closures in the tens of thousands. Such closures are not surprising given that the total shortfall in restaurant and food service sales likely surpassed $120 billion during the first three months of the pandemic. In real terms, April's eating and drinking place sales volume of $29.9 billion represented the lowest level since February 1983. Eating and drinking establishments experienced a roughly $9 billion increase in sales volume from April to May, as some openings occurred, but remained nearly $27 billion down from sales levels posted in January and February 2020. Marcus and Millichap notes that full-service restaurants have been hit particularly hard by the shutdown, due to a lack of outdoor seating and the inability to adhere to social distancing guidelines.

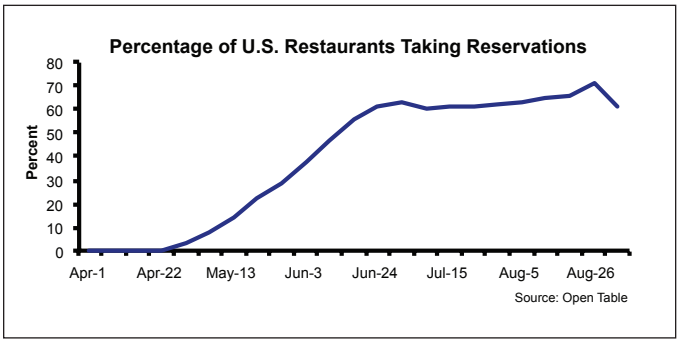


figure 11

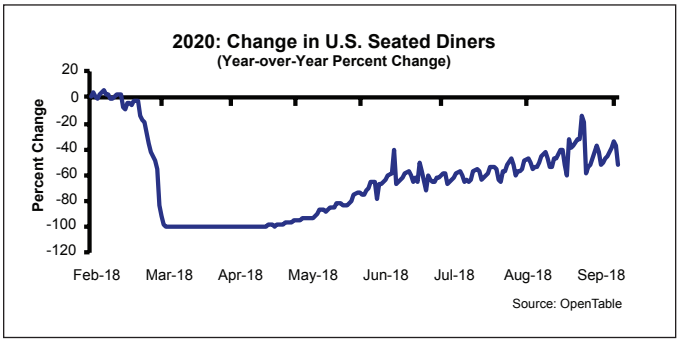


figure 12

Robert J. Barro, José F. Ursúa, and Joanna Weng calculate the economic impact of the 1918 flu epidemic (during which there were no mandated shutdowns in spite of a population-adjusted death toll of roughly 2.2 million) and apply their findings to predict the economic impact that COVID would have had absent mandated shutdowns. The researchers note that the 1918 flu had a far higher death rate as a percent of population than COVID (2.1% versus 0.06%) thus far and killed many

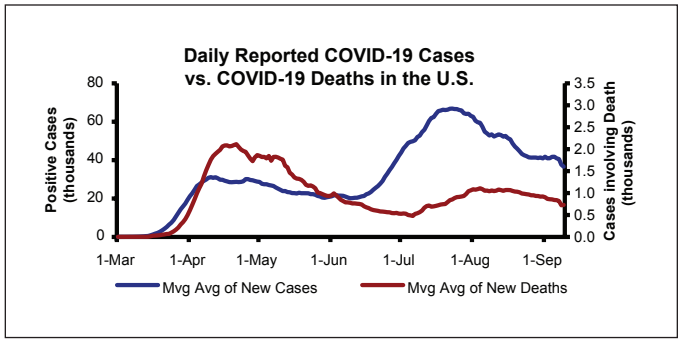


figure 13

Overall Case vs. Deaths thru 9/8/20

	Total Cases	Total Deaths
China	90,079	4,732
France	328,980	30,726
Germany	252,298	9,329
Italy	278,784	35,553
South Korea	21,432	341
Spain	525,549	29,516
Sweden	85,558	5,837
UK	350,100	41,554
U.S.	6,300,671	189,208

https://ourworldindata.org/mortality-risk-covid#case-fatality-rate

figure 14

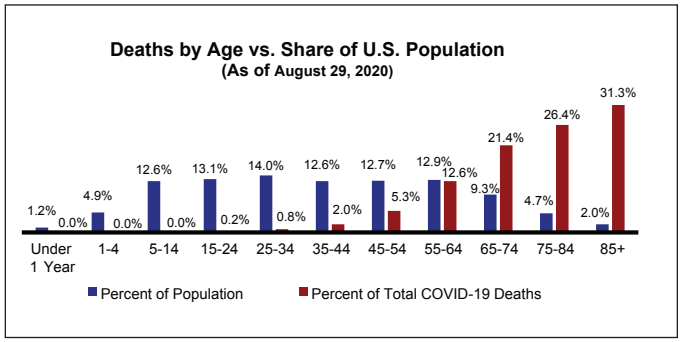


figure 15

Place of death (2/1/20 to 8/29/20)	All U.S. Deaths involving COVID-19	Deaths from All Causes	Deaths involving Pneumonia, with or without COVID-19, excluding Influenza deaths	Deaths involving COVID-19 and Pneumonia, excluding Influenza	All Deaths involving Influenza, with or without COVID-19 or Pneumonia
Total	**170,566**	1,841,678	175,096	75,771	6,600
Healthcare setting, inpatient	**110,313**	536,859	124,306	60,093	4,031
Healthcare setting, outpatient or emergency room	**6,137**	109,203	5,895	2,014	239
Healthcare setting, dead on arrival	**168**	5,247	129	41	11
Decedent's home	**9,180**	620,063	11,951	1,827	1,441
Hospice facility	**4,748**	115,649	8,277	2,152	316
Nursing home/long term care facility	**37,043**	328,647	21,629	8,871	524
Other	**2,916**	124,135	2,836	752	98
Place of death unknown	**61**	1,875	73	21	0

https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm#PlaceDeath

figure 16

Real Quarterly GDP Declines in 2020

Country	1Q20	2Q20	1H20
Japan	-0.6%	-7.9%	-9%
China	-10.0%	11.5%	2%
Sweden	0.2%	-8.3%	-8%
U.S.	-1.3%	-9.1%	-10%
Germany	-2.0%	-9.7%	-12%
Italy	-5.5%	-12.8%	-18%
France	-5.9%	-13.8%	-20%
Spain	-5.2%	-18.5%	-24%
UK	-2.2%	-20.4%	-23%

Source: OECD

figure 17

"He who knows only his own side of the case knows little of that. His reasons may be good, and no one may have been able to refute them. But if he is equally unable to refute the reasons on the opposite side, if he does not so much as know what they are, he has no ground for preferring either opinion... Nor is it enough that he should hear the opinions of adversaries from his own teachers, presented as they state them, and accompanied by what they offer as refutations. He must be able to hear them from persons who actually believe them...he must know them in their most plausible and persuasive form." ~ John Stewart Mill

young and healthy, while the most serious impact of COVID is primarily on the sick and elderly. Nonetheless, a 2.1% death rate adjusted to today's population would result in 150 million deaths worldwide and a 6% decline in GDP. For comparison, the U.S. shutdown cost 10% of lost GDP, plus an additional 20-40% of GDP in federal borrowing, far greater than even what the worst case scenario models predict for a COVID economy without a shutdown. Thus, COVID is horrendous but not remotely as virulent as the 1918 Spanish Flu.

The True Employment Situation

The U.S. economy hit bottom in mid-June and is now on a path toward rebuilding a stalled economy. It is useful to remember that the economy was quite strong prior to the virus reaching the U.S. Then the shutdown occurred, first for 14 days and eventually for about 100 days. All hiring stopped, businesses closed (many to never reopen), workers were furloughed and fired, and natural attrition through retirements and deaths occurred. We estimate that 55 million people, particularly those in the retail, entertainment, and hospitality sectors at least temporarily lost their jobs due to the shutdown, which is still ongoing to varying degrees in different cities and states.

Unemployment figures reported by the Bureau of Labor Statistics (BLS) Payroll Survey, ADP, and even BLS' Household Survey are much too low, and employment too high. This is because the nature of the reported unemployment rate is so focused by industry, geography, and demographics so as to fool typical sampling techniques. The reported peak unemployment rate was 14.7% in April 2020 and has since declined to 8.4% in August. The official rate reflects "only" about

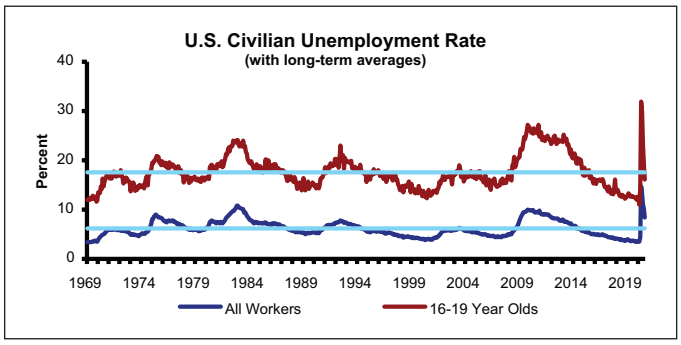


figure 18

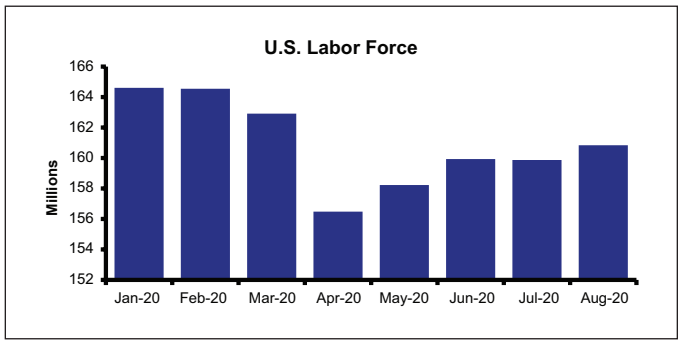


figure 19

13.6 million unemployed workers. The gap exists in part because millions of unemployed people have dropped out of the labor force and were not replaced by new entrants. This simply reflects the fact that people who would have normally entered the labor force realize it is a largely hopeless effort to seek a job. Going forward, we will use the official job data, but the reader needs to be aware that "unemployment" is higher than it appears.

We estimate that on an apples-to-apples comparison, the unemployment rate peaked at 22-25% in early June. Our basic math for estimating unemployment relative to February 2020 is simple. There were about 5.8 million unemployed at the end of February 2020. Since then, 61 million new unemployment claims were filed and (at most) 35 million workers were newly hired over the same period, resulting in at least 26 million not working and an estimated apples-to-apples unemployment rate of 16% using the February labor force. Even if an unlikely 40 million were hired during this period, the unemployment rate would be about 13%, well above the official 8.4% in August. Further, we can all feel that the economy is far weaker today than when the unemployment rate was 10.3% in 2009.

An alternative estimate is that the BLS Household Survey reported a labor force of 164.5 million (which was rising by about 125,000 per month) and 158.8 million employed in February 2020, resulting in an unemployment rate of 3.5%. In August, reported Household Survey labor force and employment were 161 million and almost 147 million, respectively. However, adding six months of projected growth of the February labor force yields an apples-to-apples labor force of over 165 million and an unemployment rate of 10.9% in August 2020.

A third approach to estimate "true" employment is to compare it to the roughly 10% decline in GDP. If employment fell roughly proportionate to GDP, it has fallen by 10%, which when added to the 3.5% February unemployment rate, generates at least a 13.5% apples-to-apples unemployment rate. The point is that any way you cut it, the "true" unemployment rate is 12-16%, far above the 8.4% official rate.

Historical Comparisons. In our last issue, we examined the nature of job losses in every U.S. recession since WWII. We update this analysis in Figures 20 and 21. In each figure, the red shaded numbers represent the sectors with the largest absolute or percentage job losses during each recession, while the blue shading rounds out the top five sector losses. For the 2020 Depression, we examined sectoral job losses that occurred between February 2020 and the low point of each sector during the pandemic. Most sectors bottomed in April 2020, while the government (May 2020), natural resources, and information sectors (both July 2020) continued to see job losses. In all cases, we utilize official employment data even though this data understates actual job losses.

Of the 12 recessions between 1945 and 2009, 10 saw the largest job losses in the manufacturing sector. During the Financial Crisis, office-using employment, which primarily includes financial activities and professional and business services, suffered the greatest job loss. The largest sectoral losses in previous recessions had a range of just 560,000-1.3 million jobs, significantly lower than today's sectoral losses.

The leisure and hospitality sector took the greatest battering during the COVID-19 shutdown, with the loss of over 8.3 million jobs between February and April 2020. The trade, transportation and utilities sector lost nearly 3.4 million jobs, and education and health services lost an unprecedented 2.8 million jobs over the same period. However, all three of those sectors

Business Cycle Employment Loss Comparison by Sector (Thousands of Jobs)

Cycle Peak (Qtr)	Cycle Trough (Qtr)	Natural resources and mining	Construction	Manufacturing	Trade, transportation and utilities	Retail Trade	Office-Using Employment	Information	Financial activities	Professional and business services	Education and health services	Leisure and hospitality	Other services	Government
February 1945 (I)	October 1945 (IV)	**-97**	40	**-3,094**	230	114	**-144**	**-135**	58	-67	66	63	24	**-385**
November 1948 (IV)	October 1949 (IV)	**-397**	-62	**-1,401**	**-311**	-49	**-188**	**-131**	26	-83	18	-18	8	101
July 1953 (II)	May 1954 (II)	304	-78	23	**-1,379**	**-194**	**-109**	**-194**	**-109**	66	-44	33	-9	14
August 1957 (III)	April 1958 (II)	-85	**-153**	**-1,343**	**-370**	-88	**-177**	**-131**	30	-76	13	-41	6	255
April 1960 (II)	February 1961 (I)	-64	**-121**	**-829**	**-306**	**-156**	-5	**-69**	53	11	80	-67	31	95
December 1969 (IV)	November 1970 (IV)	**-14**	**-64**	**-1,461**	76	42	82	**-51**	96	**37**	102	55	39	353
November 1973 (IV)	March 1975 (I)	79	**-604**	**-1,920**	**-10**	**42**	62	**-101**	61	102	241	69	92	719
January 1980 (I)	July 1980 (III)	29	**-274**	**-1,006**	**-171**	**-74**	79	**-52**	71	60	135	-20	51	217
July 1981 (III)	November 1982 (IV)	**-151**	**-352**	**-2,063**	**-324**	-42	-17	-113	50	46	194	25	71	**-198**
July 1990 (III)	March 1991 (I)	-10	**-393**	**-564**	**-314**	**-227**	**-237**	-9	-28	-200	371	-27	-4	-72
March 2001 (I)	November 2001 (IV)	-9	-78	**-1,113**	**-503**	**-198**	**-796**	-182	55	**-669**	415	-15	113	381
December 2007 (IV)	June 2009 (II)	-54	**-1,480**	**-2,020**	**-1,805**	-1,036	**-2,297**	-228	-462	**-1,607**	690	-474	-144	200
February 2020 (I)	Low Month (varies)	-97	-1,083	-1,363	**-3,355**	**-2,384**	**-2,860**	-327	-279	-2,296	**-2,781**	**-8,318**	-1,370	-1,480
Month of Shutdown Employment Low		Aug-20	Apr-20	Apr-20	Apr-20	Apr-20	Apr-20	Jul-20	Apr-20	Apr-20	Apr-20	Apr-20	Apr-20	May-20
Change from Shutdown Low to Latest		**0**	**658**	**643**	1,984	1,729	882	**15**	**88**	821	1,324	4,179	839	**649**
Net Loss		-97	-425	-720	-1,371	-655	-1,978	-312	-191	-1,475	-1,457	-4,139	-531	-831

Source: National Bureau of Economic Research, Linneman Associates
Employment changes are calculated from the indicated peak and trough months.
Red highlighting indicates the greatest absolute employment losses (or smallest gains) in each row. Blue highlighting indicates the rest of the top five absolute employment losses (greatest gains) in each row.

figure 20

markedly improved through August. Between April and August, the leisure and hospitality sector added nearly 4.2 million jobs, leaving it with a net loss of 4.1 million jobs; trade, transportation, and utilities added nearly two million jobs since the bottom, leaving a net loss of 1.4 million jobs; while education and health services added 1.3 million jobs, leaving a net loss of 1.5 million jobs. Through August, net office-using employment was down by 2 million jobs versus February, while retail trade (655,000 net jobs lost), professional and business services (-1.5 million), government (-831,000), manufacturing (-720,000), and other services (-530,000) also saw devastating losses. Private sector employment officially fell by nearly 21.2 million net jobs between February and April 2020 but regained 10.5 million jobs through August, resulting in an official net loss of 10.7 million jobs.

On a percentage basis, the largest job losses during previous recessions have been in natural resources and mining, construction, and manufacturing. In contrast, the shutdown depression was dominated by a 49.3% decline in leisure and hospitality jobs, followed by other services (-23.1%) and retail trade (-15.2%). Most major sectors bottomed in April, while government (May), information (July), and natural resources (still declining) saw prolonged losses.

Percent Change in Labor Force During Recessions

Peak	Trough	Percent Change
November 1948 (IV)	October 1949 (IV)	2.4
July 1953 (II)	May 1954 (II)	1.0
August 1957 (III)	April 1958 (II)	1.4
April 1960 (II)	February 1961 (I)	1.2
December 1969 (IV)	November 1970 (IV)	2.4
November 1973 (IV)	March 1975 (I)	2.7
January 1980 (I)	July 1980 (III)	0.6
July 1981 (III)	November 1982 (IV)	2.3
July 1990 (III)	March 1991 (I)	0.4
March 2001 (I)	November 2001 (IV)	0.2
December 2007 (IV)	June 2009 (II)	0.5
February 2020 (2019 IV)	**as of August 2020**	**-2.3**

Source: NBER, BLS, Linneman Associates

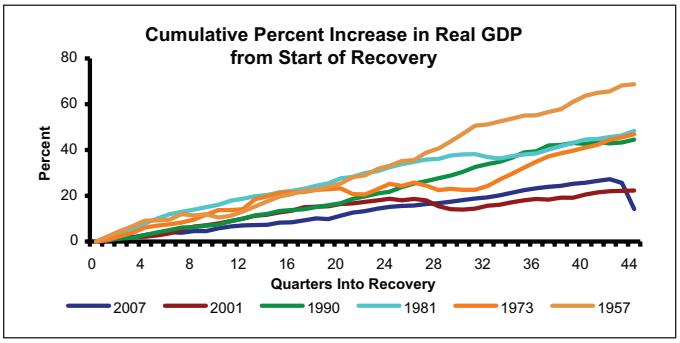
figure 22

Business Cycle Employment Percentage Loss Comparison by Sector (Percent)

Cycle Peak (Qtr)	Cycle Trough (Qtr)	Natural resources and mining	Construction	Manufacturing	Trade, transportation and utilities	Retail Trade	Office-Using Employment	Information	Financial activities	Professional and business services	Education and health services	Leisure and hospitality	Other services	Government
February 1945 (I)	October 1945 (IV)	***-10.9%***	3.4%	***-19.9%***	2.9%	3.2%	-2.6%	***-8.3%***	4.1%	***-2.6%***	4.0%	2.9%	3.7%	***-6.2%***
November 1948 (IV)	October 1949 (IV)	***-38.7%***	-2.7%	***-9.8%***	***-3.2%***	-1.1%	***-3.0%***	***-7.9%***	1.5%	-2.8%	0.9%	-0.7%	1.0%	1.7%
July 1953 (II)	May 1954 (II)	1.6%	***-8.7%***	0.9%	***-8.4%***	***-1.8%***	***-6.0%***	***-1.8%***	***-6.0%***	3.2%	-1.4%	1.4%	-0.3%	1.5%
August 1957 (III)	April 1958 (II)	***-9.7%***	***-5.1%***	***-8.5%***	***-3.4%***	-1.7%	-2.3%	***-7.3%***	1.3%	-2.2%	0.5%	-1.3%	0.6%	3.3%
April 1960 (II)	February 1961 (I)	***-8.1%***	***-4.0%***	***-5.3%***	-2.7%	***-2.8%***	-0.1%	***-3.9%***	2.1%	0.3%	2.7%	-1.9%	2.7%	1.1%
December 1969 (IV)	November 1970 (IV)	***-2.0%***	***-1.7%***	***-7.9%***	***0.5%***	0.6%	0.8%	***-2.5%***	2.8%	0.7%	2.3%	1.2%	2.2%	2.8%
November 1973 (IV)	March 1975 (I)	11.1%	***-14.3%***	***-10.2%***	***-0.1%***	***0.5%***	0.5%	***-4.7%***	1.5%	1.7%	4.6%	1.3%	4.5%	5.1%
January 1980 (I)	July 1980 (III)	2.8%	***-5.9%***	***-5.2%***	***-0.9%***	***-0.7%***	0.5%	***-2.2%***	1.4%	0.8%	1.9%	-0.3%	1.9%	1.3%
July 1981 (III)	November 1982 (IV)	***-12.4%***	***-8.2%***	***-11.0%***	***-1.7%***	-0.4%	-0.1%	***-4.7%***	1.0%	0.6%	2.6%	0.4%	2.5%	-1.2%
July 1990 (III)	March 1991 (I)	-1.3%	***-7.5%***	***-3.2%***	***-1.4%***	***-1.7%***	-1.2%	-0.3%	-0.4%	***-1.8%***	3.4%	-0.3%	-0.1%	-0.4%
March 2001 (I)	November 2001 (IV)	-1.5%	-1.1%	***-6.6%***	***-1.9%***	-1.3%	***-2.8%***	***-4.9%***	0.7%	***-4.0%***	2.7%	-0.1%	2.2%	1.8%
December 2007 (IV)	June 2009 (II)	-7.3%	***-19.8%***	***-14.7%***	-6.8%	-6.7%	***-7.8%***	***-7.5%***	-5.6%	***-8.9%***	3.6%	-3.5%	-2.6%	0.9%
February 2020 (I)	Low Month (varies)	***-13.6%***	***-14.2%***	-10.6%	-12.1%	***-15.2%***	-8.6%	-11.3%	-3.2%	-10.7%	-11.3%	***-49.3%***	***-23.1%***	-6.5%
Month of Shutdown Employment Low		Aug-20	Apr-20	Apr-20	Apr-20	Apr-20	Apr-20	Jul-20	Apr-20	Apr-20	Apr-20	Apr-20	Apr-20	May-20
Percent Jobs Recovered		*0.0%*	*60.8%*	*47.2%*	*59.1%*	*72.5%*	*30.8%*	*4.6%*	*31.5%*	*35.8%*	*47.6%*	*50.2%*	*61.2%*	*43.9%*
Net Loss		***-13.6%***	*-5.6%*	*-5.6%*	*-4.9%*	*-4.2%*	*-5.9%*	***-10.8%***	*-2.2%*	***-6.8%***	*-5.9%*	***-24.5%***	***-8.9%***	*-3.7%*

Source: National Bureau of Economic Research, Linneman Associates
Employment changes are calculated from the indicated peak and trough months.
Red highlighting indicates the greatest employment percentage losses (or smallest gains) in each row. Blue highlighting indicates the rest of the top employment percentage losses (greatest gains) in each row.

figure 21



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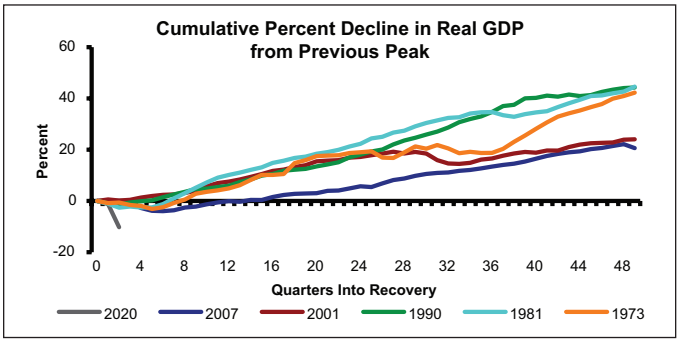

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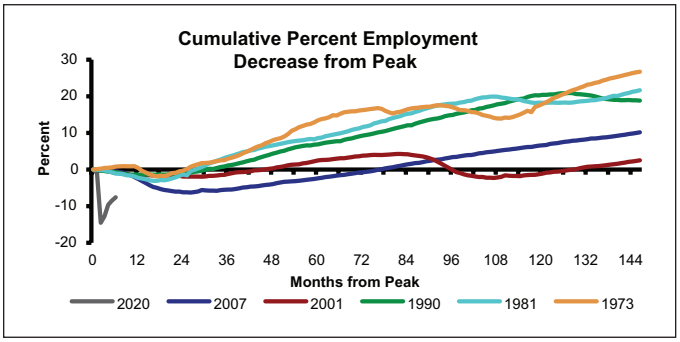

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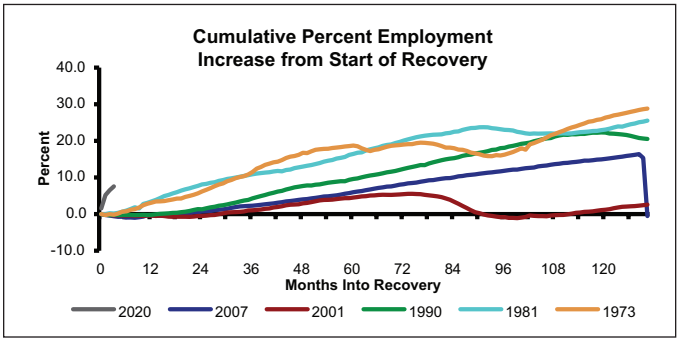

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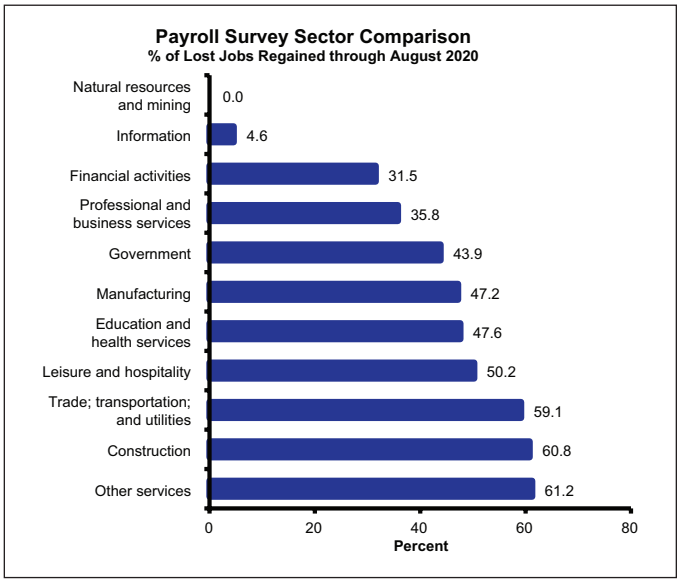

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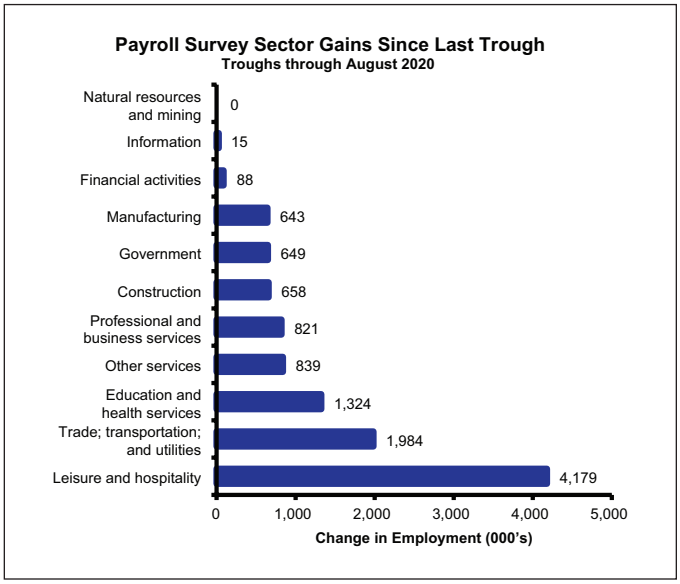

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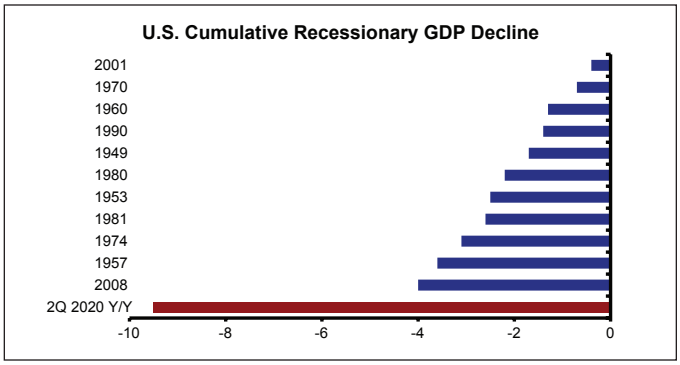


figure 29

Payroll Survey Employment (000s) - Sorted by Percent of Lost Jobs Regained

Industry	Peak Feb-20	Trough Date	COVID Trough	Latest Aug-20	Peak to Trough Change	Peak to Trough % Change	Trough to Present Change	Trough to Present % Change	% of Lost Jobs Regained
Other services	5,941	Apr-20	4,571	5,410	-1,370	-23.1%	839	18.4%	61.2%
Construction	7,639	Apr-20	6,556	7,214	-1,083	-14.2%	658	10.0%	60.8%
Trade; transportation; and utilities	27,830	Apr-20	24,475	26,459	-3,355	-12.1%	1,984	8.1%	59.1%
Leisure and hospitality	16,867	Apr-20	8,549	12,728	-8,318	-49.3%	4,179	48.9%	50.2%
Education and health services	24,586	Dec-07	21,805	23,129	-2,781	-11.3%	1,324	6.1%	47.6%
Manufacturing	12,852	Apr-20	11,489	12,132	-1,363	-10.6%	643	5.6%	47.2%
Government	22,745	May-20	21,265	21,914	-1,480	-6.5%	649	3.1%	43.9%
Professional and business services	21,550	Apr-20	19,254	20,075	-2,296	-10.7%	821	4.3%	35.8%
Financial activities	8,845	Apr-20	8,566	8,654	-279	-3.2%	88	1.0%	31.5%
Information	2,894	Jul-20	2,567	2,582	-327	-11.3%	15	0.6%	4.6%
Natural resources and mining	714	Aug-20	617	617	-97	-13.6%	0	0.0%	0.0%

Source: BLS, Linneman Associates

figure 30

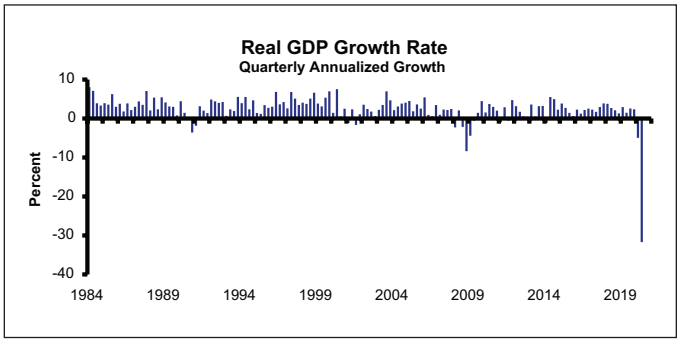
Civility Must Prevail

As we view the hostility that exists today on so many issues, including masks, I ask myself, "What happened to human empathy and a sense of humility?" Maybe it is because of my advanced years that I have come to realize that I am just not "that right" about very many issues, particularly those that are still in the early phase of discovery. A bit of empathy and humility by everyone would go a long way. The old adage that one should "walk a mile in someone else's shoes before passing judgment" comes to mind. People on all sides today do not even look at the shoes, much less try them on and walk a few steps, before rushing to judgment. What has happened to us as a society? Make a personal choice to be more empathetic, less judgmental, and more humble about what you know. Only each of us acting as individuals can bring a return to civility. Join us and take the pledge: we will not say derogatory things about people and we will listen to their ideas and policy suggestions. We then may argue about the ideas but will not denigrate the people proposing or attacking the policies. It only makes us smaller and does not change them.

Watch the Flight of the Butterfly

It is essential to understand that this is not a cyclical recession. It is an economy-wide shutdown depression. The recovery will reflect what government allows us to do and what we decide we are willing to do. It will follow a trajectory like a butterfly flying uphill: basically upwards but slowly and with fits, stops, detours, and starts. In the second quarter of 2020, real GDP fell by 9.1% year-over-year and by a stunning annualized rate of 31.7%. Similarly, real per capita GDP was down 9.8% year-over-year through the second quarter. This is exactly as we predicted on March 24, about a week into the shutdown. Meanwhile, almost 10.3 million jobs were officially lost year-over-year through August, a 6.7% decrease. This compares to the nearly 22.8 million jobs recovered after the Financial Crisis.

In a March 24 podcast, we estimated that real U.S. GDP was falling $21.5 billion per day (almost $1 billion per hour!) while the shutdown was in full force. This continued for about 100 days, leading to a staggering $2.15 trillion loss by mid-June. At that point, we stopped digging the economic hole as openings began, but we have been filling it with shovels rather than bulldozers.



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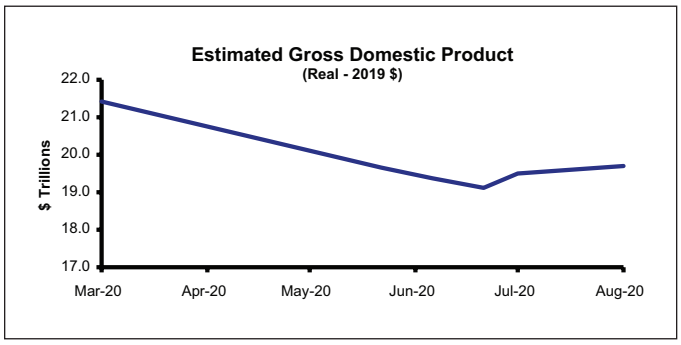

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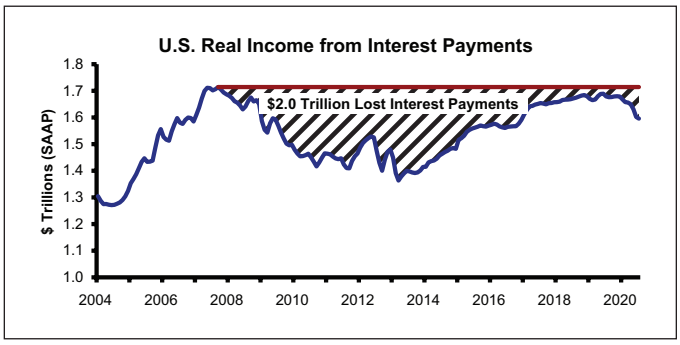

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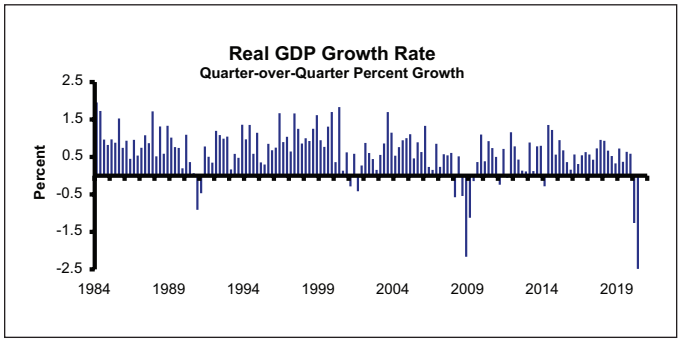


figure 33

This leaves real GDP at about $19.9 trillion at the end of the second quarter of 2020, or about 9.5% below where it stood early in the first quarter. The result is roughly $2 trillion of lost GDP plus a further $8 trillion of federal debt.

Inflation for services is just over 2% and in line with the Fed's long-term 2% target. This has occurred even as we have experienced a monetary expansion in excess of 35% since year-end 2019. Consumer prices are flat-to-falling as the shutdown depression has created an unprecedented excess supply of almost everything. However, the stock and housing markets, as well as Treasury bonds and gold, displayed notable asset price inflation over the past five months.

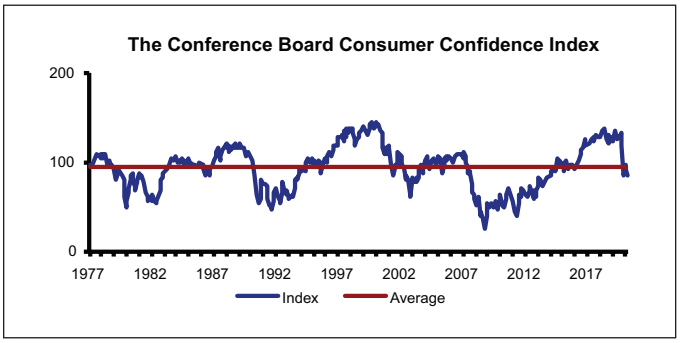
At nearly $1.6 trillion, real annualized personal interest income earned in July 2020 was about $83.3 billion less than it was the previous year due to the Fed's three rate cuts in 2019 and two more in 2020. The series of cuts resulted in a nominal target fed funds rate of 0-0.25%. The 10-year Treasury yield declined by 100 bps, from 1.7% in September 2019 to 0.7% in September 2020. Interest rates are at historic lows as people seek safety and central banks soak up debt. Rates will remain low for years to come as global monetary authorities (including the Fed) will repress rates to keep government debt affordable. In the near term, this has little cost, but it crowds out private investment through reduced investment incentives which will (as we have seen for 28 years in Japan) reduce growth.

After peaking at 135.8 in July 2019 and standing at 132.6 in February 2020, the Conference Board Consumer Confidence Index stood at 84.8 as of August 2020, 4,940 bps lower than a year earlier. The current level is 1,060 bps below the 40-plus-year average and 2,640 bps below the 2007 pre-recession level of 111.2. The University of Michigan Consumer Sentiment Index stood at 72.8 in August 2020, 1,340 bps below the 50-year average of 86.2 but 1,750 bps above the 2008 recessionary low of 55.3. It is no surprise that if unemployment is high and COVID remains, confidence suffers.

The baseline Economic Policy Uncertainty Index (EPUI) rocketed to 350 in May due to COVID-19 but stood at 295 in July 2020, still about 164% higher than the long-term average. In comparison, the news-based EPUI, which generally follows the same trend but with significantly larger swings than the baseline index, stood at 410 (240% above average) in July and is derived from:

- A search of key words and phrases (e.g. uncertainty, economy, Congress, legislation, etc.) in ten major U.S. newspapers;
- The number of temporary federal tax provisions as reported by the Congressional Budget Office; and
- Examination of the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters, specifically the level of disagreement among forecasters.

The EPUI retreated as regulatory activism receded, but a deeply divided political climate in an election



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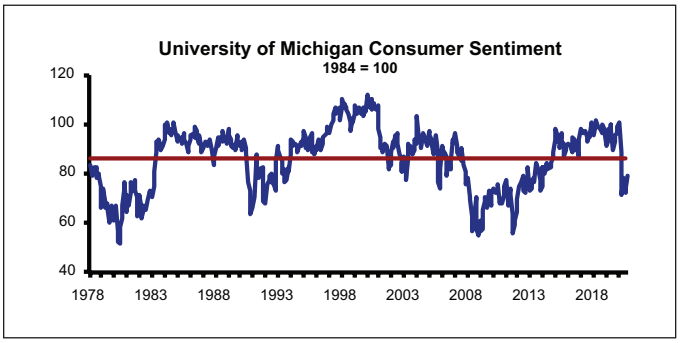

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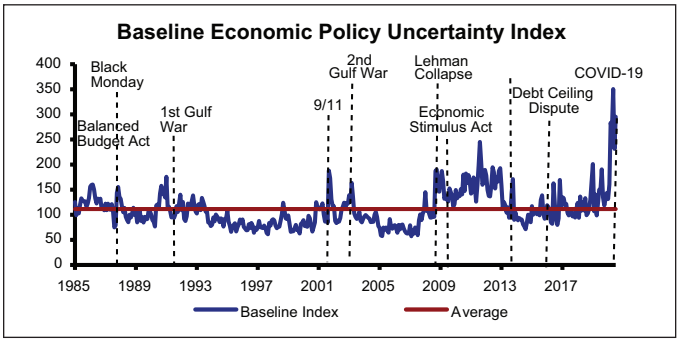

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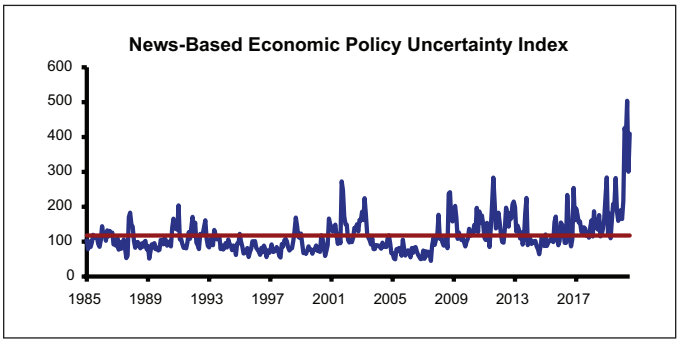


figure 38

cycle keeps uncertainty high. Plus, coronavirus policies are the very Webster definition of uncertainty.

Trend Analysis. Year-over-year real GDP growth of -9.1% through the second quarter of 2020 reflects 50 basis points (bps) of growth from population increases (versus about 95 bps over the past 40 years), and -960 bps from productivity declines (versus a norm of about 200 bps). At the end of the second quarter of 2020, both

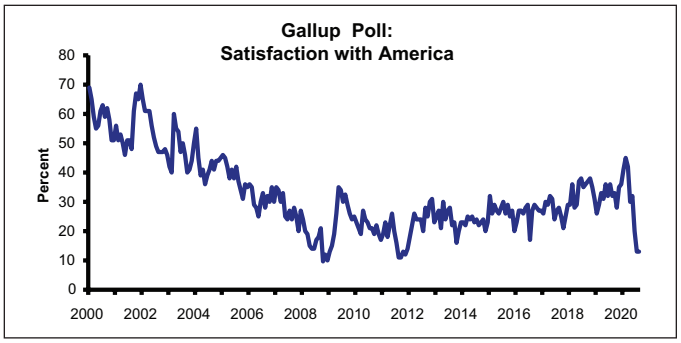
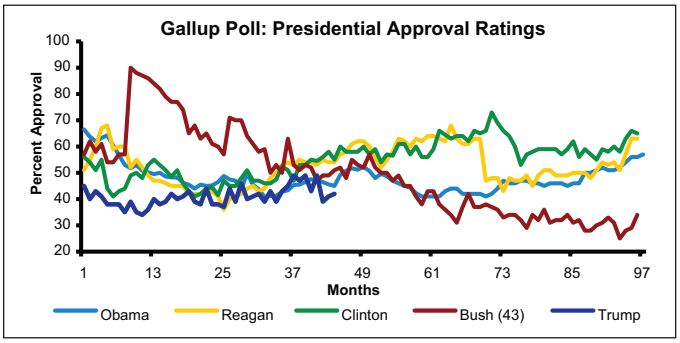


figure 39

Canary Watch Box

Like miners who brought canaries into mine shafts to detect toxic gas levels, we are tracking what we believe are key early indicators which signal a peaking market. On a scale of one to five canaries, the "danger zone" rises as canaries die. Due to the COVID-19-induced shutdown of the economy, we restarted our canary analysis to reflect the new phase of the cycle. We now have all canaries alive, with the exception of those in the COVID-19 category.

- Increase in payment-in-kind (PIK) financing
- Massive commercial mortgage growth
- Speculative real estate development boom
- First mortgage lending replaces mezzanine loans
- Mezzanine lending replaces equity
- Narrow spreads and rising LTVs
- Record buyout deals
- Empty space worth more than full space
- Coronavirus fear strangles confidence



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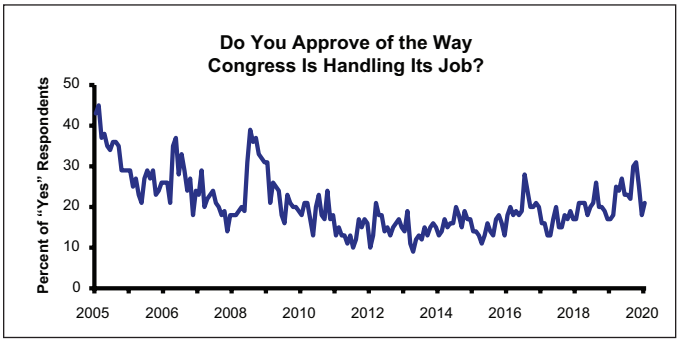

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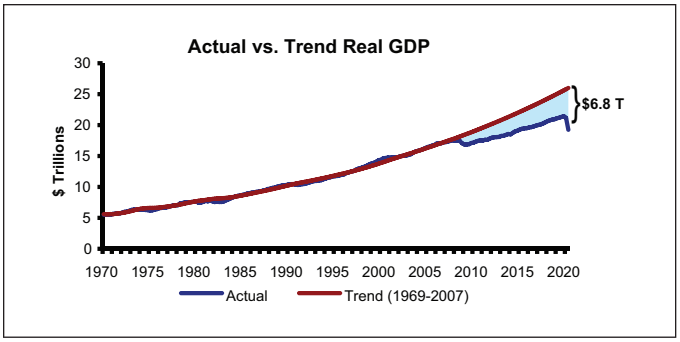

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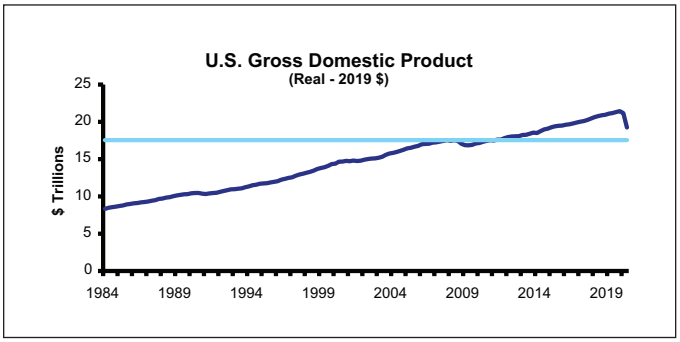

figure 43

Real Estate Finance and Investments: Risks and Opportunities — Edition 5.1

Edition 5.1 of this book, co-authored with Bruce Kirsch of Real Estate Financial Modeling, is an exploration of the key concepts of real estate finance and investment strategy. The book is designed to help you understand that there is no singular, simplistic, or formulaic answer to any real estate finance problem. Rather, real estate finance is fundamentally driven by judgement and experience, with an eye to the numbers.

Edition 5.1 has been updated with timely market data and contains insights on capital markets, real estate pricing, real estate cycles, private equity funds, REITs, and much more. This edition also comes with an extensive Online Companion website https://textbook.getrefm.com/ that includes customizable Excel model templates, "flash cards" for all the key terms used in the book, and 60 audio interviews with the authors to bring the concepts to life.

"I have been using Peter's and Bruce's book for several years and they do an excellent job of combining the theory and practice of real estate finance and investments. I use it in my university graduate class and in our analyst training program at USAA Real Estate. The book is well written, and the support materials are excellent. I appreciate the practical approach to presenting the material and the emphasis on judgment and experience to go with the numbers."
Will McIntosh, *Ph.D., Global Head of Real Estate USAA Real Estate Adjunct Professor University of Texas San Antonio*

"Peter's book brings a much needed blend of theory and practice to the analysis of real estate finance and investment. Too often this field is presented as little more than algebra, with students assembling rows and columns of numbers, but having no idea what they mean."
Samuel Zell, *Chairman, Equity Group Investments*

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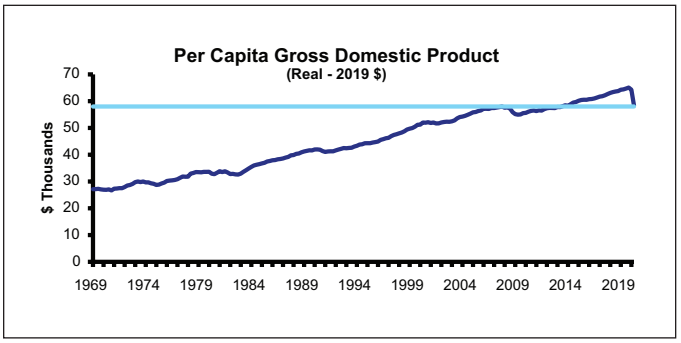
On the Road to Recovery: Then vs. Now

	2009	2020	% Change
Real GDP ($ billions)	$16,852.3	$19,244.2	14.2
Real Per Capita GDP	$54,960.7	$58,374.1	6.2
Real Retail Sales ($ millions)	$356,125.4	$475,387.7	33.5
Real Median Home Price Index (FHFA)	190.9	284.7	49.1
Durable Industrial Output Index	77.7	100.2	28.9
Non-Durable Industrial Output Index	97.0	98.4	1.4
Real Per Capita HH Net Worth	$238,081.7	$359,565.1	51.0
Payroll Employment (000s)	131,433.3	140,914.0	7.2
Unemployment Rate (%)	9.3	8.4	-9.7
Conference Board Consumer Confidence Index	48.3	84.8	75.5
Median Weeks Unemployed	14.8	16.7	12.6
Capacity Utilization Index	67.1	71.4	6.4
SA Auto & Light Truck Sales (Thousands)	809.7	1,266.1	56.4
Median Home Price-to-Per Capita DPI	6.1	6.1	-0.4
Profits After-Tax ($ billions)	$1,303.3	$1,565.3	20.1
Percent of Industries Adding Workers (LTM Avg)	30.0	45.8	52.8
Multifamily Starts (SAAR 000s)	99.0	375.0	278.8
Single-Family Starts (SAAR 000s)	425.7	1,021.0	139.9
Real Home Prices ($) (Census)	$258,921.5	$330,027.2	27.5
Real REIT Value Index	98.1	237.2	141.7
Real Private Real Estate Value Index	300.7	443.3	47.4
Real Average Office Rent PSF	$31.78	$33.94	6.8
Office Vacancy (%)	13.7	10.2	-25.9
Real Median Multifamily Rent (Census)	$844.4	$1,026.9	21.6
Apartment Vacancy (%)	8.3	7.4	-10.8
Hotel Occupancy (%)	57.6	52.8	-8.3
Real RevPAR	$62.92	$62.53	-0.6
Real Average Industrial Rent PSF	$5.27	$6.42	21.8
Industrial Vacancy (%)	10.1	3.4	-66.6

**Quarterly data through 2Q20; latest monthly varies, June-August 2020.*
SAAR indicates seasonally-adjusted annual rates.
All dollars in real 2019 dollars.

figure 44



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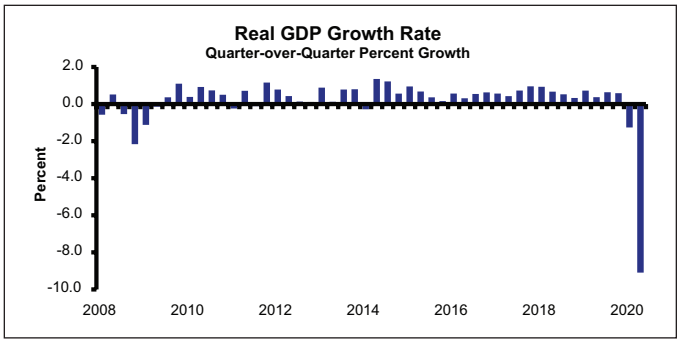

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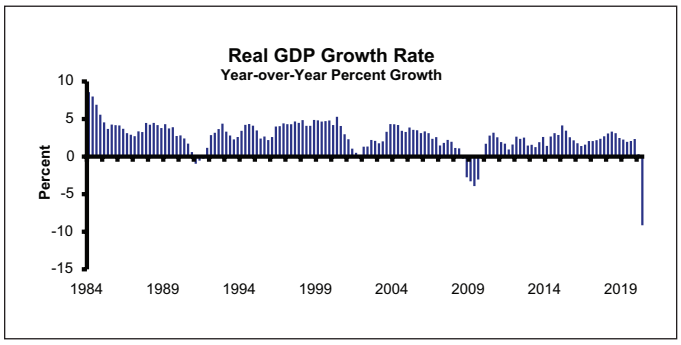

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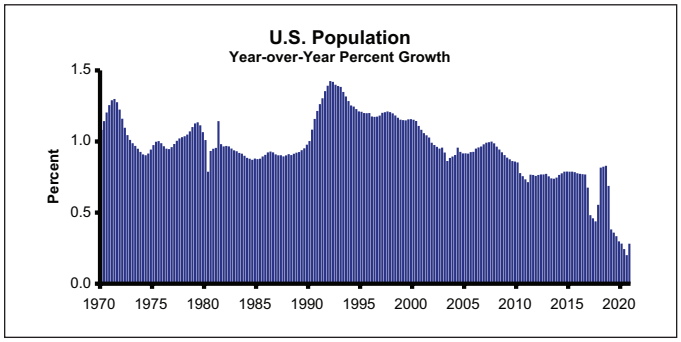

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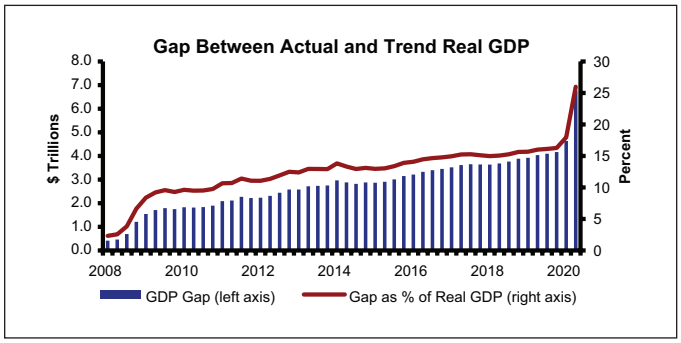

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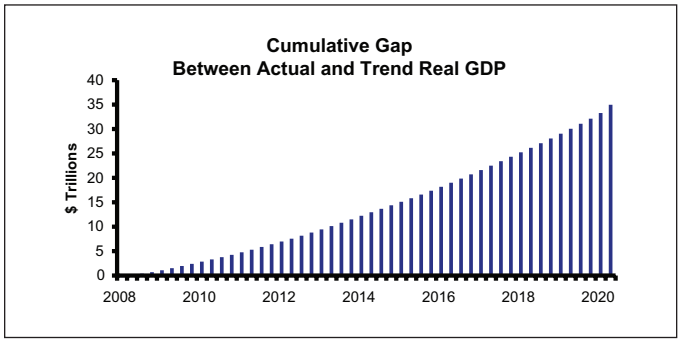

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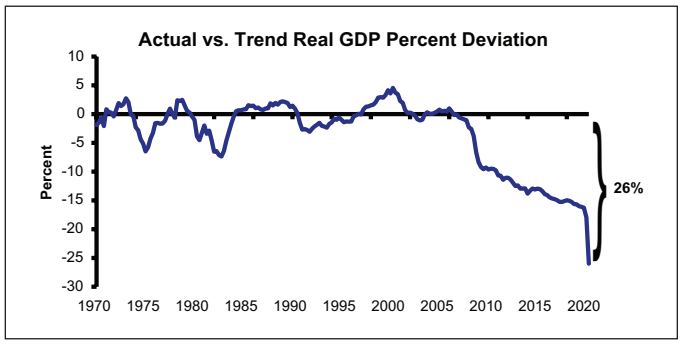


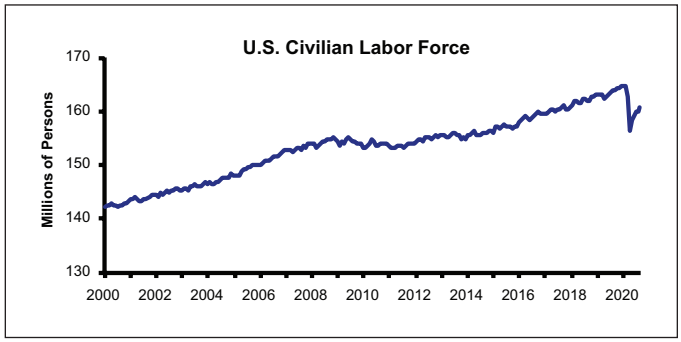
figure 51

real GDP and per capita real GDP still exceeded their pre-recession highs by 9.6% and 0.6%, respectively, despite the steep second-quarter drop. We expect modest real GDP growth during the remainder of 2020, but year-over-year real GDP growth will be negative until the second quarter of 2021. We doubt that real GDP will approach the level of the fourth quarter of 2019 before mid-2023. Butterflies simply do not fly very fast or in a straight line.

Real GDP and real GDP per capita are 1.9 and 0.9 standard deviations below trend, respectively. About 25% of the gap relates to the under-production of single-family housing over the past nine years.

Between February and April 2020, U.S. Payroll employment officially fell by nearly 22.2 million but rose by 10.6 million through August, resulting in a net decline of 11.5 million (averaging about 460,000 per week). Meanwhile, the nation's population increased by about one million people over the same period (about 4,100 per week).

Through July 2020 (latest available), almost all of the 46 MSAs that we track currently have employment above their respective 2009-2010 troughs, with the notable exceptions of the Bridgeport, CT, Cleveland,



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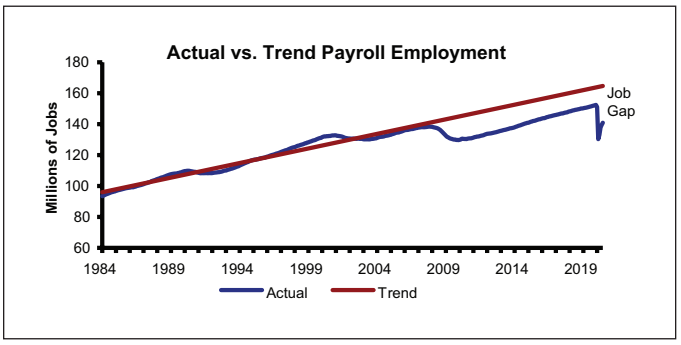

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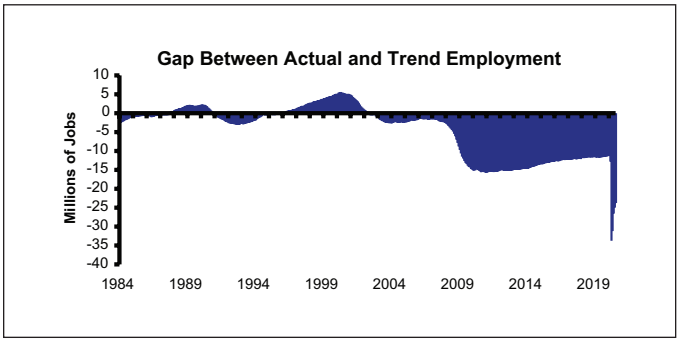

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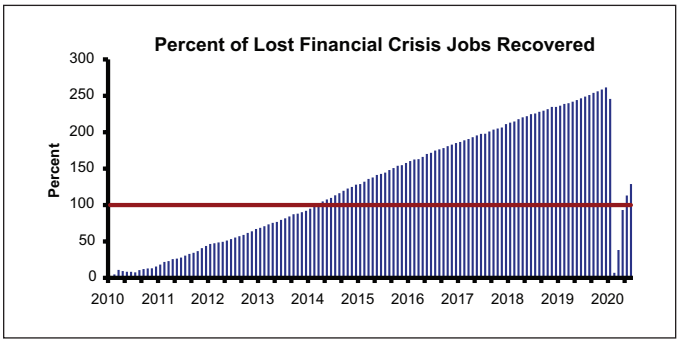

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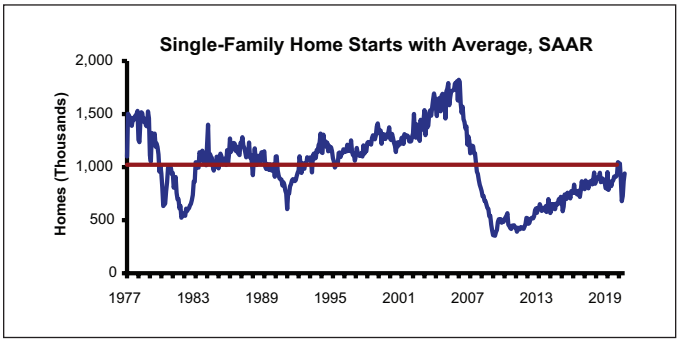


figure 56

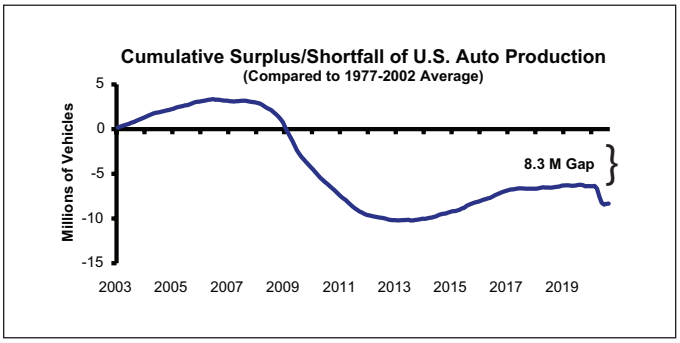
and NY/NJ metro areas. As the economy gradually re-opens, most MSAs are slowly regaining jobs.

At over one million units in August 2020, annualized single-family home starts were up 12.1% year-over-year but are now 3.3 million units below the historic norm on a cumulative basis over the past 18 years. In June, July, and August 2020, annualized single-family housing starts stood at 869,000, 940,000, and over one million units, respectively, all of which are below the long-term average of 1.1 million. Above-average multifamily production decreased the cumulative 18-year multifamily shortfall to 792,000 units through August 2020. Housing production in August was hardly red hot, but it was amazingly resilient and far stronger than we anticipated. People appear to be putting their involuntary savings into upgrading their housing, particularly in the suburbs, with many urban dwellers seeking more space.

The cumulative housing sector shortfall amounts to nearly $1.9 trillion of pent-up economic activity, while autos, which have also crashed, account for another $441 billion. The U.S. has produced about 8.3 million fewer cars and light trucks than the historic norm over the past ten years. Housing and autos combined represent

Auto & Light Truck Production Shortfall			
Average Value per Vehicle	$35,285		
Production Shortfall Since 2003	8,330,674	vehicles	
Multiplier	1.5		
Pent-up Production Value	**$441**	**billion**	
GDP Gap	$6,757	billion	
Pent-up Auto % of GDP Gap	**6.5%**		
Housing Production Shortfall			
Multifamily Shortfall (units)	792,457		
Multifamily Average Cost	$163,581		
MF Shortfall Value	$129.6	billion	
Multiplier	1.5		
	$194.4	billion	2.9% of GDP gap
Single Family Shortfall (units)	3,325,547		
Latest SF Average Cost (new)	$333,993		
SF Shortfall Value	$1,110.7	billion	
Multiplier	1.5		
	$1,666.1	billion	24.7% of GDP gap
MF+SF Shortfall Value	$1,240	billion	
Multiplier	1.5		
Total Value of Pent-up Housing	**$1,861**	**billion**	
GDP Gap	$6,757	billion	
Pent-up Housing as % of GDP Gap	**27.5%**		
Housing + Auto Production Shortfall	**34.1%**		

figure 57



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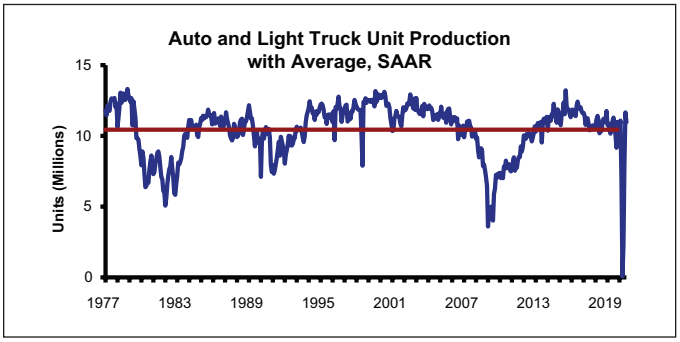

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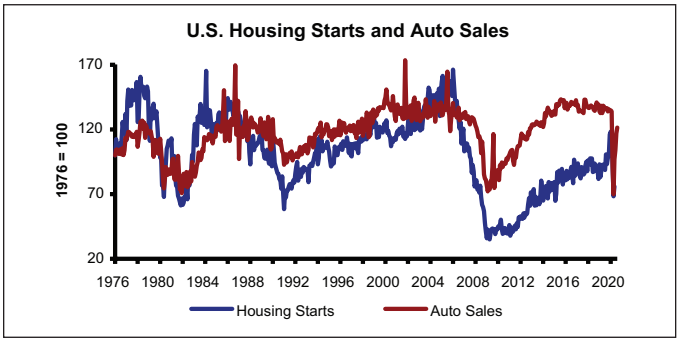

figure 60

34.1% of the current real GDP gap. The housing gap is holding steady as strong multifamily production offsets modestly below-average single-family production. The auto shortfall had fallen by about 35% since it peaked at 10.2 million vehicles in 2013 but lost ground during the shutdown. However, above-average auto production in July and August 2020 is a positive sign for the sector,

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On the Road to Recovery - A Step Backwards

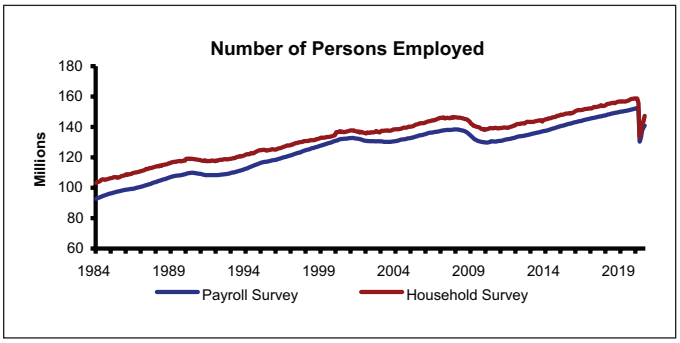
	Pre-Recession Best	Current*	Difference from Trend	% Change Needed to Achieve Trend	Std. Dev. from Trend	Versus Trend
Real GDP ($ billions)	$17,551.4	$19,244.2	-$6,756.8	35.1	-1.87	lagging
Real Per Capita GDP	$58,008.3	$58,374.1	-$8,304.3	14.2	-0.88	lagging
Real Retail Sales ($ millions)	$413,647.3	$475,387.7	$14,121.1	0.0	0.24	**beating**
Real Median Home Price Index (FHFA)	224.1	284.7	27.0	0.0	0.53	**beating**
Durable Industrial Output Index	105.3	100.2	-16.6	16.6	-0.60	lagging
Non-Durable Industrial Output Index	113.0	98.4	-12.3	12.5	-1.14	lagging
Real Per Capita HH Net Worth	$292,514.8	$359,565.1	$34,445.4	0.0	0.56	**beating**
Payroll Employment (000s)	138,403.0	140,914.0	-23,771.7	16.9	-1.11	lagging
Unemployment Rate (%)	4.4	8.4	3.0	-35.3	1.66	lagging
Conference Board Consumer Confidence Index	111.9	84.8	-12.9	15.3	-0.51	lagging
Median Weeks Unemployed	7.5	16.7	3.3	-19.5	0.80	lagging
Capacity Utilization Index	81.1	71.4	-4.9	6.8	-3.45	lagging
SA Auto & Light Truck Sales (Thousands)	1,464.4	1,266.1	-111.4	8.8	-0.58	lagging
Median Home Price-to-Per Capita DPI	7.8	6.1	-0.2	3.0	-0.28	lagging
Profits After-Tax ($ billions)	$1,557.1	$1,565.3	-$387.3	24.7	-0.76	lagging
Percent of Industries Adding Workers (LTM Avg)	65.8	45.8	-19.6	42.8	-1.90	lagging
Multifamily Starts (SAAR 000s)	378.0	375.0	107.0	0.0	0.89	**beating**
Single-Family Starts (SAAR 000s)	1,823.0	1,021.0	152.5	0.0	0.47	**beating**
Real Home Prices ($) (Census)	$332,475.5	$330,027.2	$7,388.3	0.0	0.17	**beating**

**Quarterly data through 2Q20; latest monthly varies, June-August 2020. SAAR indicates seasonally-adjusted annual rates.*
***GDP and employment trend lines based on 1969-2007 data. All others based on historical data 1980-present. All dollars in 2019 real dollars.*

figure 61

though post-shutdown auto sales have yet to catch up with increased production.

With the nation's metropolitan areas still in varying states of economic openness, only real median home prices from both the Federal Housing Finance Agency (FHFA) and the Census, real per capita household net worth, both multifamily and single-family housing starts, and real retail sales are at or above their respective trends. In August 2020, multifamily home starts were 0.9 standard deviations above trend, due to a long-term gradually declining trend. Strong production in August also pushed single-family home starts above trend by 0.5 standard deviations. After achieving several quarters above trend, median home prices-to-per capita disposable personal income was well below trend, by 0.3 standard deviations in July 2020. In the second quarter of 2020, real home prices based on both Census and FHFA data were above trend by 0.2 and 0.5 standard deviations, respectively. Other key economic metrics remain below their long-term norms, with second-quarter corporate profits and August 2020 employment lagging trend by 0.8 and 1.1 standard deviations, respectively.



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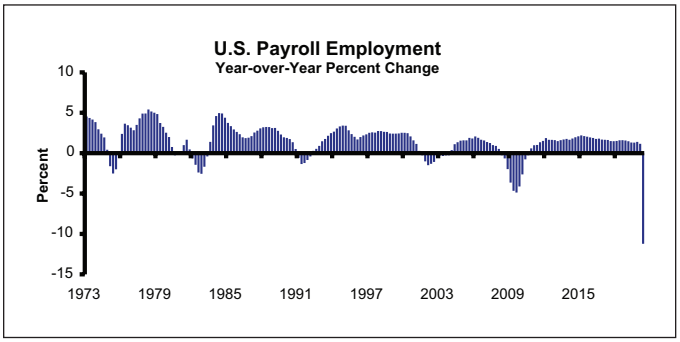


figure 63

Employment. Through August 2020, the U.S. had 11.2 million more jobs than at the February 2010 recessionary low but 11.5 million fewer than the February 2020 pre-COVID peak of 152.5 million.

Payroll Survey employment decreased by nearly 10.2 million jobs over the last 12 months but gained 7.9 million jobs (not annualized) over the last three months through August 2020. The trailing 12-month employment trend implies an annual growth rate of -6.8%, which will reverse course as the economy continues to open. Going forward, we project a total

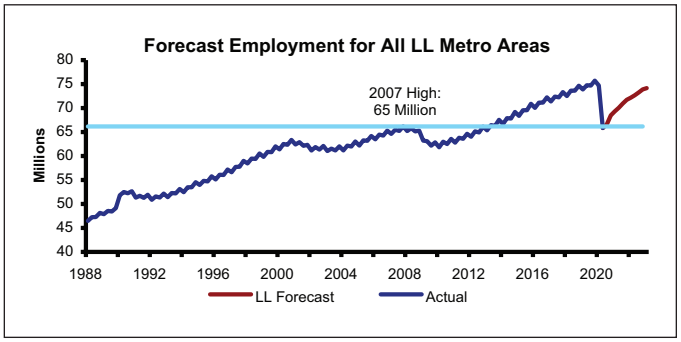


figure 64

U.S. Recovery Snapshot - August 2020

(Employment in Thousands)

Pre-Shutdown Peak Employment	152,463
Current Employment	140,914
Percent (Below)/Above Pre-Shutdown Peak	-7.6%
Current Employment	140,914
Lowest Employment Level	130,303
Total Jobs Added From the Bottom	10,611
Peak Unemployment Rate	14.7%
Current Unemployment Rate	8.4%
Decline in the Unemployment Rate (bps)	630

Source: BLS, Linneman Associates

figure 65

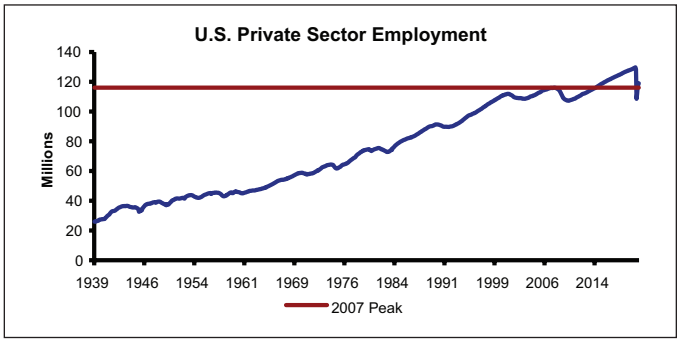
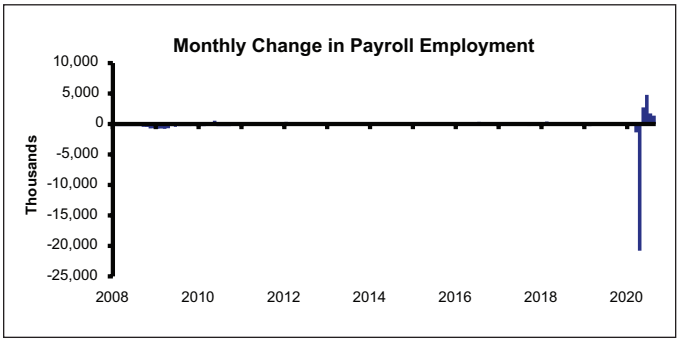


figure 66

net loss of eight million jobs in 2020, followed by gains of three million new jobs per year in 2021 and 2022 (2-2.1%) and 2.5 million jobs per year in 2023 and 2024 (1.6-1.7%).

Household Survey employment, from which the unemployment rate is derived, hit a cyclical peak in December 2019 at 158.8 million jobs and fell to 133.4 million in April, (a loss of 25.4 million jobs). The Household Survey indicates a gain of 13.9 million jobs between April and August 2020, leaving the nation with 147.3 million jobs. The previous cyclical low of 138 million jobs was seen in 2009. The Household Survey indicates that over the most recent three months through August 2020, the economy gained 10 million jobs.

Manufacturing workers put in an average of 39.2 hours per week in the second quarter of 2020, 3.9% and 7% below the 50-year average of 40.8 hours and the all-time high of 42.2 hours, respectively. Manufacturing in the U.S. is not dead, though it accounts for a much smaller share of the job base than in the past. The shutdown did its best to try to eliminate this sector (and others).



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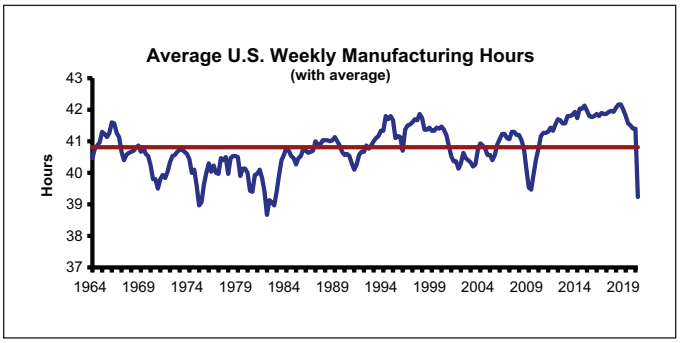

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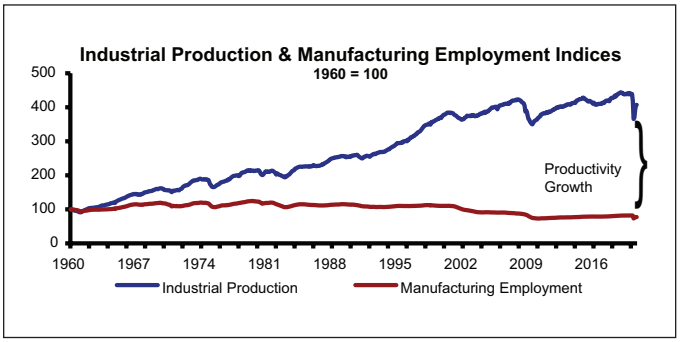

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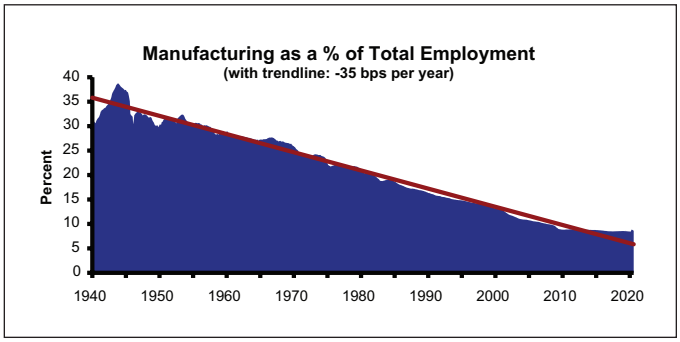

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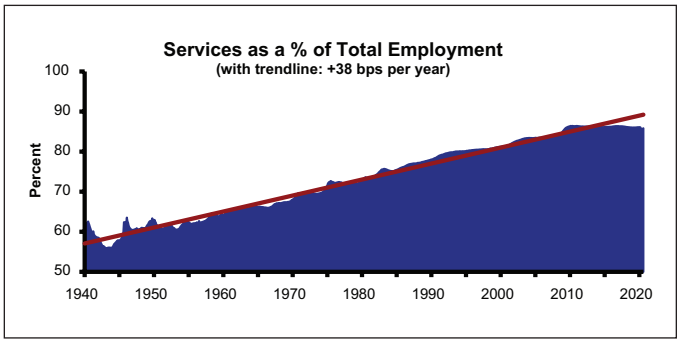

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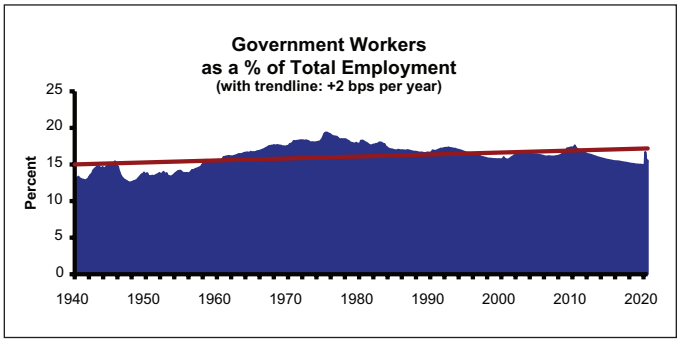


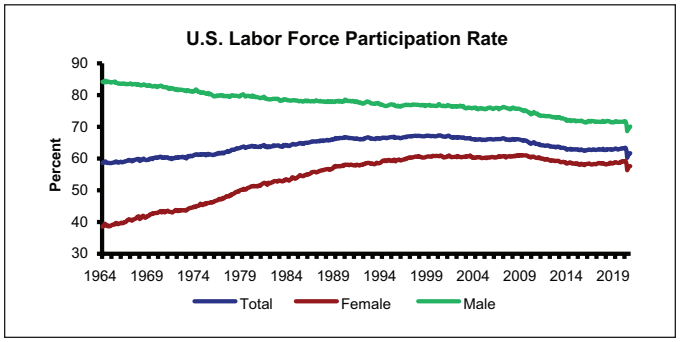
figure 72

As of August 2020, manufacturing jobs accounted for 8.6% of total U.S. employment, 300 bps above the long-term trend of 5.6%. On an absolute basis, 12.1 million people work in manufacturing in the U.S., down by 716,000 jobs year-over-year. Correspondingly, real manufacturing output fell 6.6% year-over-year through August 2020.

The service sector (including private and government employment) as a percent of total employment represents 85.8% of all jobs today. It is 375 bps below the level expected by its long-term trend and 40 bps higher than where it stood one year earlier. The government sector accounts for 15.6% of total employment, 185 bps below trend and up by 60 bps year-over-year.

The civilian employment-to-population ratio bottomed at 58.3% in October 2013, peaked in January 2020 at 61.2%, and dropped to 56.5% in August. This is 360 bps below the historical average and reflects a decline of about 7.6 million workers. In comparison, the August 2020 labor force participation rate stood at 61.7% overall and 19.4% among the 65+ age cohort. Many of those over 60 simply called it quits 1-5 years before they previously planned. The 16-24 and 25-34-year-old participation rates stood at 53% and 81.1%, respectively, in August 2020.

After a low of 3.5% in February 2020, the U.S. unemployment rate officially stood at 10.2% in July and 8.4% in August 2020, but we estimate that it is closer to 15% at the end of September on an apples-to-apples basis compared to February 2020. This is compared to the long-term average (1984-present) unemployment rate of 6.2%. As a point of reference, a 6.0% unemployment rate is generally viewed as the upper bound of a healthy job market, while 4%



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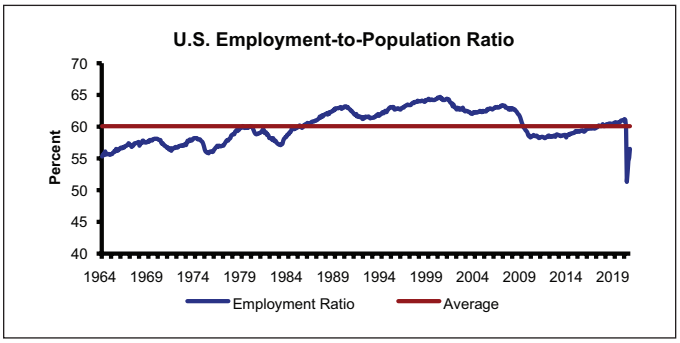

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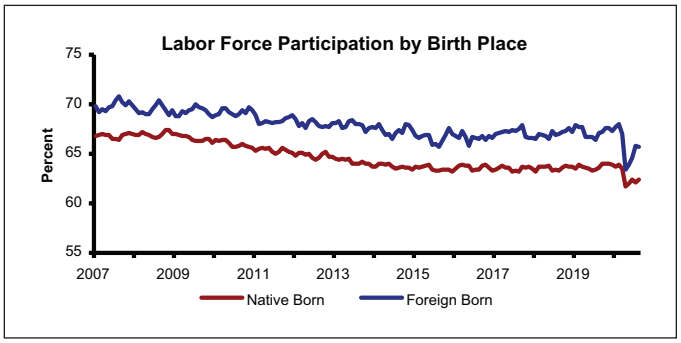

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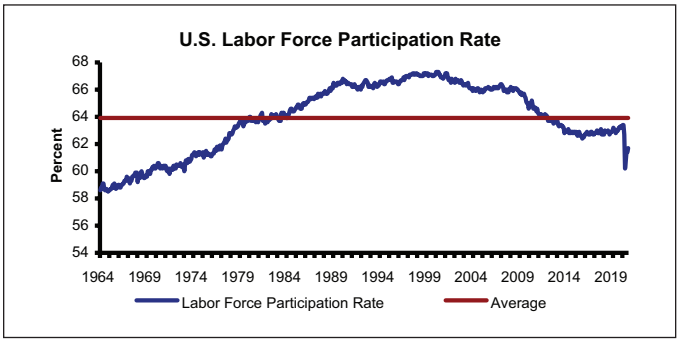

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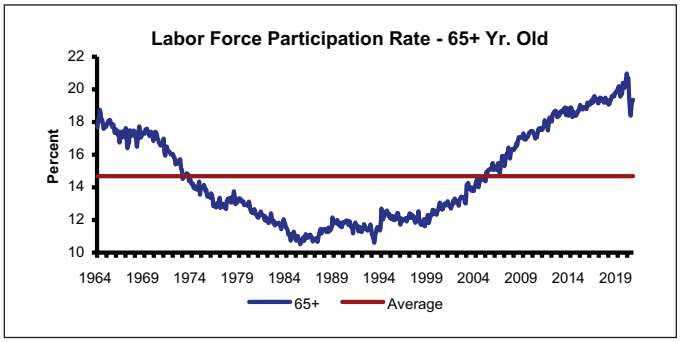

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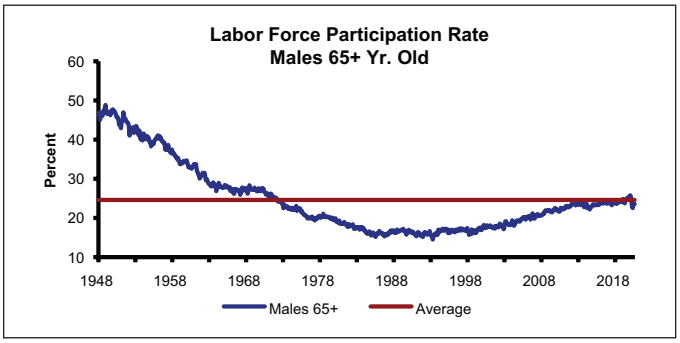

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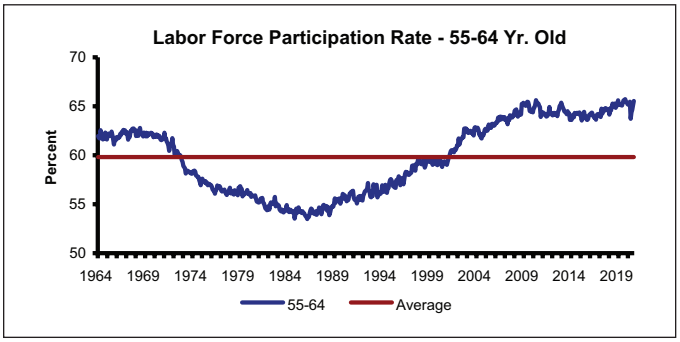

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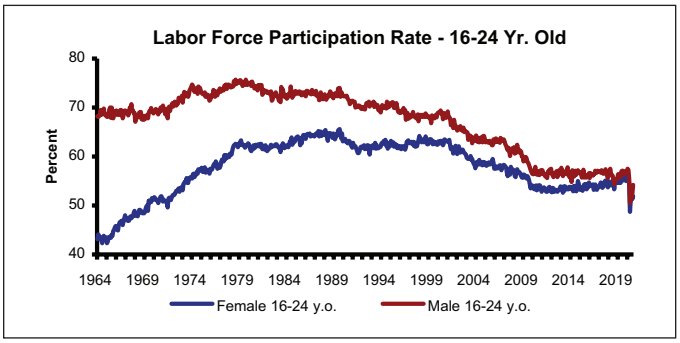

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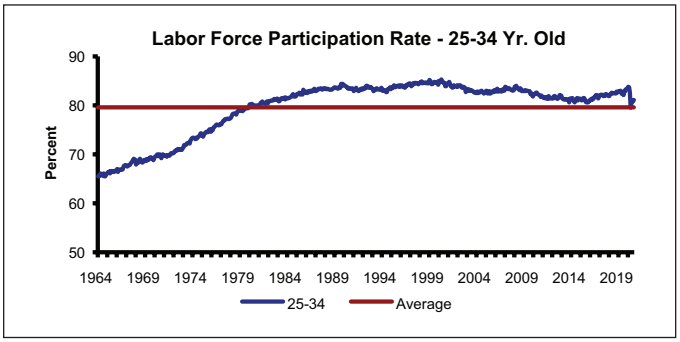

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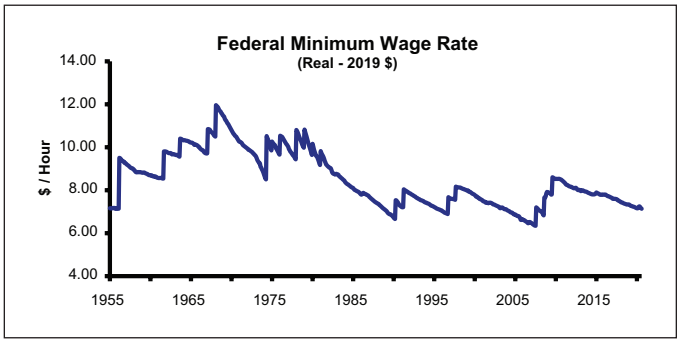

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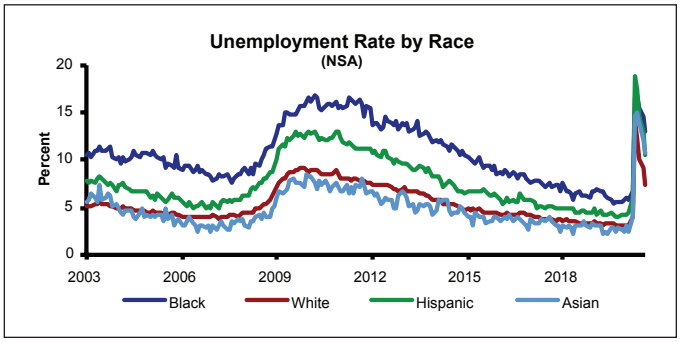

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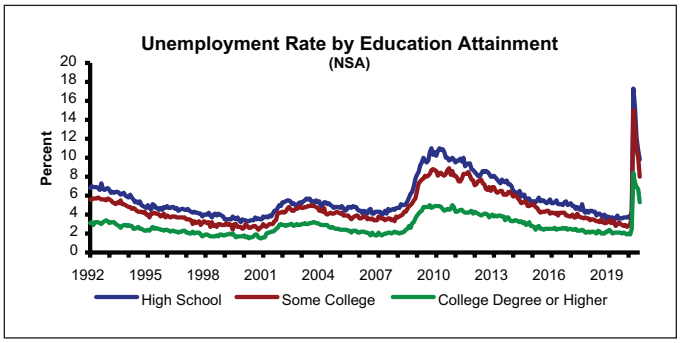

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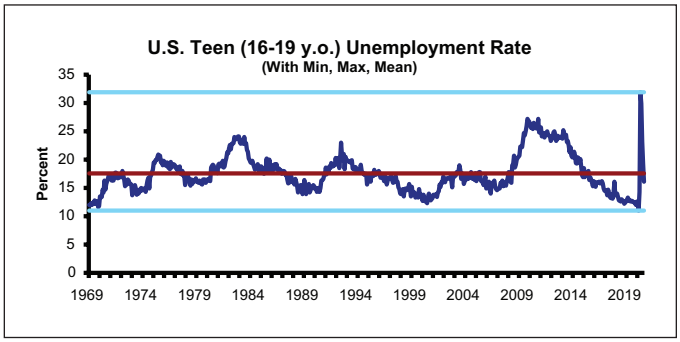

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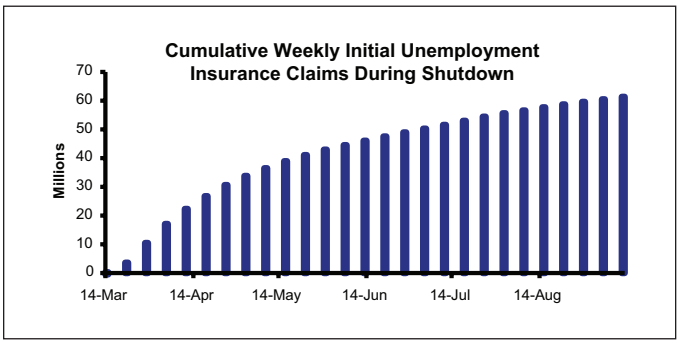

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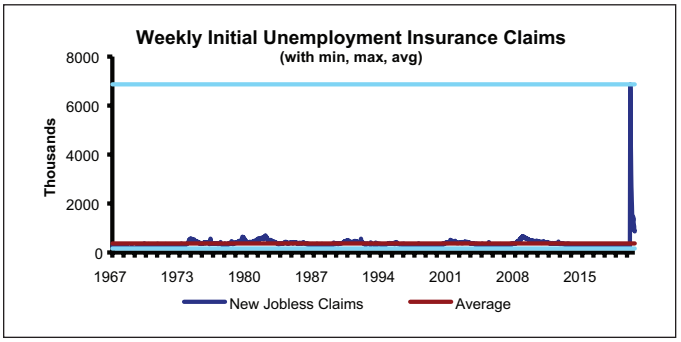

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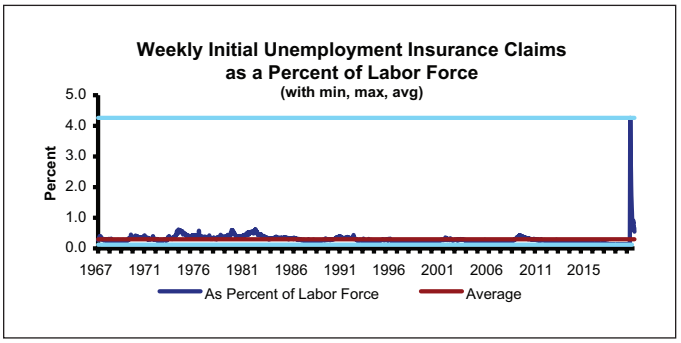

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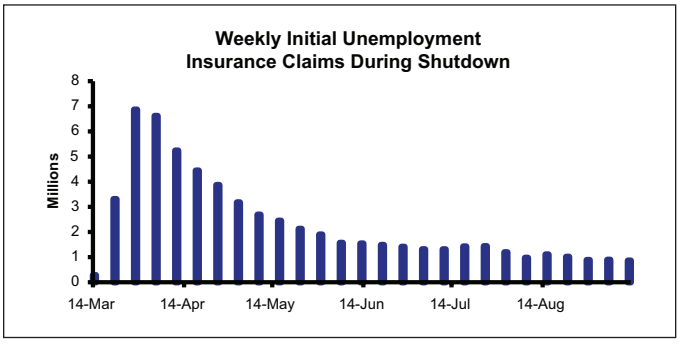

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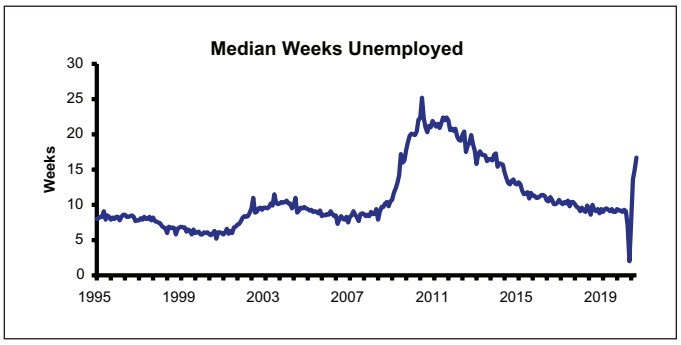

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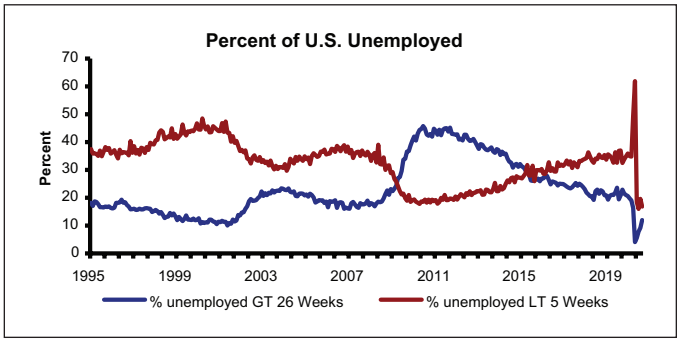

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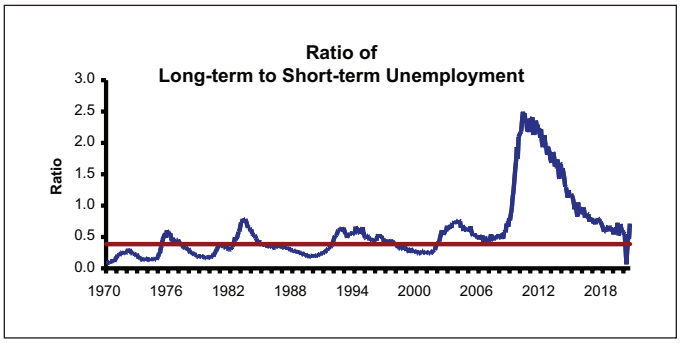

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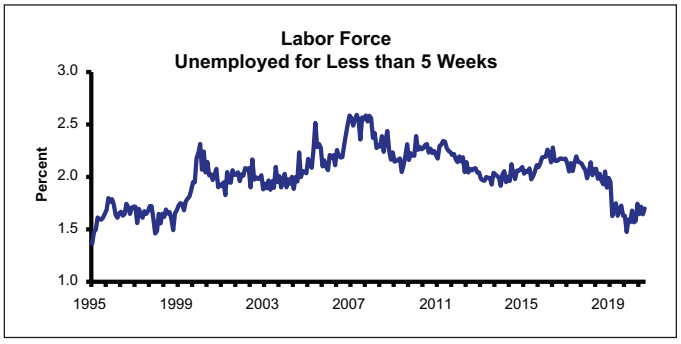

figure 93

or lower indicates a strong labor market. The most dramatic unemployment rate increase occurred among those 16-19 years old, rising from 11% in February to 31.9% in April 2020 but dropping to 16.1% in August. The current level is 150 bps below its historic average (since 1948) of 17.6%.

A strong labor market existed through the first week of March, and then it all disappeared in the blink of an eye. Initial weekly unemployment claims rose sharply and swiftly due to the shutdown, totaling about 61 million from mid-March through mid-September. On March 7 and March 14, reported claims were 211,000 and 282,000, respectively. They peaked at 6.9 million in the last week of March and gradually moderated over the following six months. In mid-September, initial weekly unemployment claims were still 860,000.

Most recently, new claims are 0.55% of the labor force (after peaking at over 4% in March), which compares to the long-term pre-shutdown average of 0.29% and the cyclical lows of 0.20% registered in 1968 and 0.18% in 2000. We expect this ratio to be about 0.25-0.5% for the next six weeks.

Long-term unemployment, as measured by the percent of total unemployed who have been out of work for 27 weeks or more dropped to 4% in April 2020 in the wake of the shutdown but as expected, rose thereafter, to 12% in August. When the shutdown occurred, the percent of total unemployed who were unemployed for less than 5 weeks spiked in March (49.6%) and April (61.9%) but was down to 16.8% in August. Usually a high percent of short-term unemployed means a strong labor market, as people can quickly find jobs. In marked contrast, it spiked because everyone lost their jobs en masse due to the shutdown. It will take several months for this metric to revert to its traditional meaning. The ratio of longer-to-short term unemployment duration is 0.71 (versus a long-term average of 0.39) and is rising fast.

The Bureau of Labor Statistics defines the marginally attached labor force as "individuals who are not part of the labor force and are available and seeking work, having looked for a job in the last 12

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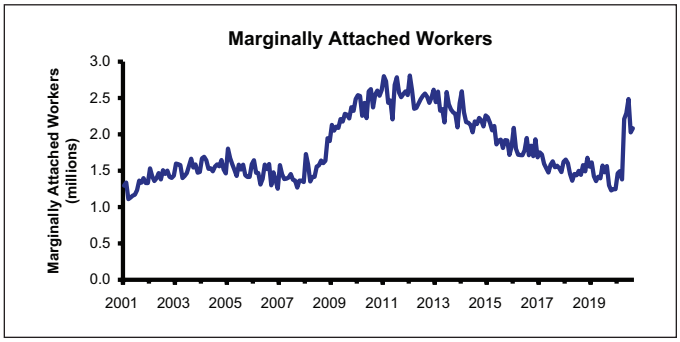

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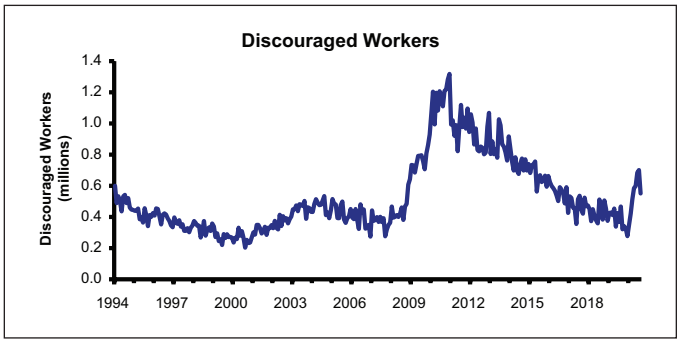

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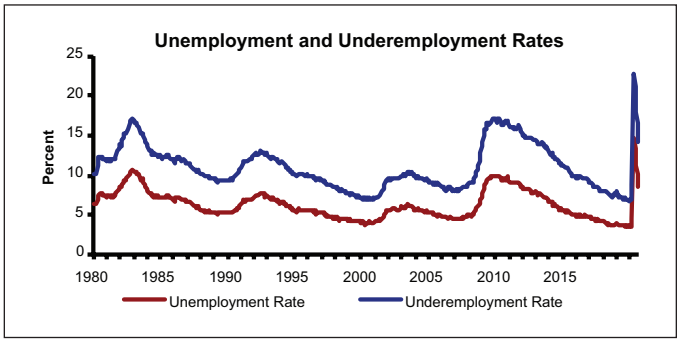
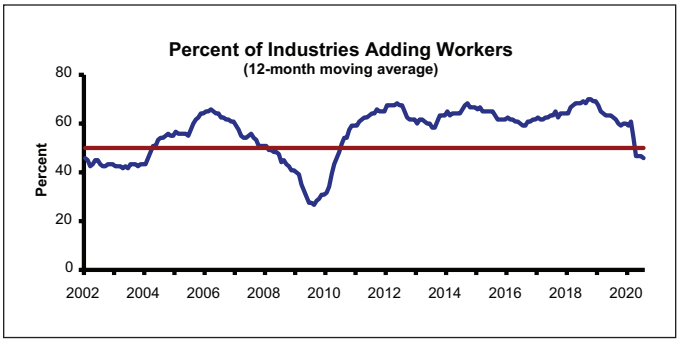


figure 96

months but not in the last four weeks." The marginally attached labor force increased by 519,000 (33.2%) over the last 12 months and by 589,000 since February (before the shutdown), to nearly 2.1 million in August 2020. Of those who are marginally attached, 551,000 individuals (26.5%) were classified as "discouraged" in August 2020.

Our analysis shows that the underemployment rate rises (falls) by about 157 bps per 100-bp increase (decrease) in the unemployment rate and that, on average, underemployment generally exceeds the unemployment rate by about 160 bps. Including marginally attached workers, the August 2020 effective unemployment rate increases by 580 bps, from 8.4% to 14.2%. There were nearly 2.5 million Temporary Help Service workers in August 2020, reflecting an increase of 106,700 (4.5%) over the previous month but a decrease of 473,000 (16.1%) year-over-year.



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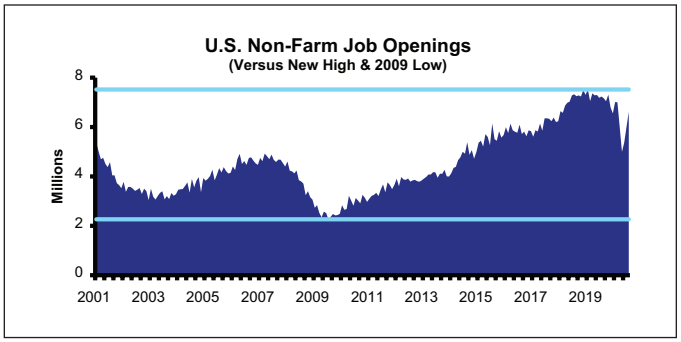

figure 98

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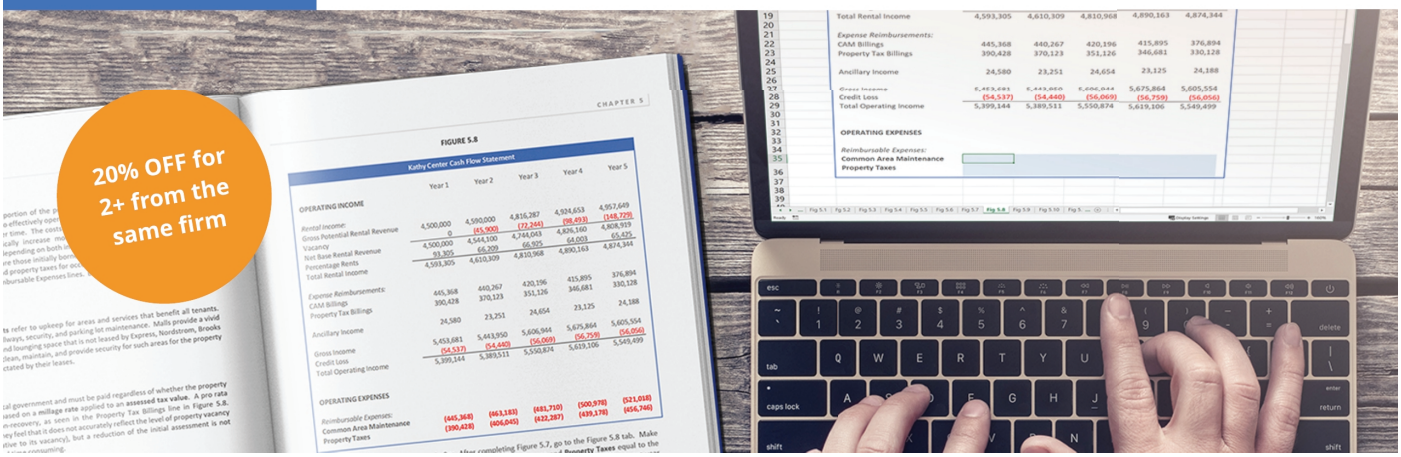

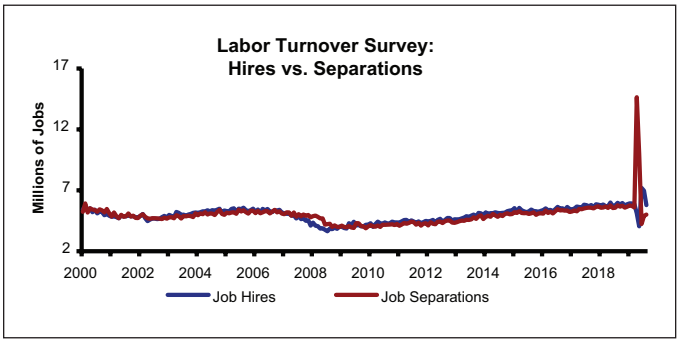

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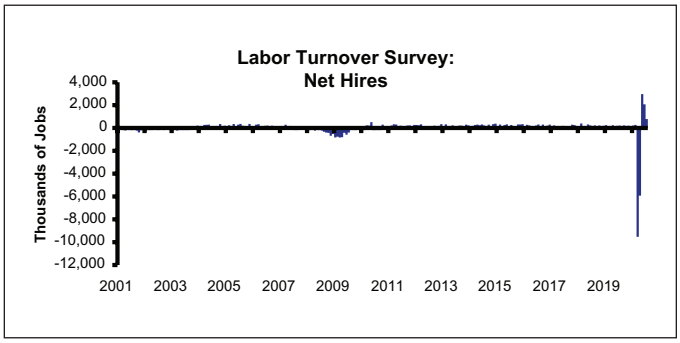

figure 101

Metropolitan Area Employment Growth
Employer Payroll Survey versus Household Survey

Jobs in Thousands	Unemp. Rate	Payroll Survey: Jobs Lost During Covid-19	Payroll Survey: % Jobs Lost	Payroll Survey: Jobs Regained To Date*	Payroll Survey: Latest % Regained*	Household Survey: Jobs Lost During Covid-19	Household Survey: % Jobs Lost	Household Survey: Jobs Regained To Date*	Household Survey: Latest % Regained*
U.S.	**8.4**	**22,160**	**14.5**	**10,611**	**48**	**25,400**	**16.0**	**13,885**	**55**
SOLID									
Austin	6.5	133	12	66	50	238	19	152	64
WEAK									
Kansas City	7.1	126	11	71	56	121	11	54	44
Baltimore	7.2	217	15	95	44	202	14	114	56
Dallas/Fort Worth	7.4	409	11	178	44	695	18	417	60
Durham	7.6	44	13	16	37	50	17	20	41
Cincinnati	7.6	176	16	91	52	175	16	92	53
Washington, D.C.	7.8	292	10	22	8	368	11	97	26
Raleigh	7.8	99	15	31	31	133	19	58	44
St. Louis	7.8	168	12	79	47	181	13	83	46
Denver	7.8	183	12	74	41	226	14	96	42
Indianapolis	7.8	131	12	84	64	192	18	131	69
Columbus	8.1	162	14	54	33	160	15	73	46
Atlanta	8.2	337	12	159	47	483	16	225	47
Minneapolis	8.3	274	13	87	32	180	9	38	21
Jacksonville	8.5	92	12	46	50	149	19	55	37
Charleston	8.7	56	15	23	40	52	13	27	52
RECESSION									
San Jose	9.1	151	13	46	31	135	13	37	27
Charlotte	9.1	175	14	61	35	233	17	125	54
Detroit	9.2	503	24	252	50	593	28	338	57
Houston	9.3	365	11	107	29	621	19	343	55
Seattle	9.4	333	16	141	42	333	16	191	57
Nashville	9.6	150	14	62	41	203	19	34	16
Tampa	10.0	176	12	90	51	300	20	108	36
Phoenix	10.1	218	10	93	43	288	12	90	31
Fairfield County	10.3	80	20	27	33	70	15	22	31
San Francisco	10.9	400	16	104	26	394	15	89	23
Portland	11.0	164	13	55	34	153	12	36	23
West Palm Beach	11.2	103	16	40	39	160	22	54	34
Sacramento	11.3	147	14	45	31	157	15	43	27
Cleveland	11.3	186	17	55	30	209	21	90	43
Chicago	11.7	636	13	218	34	806	17	306	38
San Diego	11.8	231	15	64	28	229	15	61	27
Orange County	11.9	277	16	70	25	255	16	58	23
Inland Empire	12.7	209	13	57	27	279	14	78	28
Ft. Lauderdale	13.0	131	15	55	42	218	21	71	32
Miami	13.9	162	13	80	50	285	21	61	21
Long Island	13.9	298	22	121	41	255	18	118	46
Fresno	13.9	45	12	13	29	51	12	9	17
Philadelphia	14.0	489	16	204	42	402	13	103	26
Pittsburgh	14.3	226	19	111	49	186	16	39	21
Boston	15.3	505	18	144	29	648	23	176	27
Orlando	15.3	233	17	100	43	325	24	112	34
Las Vegas	16.3	252	24	112	44	412	37	221	54
Westchester County/N.NJ	17.4	1,534	21	381	25	1,296	19	265	20
Los Angeles	17.5	727	16	235	32	1,217	25	325	27
New York City	19.8	944	20	161	17	914	23	210	23

**MSA Payroll and Household Survey data are seasonally-adjusted through July 2020.*
U.S. data is seasonally-adjusted through August 2020. Source: BLS, Linneman Associates.

figure 100

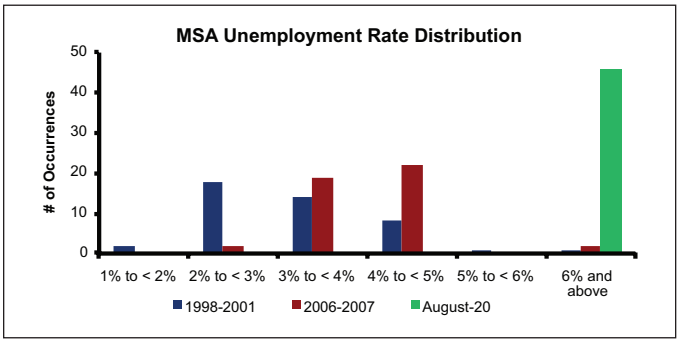

figure 102

The Job Openings and Labor Turnover Survey indicates that 70% and 90% of industries were adding workers in June and July 2020, respectively, resulting in a 46% 12-month rolling average through July. This compares to the long-term rolling average of 56%, the 2014 peak of 70%, and 63% a year ago. As benchmarks, about 60% of industries add employment in a red hot economy, while about 60% lose jobs in a recession. However, the latest readings are a signal of false strength, as many are bringing back workers from a business coma.

In July 2020, non-farm job openings stood at just over 6.6 million, up by nearly 1.6 million since April but still 386,000 below the February 2020 level. The current level represents a decrease of 618,000 (8.5%) over the previous year. Compare this to the 13.6 million unemployed based on the August 2020 Household Survey. No longer are there more job openings today than people actively seeking employment. This will be the case for the next 3 years.

In Figure 100, MSAs are sorted by July 2020 unemployment rates (latest available), with only Austin breaking into the "Solid" category at 6.5%. The rest are split between "Weak" (7-9%) and in "Recession" (>9%). This is a significant improvement from last quarter, when all markets, except Fairfield County ("Weak" at 8%),

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Change in Unemployment Rates

MSA	Feb-20	Jul-20	Change (bps)
New York City	3.4	19.8	1,640
Westchester County/N.NJ	3.5	17.4	1,390
Los Angeles	4.3	17.5	1,320
Boston	2.5	15.3	1,280
Las Vegas	3.7	16.3	1,260
Orlando	2.8	15.3	1,250
Miami	1.8	13.9	1,210
Long Island	3.6	13.9	1,030
Ft. Lauderdale	2.8	13.0	1,020
Pittsburgh	4.7	14.3	960
Philadelphia	4.4	14.0	960
Orange County	2.7	11.9	920
San Diego	3.0	11.8	880
Inland Empire	3.9	12.7	880
San Francisco	2.5	10.9	840
Chicago	3.4	11.7	830
West Palm Beach	3.1	11.2	810
Sacramento	3.4	11.3	790
Portland	3.2	11.0	780
Cleveland	4.1	11.3	720
Tampa	2.9	10.0	710
Fresno	6.9	13.9	700
Nashville	2.6	9.6	700
San Jose	2.5	9.1	660
Charleston	2.1	8.7	660
Fairfield County	3.8	10.3	650
Seattle	3.1	9.4	630
Phoenix	3.9	10.1	620
Charlotte	3.3	9.1	580
Jacksonville	2.9	8.5	560
Houston	3.8	9.3	550
Minneapolis	2.8	8.3	550
Denver	2.4	7.8	540
Detroit	3.9	9.2	530
Atlanta	3.0	8.2	520
Indianapolis	2.8	7.8	500
Washington, D.C.	2.9	7.8	490
Raleigh	3.2	7.8	460
Columbus	3.6	8.1	450
Durham	3.2	7.6	440
St. Louis	3.5	7.8	430
Dallas/Fort Worth	3.2	7.4	420
Austin	2.6	6.5	390
Cincinnati	3.7	7.6	390
Baltimore	3.4	7.2	380
Kansas City	3.3	7.1	380

figure 103

registered unemployment rates above 9% ("Recession"). A year ago, all of our markets, except Fresno, were categorized as "Red Hot" (below-4% unemployment rates) or "Hot" (5.5% and below), but today, only one covered market even qualifies as "Solid" (5.6%-7.0%). The covered markets with the highest unemployment rates in July 2020 were New York City, Los Angeles, NY/NJ, Las Vegas, Orlando, and Boston.

We are now tracking the recovery of jobs lost due to the COVID-19 shutdown for each MSA. Comparing February-to-July net changes in seasonally-adjusted MSA unemployment rates, New York City (+1,640 bps), Westchester County, NY/NJ (+1,390 bps), Los Angeles (+1,320 bps), Boston (+1,280 bps), Las Vegas (+1,260 bps) saw the greatest increases. Kansas City and Baltimore (each +300 bps), Cincinnati and Austin (each

Change in Payroll Employment Due to Shutdown

Jobs in 000s	Feb-20	Jul-20	Change	% Change
Atlanta-Sandy Springs-Marietta, GA MSA	2,881.7	2,710.9	-170.8	-5.9%
Austin-Round Rock-San Marcos, TX MSA	1,139.7	1,073.1	-66.6	-5.8%
Baltimore-Towson, MD MSA	1,444.2	1,322.8	-121.4	-8.4%
Boston-Cambridge-Quincy, MA-NH Met NECTA	2,827.6	2,467.3	-360.3	-12.7%
Bridgeport-Stamford-Norwalk, CT Met NECTA	406.4	354.3	-52.1	-12.8%
Charleston-North Charleston-Summerville, SC	380.3	347.8	-32.5	-8.5%
Charlotte-Gastonia-Rock Hill, NC-SC MSA	1,243.7	1,139.1	-104.6	-8.4%
Chicago-Naperville-Elgin, IL-IN-WI	4,779.1	4,365.9	-413.2	-8.6%
Cincinnati-Middletown, OH-KY-IN MSA	1,122.2	1,040.5	-81.7	-7.3%
Cleveland-Elyria-Mentor, OH MSA	1,079.2	951.2	-128.0	-11.9%
Columbus, OH MSA	1,123.2	1,015.8	-107.4	-9.6%
Dallas-Fort Worth-Arlington, TX MSA	3,864.8	3,634.0	-230.8	-6.0%
Denver-Aurora-Broomfield, CO MSA	1,559.3	1,451.2	-108.1	-6.9%
Detroit-Warren-Livonia, MI MSA	2,054.0	1,803.2	-250.8	-12.2%
Durham-Chapel Hill, NC MSA	326.1	298.5	-27.6	-8.5%
Fort Lauderdale-Pompano Beach-Deerfield Beach, FL Met Div	867.8	794.0	-73.8	-8.5%
Fresno, CA MSA	365.3	334.6	-30.7	-8.4%
Houston-Sugar Land-Baytown, TX MSA	3,220.6	2,962.6	-258.0	-8.0%
Indianapolis-Carmel, IN MSA	1,097.2	1,050.2	-47.0	-4.3%
Jacksonville, FL MSA	740.2	694.2	-46.0	-6.2%
Kansas City, MO-KS MSA	1,105.6	1,050.8	-54.8	-5.0%
Las Vegas-Paradise, NV MSA	1,038.9	903.7	-135.2	-13.0%
Los Angeles-Long Beach-Glendale, CA Met Div	4,632.6	4,140.3	-492.3	-10.6%
Miami-Miami Beach-Kendall, FL Met Div	1,222.9	1,141.3	-81.6	-6.7%
Minneapolis-St. Paul-Bloomington, MN-WI MSA	2,033.4	1,850.5	-182.9	-9.0%
Nashville-Davidson-Murfreesboro-Franklin, TN MSA	1,069.1	980.4	-88.7	-8.3%
Nassau-Suffolk, NY Met Div	1,356.3	1,180.9	-175.4	-12.9%
New York City	4,698.1	3,915.2	-782.9	-16.7%
New York-White Plains-Wayne, NY-NJ Met Div	7,220.4	6,206.1	-1,014.3	-14.0%
Orlando-Kissimmee-Sanford, FL MSA	1,344.3	1,212.7	-131.6	-9.8%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD MSA	2,999.1	2,714.2	-284.9	-9.5%
Phoenix-Mesa-Glendale, AZ MSA	2,221.6	2,096.6	-125.0	-5.6%
Pittsburgh, PA MSA	1,201.3	1,087.0	-114.3	-9.5%
Portland-Vancouver-Hillsboro, OR-WA MSA	1,230.4	1,121.7	-108.7	-8.8%
Raleigh-Cary, NC MSA	662.7	594.1	-68.6	-10.4%
Riverside-San Bernardino-Ontario, CA MSA	1,549.5	1,401.8	-147.7	-9.5%
Sacramento-Arden-Arcade-Roseville, CA MSA	1,029.4	927.4	-102.0	-9.9%
San Diego-Carlsbad-San Marcos, CA MSA	1,522.9	1,355.9	-167.0	-11.0%
San Francisco-Oakland-Fremont, CA MSA	2,503.2	2,206.7	-296.5	-11.8%
San Jose-Sunnyvale-Santa Clara, CA MSA	1,157.8	1,053.6	-104.2	-9.0%
Santa Ana-Anaheim-Irvine, CA Met Div	1,684.1	1,477.2	-206.9	-12.3%
Seattle-Tacoma-Bellevue, WA MSA	2,116.2	1,928.4	-187.8	-8.9%
St. Louis, MO-IL MSA	1,399.7	1,315.0	-84.7	-6.1%
Tampa-St. Petersburg-Clearwater, FL MSA	1,412.8	1,326.9	-85.9	-6.1%
Washington-Arlington-Alexandria, DC-VA-MD-WV MSA	2,784.4	2,514.8	-269.6	-9.7%
West Palm Beach-Boca Raton-Boynton Beach, FL Met Div	642.0	581.5	-60.5	-9.4%

Source: U.S. BLS, Linneman Associates

figure 104

+390 bps), and Dallas-Ft. Worth (+420 bps) experienced the smallest net increases in unemployment rates between February and July 2020. The average and median five-month increases in covered MSA unemployment rates were 750 bps and 680 bps, respectively.

Of the 46 markets we track, all had regained at least 100% of Payroll Survey jobs lost during the recession prior to COVID-19, but the shutdown resulted in widespread and unprecedented job losses. After a decade of growth, all of our covered MSAs suffered epic job losses, but most are climbing out of the COVID hole. On an absolute basis, the MSAs that lost the most jobs between their respective pre-COVID peaks and subsequent COVID lows were the NY/NJ metro area (1.5 million of which 944,000 were in NYC), Los Angeles (727,000), Chicago (636,000), Boston (505,000), and Detroit (503,000). The smallest absolute COVID-related job losses through July were seen in Durham (44,000), Fresno (45,000), Charleston (56,000), Bridgeport (80,000), and Jacksonville (92,000).

On a percentage basis, the largest job losses during the shutdown were in Detroit and Las Vegas (each 24%), the NY/NJ metro area (21%), Bridgeport (20%), and Pittsburgh (20%). In contrast, the MSAs with the smallest percentage job losses include Phoenix and D.C. (each 10%) and Dallas-Ft. Worth, Houston, and Kansas City (each 11%).

Through July 2020, the markets that have regained the most jobs on an absolute basis are NY/NJ (381,000 jobs, 25% of those lost), Detroit (252,000, 50%), Los Angeles (235,000, 32%), Chicago (218,000, 34%), and Philadelphia (204,000, 42%). On a percentage basis, the MSAs that recovered the most jobs lost to COVID through July 2020 include Indianapolis (64% of jobs lost during the shutdown recovered), Kansas City (56%), Cincinnati (52%), Tampa (51%), and Detroit, Jacksonville, Austin, and Miami (each 50%).

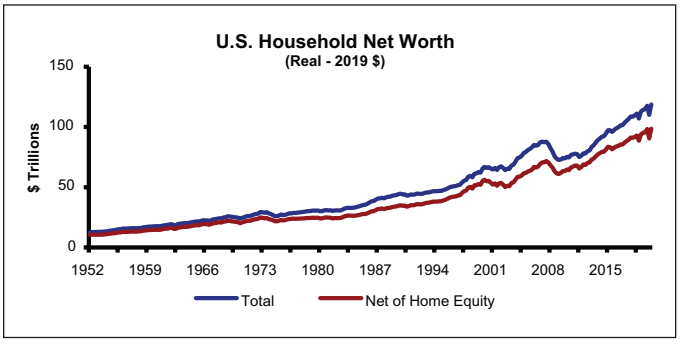


figure 105

Household Wealth. Real household net wealth as of the second quarter of 2020 stood at $118.7 trillion (2019 dollars). This is a record high, up by 3.9% over the previous year and 7.8% over the quarter. Through the second quarter of 2020, households had regained 114% of the $7.5 trillion lost during the shutdown as asset values rebounded from March 2020 lows.

Standing at approximately $359,600 in the second quarter of 2020, real U.S. household net wealth per capita decreased 3.3% over the last year. The current level is 0.6% above the 2019 peak and 102% above the real long-term average (since 1955) of $177,600. This is also in comparison to the 2009 cyclical real wealth trough of $237,000 per capita. After rising in the second quarter of 2020, real wealth per household stood at nearly $936,000, down just $12,600 versus the pre-COVID level.

Through mid-September, the S&P 500 had increased by 52% from the March 23, 2020 low that resulted from the COVID shutdown. It is very volatile and was just above the February peak as of mid-September.

Many wonder why stock market values have not fallen more given economic weakness. Simply stated, we do not know. No one knows. A somewhat logical explanation is that investors believe that the massive monetary injections will ultimately end up in asset prices, as occurred in 2009-2019. In addition, sustained low interest rates will boost earnings while reduced

BASE CASE

Annual Growth Rate	3%
Discount Rate	7%
Residual Value Multiple	20.0

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash Flow	100.0	103.0	106.1	109.3	112.6	
Residual Value						2,251.0
	(Y1-Y6)	(Y2-Y6)				
CF NPV	433.6	364.0				
Residual NPV	1,499.9	1,499.9				
Total NPV	**1,933.6**	**1,863.9**				

COVID CASE

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cash Flow	0.0	40.0	80.0	105.0	112.6	
Residual Value						2,251.0
	(Y1-Y6)	(Y2-Y6)				
CF NPV	260.6	278.8				
Residual NPV	1,499.9	1,499.9				
Total NPV	**1,760.5**	**1,778.8**				

	(Y1-Y6)	(Y2-Y6)
Change in NPV ($)	-173.0	-85.2
Change in NPV (%)	**-8.9%**	**-4.6%**

figure 106

Percent Change in NPV of Base vs. COVID Case

Discount Rate	Residual Multiple 15x	20x	25x	30x	35x	40x
5%	-10.4	-8.3	-7.0	-6.0	-5.3	-4.7
6%	-10.7	-8.6	-7.2	-6.2	-5.5	-4.9
7%	-11.1	-8.9	-7.5	-6.4	-5.7	-5.0
8%	-11.5	-9.3	-7.8	-6.7	-5.9	-5.2
9%	-11.8	-9.6	-8.0	-6.9	-6.1	-5.4
10%	-12.2	-9.9	-8.3	-7.2	-6.3	-5.6
11%	-12.6	-10.2	-8.6	-7.4	-6.5	-5.8
12%	-13.0	-10.6	-8.9	-7.7	-6.8	-6.0
13%	-13.4	-10.9	-9.2	-8.0	-7.0	-6.3
14%	-13.8	-11.3	-9.5	-8.2	-7.2	-6.5
15%	-14.2	-11.6	-9.8	-8.5	-7.5	-6.7
16%	-14.7	-12.0	-10.1	-8.8	-7.8	-6.9
17%	-15.1	-12.4	-10.5	-9.1	-8.0	-7.2
18%	-15.5	-12.7	-10.8	-9.4	-8.3	-7.4
19%	-16.0	-13.1	-11.1	-9.7	-8.6	-7.7
20%	-16.4	-13.5	-11.5	-10.0	-8.8	-7.9

Discount rate that results in a 30% NPV drop*	55.3%
Residual multiple that results in a 30% NPV drop*	1.9x

**ceteris parabus*

Source: Linneman Associates

figure 107

rates raise the value of earnings cash streams, but only time will tell. However, the value rebounds are in line with the analysis of the swing from greed, to extreme fear, to something closer to normalcy, as we discussed in our last issue. Summary figures of that analysis are in Figures 106 and 107.

The largest category of U.S. household assets is financial assets that are not equity, which stood at $75 trillion in the second quarter of 2020, up from $73.7 trillion at year-end 2019. Corporate equities are $19.5 trillion as of the second quarter of 2020. The net value of real home equity is $20.1 trillion today versus $19.1 trillion a year earlier. Despite the urban exodus to the suburbs, many potential buyers lack the job, income, confidence, and/or wealth required to purchase homes, even as they seek to spend more on housing upgrades in a shutdown world.

Total household liabilities rose slightly, to $16.5 trillion, in the second quarter of 2020, with home mortgages accounting for about 64.3% of the total. This is compared to $16.4 trillion in liabilities in the fourth quarter of 2019. At nearly $4.1 trillion, consumer credit is currently 24.8% of total household liabilities. This is down from 25.5% in the fourth quarter of 2019 and 25.2% a year ago. Meanwhile, consumer installment credit as a percent of personal income is up to 44%, from 21% in 1960 and 30% in 1990. Total real household debt as a percent of real disposable personal income was sharply down in the second quarter, to 78.9%, significantly lower than its peak of 122% in 2008.

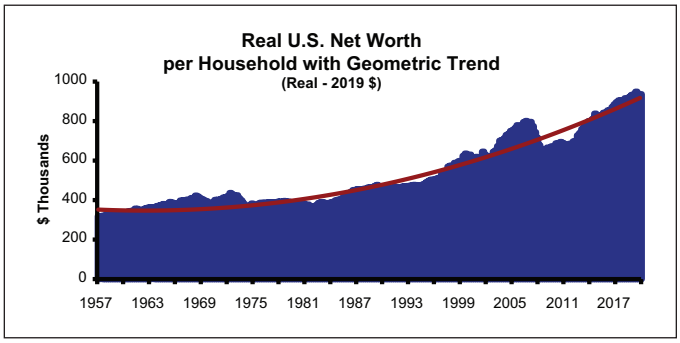


figure 108

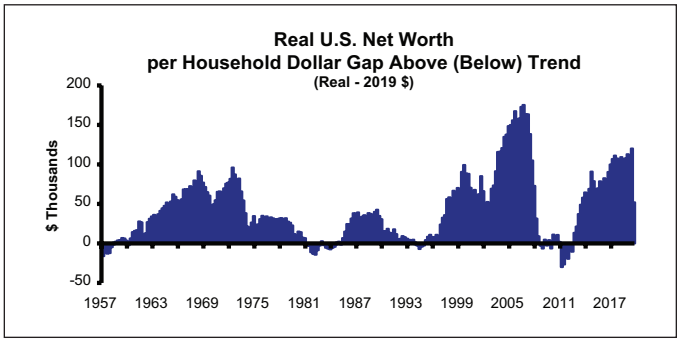


figure 109

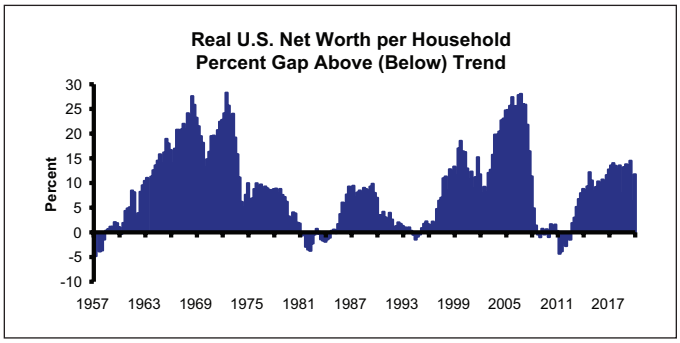


figure 110

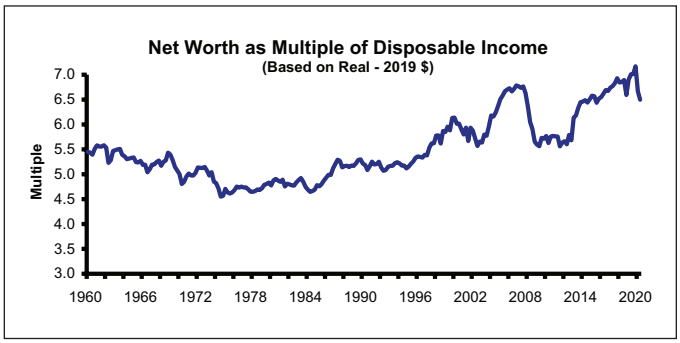


figure 111

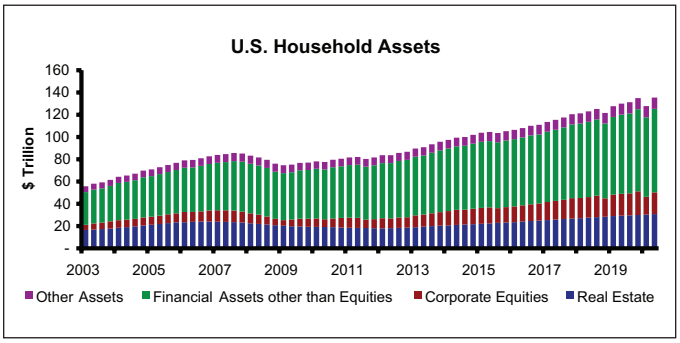


figure 112

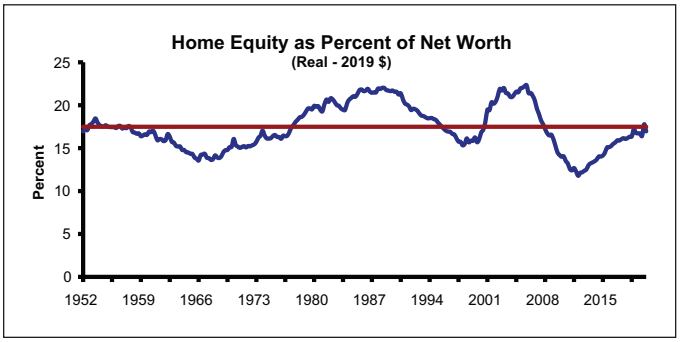
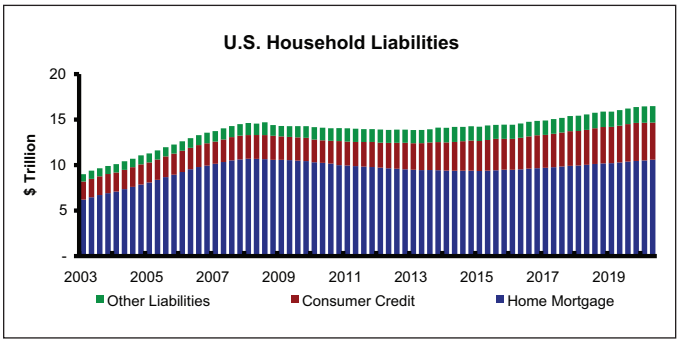


figure 113



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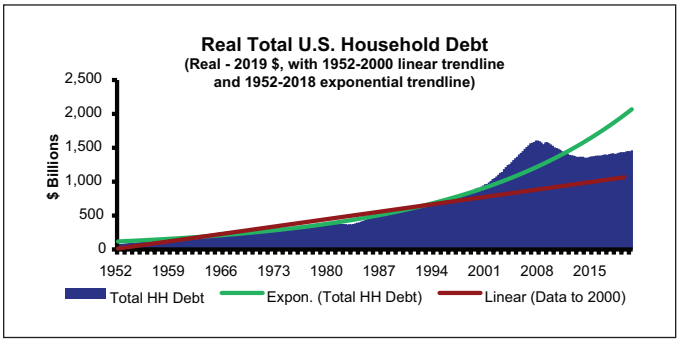


figure 115

In real terms, auto and student loans are up by 19.3% and 171.3%, respectively, from 2006 through the second quarter of 2020, while credit card debt and other consumer loans are down by 11.8% and 16.4%, respectively, over the same period. Real student debt rose by nearly $63 billion in the second quarter of 2020, a 3.9% increase over the past year.

Household debt as a percent of GDP was 68% in the fourth quarter of 2019 but jumped to 76% in the second quarter of 2020. This is above the long-term average (1969-present) of 64% but below that 2009

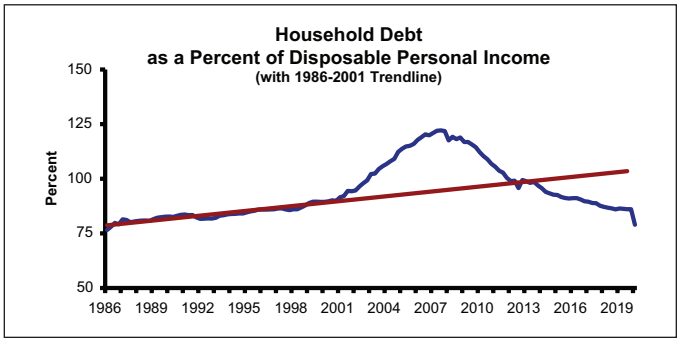


figure 116

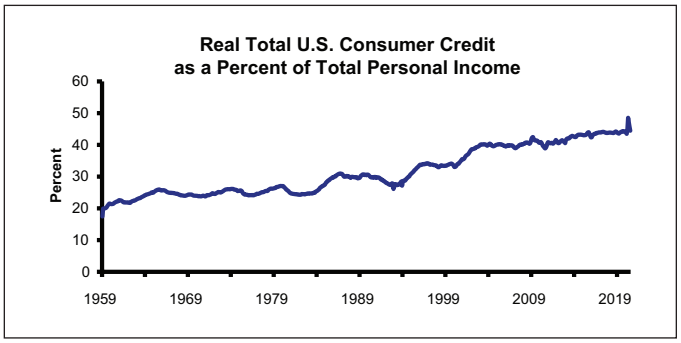


figure 117

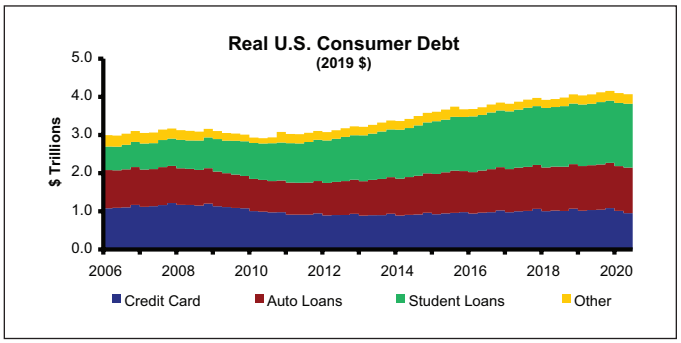


figure 118

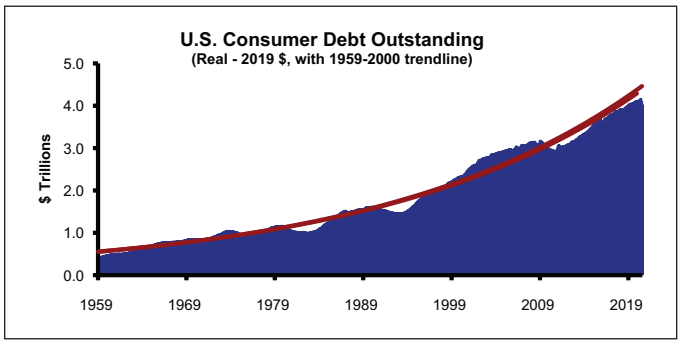


figure 119

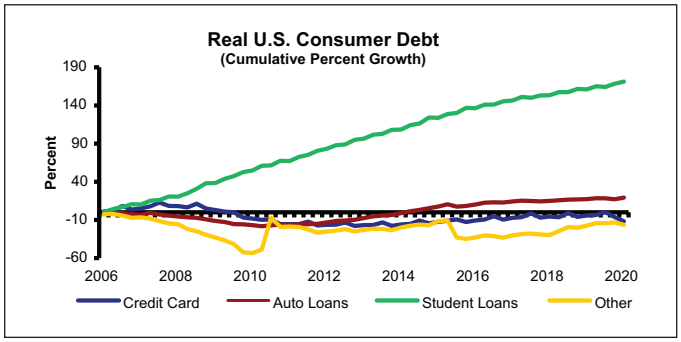
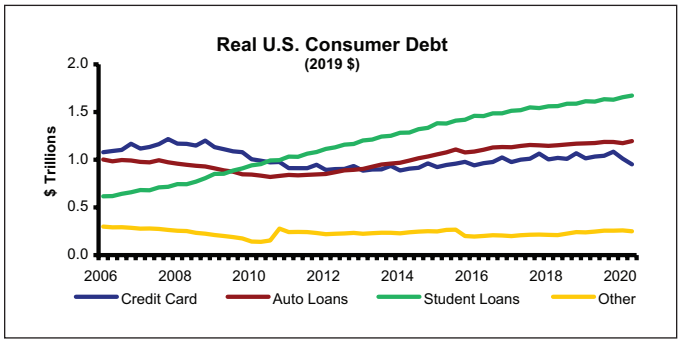


figure 120



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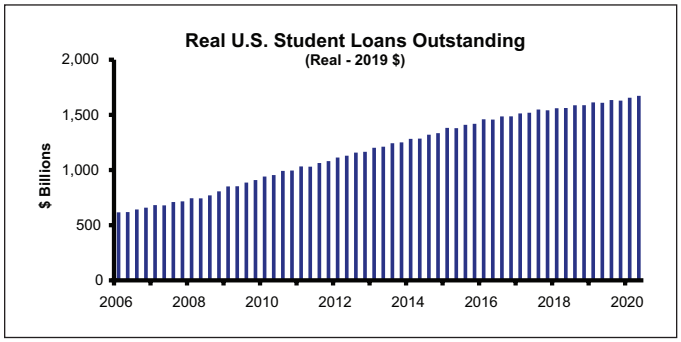

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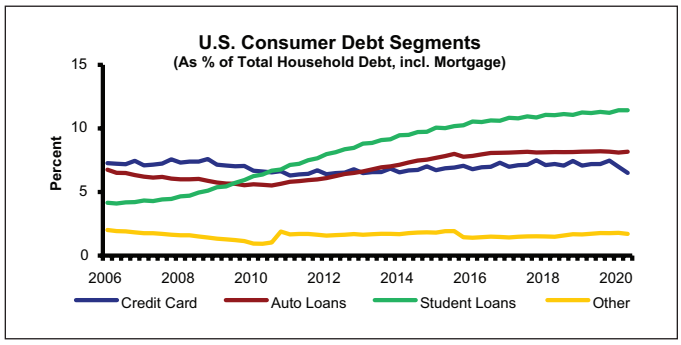

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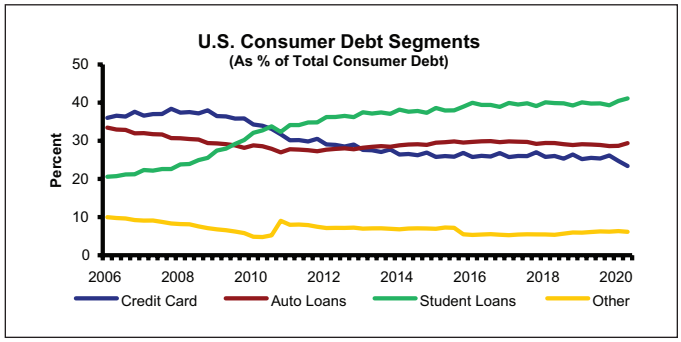

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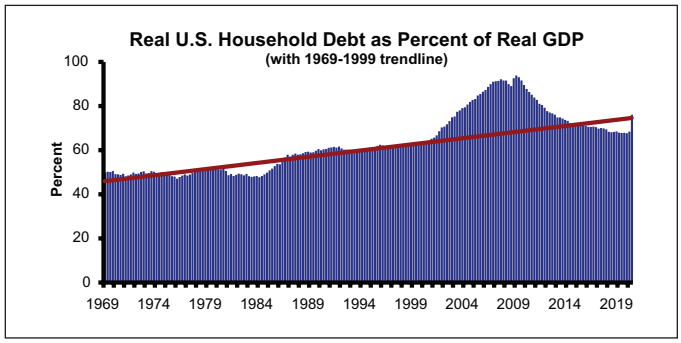

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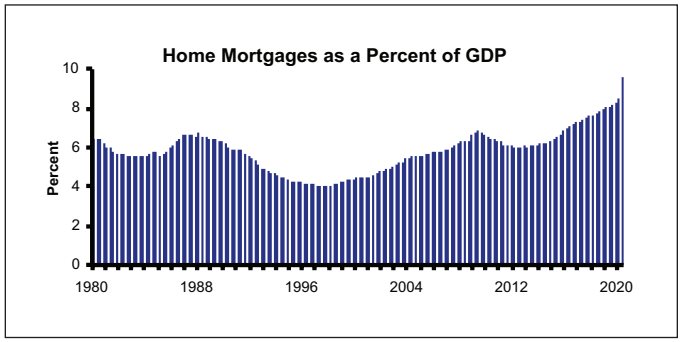

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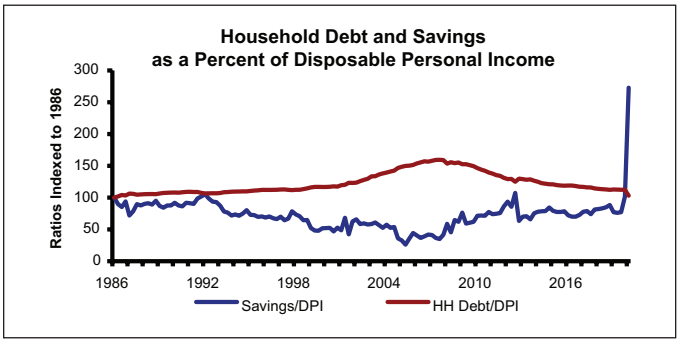

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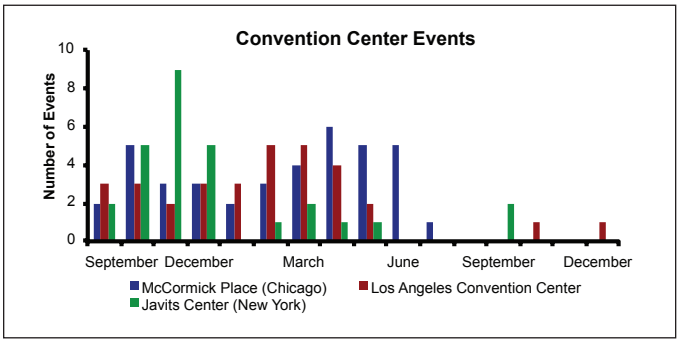

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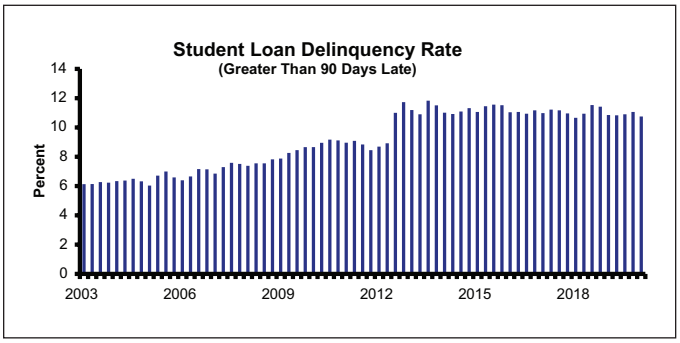

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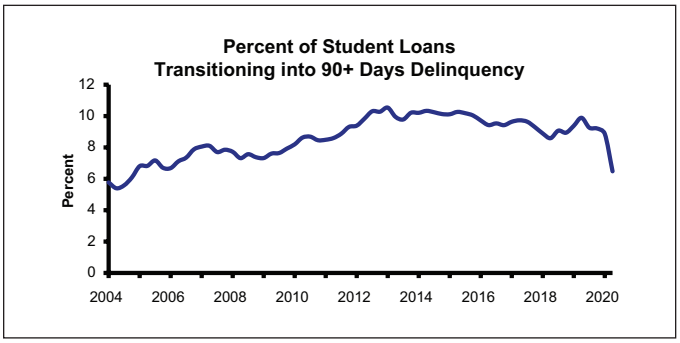


figure 130

high seen in 2009. Real home mortgage debt as a percent of real GDP stood at a 40-year high of 9.7% in the second quarter of 2020, versus a long-term average of 5.8%. While the household sector balance sheet is still solid, the disappearance of jobs threatens many households. "Involuntary savings" have spiked due to cancelled trips, theater performances, concerts, vacations, sporting events, commuting, parking at work, etc. With few options on which to spend, people have simply saved this income.

Of the more than $951 million in student loans outstanding (real 2019 dollars) in the second quarter of 2020, just under 7% had a (90+ day) delinquency rate, down from the 11.8% high seen in 2013. About 6.5% of student loans transitioned into the "seriously delinquent" category (90+ days delinquent) in June 2020. As part of its $2 trillion economic rescue plan, Congress allowed for a 6-month payment forbearance period with no accrued interest. However, this only applies to student loans held or owned by the U.S. government, leaving millions out of the program. Credit card delinquencies bottomed at just below 1.4% in the second quarter of 2016 and stood at 1.5% in the second quarter of 2020.

The household debt service ratio (DSR) is the ratio of total required household debt payments to total disposable personal income (DPI). Total DSR peaked in 2007 at 13.2% and stood at 9.7% in the first quarter of 2020 (latest available). This is flat year-over-year. The financial obligations ratio (FOR), which includes additional required minimum payments (e.g., rent) other than debt service, peaked at 18.1% in 2007 and stood at 15% in the first quarter of 2020. In 2008, consumer debt payments peaked at 6% of DPI, and mortgage payments accounted for 7.2% of DPI. The ratio of consumer debt payments to DPI subsequently bottomed at 4.9% in 2012 and stood at 5.6% in the second quar-

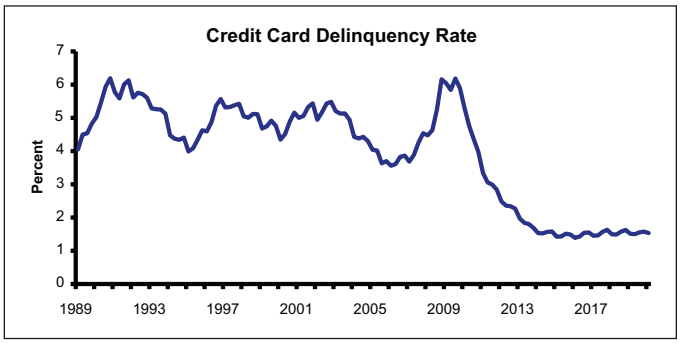


figure 131

ter of 2020. It has been essentially flat for the last three years. In contrast, mortgage payments as a percent of DPI (4.1%) were still on a slight decline through the second quarter of 2020. Consumer loans from commercial banks continue to exhibit very low (2%) delinquency rates in the second quarter of 2020. This apparent strength will disappear as the data catches up to shutdown reality.

Real median household income (2019 dollars) stood at $64,600 in the fourth quarter of 2018 (latest available). This represents an increase of 0.8% versus the previous year and 14.7% versus the 2012 low of $56,300. It is also the highest in U.S. history but will fall as the effects of the shutdown are felt. Total real wage and salary compensation declined by 2.1% year-over-year through July 2020 and by 4.9% since February 2020. However, real disposable personal income per capita rose 7.9% to about $54,300 year-over-year through July.

Involuntary savings caused the official personal savings rate to spike to 33.7% in July 2020, up from 7% a year earlier. This compares to the previous historical

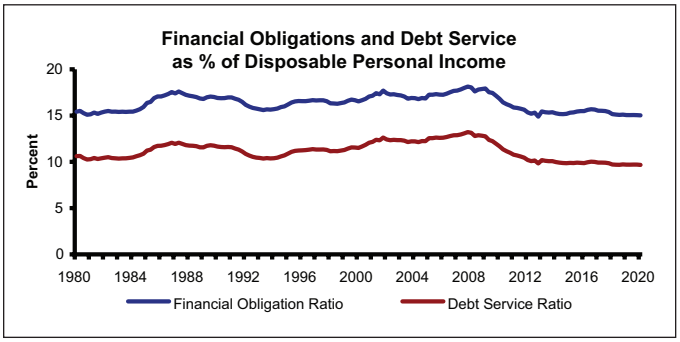


figure 132

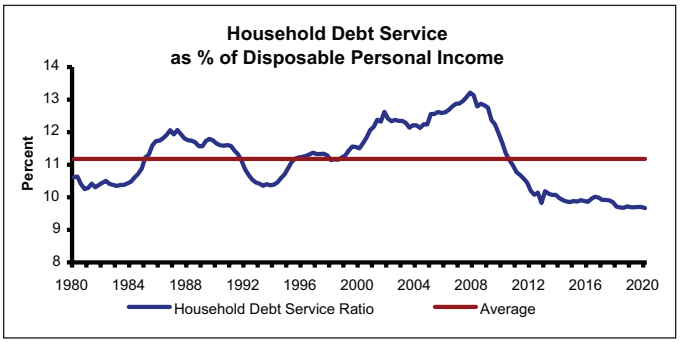


figure 133

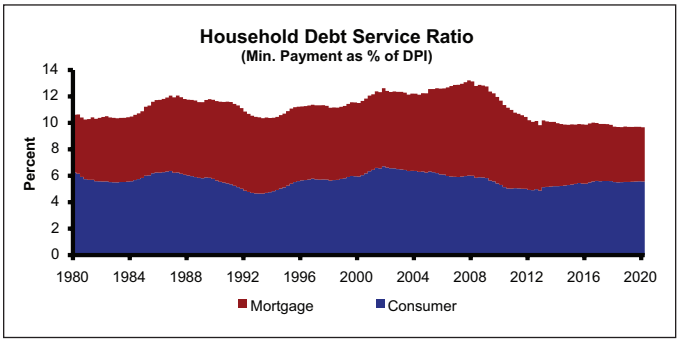
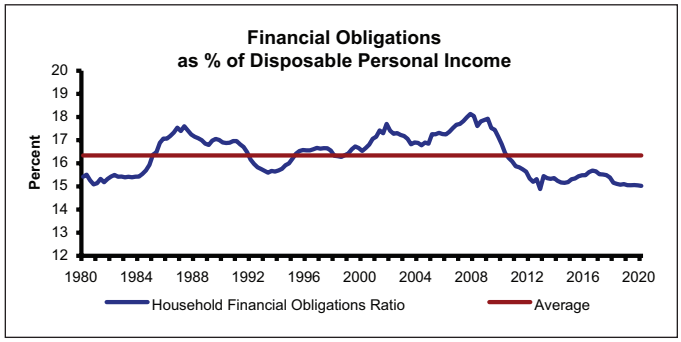


figure 134



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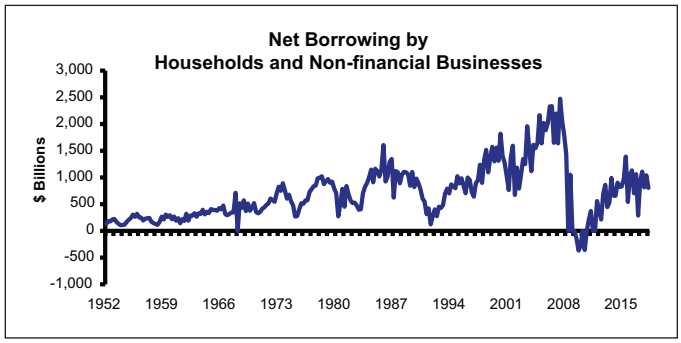

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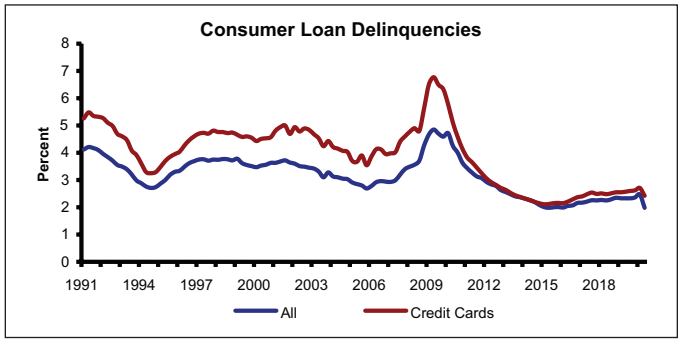

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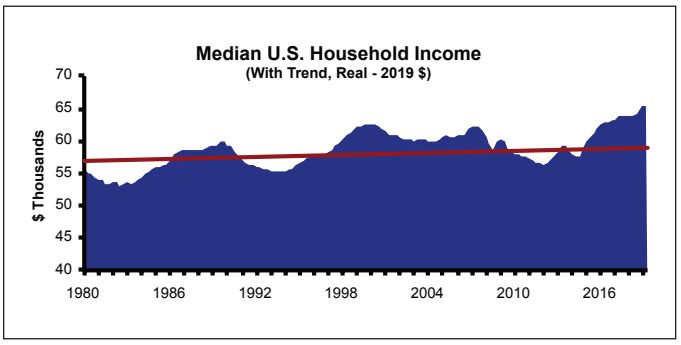

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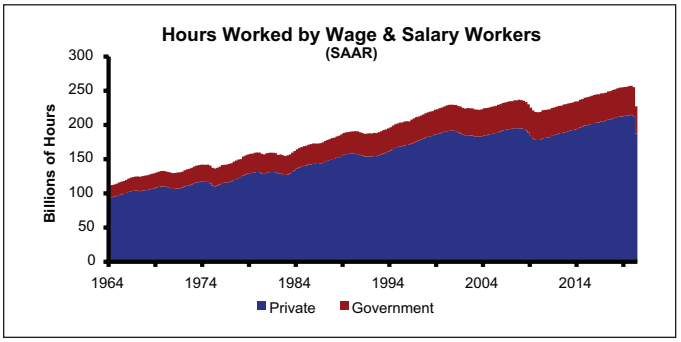

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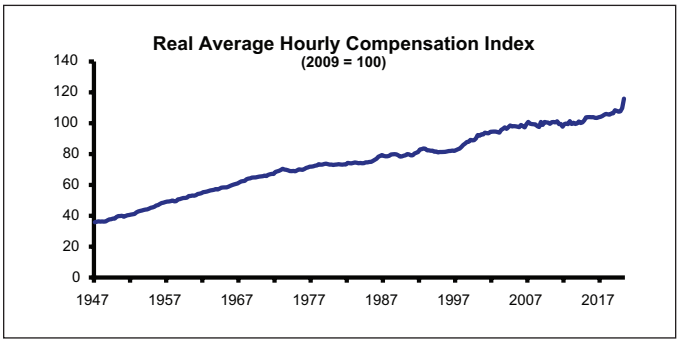

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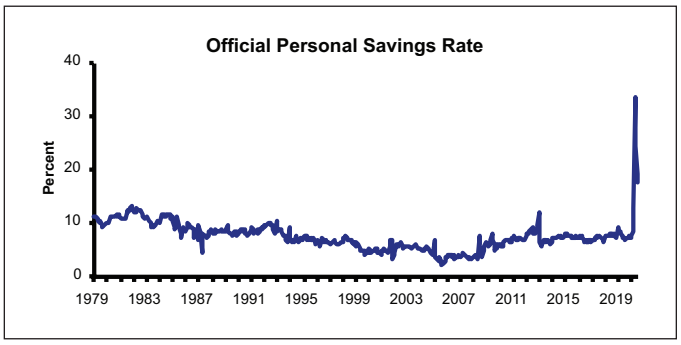

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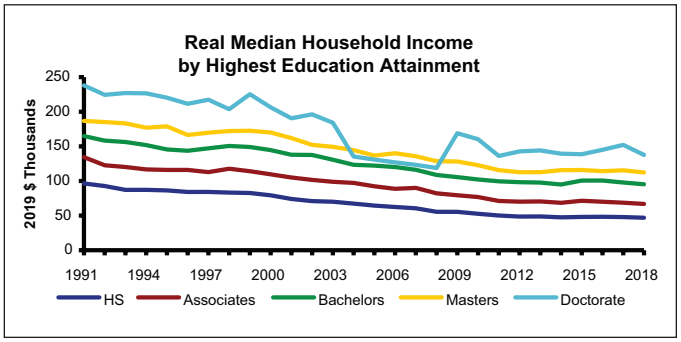

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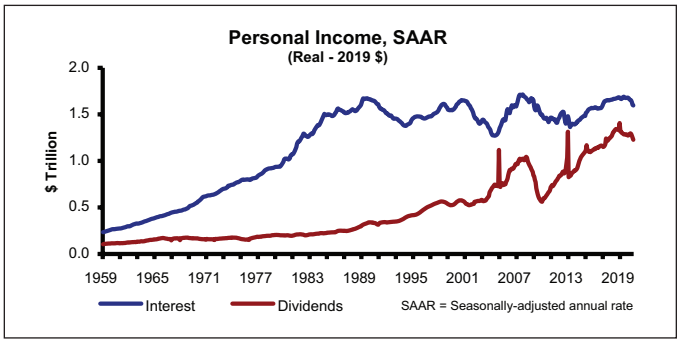
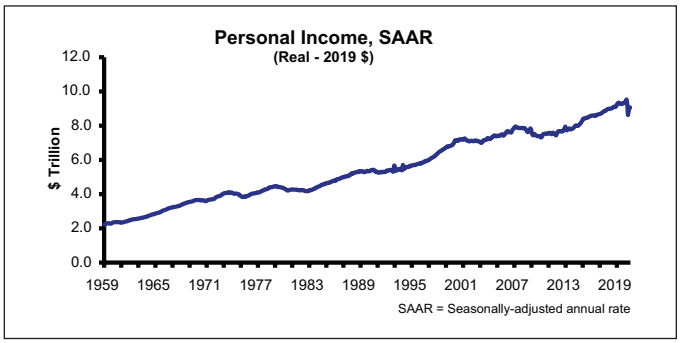


figure 143

peak of 12.7% in 1981 and a low of 1.0% in 2005. As shutdown restrictions eased, the savings rate commensurately declined but was still at 17.8% in July.

At nearly $1.6 trillion as of July 2020, real personal annual interest income is $118 billion (5%) less than it was in 2007 ($925 per household per year). This is striking given that total outstanding U.S. debt (government + private) is up by $15.3 trillion (about $119,000 per household) since 2007, to more than $75.7 trillion. At over $1.2 trillion, real annual dividend income is down by 4.4% year-over-year through July 2020 but is $183



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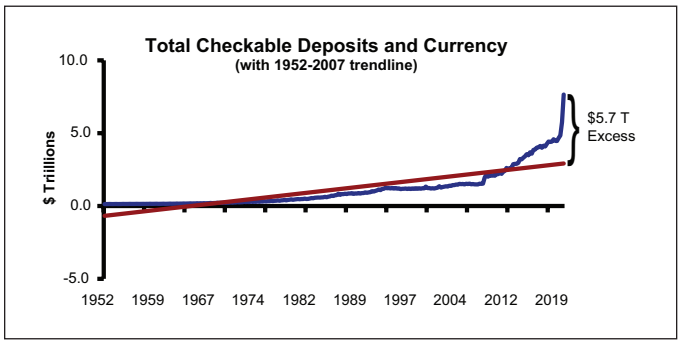

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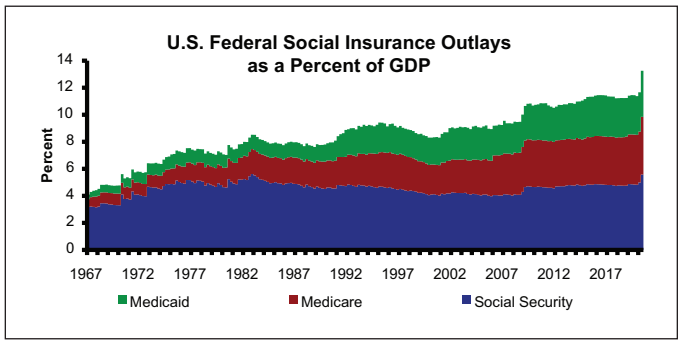
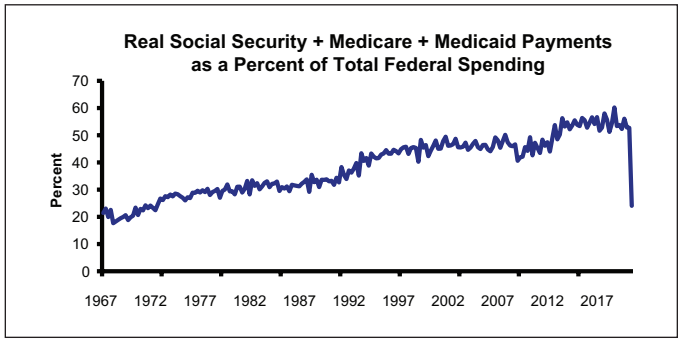


figure 147

billion (17.6%) above its 2008 high. Dividends are being slashed as the shutdown takes hold. At almost $7.7 trillion, real checking deposits and currency levels remain at all-time highs and are $5.7 trillion above the 1952-2007 trend.

Monthly personal income from real annual government social insurance (including Social Security, Medicare, unemployment compensation, etc.) increased by a staggering $1.7 trillion (55.9%) year-over-year through July 2020. Social Security currently has over 54 million recipients, including retired workers, their dependents, and recipient survivors, while nearly 10 million receive disability insurance. In addition, Medicare and Medicaid have 62.4 million and 76.5 million recipients, respectively. Social Security, Medicare, and Medicaid currently absorb 5.6%, 4.3%, and 3.4% of GDP, respectively, and this is projected to increase primarily due to rising Medicare payments. These programs accounted for 24% of all federal spending in the second quarter of 2020, drastically down from 53% in the first quarter due to a 126% increase in annualized federal spending in the latest quarter. In comparison, these programs accounted for 20% of federal spending in 1970.



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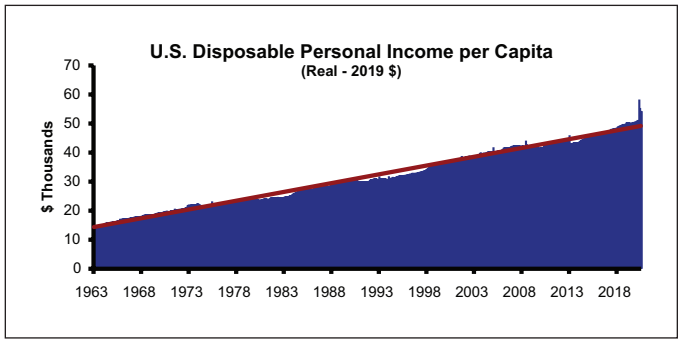

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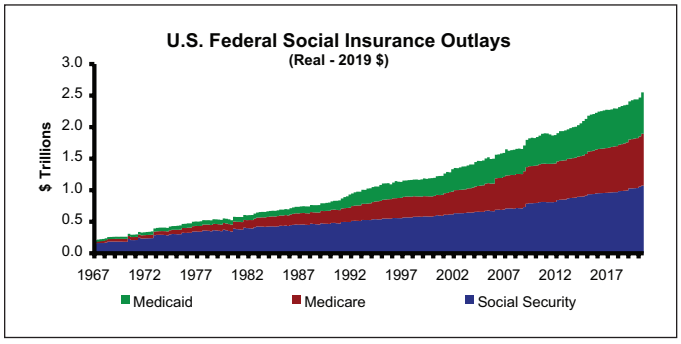

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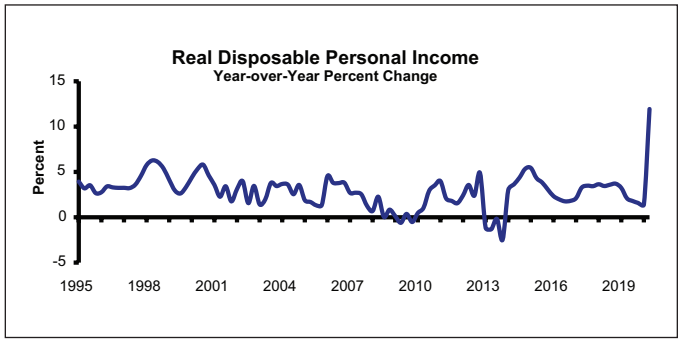

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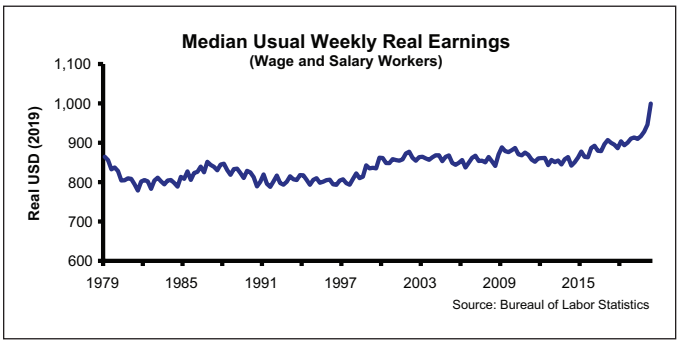

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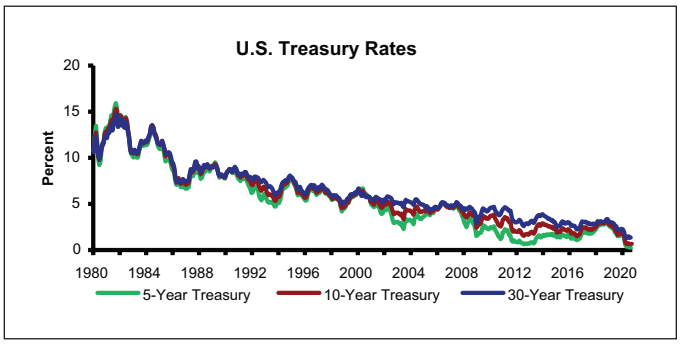


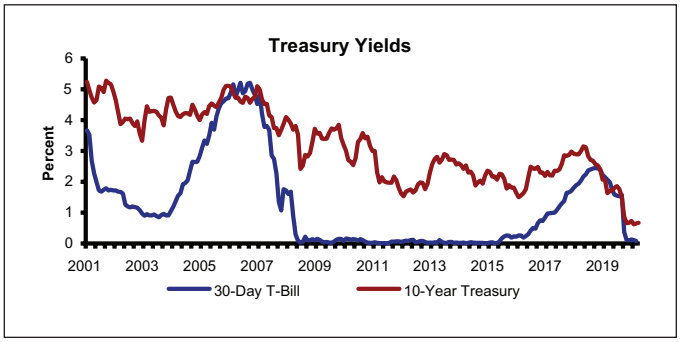
figure 152

After raising short-term interest rates nine times between 2015-2018, the Fed reversed course with three rate cuts in 2019 (July, September, and October) and two more in March 2020 in response to coronavirus fears. In late August 2020, the Fed signaled a major policy shift by changing targeted inflation from a fixed rate of 2% to an "average" of 2%. This obfuscation gives the Fed additional flexibility to suppress interest rates. That is, the Fed will not necessarily raise interest rates even if inflation goes notably above 2%.

…the Fed signaled a major policy shift by changing targeted inflation from a fixed rate of 2% to an "average" of 2%.

The flight to safety and massive quantitative easing (QE) by the Fed pushed both long and short interest rates to record lows. Nominal discount and Fed Funds rates were both down to 0.25% in September 2020. The 10-year Treasury yield hit 3% in September 2018 but declined to a stunning low of 0.7% in September 2020. Similarly, the 30-year Treasury yield was 3.4% in 2018 but currently stands at 1.4%. Jerome Powell's Fed continues to keep debt cheap, particularly for the banks and governments. Meanwhile massive QE infusions are keeping banks awash with liquidity.

In 2020, the M1 money supply increased the Fed's balance sheet by a stunning 36% between December 2019 and August 2020 due to the Fed's QE policies, monetary injections have helped prop up asset prices. Injections into goods and service prices have somewhat reduced the deflationary impact of the massive excess of the supply of almost everything that was created as demand plunged during the shutdown. The Fed has absorbed Milton Friedman's key insight about the main source of the Great Depression: the money



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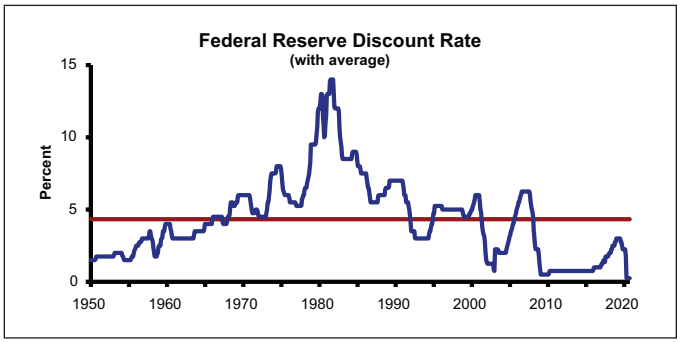

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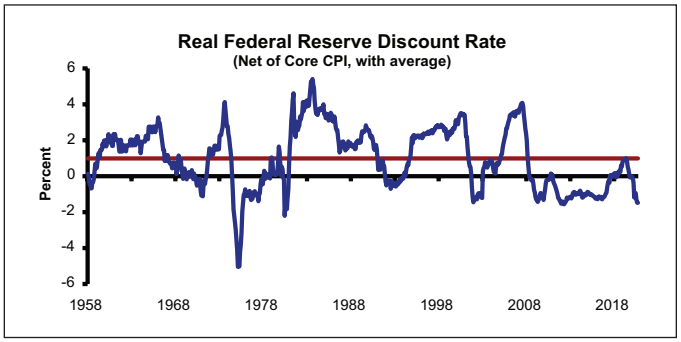

figure 155

supply plummeted by 30%, causing liquidity to disappear, asset values to plummet, and massive business failures. Today's monetary injections have prevented the repetition of that fate. However, no amount of liquidity can save businesses with no customers because they are closed by either government mandate or consumer fear.

As we have written several times over the past few years, for the first time in history, banks entered an economic crash with enormous excess reserves. And the Fed has given them even more reserves via QE Infinity. This means banks can provide forbearance to distressed borrowers. Greater forbearance will result in far fewer distressed sales and business failures than occurred in previous downturns, causing a relative paucity of distressed opportunities.

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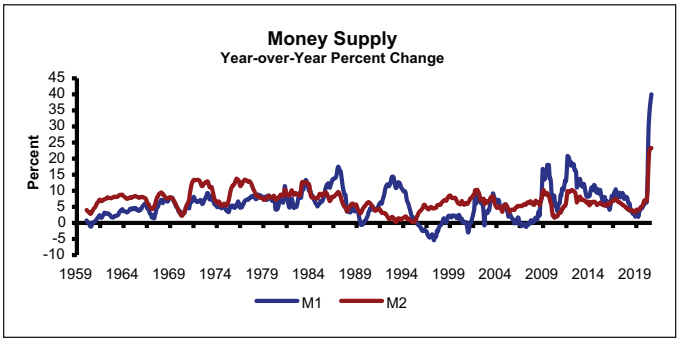

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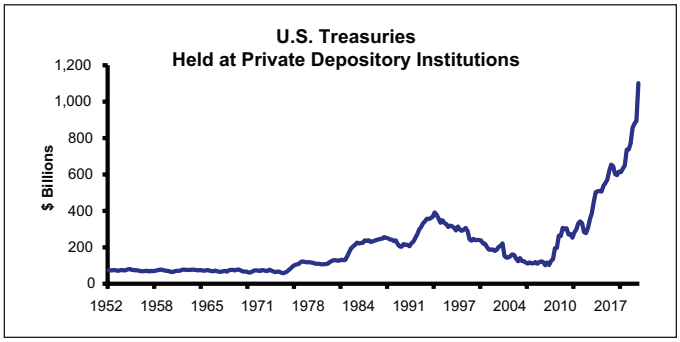

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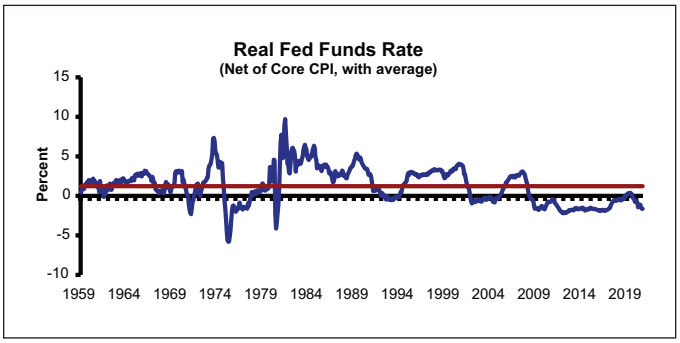

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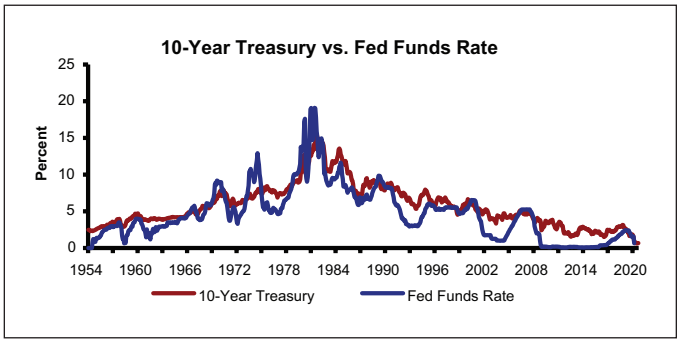

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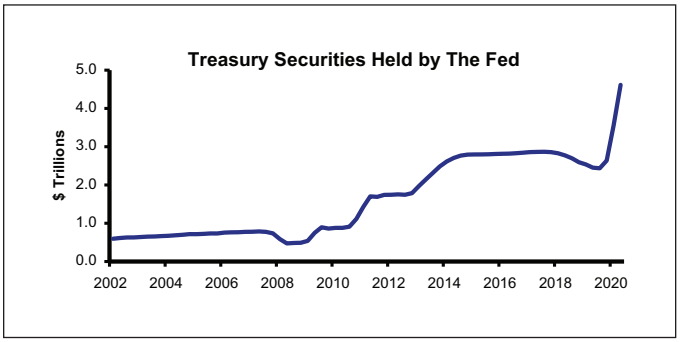


figure 158

10-Year Government Bond Yields

	Dec-06	Dec-15	Dec-16	Dec-17	Dec-18	Dec-19	Sep-20
Brazil	11.20%	6.25%	11.82%	10.28%	9.98%	6.77%	7.06%
China	3.06%	3.07%	3.09%	3.97%	3.34%	3.21%	3.14%
France	3.81%	1.00%	0.75%	0.63%	0.70%	0.00%	-0.18%
Germany	3.77%	0.67%	0.34%	0.31%	0.27%	-0.30%	-0.47%
India	7.60%	7.75%	6.41%	7.18%	7.41%	6.78%	6.04%
Ireland	3.76%	1.14%	0.89%	0.53%	0.94%	0.00%	-0.07%
Italy	4.70%	1.63%	1.88%	1.65%	2.95%	1.27%	1.06%
Japan	1.65%	0.32%	0.02%	0.05%	0.06%	-0.02%	0.03%
Poland	5.14%	2.91%	3.63%	3.25%	2.96%	1.86%	1.37%
Portugal	3.96%	2.43%	3.51%	1.78%	1.68%	0.38%	0.35%
Spain	4.04%	1.70%	1.42%	1.47%	1.40%	0.43%	0.32%
Switzerland	2.49%	-0.26%	-0.10%	-0.18%	-0.02%	-0.56%	-0.45%
U.K.	3.82%	1.86%	1.35%	1.22%	1.26%	0.79%	0.19%
U.S.	**4.54%**	**2.26%**	**2.34%**	**2.38%**	**2.90%**	**1.82%**	**0.67%**

Source: tradingeconomics.com/bonds; ft.com

figure 161

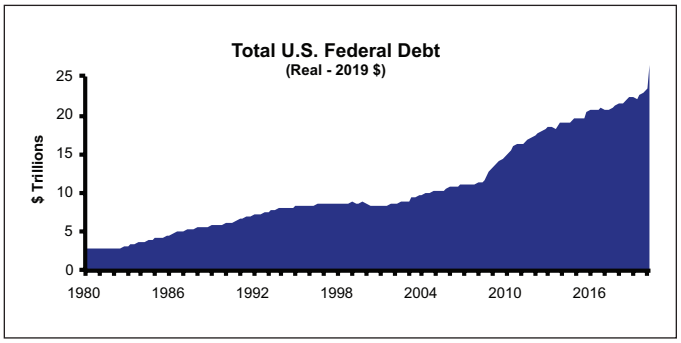
Massive excess bank reserves relative to their book of loans means banks can absorb unprecedented losses. The government is actively encouraging banks to forbear, reminding them that the Fed saved them during the Financial Crisis. Unprecedented forbearance will prevent the cascading effect of bad loans from temporarily depressing values. But while banks, life companies, Freddie, and Fannie will largely forbear, securitized debt will be structurally more challenged. Fortunately, outstanding CMBS is a relatively small share of real estate debt, but Chapter 11 will be sought by many securitized borrowers.

The Fed has pumped trillions into the banking system over the past four months and will allow banks to have lower Tier 1 capital in exchange for not paying dividends and/or executing buybacks. Despite the large amount of money the Fed is pouring into banks, there will be no inflation in the near term because the shutdown depression means there is excess supply of almost everything. For example, having a lot more money in the system does not push up hotel room rates because no one is staying in hotels. Only as economic activity returns to supply and demand balance will you start to see some upward price pressures.

In July 2020, total real monthly federal government net interest payments stood at $26.3 billion. This is just $1.2 billion (4.3%) more than federal government interest payments in August 2008, even though between September 2008 and the second quarter of 2020, an increase of nearly $14.7 trillion (125.5%) in real total federal debt held by the public occurred. Ultimately this federal government debt crowds out private debt, diverting capital from relatively productive private investments, slowing long-term growth. This has been Japan's fate for nearly 30 years. At about $20.5 trillion in the second quarter of 2020, real federal debt held by the public was 106% of GDP. The Federal debt-to-GDP ratio is the highest in U.S. history, except during World War II and its immediate aftermath, and is up from 59% a decade ago.

The U.S. government will float perhaps $8 trillion in new debt to relieve COVID-related misery. If we finance this additional debt with 30-year government bonds yielding less than 1.3%, it implies almost $100 billion in additional annual interest payments. This is a rounding error in a $21 trillion economy that historically averages real growth of 2.5% per annum and federal outlays of $4.3 trillion in 2019. If nominal GDP grows 4.5%, and the federal government takes 18% of this growth in taxes, a single year's growth will cover this additional burden – with about $75 billion to spare. In addition, $8 trillion is only about 1-1.5% of the present discounted value of U.S. GDP. This is a small amount to borrow from the future to provide relief in the presence of generational suffering.

The real question is whether this incremental $8 trillion in government debt is wisely – rather than politically - spent. In 30 years, people will be about 50-60% richer than we are today, and we are simply saying,



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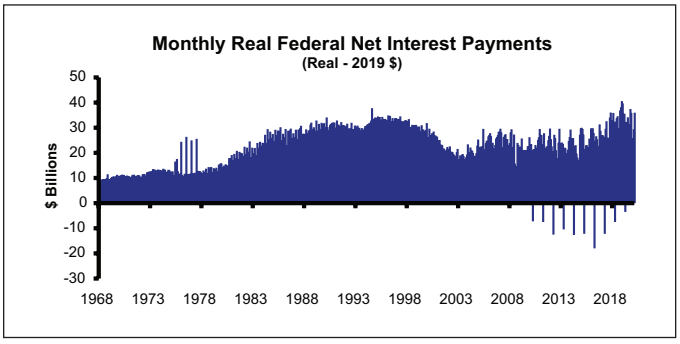

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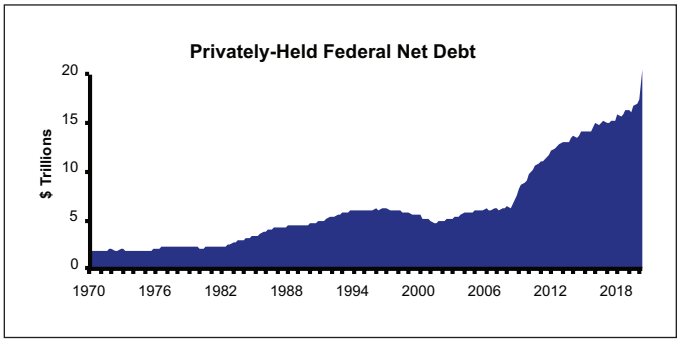
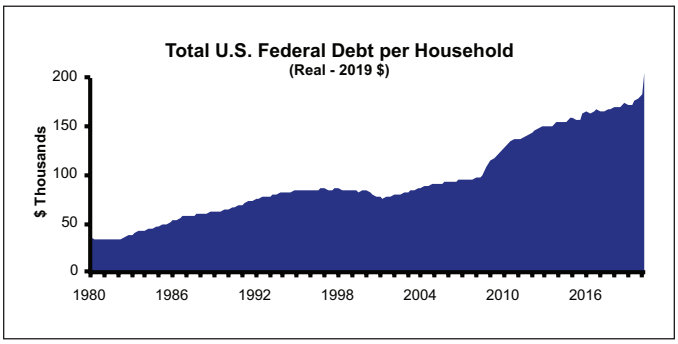


figure 164

"Dear grandchildren, to ameliorate our acute pain and suffering, we have slightly reduced your inheritance."

If this borrowing effectively ameliorates and alleviates (though imperfectly) the pain and suffering of a generation, it is worth doing. Our grandchildren will still inherit trillions on our demise. In fact, their inheritance will far exceed the government debt we hand them.

The real federal debt burden doubled from $100,200 per household in September 2008, to $204,700 in June 2020, an increase of over $104,500 (104%) per



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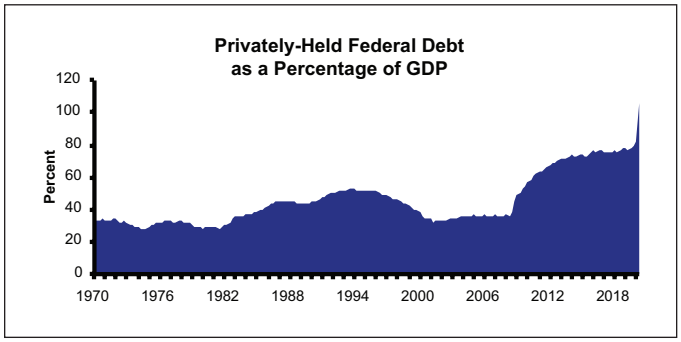

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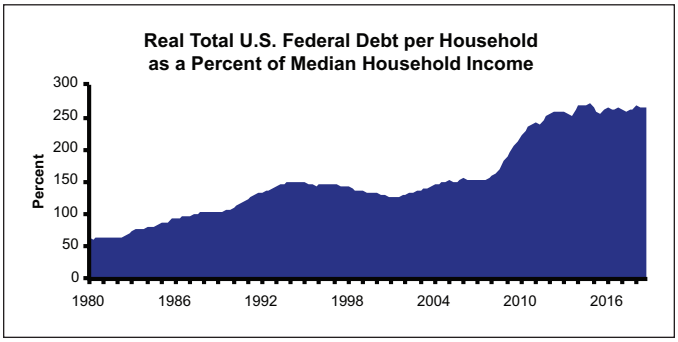

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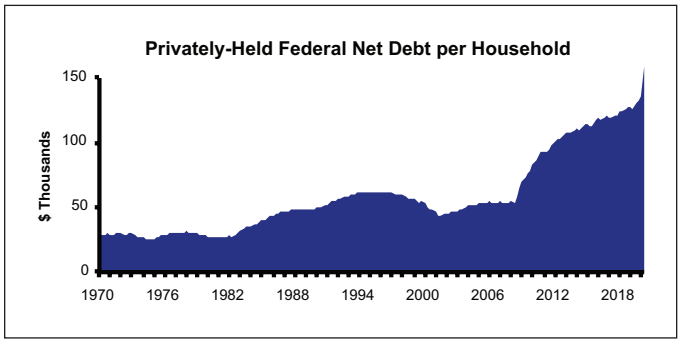

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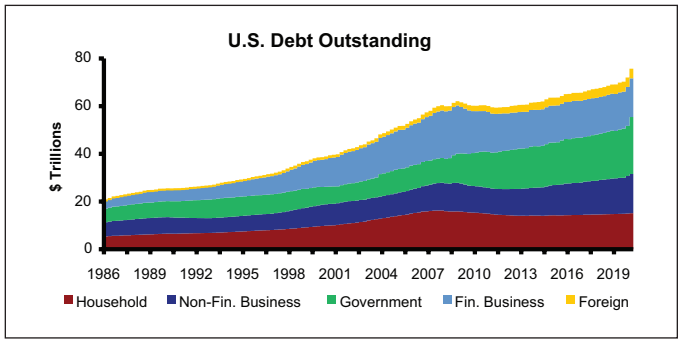

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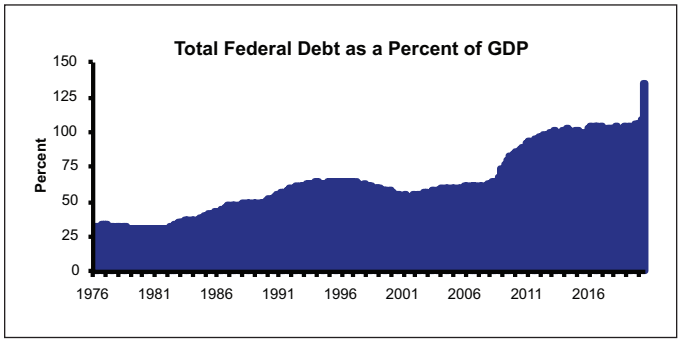

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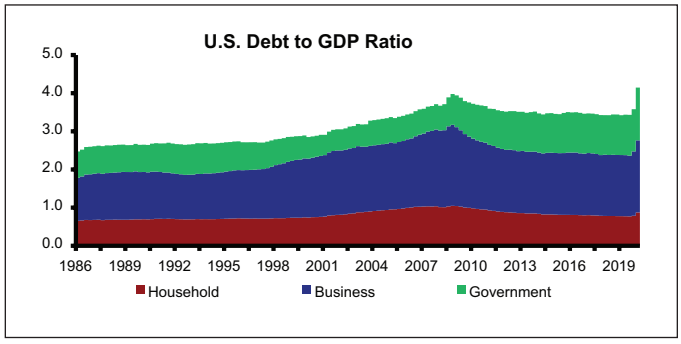

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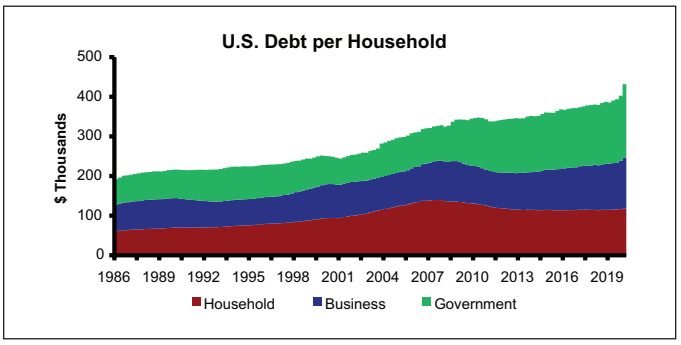

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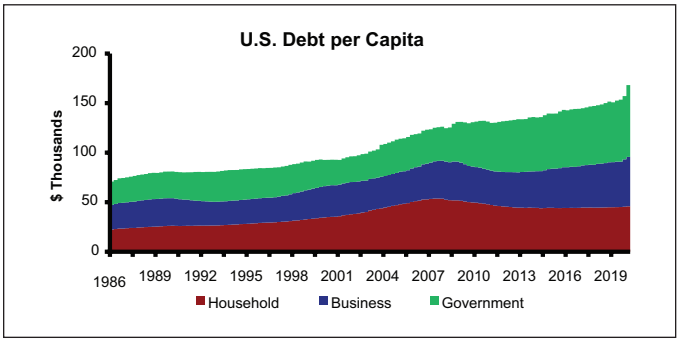


figure 173

household. As a reminder, this compares to net wealth of $936,000 per household in the second quarter of 2020. The ratio of the total debt burden per household, relative to median income, stood at 171% in the third quarter of 2008 and was 168% at year-end 2018 (latest available).

Budget Deficit. From 2008 through the first quarter of 2020, the annual federal budget deficit averaged roughly $844 billion, or 5% of GDP. In comparison, the trailing four-quarter federal deficit through the second quarter of 2020 nearly reached a staggering $3 trillion, up $2.1 trillion over of the same period in 2019. Over

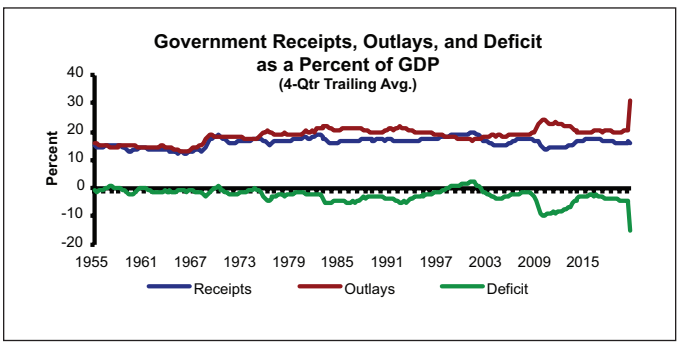
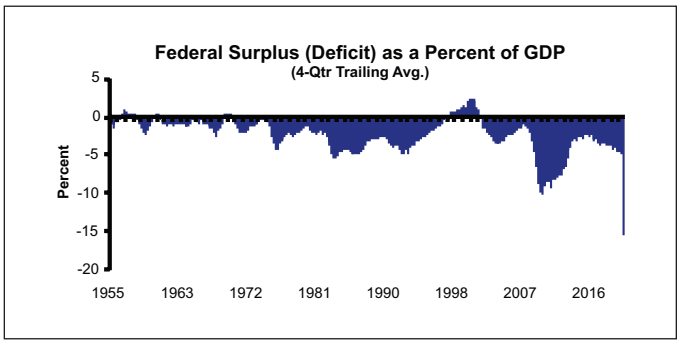


figure 174



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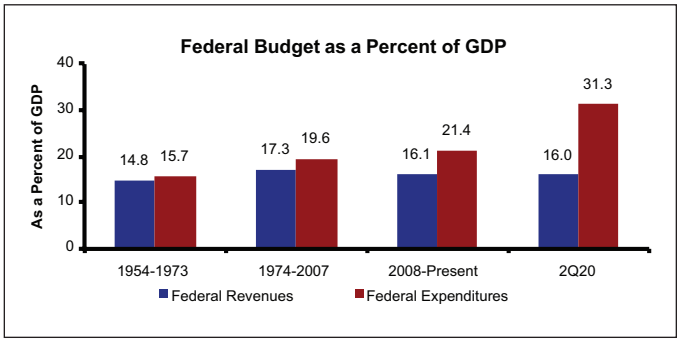

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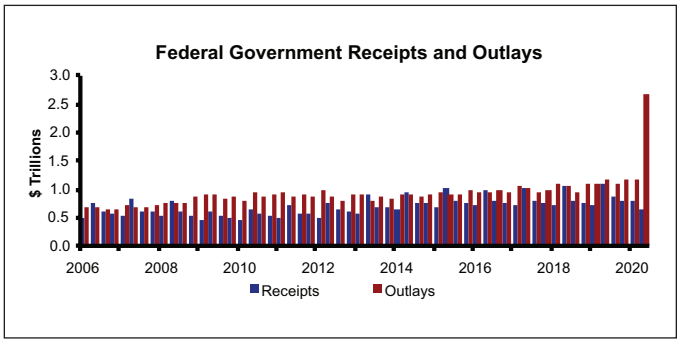

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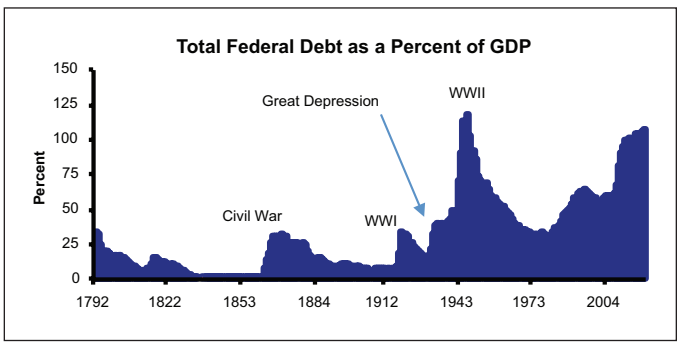


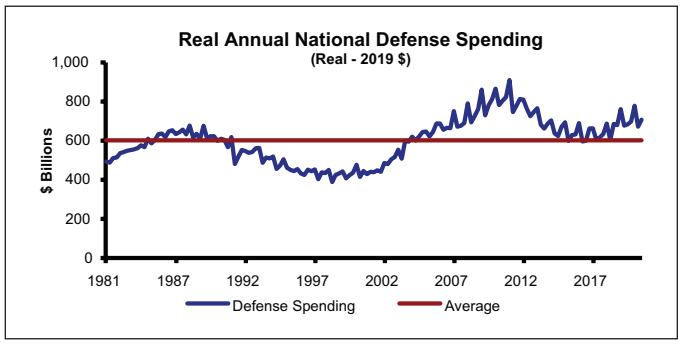
figure 178

the last year, federal revenues were 16% of GDP versus spending of 31.3% of GDP, resulting in a rolling 12-month budget deficit of 15.3% of GDP. With the shutdown, tax revenues dropped by $2 trillion in the second quarter, while outlays reached an unprecedented height. The CBO projects that the deficit will rise to $3.7 trillion in 2020.

In the second quarter of 2020, real (2019 dollars) annualized federal defense spending of approximately $707 billion was 22.3% below the 2010 peak of $910 billion and 17.5% above its historical average (since 1981) of $602 billion. Government defense spending currently accounts for approximately 3.7% of U.S. real GDP, down from 5.2% in 2010 and below its historical average (since 1982) of 4.5%. The lowest level of real quarterly annualized government defense spending over the past 30 years was $389 billion in 1998, and the lowest share of GDP was 2.9% in 2000. Defense will be an obvious place people will look to absorb some of the spending cuts necessary to cover the additional interest cost of shutdown-related federal debt. Defense spending could be reduced by the full incremental $100 billion in annual interest payments and still be above its long-term real average.

Inflation. The August 2020 year-over-year change in the consumer price index (CPI, all goods) was 1.3%, down from 1.7% the previous year. The long-term average is 2.4% since 1990 and 3.7% since 1960. Excluding food and energy prices, core CPI rose by 1.7% over the last 12 months through August 2020, versus 2.4% for both the previous 12-month period and the 30-year average. The year-over-year increase in service prices through August 2020 was 2%, about 100 bps and 250 bps below the 30-year and 60-year averages, respectively. A lot of money has been created in 2020, but in the near term, it will not cause inflation because the supply is essentially the same, and demand is way down. Prices will be pushed down but not quite as much as they would have otherwise. There will ultimately be somewhat higher taxes to cover the $100 billion incremental interest payments, but they will be small.

We utilize service sector inflation to provide a more robust view of inflationary pressure than PCE or CPI, as services are the dominant consumption focus for consumers. Services inflation has been steady between 2.5-3% for the past 30 years. Services represent about 85% of the economy and provide a better snapshot of



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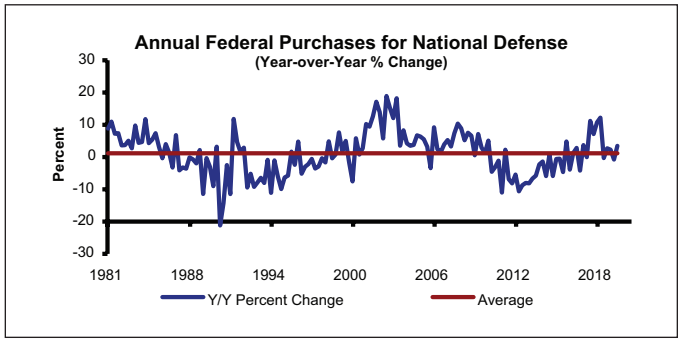

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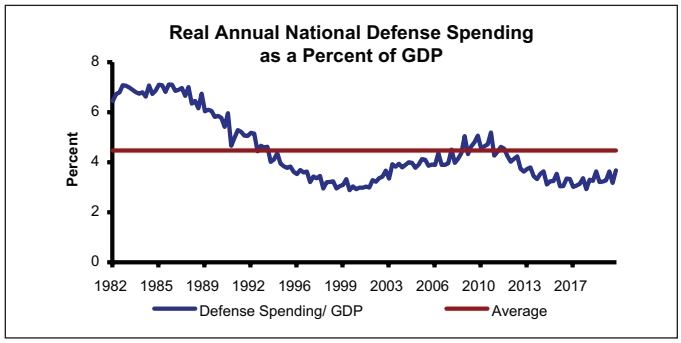

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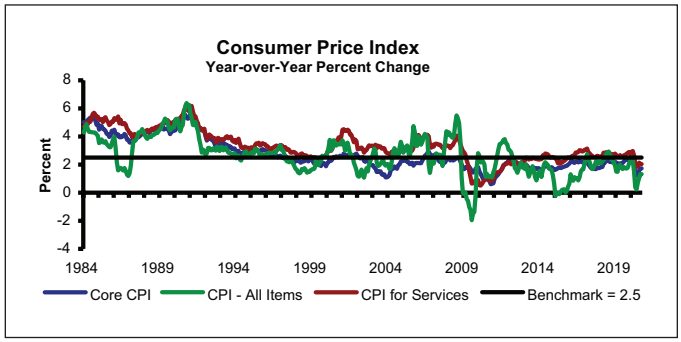


figure 182

true inflationary pressures, as they are well documented to be less prone to quality change and product substitution biases than are goods.

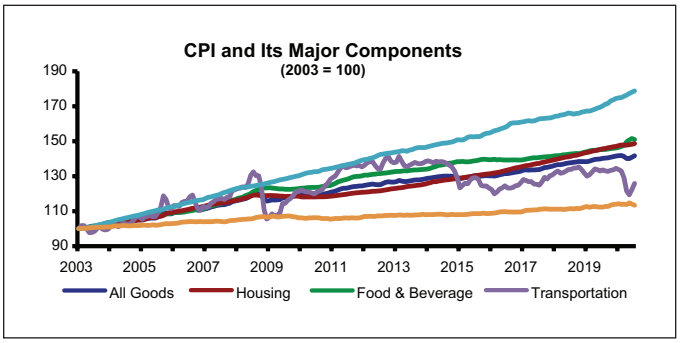
At -0.42% in mid-September 2020, the yield on long-term Treasury Inflation-Protected Securities (TIPS) was down by 141 bps versus 0.99% from a year earlier and remains 300-350 bps too low.

Retail Sales. Locate AI tracks daily retail traffic relative to the benchmark period of February 1-23 (i.e., before the shutdown). This index shows increasing declines in retail traffic throughout June, lessening in July and on a butterfly flight pattern upward in August. The recovery will go up, down, sideways, backwards, and occasionally will stop, but it will eventually get to the top. We are living through the Butterfly Recovery.

Real monthly retail sales (2019 dollars) plunged to $382 billion in April 2020 but made a come-back in June-August, reaching about $475 billion per month. This is now 3.7% above the pre-COVID-19 peak of $458.4 billion seen in January 2020 and 26% above the long-term average of $377.1 billion per month. As a result of the gradual reopening of stores and restaurants, real retail sales are now 0.2 standard deviations above the 40-year trend.

Real monthly retail sales excluding autos similarly bottomed in April 2020 at $314 billion but rebounded to $367 billion in August, 2.9% above the March 2020 high. The decline in July shows that online retail is not a robust replacement for brick sales. If that were the case, total retail sales would have been little impacted by the shutdown, as all sales would have effortlessly shifted online. The 16% and 12% shutdown declines in total and non-auto retail sales, respectively, show that this was not the case.

In the second quarter of 2020, real quarterly total retail sales stood at over $1.3 trillion, of which e-commerce accounted for $211 billion, or an all-time high of 16.1% of the total. This share stood at 10.8% and 9.8% one and two years earlier, respectively. The remaining 83.9% of total quarterly retail sales – or sales from brick retailers – stood at over $1.3 trillion in the second quarter of 2020. Real total quarterly "brick" sales declined by 7.8% over the last quarter and 9.8% year-over-year. This is not bad, considering many were forced to close and subsequently went out of business. In comparison, real quarterly e-commerce sales grew by a robust 33.1% and 43.9% over the quarter and year, respectively.



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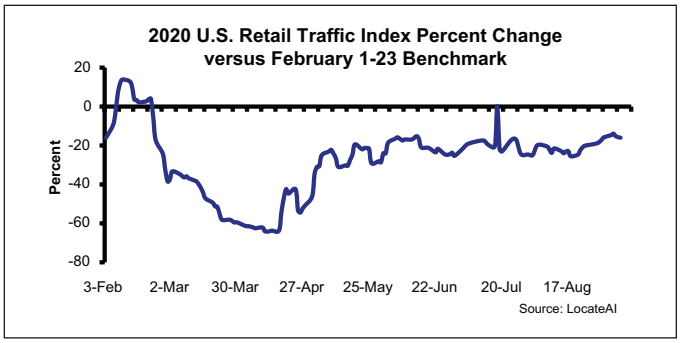

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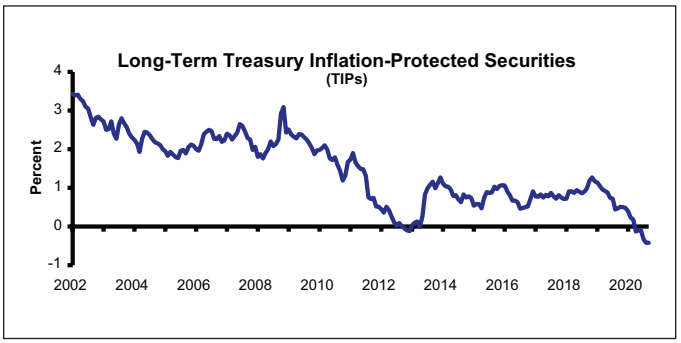

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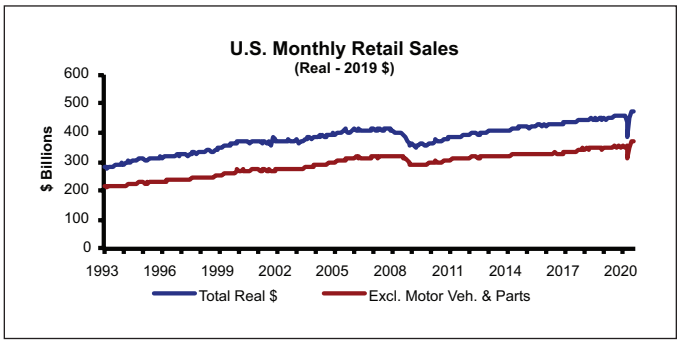

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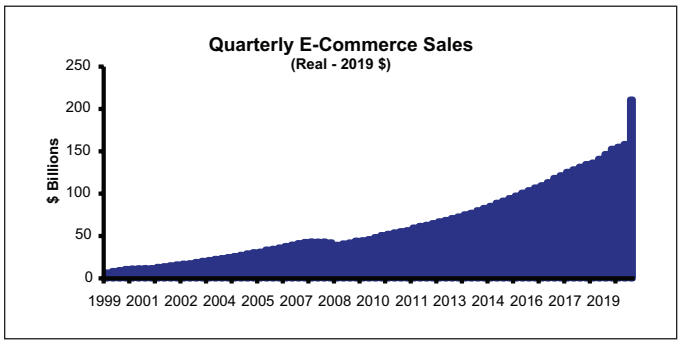

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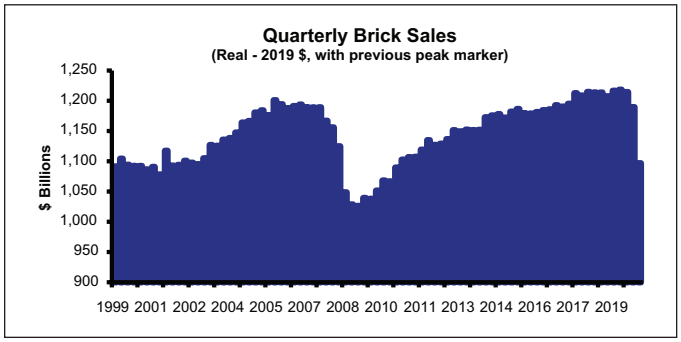
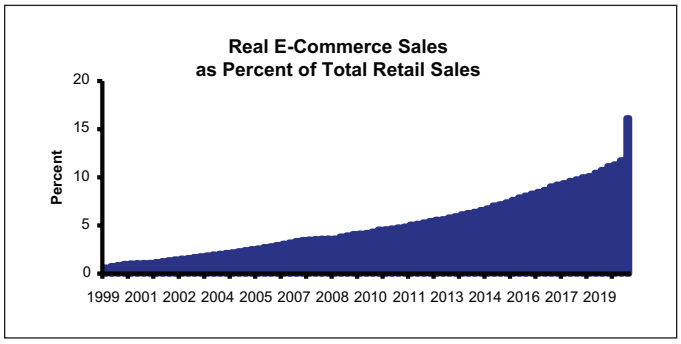


figure 188

Due to the shutdown, real monthly retail sales at clothing and shoe stores (-87.7%), furniture and home furnishing stores (-59.8%), restaurants and bars (-53.7%), electronics and appliance stores (-53.4%), sporting goods and book and music stores (-44.6%), gas stations (-38.6%), and building materials and garden supply dealers (-2.2%) all fell below their respective highs seen prior to the COVID shutdown. Grocery and liquor stores (+27.4%), warehouse stores (+15.4%), and personal care stores (+5.6%) saw real monthly sales increase between February and March 2020, as consumers engaged in mass hoarding in the days leading up to the shutdown. Sales in all three sectors subsided in April, but grocery and warehouse sales have remained above the February level. E-commerce sales never declined during the shutdown but, rather, rose by 30.4% between February and May 2020.

Through August 2020, real monthly retail sales at restaurants and bars (+18.7%), building materials and garden equipment stores (+11.6%), sporting goods and hobby stores (+10.4%), and home furnishing and furniture stores (+0.6%) were all above their respective pre-shutdown highs by the indicated percentages. Real



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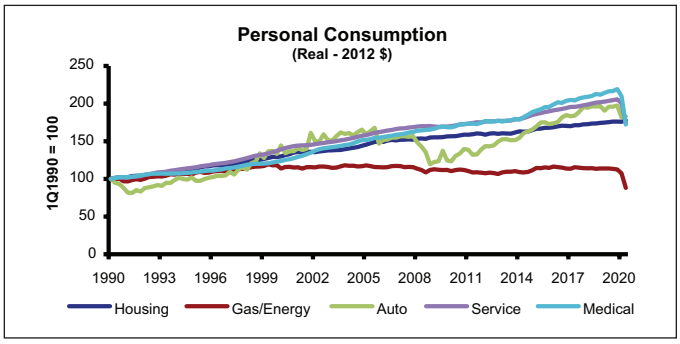

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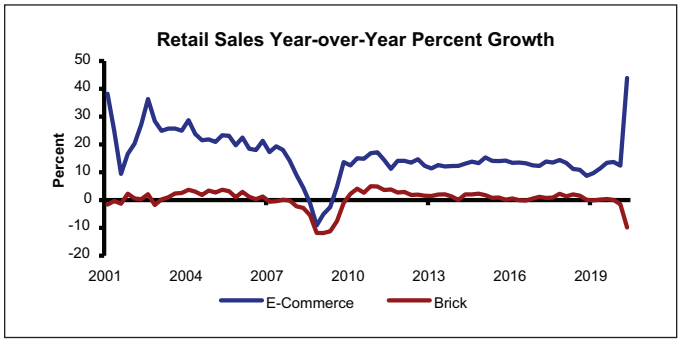

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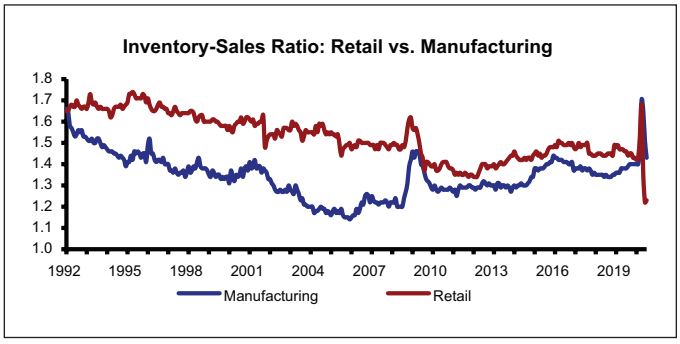

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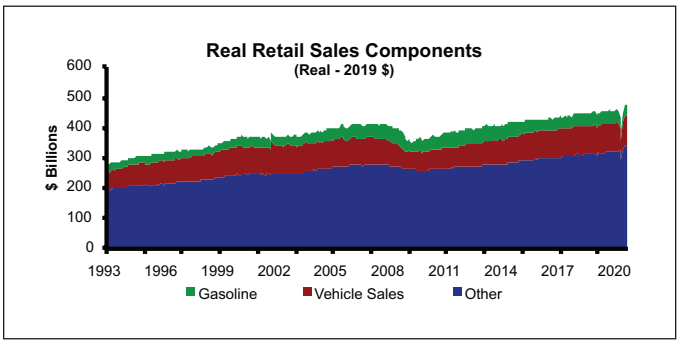

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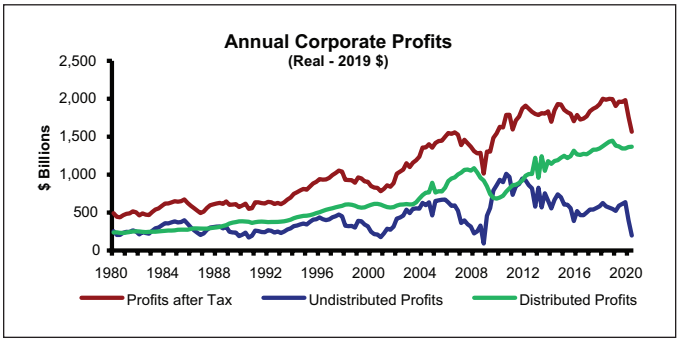

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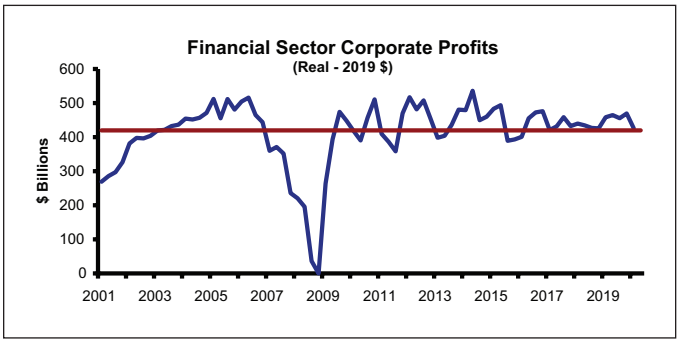

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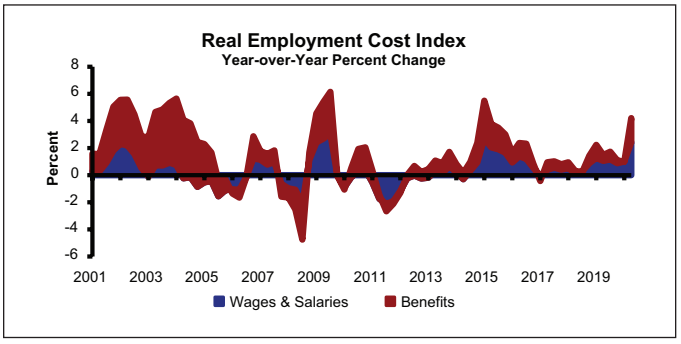


figure 196

retail sales at clothing stores continue to decline and were 28.6% below the pre-shutdown level as of July. The latest real monthly sales at grocery stores (-13.5%), health and personal care stores (-1.2%), and warehouse stores (-11%) are all below their respective hoarding-induced peaks but are above their pre-hoarding levels. Real e-commerce sales subsided modestly in July but were still 23% above the February level.

Profits. Real after-tax corporate profits are 18.7% below the 2014 peak and 20.2% below the prior year, standing below $1.6 trillion in the second quarter of 2020. After a temporary boost from reduced taxes, after-tax corporate profits have been held back by increasing uncertainty around tariffs and remain 0.8 standard deviations below trend as of the second quarter of 2020.

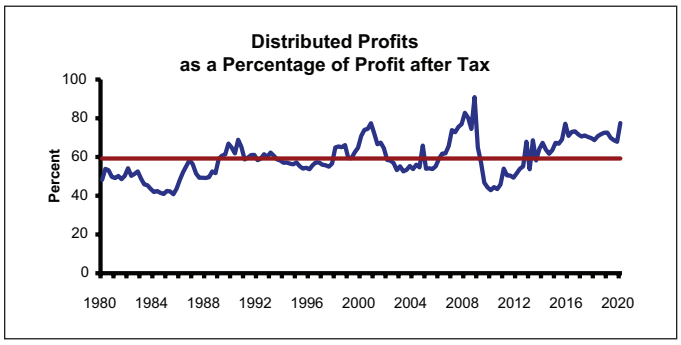
Real after-tax seasonally-adjusted annual profits as a percent of GDP previously peaked at 10.6% in 2012 but dropped to 8.1% in the second quarter of 2020. This is modestly above the long-term historical average (since 1980) of 7.6%. Profits will fall even further for the rest of the year. Undistributed profits are rapidly falling, and distributed profits are rising modestly as total profits fall.

Average profit distributions over the trailing four quarters through the second quarter of 2020 reached 75%, versus a high of 82% in 2008 and a low of 44% in 2010. The current level is 1,600 bps above the long-term average (since 1980) of 59%, but payouts will be near lows as firms deal with the fallout of the shutdown.

Industrial Production. The overall industrial production index stood at 101.4 in August 2020 and is 7.3% below where it was in February. Through August 2020, durable and non-durable industrial output were down by 7.3% and 5.4% from February, respectively.

U.S. real annualized exports dropped by $910.4 billion (36.2%) between February and June 2020 due to the shutdown. Exported goods decreased by $722.8 billion (40.3%) and exported services decreased by $208 billion (24.4%) over the same period.

The U.S. trade deficit is, by definition, equal to the U.S. capital surplus, which derives from the desire of the rest of the world to invest in U.S. assets, particularly in globally troubled times. Over the past 30 years, real foreign investment in U.S. assets has totaled roughly $17 trillion, about half of which was in U.S. government debt. These investments reduce interest costs, raise U.S. asset prices, increase asset liquidity, and create millions of jobs in the financial services sector. Our trade deficit



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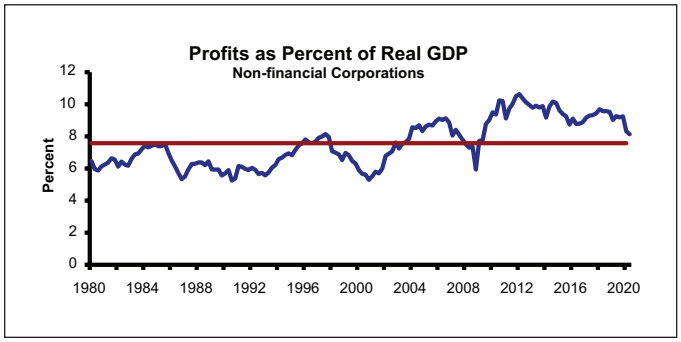

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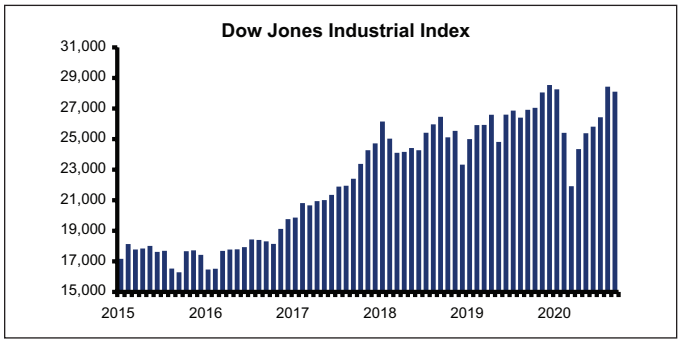

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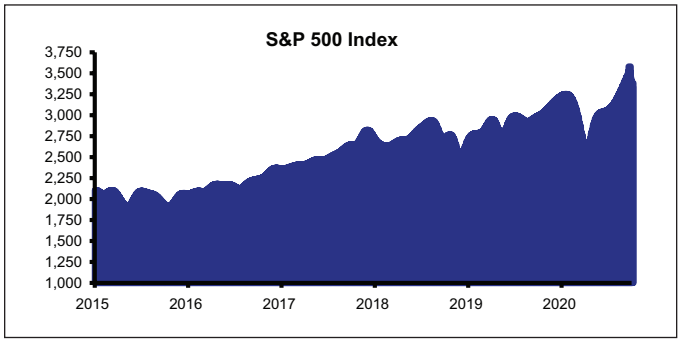

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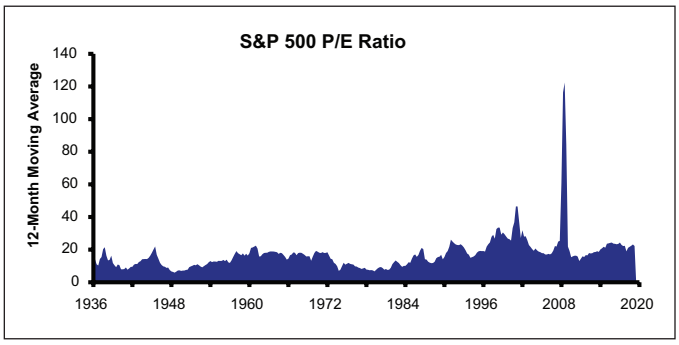

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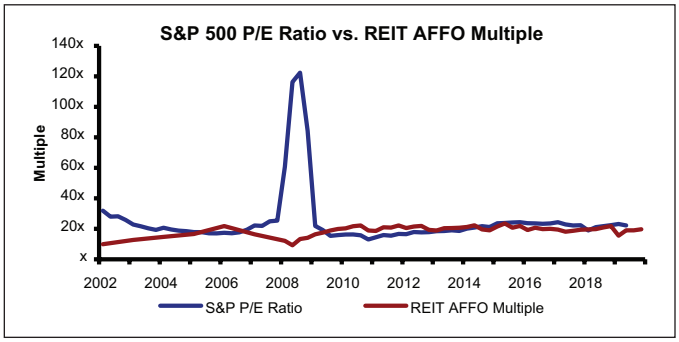

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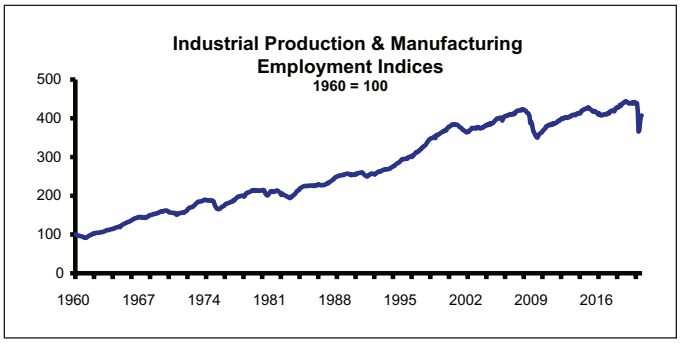

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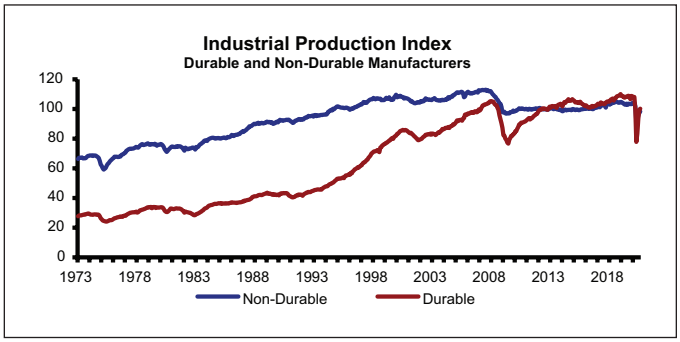

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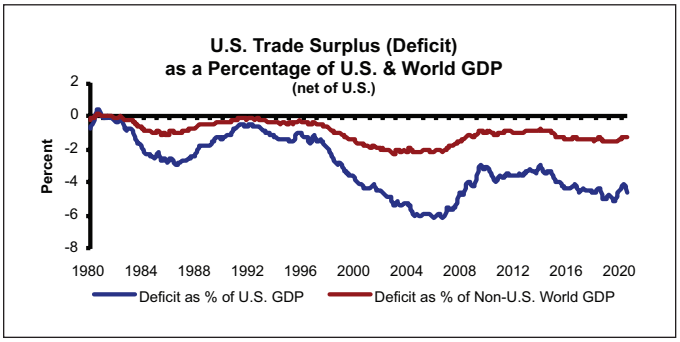

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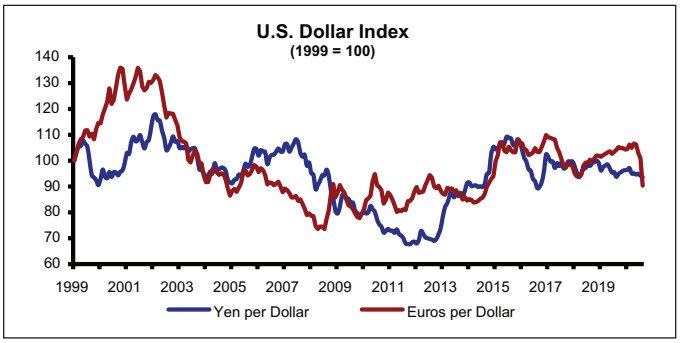

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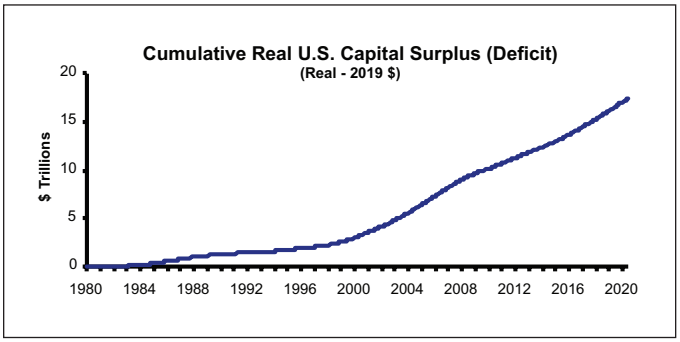


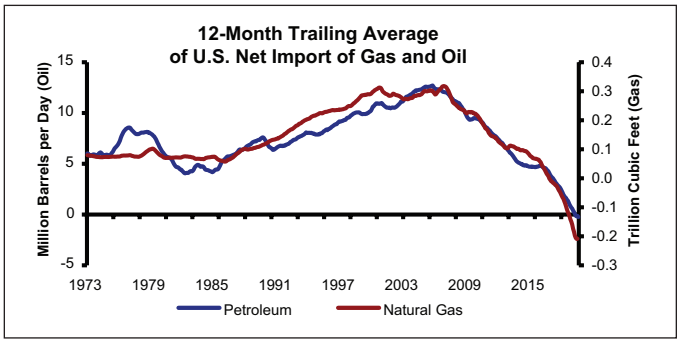
figure 208

as a percent of rest-of-world GDP is 1.25%, slightly lower over the past year. The simple fact is that non-residents desire U.S. assets in their portfolios.

In August 2020, mining sector output was 17.5% below the February 2020 level and down 17.9% year-over-year. The current level is also 11.1% below the 2014 peak. The electric and gas utility industrial production index is 0.5% higher than the previous year and 2.9% above February 2020.

In December 2019, West Texas Intermediate oil prices stood at just over $60 per barrel but fell precipitously in March and April, even recording negative pricing for a brief moment. In September 2020, it stood at about $37 per barrel, which is 21% below the $47-per-barrel historical real average (since 1901). From 1994 through the first quarter of 2009, the ratio of real crude oil prices to real natural gas prices (2019 dollars) averaged 13.5x. It peaked at 43.1x in early 2012 and was 15.6x in September 2020.

In February of 2020, the U.S. was consuming over 19.8 million barrels of petroleum products a day. By June, this had fallen to about 17.4 million barrels, a 12.2% decline. This is in line with the roughly 10% decline in real GDP. Similarly, finished motor gasoline



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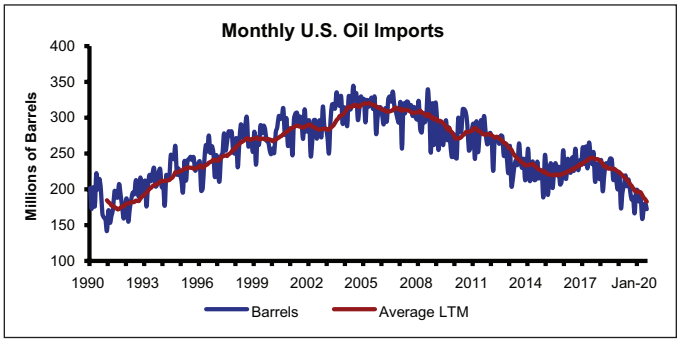
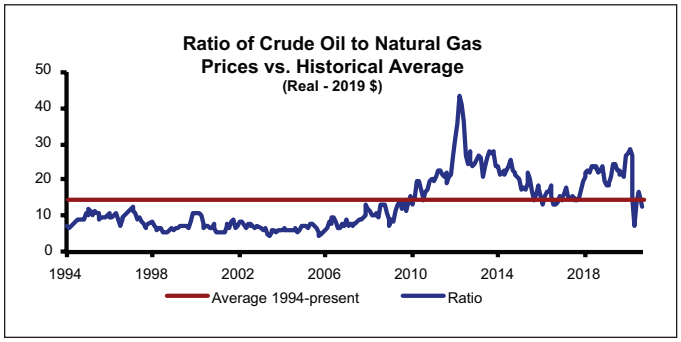


figure 210

consumption dropped from almost nine million barrels per day in February, to less than 5.9 million in April, but rebounded to about 8.3 million in June. U.S. oil production declined from nearly 12.9 million barrels per day in November 2019 to a low of 10 million in May 2020 but subsequently rose to over 11 million barrels per day in July.

Moving 12-month total auto traffic declined by 275 billion miles (8.4%) between February and June 2020. Similarly, U.S. air travel declined dramatically as illustrated by passenger volume: 2.2 million on April 14, 2019 versus just 87,534 on the same day in 2020. This rose to 441,255 U.S. air travelers on June 7, 2020 as the economy follows a butterfly trajectory.

In August 2020, computer output regained lost ground, standing 1.1% above the February level. Motor vehicle production also rose from its early shutdown low and was only 2% below the February level in August. Similarly, August 2020 output indices of fabricated metals (-10.2%), apparel (-8.9%), consumer products (-3.8%), and defense production (-3.6%) were all below respective February 2020 levels. Meanwhile, after de-



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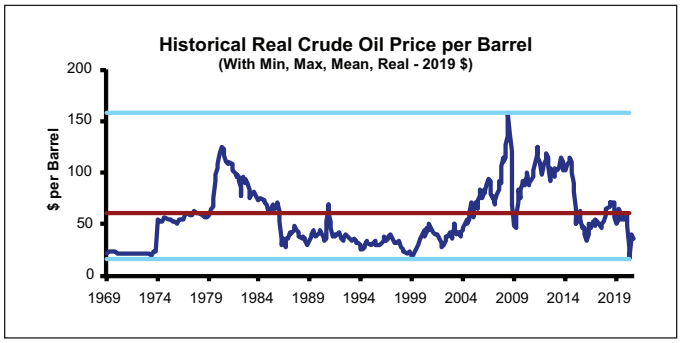

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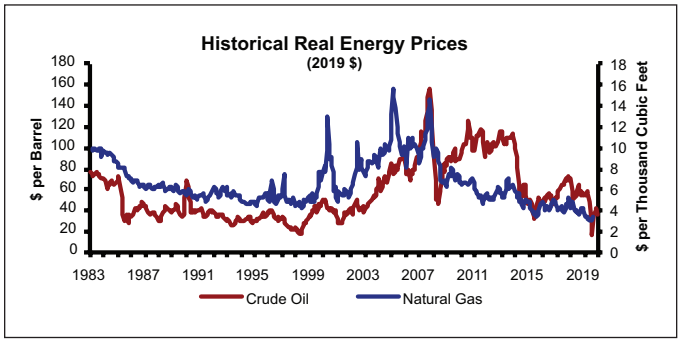

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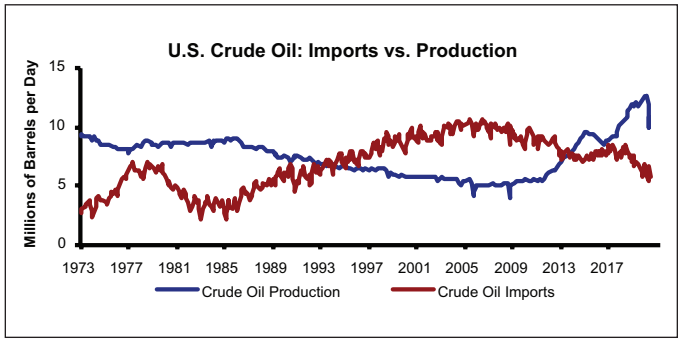

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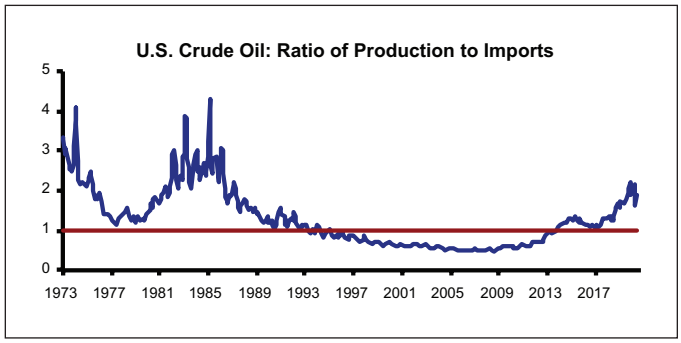

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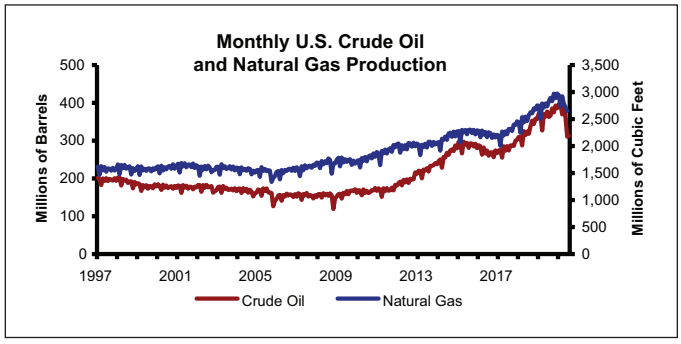

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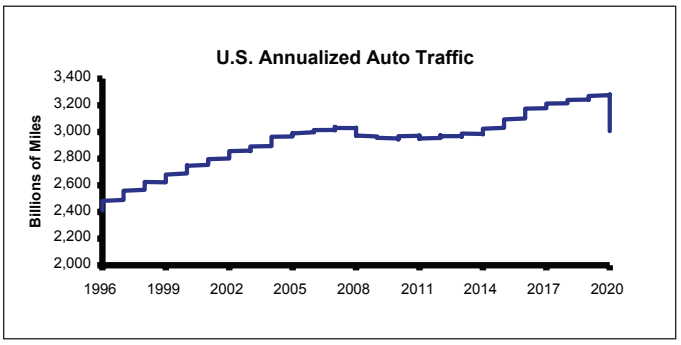

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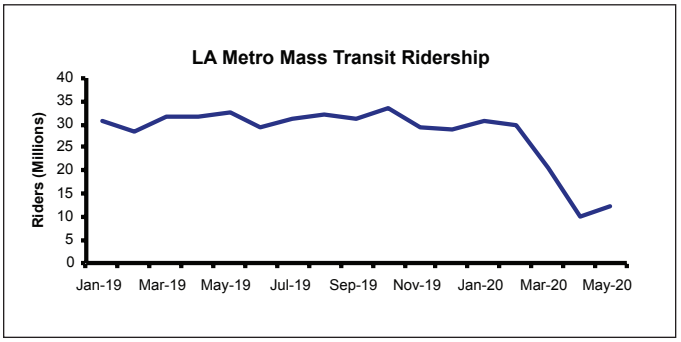

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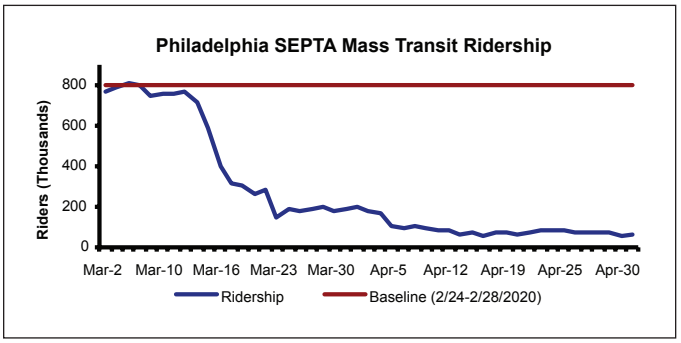

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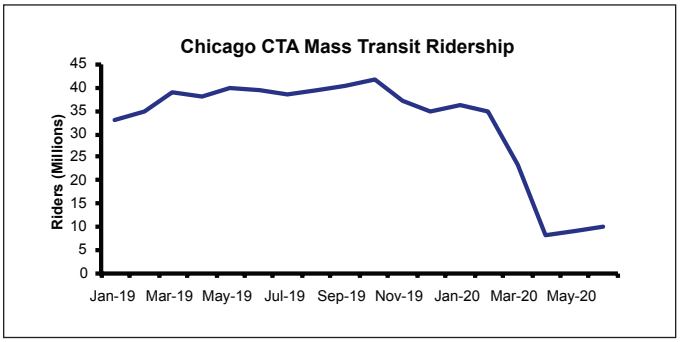

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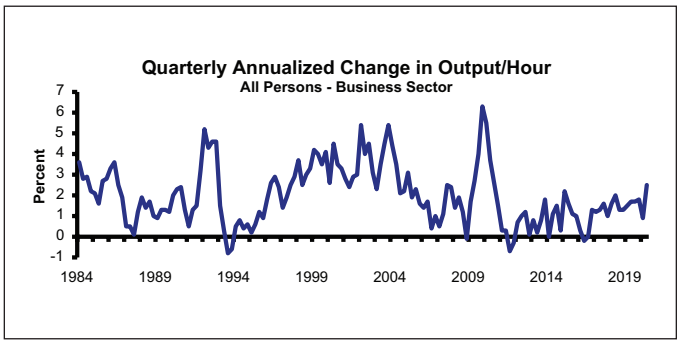

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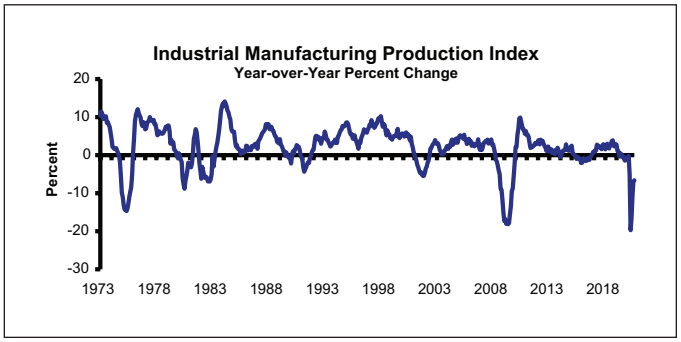

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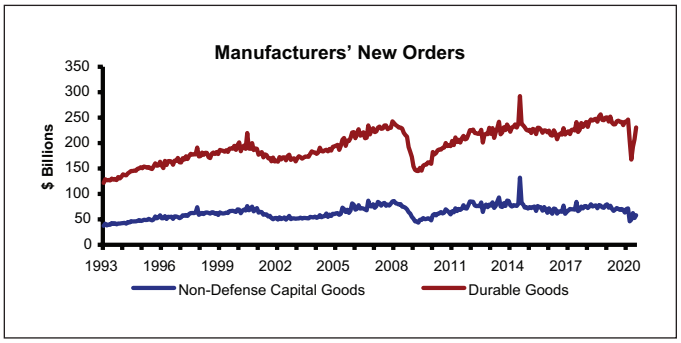

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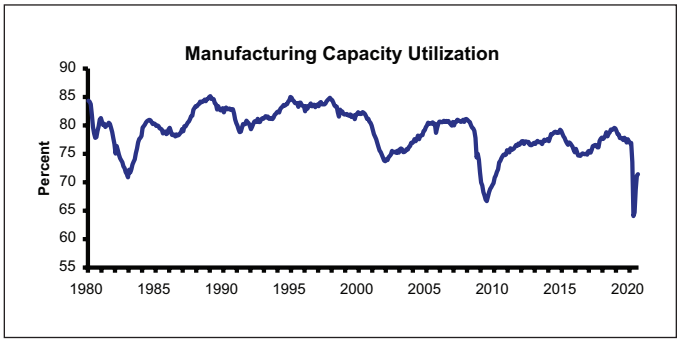


figure 224

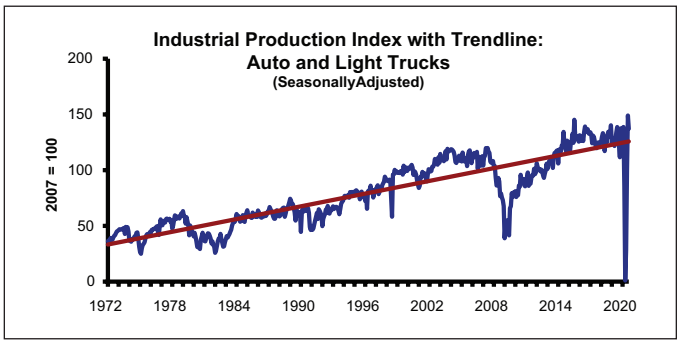
clining sharply in April 2020, manufacturing capacity utilization rose to 71.4% in August which was still 550 bps below the pre-COVID level.

Auto Sector. Real auto sales historically (1992-present) represent roughly 6.2% of real GDP, versus today's 6.7% share. This is up from the 3.7% historical low seen in April. As of July 2020, U.S. auto and light truck sales stood at 1.3 million vehicles per month or nearly 15.2 million per year. This is down from 1.5 million per month from a year earlier and 1.4 million in February 2020.

After dropping to just 100,000 units in April 2020, the seasonally-adjusted annual production of automobiles and light trucks rose to 11.7 million units in July and stood at 11 million units in August. This is compared to the long-term average of 10.4 million units produced per year. Similarly, the auto and light truck production index previously peaked at an all-time high of 138.3 in February 2020, dropped to one in April, and rose to a new high of 149 in July. It stood at 137.2 in August, versus the long-term (40+ years) average of 79.5. Cumulative U.S. underproduction of autos jumped from 6.4 million in February to 8.3 million in August. This analysis is based on historical (1976-2002) average production levels of 10.6 million units per year. Further declines below the 2009 lows are coming as the shutdown Depression experiences a Butterfly Recovery.

The average age of owned cars has increased by 22.9% per annum since 2002 due to engineering improvements. At 11.8 years in 2019, it was 2.2% below its historical trend of 12.1 years. This will soar over the next 3 years as consumers defer auto purchases due to severe economic stress.

Construction. Historically, real estate was a safe asset, as rents tended to be paid even as the economy



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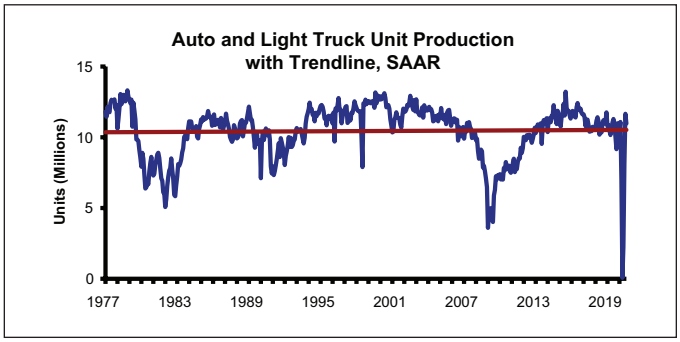

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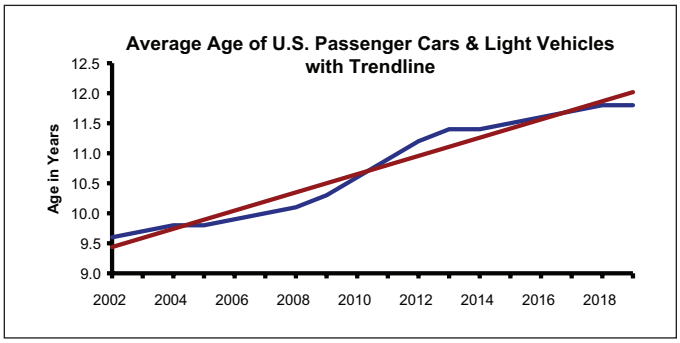

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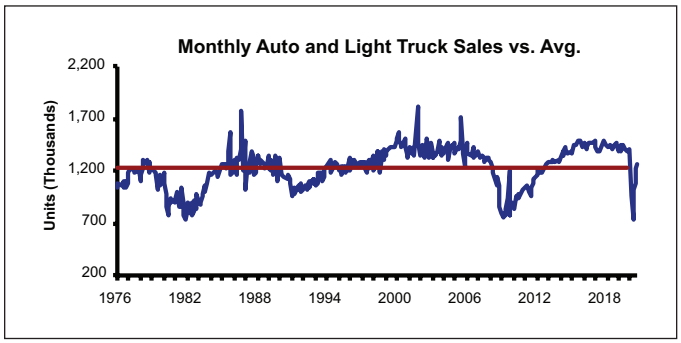

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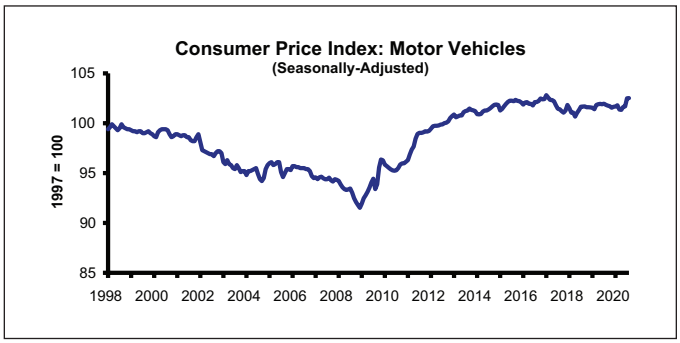
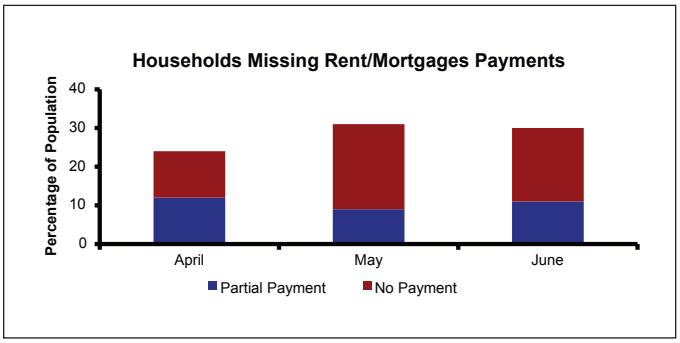


figure 229

fell. But this time, the ability to pay rent effectively disappeared for many tenants, as it is tough to pay rent without revenue. Absent revenue, tens of thousands of businesses ceased to exist, with more to come.

As to new commercial construction activity, over the next year, little will get started unless it is already fully funded (equity in and construction loan in place) or fully appropriated (for state and municipal facilities). Construction spending for the next 24 months will primarily reflect finishing projects which are already underway (almost all of which will be completed). Simply stated, there is little appetite for new development risk in the current environment, and capital will primarily focus on distressed "cash flow" investments.

Seasonally-adjusted real annual office construction is down by $7.2 billion (9.4%) year-over-year through July 2020, to $68.9 billion, and is now 32.9% above its historic norm (1993-present). Real industrial construction (including warehouse and manufacturing facilities) is down by $5.9 billion or 5.2% year-over-year, to $106.5 billion, but is still above its historic norm by 42.2%. Real retail construction decreased by $3.1 billion (8.4%) over the last 12 months through July 2020, to $33.6 billion and remains 34.2% below its norm.



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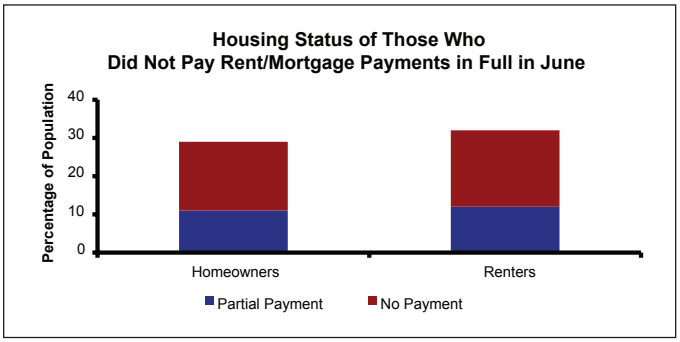

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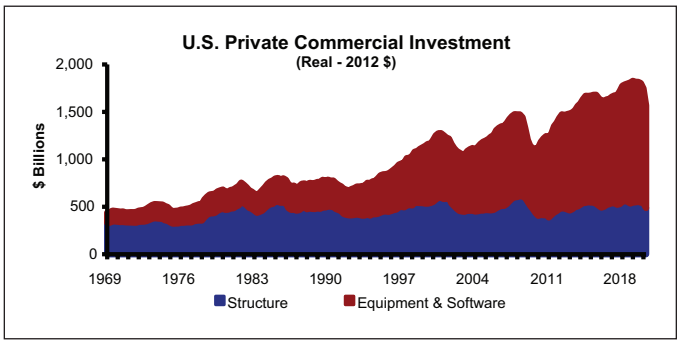

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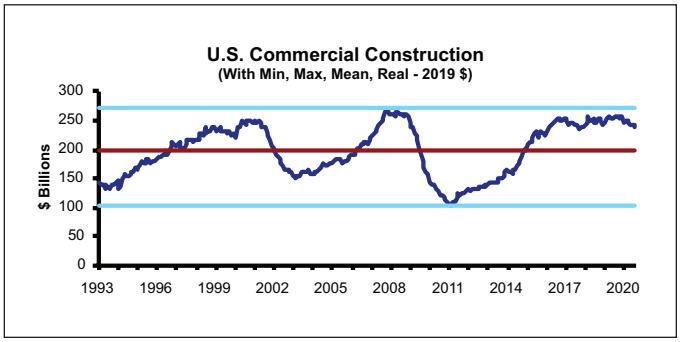

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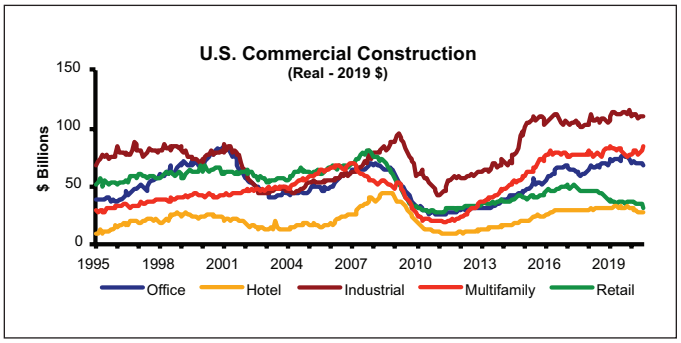

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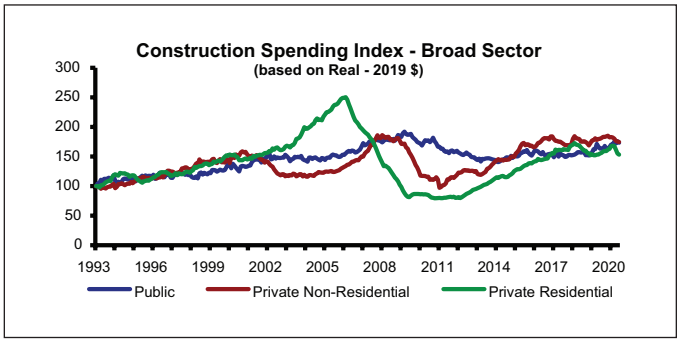


figure 235

Lodging construction activity is down by $4.7 billion (14.9%) over the same period, to $26.9 billion, but is above its historical norm by 28.7%. Real multifamily construction spending decreased by $4.4 billion (5.4%) year-over-year through July 2020, to $76.4 billion, but is now 58% above its norm. All of these will fall to record lows as the absence of construction loans and weak demand take hold over the next 24 months.

The COVID-19 Learning Curve

When we entered the shutdown, schools were among the first to close, with little time to prepare for online learning. The Center on Reinventing Public Education (CRPE) released a comprehensive examination of 477 public school districts, which revealed that the majority of public school educators received minimal educational guidance from their respective districts. Instead, almost all districts opted to leave implementation up to individual schools and teachers, almost none of which were fully prepared. The CRPE used three categories for a district's stated expectations of teachers: provide instruction to all students, track student engagement, and monitor academic progress.

About 85% of districts required teachers to post grade and subject-specific curriculum assignments and/or guidance on how to complete them online, but this did not replace actual instruction. In fact, only one-third of districts expected teachers to interact in any way with their students. That is not to say that there were no teachers in such districts who interacted with students, but without clear job expectations, the quality and consistency of interaction was highly variable (at best) or (often) absent. Many teachers likely stayed in touch with students who were easy to contact, while many students fell through the cracks.

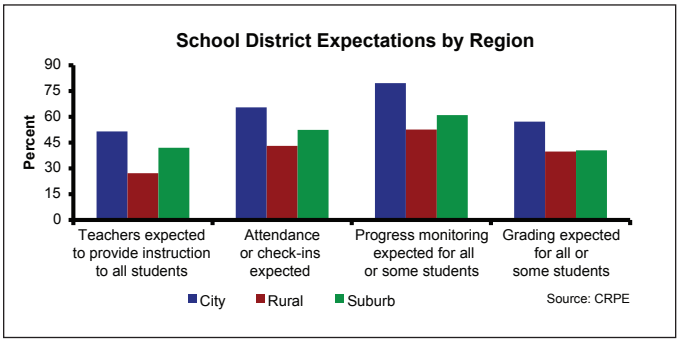


figure 236

Only 27% of public school districts required teachers to track attendance, and just 37% required one-on-one check-ins. About 50% provided clear expectations for monitoring student engagement. A stunningly low 42% of districts expected teachers to collect and grade student work and include it in their final grades, and only 52% expected teachers to monitor student progress and provide feedback (if not grades). Anecdotally, teachers state that any work that was graded was heavily curved to accommodate the unique circumstances, and that generally, students simply did not turn in ungraded assignments. It was unwise to expect students to perform and attend classes regularly, especially given inconsistent access to the internet and other technology.

These metrics provide much needed context for policymakers and educators as they assess the future. Attendance and academic progress are not meant to punish students but rather to gauge (and guide) how far ahead or behind they are of expectations. This is always essential for effective education but is especially critical during the COVID pandemic when personal contact with teachers is limited at best. Sadly, as the academic year resumes, teachers have little information on where in the curriculum to restart instruction. Many (if not most) will assume that students learned nothing during the shutdown.

The study notes the differences in district expectations between affluent versus high-poverty districts and between urban versus rural districts. Relatively affluent school districts were twice as likely to require live instruction as high-poverty districts. Rural schools performed worse than urban schools on all measures, including: the expectation of teachers to provide instruction to all students (27.2% rural, 42% suburban, 51.5% urban); attendance or check-in requirements (43.1% rural, 52.4% suburban, 65.5% urban); progress monitoring for some or all students (52.6% rural, 61% suburban, 79.6% urban); and grading expectations for all or some students (39.8% rural, 40.5% suburban, 57.2% urban). Access to the internet and other technology likely plays a major role in the varied expectations.

Students in low-income households, with disabilities, or who speak a language other than English at home most likely suffered the most from the lack of consistent standards, though it is becoming clear that all students were harmed to varying degrees. We found it disheartening that a bright 18-year-old told us

recently that he and his peers found it the best school term ever because they only did about an hour a day of school, had no tests or assignments, did not need to attend virtual class, and everyone got all A's. At the start of 2020, we thought American education could not get worse. Wrong again!

The following article by Dr. Todd E. Petzel, Chief Investment Officer of Offit Capital, was published on August 1, 2020 and is reprinted in The Linneman Letter *with permission.*

Ambiguity Aversion: One Factor in Market Corrections

The world is an uncertain place.

The world is a risky place.

To many people these two sentences may appear to be saying the same thing, but they do not. Risk is neat and tidy, like the probability of rolling a three with a single fair die. If you are told the die is not fair, but in an unknown way, uncertainty enters. Instead of a statistical 1/6 chance with the fair die, the probability of that roll with the crooked die could be anything between zero and one. Only with many experimental rolls can one begin to estimate what the true probability is.

Risk and uncertainty permeate our lives, and rarely as simple as comparing fair and unfair dice. What is the chance the total return of the S&P 500 will exceed its historical average of 9% over the next 12 months? Nobody can give you a precise probability based on pure risk. The fact that so-called experts suggest probabilities that vary all over the place is another reminder that investing is an uncertain activity.

We may be quite confident that T-bills are less risky than emerging market debt and small cap stocks, and this kind of knowledge allows us to generally shape more or less risky portfolios. Unfortunately, because of uncertainty and systemic behavioral elements discussed below, we cannot say exactly how much different assets will vary in risk. If we could, portfolio construction could be reduced to a mathematical formula. Ample evidence says it cannot.

The economic distinction between risk and uncertainty was first articulated by Frank Knight in Risk, Uncertainty and Profit in 1921. Like most economic research done before 1950, it was based on careful logic and the occasional anecdotal evidence. Only in the last few decades have tools to efficiently collect and analyze large data sets allowed us to more completely explore these theories. Behavioral economists are now starting to connect the dots between uncertainty and actual behavior. As this work progresses, we are getting a better understanding of phenomena as diverse as bank runs and shortages of toilet paper. Another logical frontier to explore is how the stock market moves.

Investors and advisors have for decades recognized that there are differences across people in their appetite for risk. Some people do not like to play gambling games or expose their wealth to much variation. They are said to be *risk averse*. Risk aversion explains a great deal of investment activity, but it appears there may be the added dimension of *ambiguity aversion*. This is the label attached to a fundamental dislike of uncertainty, no matter what the starting risk level is. Just as people vary in their tolerance of risk, there is a wide range in the population for ambiguity aversion.

Recent research tries through interviews to scale a person's ambiguity aversion and then map that measurement against how they behave at times of heightened uncertainty. As the reality of the global pandemic set in, one of the biggest changes was in a sudden and a better appreciation of how uncertain the world is. This shock provided a natural experiment testing attitudes toward ambiguity.

…ambiguity aversion…is the label attached to a fundamental dislike of uncertainty, no matter what the starting risk level is.

Not surprisingly, perhaps, people who are least comfortable with uncertainty were the first to stock up on paper products and other essentials, acting to protect themselves against the chance of a shortage. If this had been a simple problem of risk and known probabilities, none of the behavior by the panic shoppers would have mattered at a higher level. The analogy here is that every person gambling at a roulette table could decide to bet red, but that action does not change the fundamental odds. Many people buying toilet paper at the same time does change the game.

The Appearance of Uncertainty Versus the Reality. There is no question that the world has always been an uncertain place, but beliefs about how uncertain can vary through time. Today looks particularly uncertain.

The list may start with the virus, but it includes the size and effectiveness of fiscal responses, relations with China, Russia and Iran, and the elections in November. It is easy to play "what if" games with any of these topics. It is impossible to attach any probabilities to those outcomes with much confidence.

In calmer times there is the appearance of less ambiguity, but that is largely an illusion. Any read of history finds regular surprises in weather, politics, violent conflicts, medicine, economic shocks and a host of other important factors in our daily lives. Those most averse to ambiguity react negatively whenever these reminders of uncertainty appear, but they also appear to be the most optimistic in periods of observed calm. It is this phenomenon that may help explain extreme stock market fluctuations.

A New Data Set and a Peek into the Minds of Investors. In 2017, a group of academics began collaborating with Vanguard to conduct surveys of investors, largely gauging expectations for stock market returns and GDP in the short and long run. Surveys were done every two months and the results were then matched to the actual trading at Vanguard by the respondents. Everything was scrubbed of any identifying features to preserve confidentiality of sensitive information. The idea behind the study was to identify any links between expectations and actual trading behavior through time. The work was progressing as expected for three years, but then the virus happened.

The last survey before COVID became a major concern was February 11, 2020, just eight days before the S&P top. As the market rapidly fell from that February peak, the scholars added a March survey to the regular bi-monthly rotation. They therefore had observations from pre-crisis, the teeth of the decline, and the start of the recovery. Their results offer a rare look into the ties between attitudes and trading behavior in wildly different markets.

In the February survey, there was a range of expectations capturing differences of opinion across the investors. The most optimistic investors also had the most stock exposure in their portfolios. There were numerous pessimists who held fewer stocks. None of this is surprising. By the March survey, expectations about the short run equity returns had generally fallen. As the market was rebounding in April, the February optimists did not improve their views. Many of the original pessimists, though, had started to improve their 1-year outlook as early as the March survey. Interestingly, questions about the 10-year returns to the market showed a modest increase from 6.9% per year to 7.2% after the crash.

Most academic studies are forced to stop with the survey data. These researchers could go further with the Vanguard trading data. The original optimists made the biggest cuts to their equity holdings after the market decline, apparently selling low and not participating as much in the early part of the recovery. The pessimists largely held their equity exposures intact over the three survey periods. They too had a bumpy ride, but participated in both the down and up parts of the cycle.

The researchers in the Vanguard study were not exploring ambiguity aversion per se, but it seems that as the market was approaching its peak the optimists displayed characteristics of people who underestimate possible uncertainty when times are good, but then react abruptly when extreme uncertainty reveals itself. That is, they might be among the most averse to ambiguity. The pessimists in contrast may have better anticipated the chance of a jump in apparent uncertainty. Having planned for some shock event, they were both emotionally and financially better equipped to ride through the market volatility.

Implications for Market Behavior. Just as individual investors should try to think where they are on a risk aversion scale when they shape the profile of their portfolios, the dimension of ambiguity should also be considered, There is no right or wrong answer to the questions of either risk or ambiguity aversion, but a candid appraisal should help the investor avoid mistakes caused by swings in the emotional pendulum. Ambiguity averse people should probably always have more ultimately safe assets to cushion themselves against the temptation to make big portfolio changes at volatile moments.

Warren Buffett may be simultaneously risk averse and ambiguity loving, hoping for major opportunities at times others are experiencing the greatest stress.

People with less concern for uncertainty, may still not be risk loving. Cash for them is not only a risk mitigator, but also a source of dry powder to be deployed in big market swings. Investors like Warren Buffett may be simultane-

ously risk averse and ambiguity loving, hoping for major opportunities at times others are experiencing the greatest stress.

As important as it is for individuals to know their own minds and emotions when it comes to investing, there are systemic elements to aversion ambiguity. If a few people are concerned about uncertainty, it probably does not have much market impact. Increase the fraction of the investment population averse to ambiguity and snowballs can begin to roll. A market falling 2% is barely noticed. Down 10% gets considerable attention. Stories about bear markets begin around down 20%. On each step of the down escalator more ambiguity averse people try to ease their anxiety by selling stocks to lessen the chance of even worse outcomes in the future. It is the exact same behavior that creates shortages of paper goods or runs on a bank. Ambiguity aversion, when triggered by an extreme enough event, can create systemic risk in a market.

Often when people talk about systemic risk there is a desire for a regulatory approach to control it. Realistically, there is nothing a regulated society can do to stamp out uncertainty. In fact, attempts to do so by tightly controlling interest or exchange rates have historically ended up ultimately creating more extreme and traumatic events. The best approach for investors is to have as good an assessment of their own emotional makeup as possible, build portfolios with the knowledge that uncertainty will always be with us, and try not to run with the crowd that failed to adequately plan at times of crisis.

…tightly controlling interest or exchange rates have historically ended up ultimately creating more extreme and traumatic events.

Ambiguity aversion affects many more parts of our life than just our investment behavior. As COVID-19 touches every part of the planet, businesses are discovering the challenges of securing safe, dependable supply chains. As globalization exploded in the last decades, there may have been too much attention on shaving pennies off of costs and too little about the challenges from all kinds of uncertainties. In a future Commentary, we shall explore this complicated topic and its implications for the costs of doing business.

> *"I would rather have questions that can't be answered than answers that can't be questioned."*
> ~ Richard Feynman
> (Nobel Prize Laureate in Physics)

The following piece was co-authored with Matt Larriva, CFA of FCP, a privately-held national real estate investment company.

If Interest Rates Determine Cap Rates, Where Is the Evidence?

The positive relationship between location (location, location) and value is the best-known relationship in real estate, but the relationship between interest rates and cap rates is a close second. The supposedly positive connection is reiterated by brokers (CBRE), assumed by industry groups (NAREIT), posited by education sites (Investopedia), and examined by academic journals (Briefings in Real Estate Finance). At first blush, the presumption of a positive relationship seems reasonable. After all, real estate has a bond-like component in its perpetual income stream and the discount rate should be closely related to the interest rate. When the discount rate falls, value should rise, establishing a tight relationship between interest rates and real rates. Or, if that argument does not convince you, consider that the weighted average cost of capital presumably decreases proportionally with rates. If the WACC is used as a discount rate, then it will move roughly with rates (holding all else equal) and should also create a tight connection between cap rates and interest rates. And should those two relationships fail to satisfy you, then there is always the argument that decreased borrowing costs will force funds into the market and create a demand-pull inflation on pricing. With all these pricing mechanisms at work, the positive relationship should be a foregone conclusion. But if real rates drive cap rates, then why is the empirical relationship so weak? And how could we have the same cap rates in grossly different real rate environments? For example, how did we have cap rates of 5.7% in January 2007, when the 10-year Treasury yield was at 4.7%, and cap rates 50 bps higher in July 2012 when the 10-year Treasury yield was 300 bps lower?

Background. Of course, all patterns have aberrations, and one contrary observation does not a proof make. But looking at the graph of the 10-year Treasury yield versus Green Street's major sector cap rates hardly shows a tight positive relationship (Figure 237). The same is true of real rates and all property cap rates (Figure 238).

At first blush, an R-squared of 0.68 might suggest that the relationship is adequate. But then again, that same level of correlation exists in the relationship between pool-drownings and Nicholas Cage films. And both relationships pale in comparison to the 0.95 R-square of cheese consumption and death-by-bedsheet-entanglement (Figures 239 and 240).

If Statistics 101 teaches us anything, it is that simple *correlation does not mean causation*. And if Advanced Statistics taught us anything, it was that grad school is very expensive when you are paying your own way. We also remember something about the perils of randomly correlated time series. On that note, the scatterplot of interest rates against cap rates warrants investigation (Figure 241).

This plot appears to reflect the common wisdom that interest rates move with cap rates. But when we separate the interest rate and cap rate data by time period, a very different picture emerges. Specifically, as seen in Figure 242, three very separate patterns exist over time, each with negative (rather than the expected positive) relationships between 10-year yields and cap rates. The same phenomenon exists between cap rates and real interest rates (Figures 243 and 244).

This is known in statistics as a lurking variable problem, or Simpson's paradox: a false pattern that appears when distinct relationships are comingled. Specifically, the time period of the observation tells us much more about cap rates than does than the interest

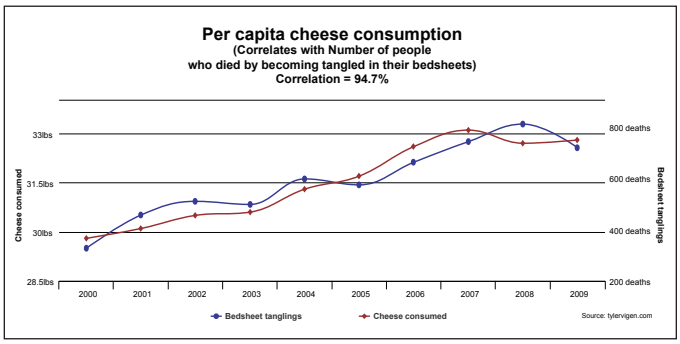
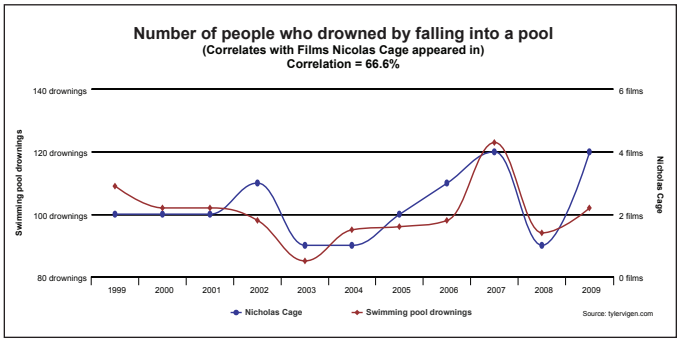


figure 239



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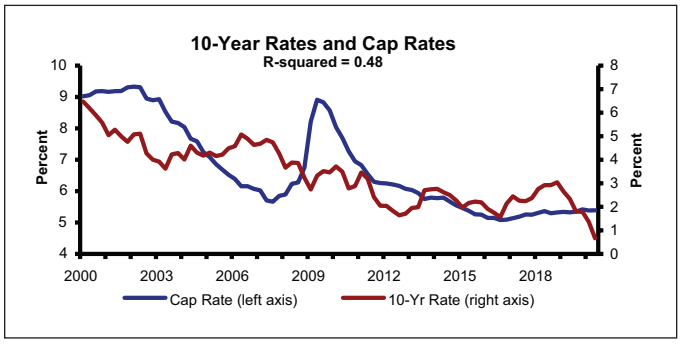

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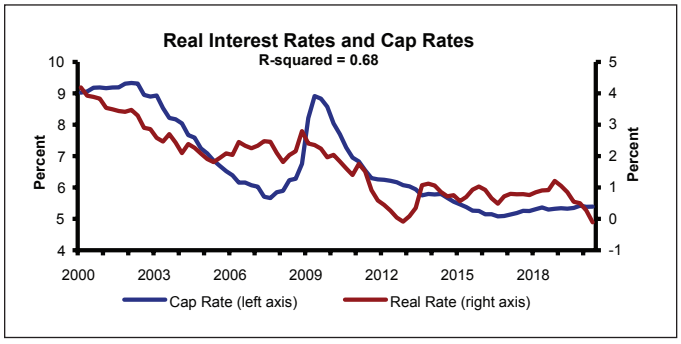

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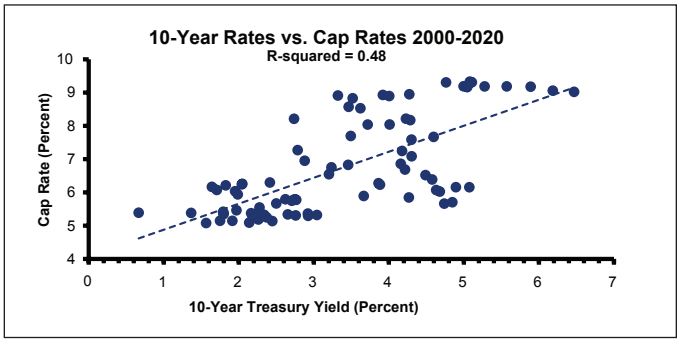

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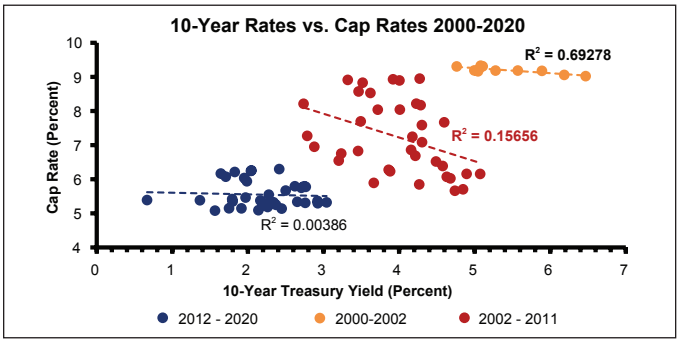

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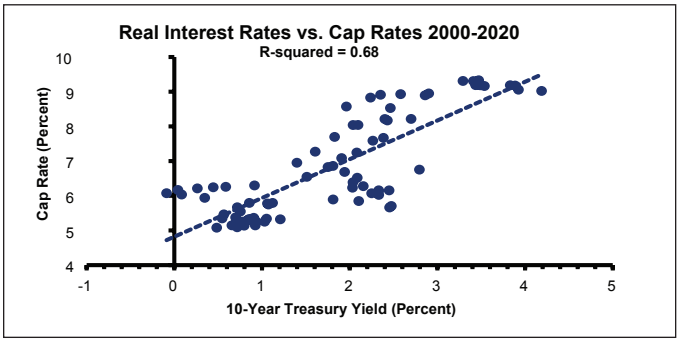

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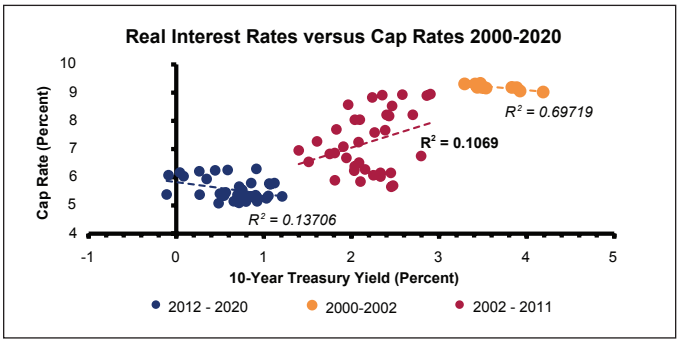

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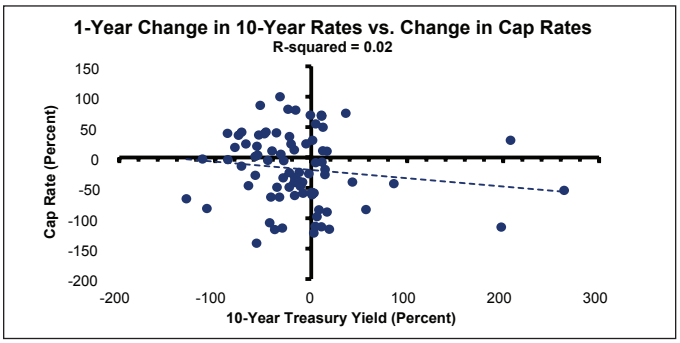


figure 245

rate. That is, one can estimate the cap rate with a much higher accuracy by simply knowing what time period one was trying to estimate. Knowing what the cap rate was in 2000, one could estimate with near-perfect accuracy what the cap rate would be in 2002 without knowledge of the 10-year Treasury yield. In fact, we find that both nominal and real rates, versus cap rates, show spurious patterns over time.

Statistically, one can often obviate the problems of spurious correlations by looking at the *changes* in the values, instead of the values. This exercise, with its 0.02 R-squared (Figure 245), reveals that cap rates are not driven by either real or nominal interest rates. Something else is determining cap rates.

A stronger relationship. If not interest rates, what determines cap rates? To be sure, the inability of real rates to explain cap rates has been explored by a number of researchers over the past decade. Some authors find that the relationship between interest rates is weak but noteworthy; others cite interest rates as important only in certain circumstances. In this search for a more comprehensive understanding of the factors that drive cap rates, Linneman (2015), and Chervachidze & Wheaton (2013) independently arrive at a similar metric: the flow of funds into commercial real estate.

Linneman's thought experiment is helpful: if you knew for certain that three times as much capital was competing for the same real estate a year from now, what would happen to real estate values? His answer is that they would be roughly three times higher, irrespective of interest rates. Linneman then finds that the flow of commercial mortgage funds has by far the greatest empirical impact on cap rates. His statistical analysis uses the 10-year Treasury yield, outstanding multifamily and commercial mortgages as a percent of GDP, and the unemployment rate as potential explanatory variables. With these, he established a model that tightly forecasted cap rates for a variety of property types and allowed him to make the prescient statement in 2015:

"…our bet is on the flood of liquidity, which could easily increase by more than 25%, keeping cap rates low even as other fundamentals exert upward pressure. So worrying about interest rates increasing appears not to be worth the effort. Instead, take advantage of the era of abnormally low rates by locking in debt financing for as long as possible, and watch the flow of mortgage funds as the key driver of changing cap rates."

In today's environment, where both real rates and nominal interest rates are uniquely low for as far as one can see, this result warrants revisiting. The aim here is to re-examine his fund flow model for robustness and ask if fund flows are simply another lurking variable. We utilize more cutting-edge statistical techniques than Linneman's original work, use better cap rate data (Green Street's transactional cap rate series for both apartments and offices) and examine how the model fares not just as a description of cap rates but also as a predictor of cap rates.

That last point is important. There is a distinction between a model which describes versus one that can predict. While we can *describe* the events of the past world conflicts—Antietam through D-Day—we struggle to forecast when and where such events will happen next. It makes the study of the events no less important, as we better understand market dynamics, but understanding World War II does not help one predict Operation Desert Storm. So too, it is possible that the fund flows explain cap rates but do not predict cap rates over the next year. We address both challenges.

Modeling Cap Rates as Functions of Different Variables. Linneman originally used the 10-year Treasury yield, the flow of mortgage funds relative to GDP, and unemployment rates to explain cap rates. We also use past values of the multifamily and office cap rates, fund flows (mortgage debt outstanding as a ratio of GDP), and U.S. unemployment rates.

This choice of variables is founded in economic theory, with cap rates determined by past cap rates, current supply and demand dynamics, and risk. We use one variable to capture each component. We regressed cap rates on earlier cap rates, the unemployment rate (to capture risk), and mortgage debt as a portion of GDP to capture the flow of funds.

To model these variables, we use a more sophisticated statistical model, which allows for multivariate time series analysis and addresses an array of knotty statistical issues.

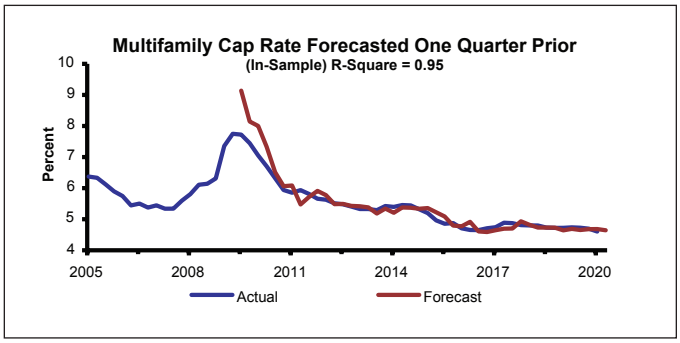
For further reading on the specifics of our model, see our technical paper. The salient point is that statistics has a test of causality called *Granger Causality* which asks, "Am I better able to forecast cap rates if I know what funds flows are?" We find the answer is clearly yes, confirming Linneman's original experiment and empirical result.

Results: Does It Work? Does the model work descriptively? We examined the efficacy in forecasting one period ahead and conclude that the model tracks cap rates quite nicely and with very low errors. Note that this is the result of building a model on all the data available (2005-2020) and then using that model to forecast the series. While our study focused on the multifamily and office sectors, we believe (consistent with Linneman's original work) this analysis extends to other sectors.

The fit is excellent, though the model indicates a bigger jump in cap rates during the Financial Crisis than actually occurred. This is most likely because "extend and pretend" lender forbearance limited market discovery pricing. But also note that interest rates plunged during the Financial Crisis, while cap rates soared, contrary to the supposed positive correlation.

To explore the predictive power of our model, that is its ability to forecast cap rates for periods beyond the data, we estimated a new model at each period using only the data *prior* to that period. In this way, we test the model's predictive ability *out-of-sample*.

While the measures of fit decrease, they do so only marginally, and overall, the fit is good. This speaks to



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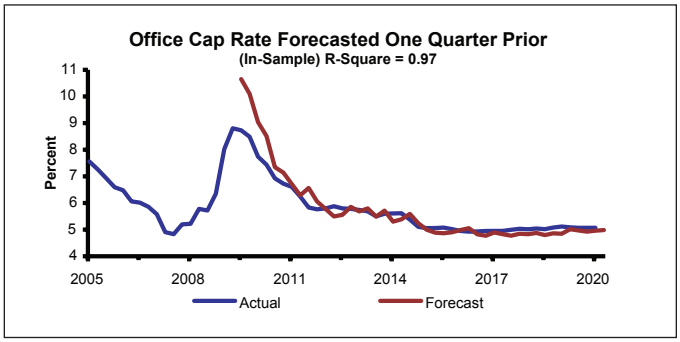

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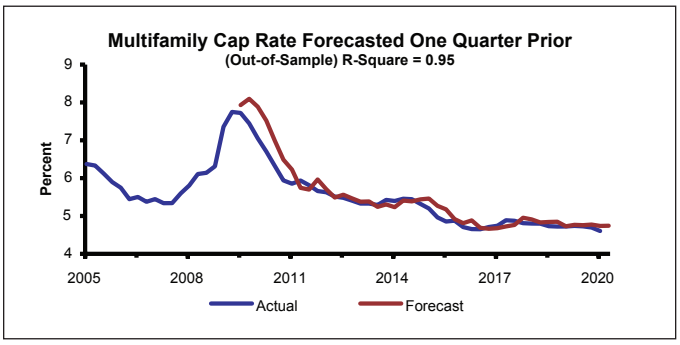

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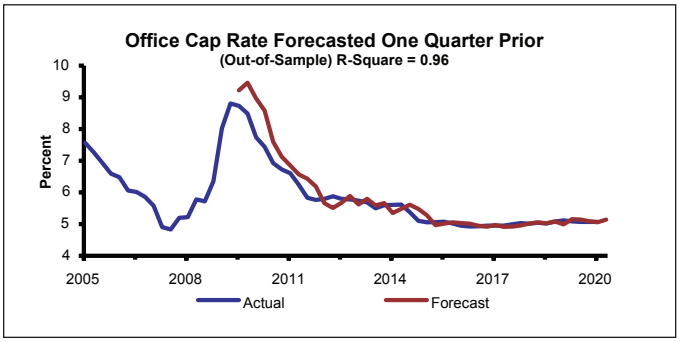

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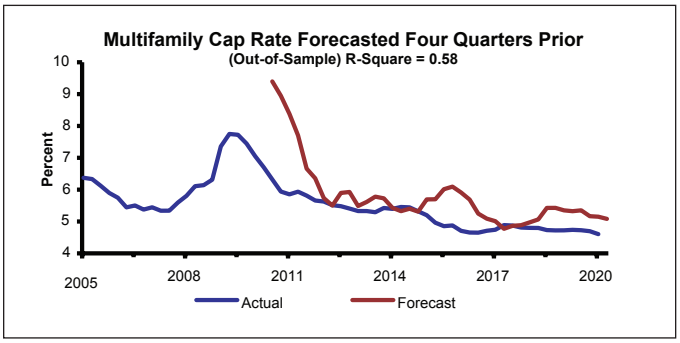

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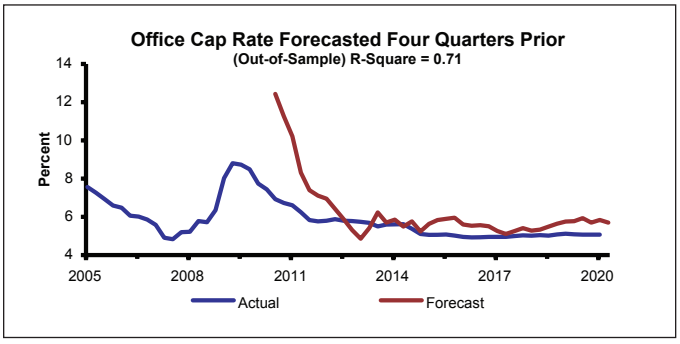

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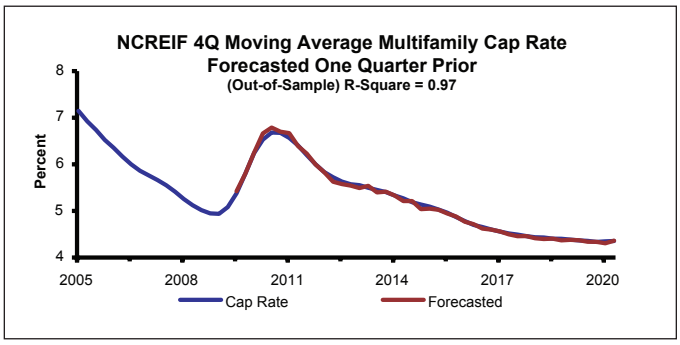

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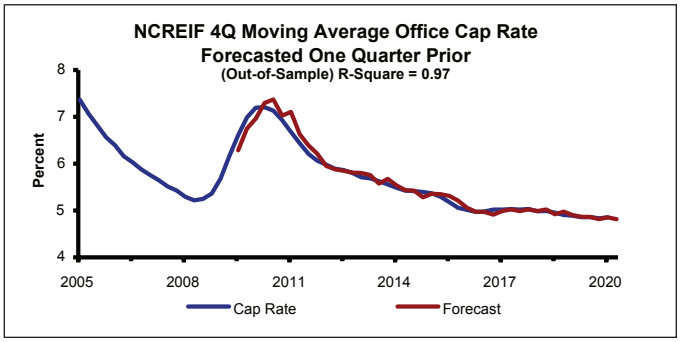


figure 253

the efficacy of the model in capturing the dynamics of cap rates.

As to the more challenging test of evaluating the model's ability to forecast cap rates one year in the future, we evaluate the four-quarter ahead cap rate forecast and find that the forecasts are highly volatile during the Financial Crisis (again due to forbearance limiting price discovery) but are less noisy and more accurate outside in other periods. It is reasonable to ask, what is the efficacy of a model that has an R-squared of 0.6-0.7? Interestingly, this R-squared is similar to that of the original real rates versus cap rates graph, on which many practitioners have relied. The difference is, our fund flow model (above) is as relatively accurate *predictively* as the real rates model is *descriptively*. Furthermore, the fund flow model is strong statistically, validated out-of-sample, and is based on variables proven to statistically cause cap rates.

How helpful is it to have a four-quarter ahead cap rate forecast? One-year cap rate forecasts can aid fund managers with optionality as to when to exit, looking for additional return in a space where the difference between top and middle quartile performance is mere percentage points. This result also helps the individual

buyers and sellers looking to purchase or sell. Such sellers have optionality as to time and would be served greatly by knowing which direction pricing would head in the next year.

It is also worth noting that the accuracy achieved above is the highest of any published research to date and is based on transactional data. Most previous works have focused on NAREIT appraisal data and have not extended past the one-quarter prediction framework.

Evaluating our model on this benchmark, we see very high R-squared values.

What Does It Mean? Empirically, the in-sample and out-of-sample forecasts are quite robust, but examining why is tantamount. So how big are the impacts we find? The model's coefficients produce the following sensitivities:

Cap Rate Response to a 100-bp increase in:	Mortgage Debt as a % of GDP	Unemployment
Multifamily Cap Rates	-22	1
Office Cap Rates	-65	3

figure 254

We find that a change in the unemployment rate from 5% to 4% lowers cap rates by a negligible one to three basis points. Thus, even the 600-bp increase in the unemployment rated during the Financial Crisis only raised cap rates by 6-18 bps, and the inverse as unemployment fell. This is not really economically significant though it is statistically precise.

More importantly, we find that when mortgage debt grows 100 bps faster (slower) than GDP, cap rates fall (rise) by 22 and 65 basis points for multifamily and office properties respectively. If debt grows by 10%, relative to GDP, cap rates stand to compress by 220-650 bps. This is a dramatic impact.

So we clearly find that an increase in mortgage debt as a percent of GDP drives down cap rates, and an increase in unemployment slightly drives up cap rates. And this stands to reason, as these two variables provide insight to the risk side and the demand side of pricing, through unemployment and mortgage debt, respectively.

In sum, we confirm Linneman's earlier finding that the connection between both multifamily and office cap rates and interest rates is weak, while the connection with flow of funds is the powerful driving force. Given that, we encourage investors to look to the flow of mortgages relative to GDP (specifically its change) as an indication of where cap rates should go in the near term and perhaps the longer term.

Our model finds that a spike in unemployment is very weakly negative for real estate valuation in the short term, but in the longer-term, the view on rates has not changed, as the flow of funds itself has been stable the past five years, with all real estate mortgage debt at 75% of GDP.

As monetary infusions spike, rates dive, and equity valuations move upwards, there is value to having a model which suggests a single variable of focus. As of 1Q 2020 there is an increase in the amount of mortgage debt as a percent of GDP. Granted, this is in large part due to the compression of GDP rather than the expansion of mortgage debt, but the model as stated accounts for this. And while unemployment is certainly wide of normal, the net impacts of these factors suggests stable-to-decreasing cap rates for the near-term.

Over the next year, we expect multifamily cap rates to drop 10 basis points while the office sector drops 20 basis points. There are, of course, ways that this dynamic can be muted. Two that come to mind are surprise inflation and cloudy price discovery via forbearance. The former may cause an exodus from real estate into higher-yielding asset types, while the latter may unhinge pricing from supply and demand dynamics. In all cases, we stand with George Box, who said, "All models are approximations. Assumptions, whether implied or clearly stated, are never exactly true. All models are wrong, but some models are useful. So the question you need to ask is not 'Is the model true?' (it never is) but 'Is the model good enough for this particular application?'" As interest rates approach zero, we submit the funds flow metric as a *useful* model in the current application.

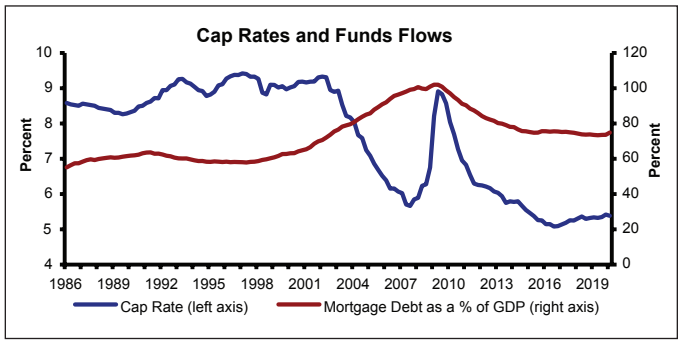


figure 255

Real Estate Capital Markets

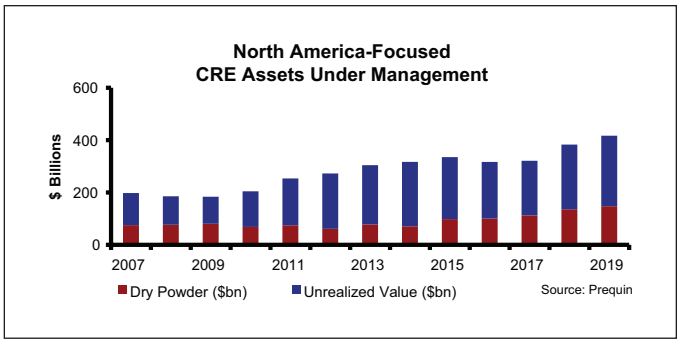
Today's very low interest rates make the sale and paying off of commercial and multifamily loans uneconomic. Most fixed-rate loans are not pre-payable without a penalty, and the lower the interest rate, the higher the penalty. Thus, most will opt not to sell. However, since you can avoid this penalty by selling the property subject to debt assumption by the buyer, we expect such sales to become the norm.

Developments at hospitals, schools, universities, museums, municipal projects, etc. will all be put on hold due to the lack of available capital. Some not-for-profit projects will literally run out of funding as donations dry up. Universities, in particular, will see revenues plunge 10-40% this year as students (particularly full-tuition paying foreign students) do not return to campus in the fall, causing only "absolutely necessary" renovations to occur. Even hospitals, which have had a seemingly never-ending expansion and major renovation trajectory over the past 12 years will mothball most projects.

With the shutdown and COVID wiping out profits for almost every part of the economy, it is hard to find much good real estate news. The lack of demand created first by the shutdown and then by fear of COVID means that we now have more space than demand. And the lack of capital means that the capacity to fund new properties and major renovations will have little supply-side push.

As the Butterfly Recovery occurs, it seems prudent for most investors to stay patient. There are still massive medical, political, economic and social uncertainties. For example, what happens socially if Trump wins? Or loses? We repeat baseball announcer Bob Uecker's statement about how he caught Phil Niekro's fabled knuckleball: "I didn't find it so hard; I just waited until it stopped rolling and then picked it up!" Until things "stop rolling," there will be huge bid-ask spreads on pricing as owners seek pre-shutdown prices and buyers want 10-60% discounts to that pricing. Remember, it is hard to predict a butterfly's trajectory.

Because of the large excess reserves of money center banks, massive new QE activity, and the $147 billion in real estate private equity dry powder targeting North American real estate, we expect cap rates to revert once the market freeze recedes and investors to gravitate toward Core and Core-Plus strategies. But private real estate sales will be dead for months as forbearance rather than forced sales prevail. Also,



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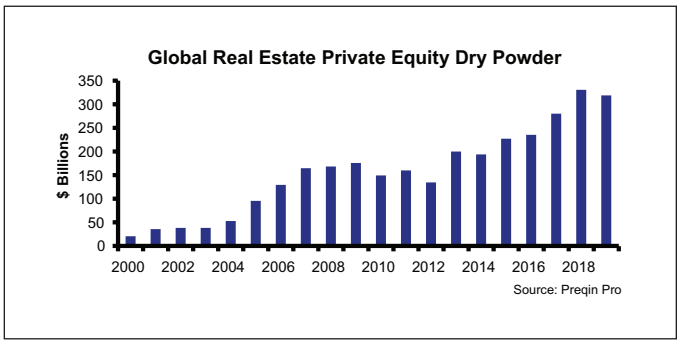

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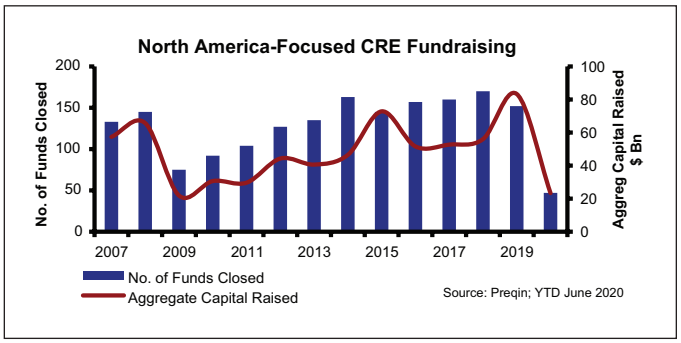

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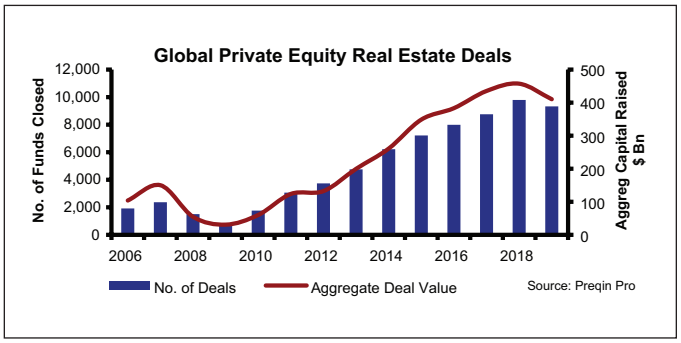


figure 259

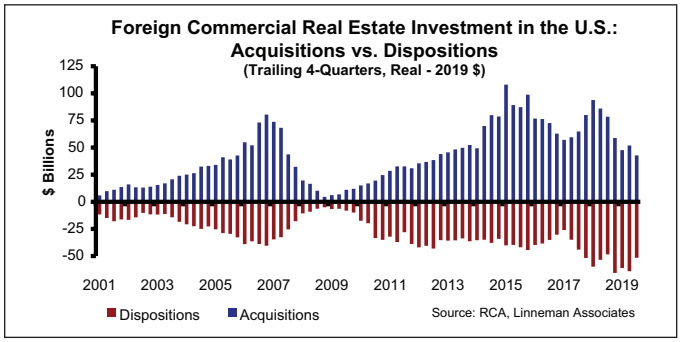
very low rates will discourage sales due to stunning prepayment penalties.

Real commercial real estate mortgage debt outstanding increased by 5.2% year-over-year through the second quarter of 2020. CMBS issuance was a net positive source of real estate capital, while life companies and government-sponsored entities (GSEs) also continued to actively lend. But new lending has largely gone on hold as lenders turn their attention to forbearance, workouts, and restructurings. CMBS loans, for which forbearance is difficult, will be the main source of forced sales in the next year.

The Linneman Real Estate Index (LREI) monitors the supply of real estate capital, as proxied by the aggregate flow of commercial real estate debt (the numerator), with the fundamental demand for space, as measured by nominal GDP (the denominator). Excluding net real estate equity flows from the numerator modestly understates capital oversupply situations and overstates an undersupplied market. The LREI captures whether debt for commercial real estate is growing more quickly or slowly than the economy. When the index is rising, mortgage debt available for commercial real estate is rising more rapidly than the economy, and when it is declining, money is tight relative to economic growth. The index is set to 100 in the base year of 1982.

We remind readers that our research indicates that this metric is the key determinant of cap rates, with a 1,000-bp increase in the LREI decreasing cap rates by 106 bps (a 15-25% value increase). In the article in this issue co-authored with Matt Larriva of FCP entitled, "If Interest Rates Determine Cap Rates, Where Is the Evidence?" our updated analysis shows that a 100-bp increase in the LREI results in a 22-bp and 65-bp decline in multifamily and office cap rates, respectively.

The LREI proxies the availability of capital to an inherently capital-intensive asset class. The LREI peaked at 170 in 2009 and bottomed at 134 in 2014 (a 21% decline) as the Financial Crisis drove substantial deleveraging of commercial real estate. Because banks subsequently resumed lending, the index had risen to 155 through first quarter of 2020. Due to the extreme contraction in GDP during the shutdown, the LREI shot up to 170 in the second quarter of 2020. It is noteworthy that the LREI was up only 2.1% in 2016, 1.4% in 2017, 0.9% in 2018, and 2.4% in 2019, indicating remarkable lender discipline existed prior to the shutdown



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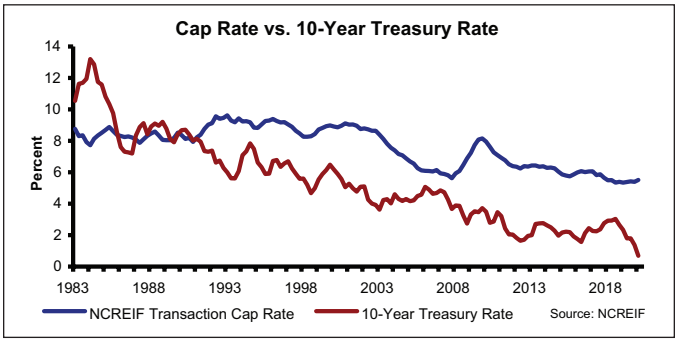

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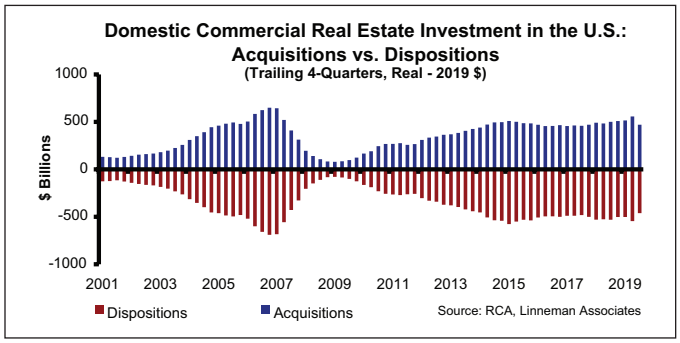

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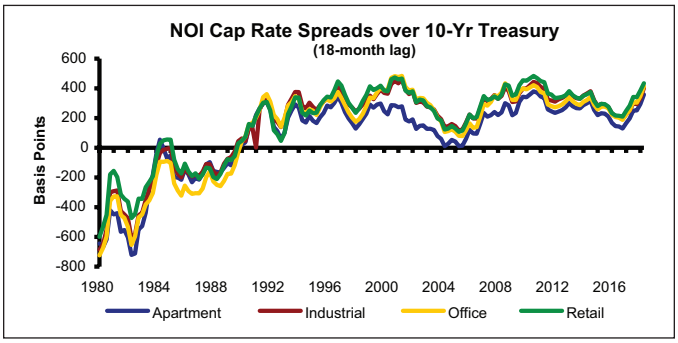

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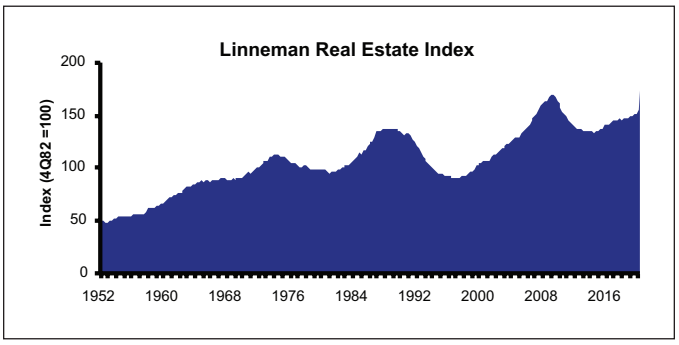

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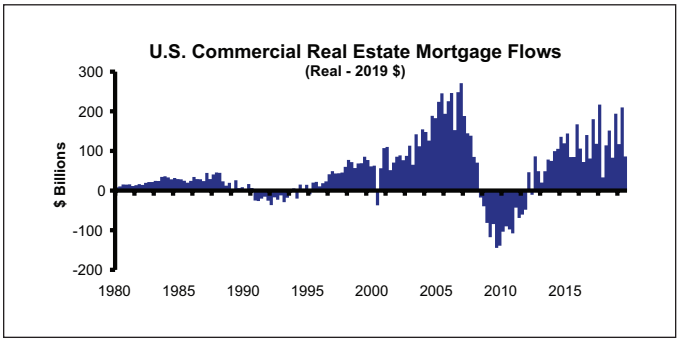

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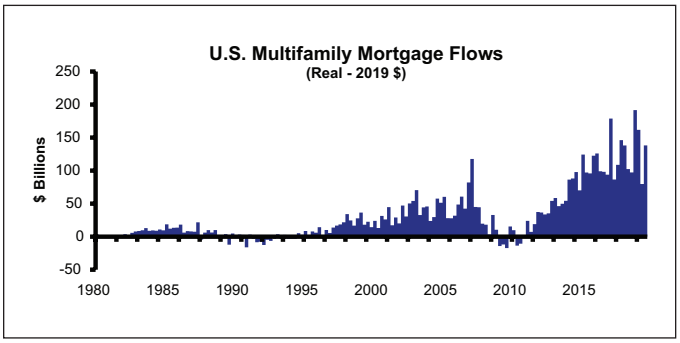

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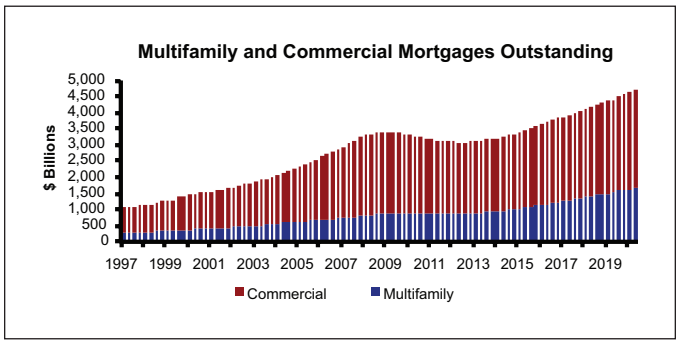

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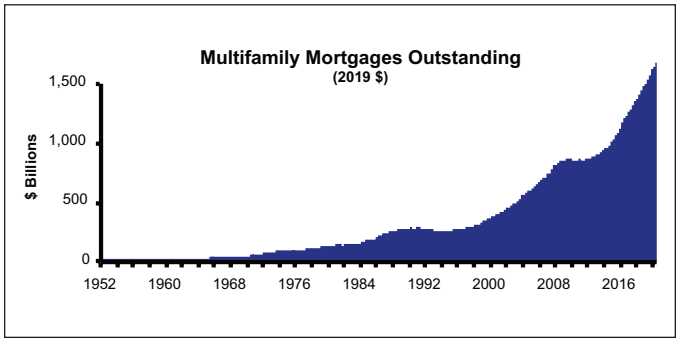

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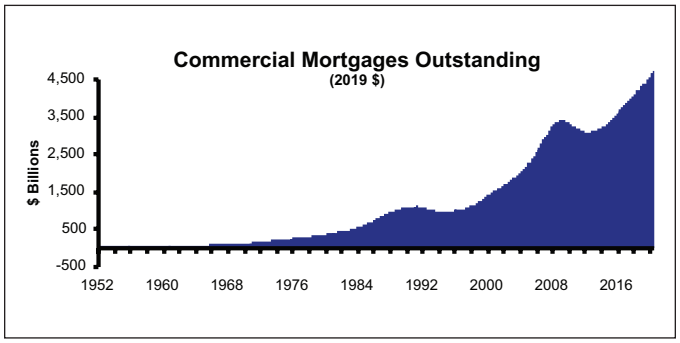

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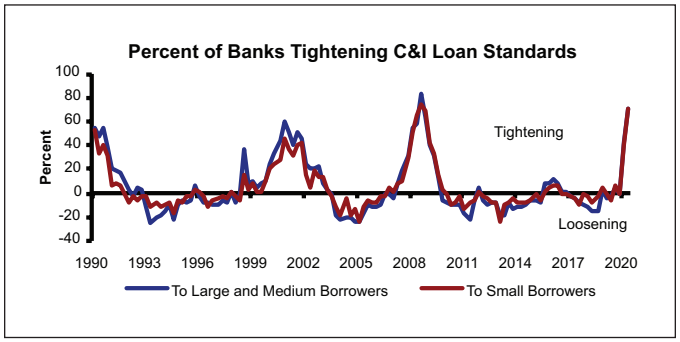


figure 271

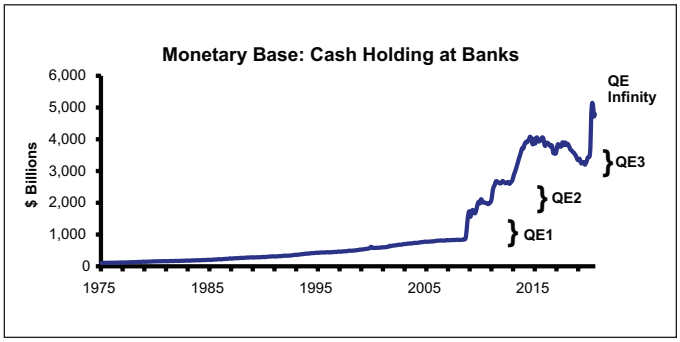
depression. This is a relatively rare condition at the end of a strong recovery period. This discipline was due to both heightened regulatory scrutiny of banks and high construction costs limiting development. Such discipline will prove useful during the next year as it gives lenders far more leeway for forbearance and constructive restructuring. It is also why cap rates were largely unchanged for the past several years through February 2020.

Real commercial and industrial loans (primarily lines of credit to non-real estate businesses, secured by inventory and receivables) hit a high in February 2020. However, banks are significantly tightening their lending standards, according to the Federal Reserve's July 2020 survey of loan officers. Specifically, 28.8% of survey respondents indicated their lending standards to medium to large firms "remained basically unchanged," while 11% "tightened considerably," 60.3% "tightened somewhat," and none "eased somewhat" or "eased considerably," resulting in a 71.2% net tightening. Lending to smaller firms (less than $50 million in sales) also tightened from last quarter, with 30% of those loan officers indicating their C&I lending standards "remained basically the same," while 12.9% "tightened considerably," 57.1% "tightened somewhat," and none of the respondents "eased somewhat" or "eased considerably." Real commercial and industrial loans were $2.7 trillion in August, up 17% year-over-year as the Fed fuels liquidity.

Excess bank reserves held at the Fed were basically zero every year prior to 2008, meaning that banks essentially lent every dollar they were statutorily allowed to lend. But after the Financial Crisis, the banking system lent relatively little of the funds that were gifted to them by QE 1-3. As a result, the U.S. banking system had a staggering $1.5 trillion in excess reserves as of February 2020. A new round of monetary injections (QE Infinity) brought excess reserves to a staggering $3.2 trillion in May 2020, subsequently dropping to "only" $2.8 trillion in August 2020. In six months, the Fed expanded the money supply at an annualized rate of 70% and clearly stands at the ready to inject more.

Bank excess reserves as a percent of total reserves averaged just 2.1% from 1959 to September 2008, then exploded to 58% and 91% in the third and fourth quarters of 2008. At the end of March 2020, the Fed took the unprecedented step of completely eliminating banking required reserves due to the COVID-19 pandemic, effectively making all reserves excess reserves. This allows banks to increase their lending capacity for individuals and businesses that may need additional liquidity during the shutdown and prolonged reopening, without any regulatory limitations. Lenders will lend to strong borrowers, even when loan defaults occur. Such a cushion has never existed during a cyclical downturn and provides the foundation for a far more forgiving and patient capital cycle than in the past.

Assuming a 6.3x loan multiplier, total lending potential peaked at $25.8 trillion in October 2015 but



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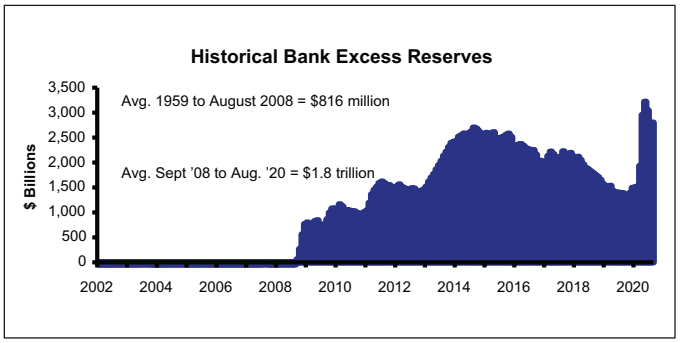

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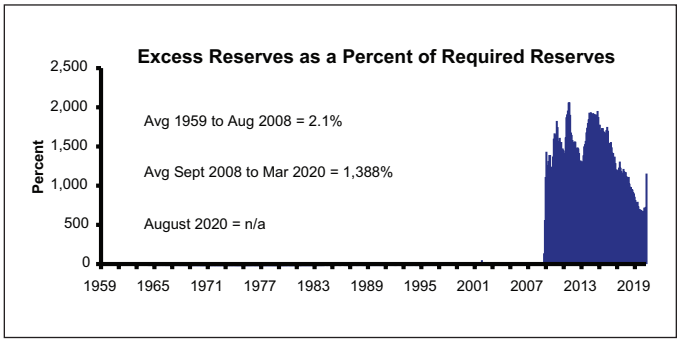

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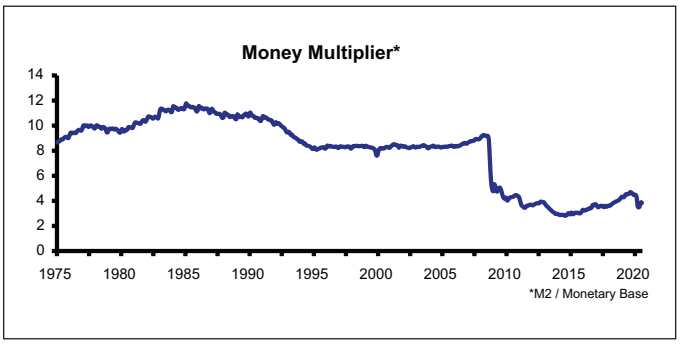

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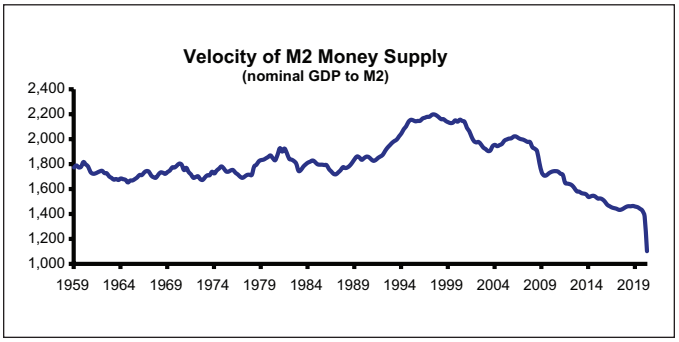

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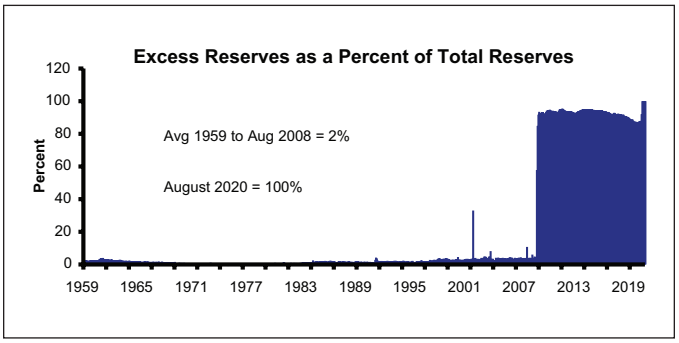

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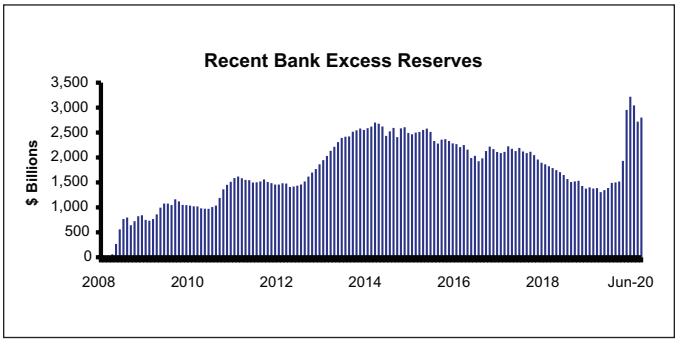

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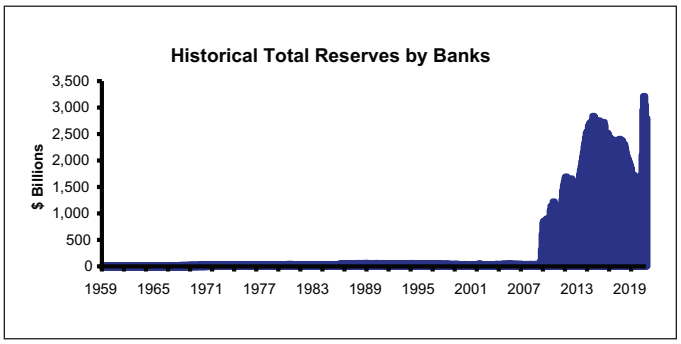

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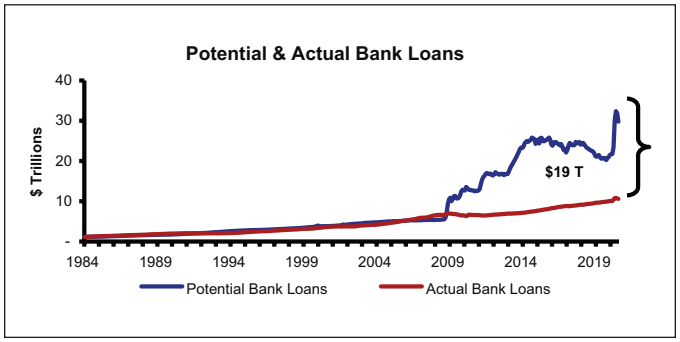

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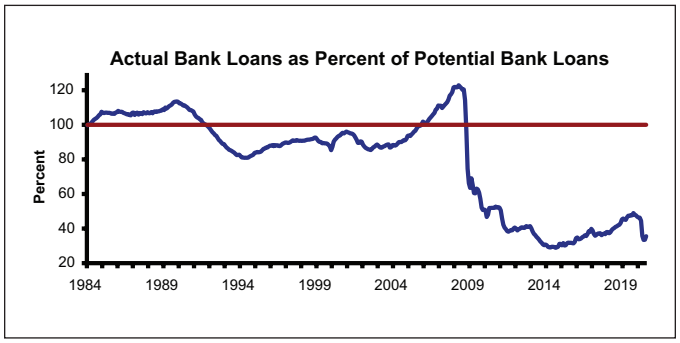

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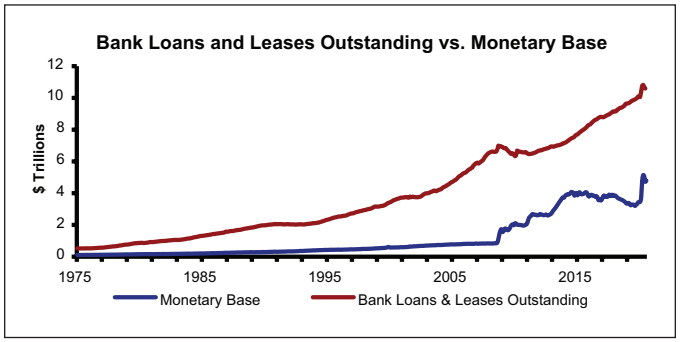
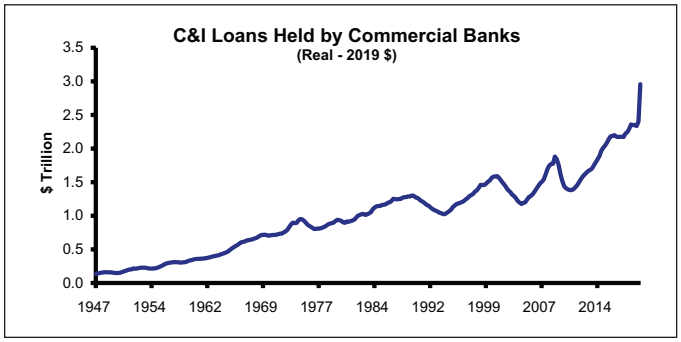


figure 282

dropped to about $20.2 trillion (-21.7%) by November 2019. With the Fed's QE Infinity injection, potential bank lending rose to $29.8 trillion as of July 2020. Actual bank loans are just 35% of potential bank loans, lagging by over $19 trillion in the second quarter of 2020.

Real outstanding C&I loans held by commercial banks have risen by 113% since their 2010 low and are 57% above the pre-recession peak. They stood at nearly $3 trillion (2019 dollars) in the second quarter of 2020, up by 25.9% year-over-year. The long-term historical average (1947-present) ratio of C&I loans to GDP is 10.4% versus 15.4% in the second quarter of 2020. Forbearance will result in this remaining relatively flat, rather than plunging as was the case in past downturns.

Over the trailing four quarters through the second quarter of 2020, real estate loans (in real inflation-adjusted terms) held by commercial banks rose by $168.3 billion (3.7%), to nearly $4.7 trillion. The current level is 1% above the 2009 high. Real commercial bank real estate loans have experienced a notable uptick since 2013. Real outstanding commercial mortgages stood at over $3 trillion in the second quarter of 2020, up 5.2%



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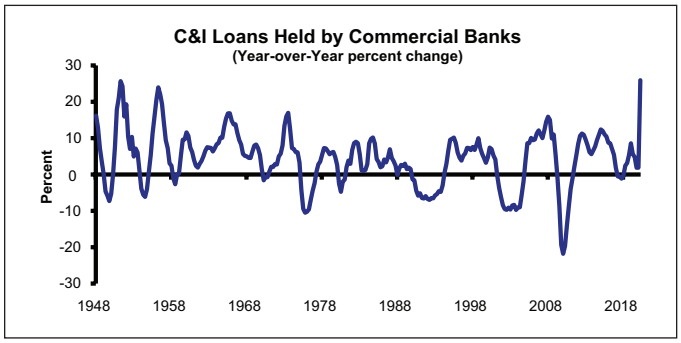

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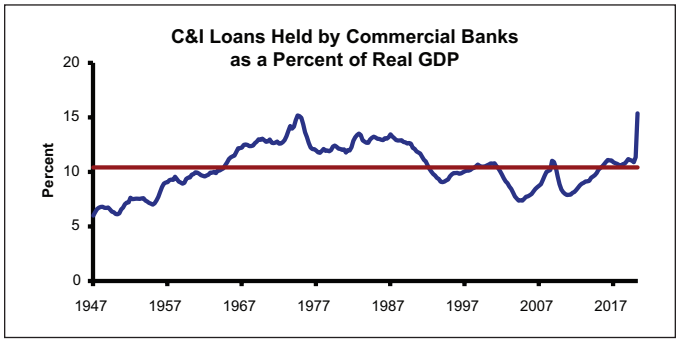

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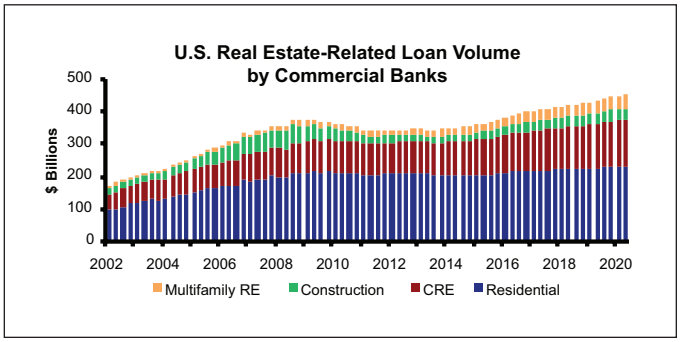

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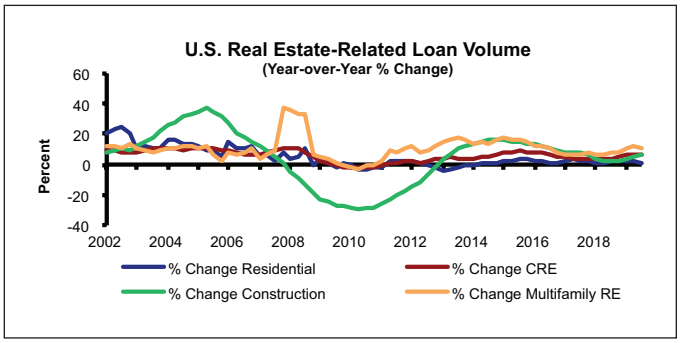

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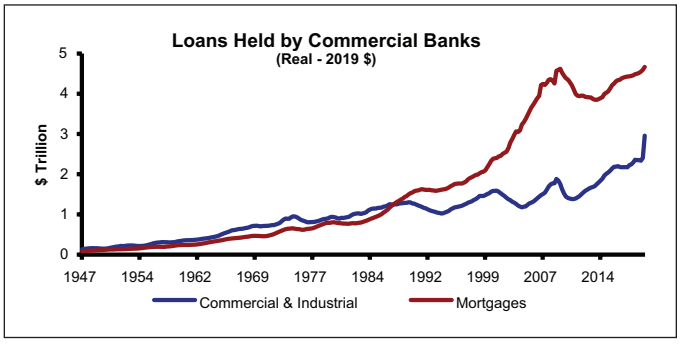

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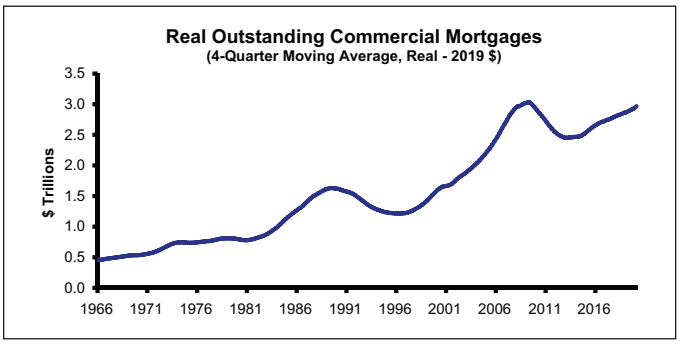

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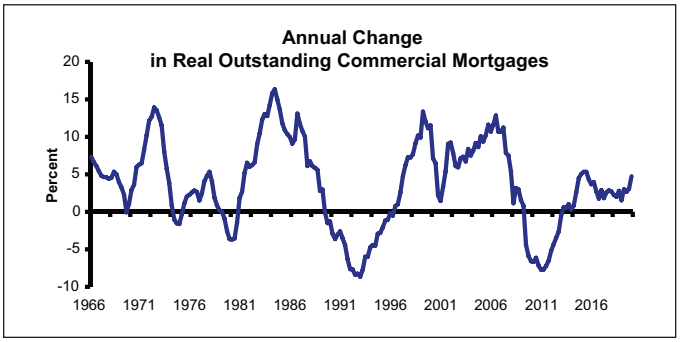

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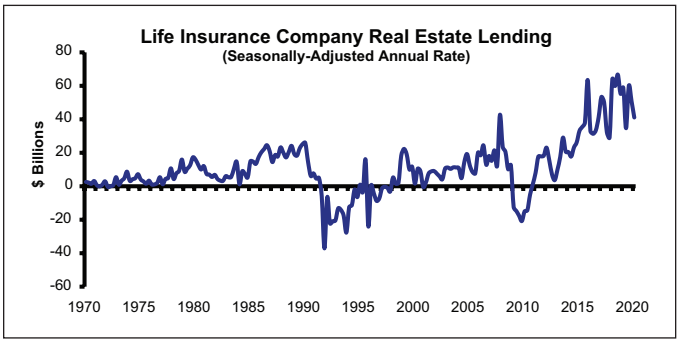

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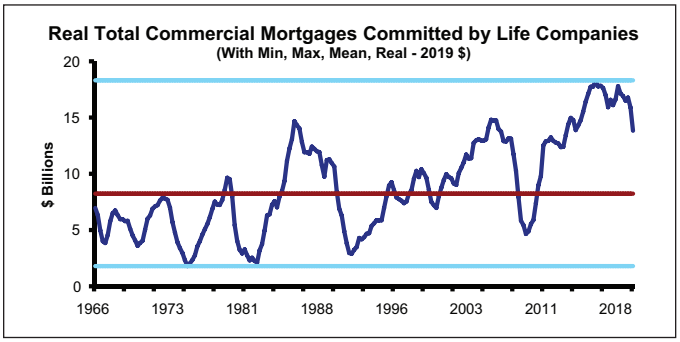

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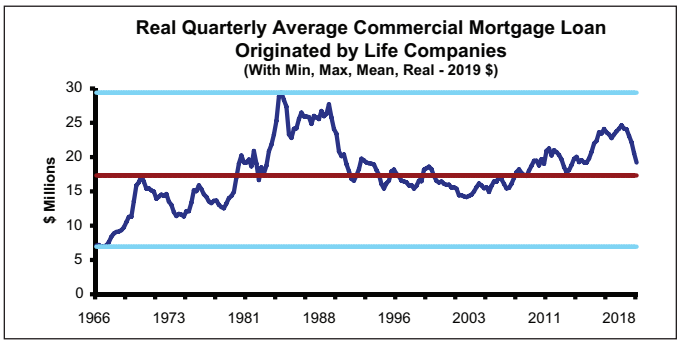

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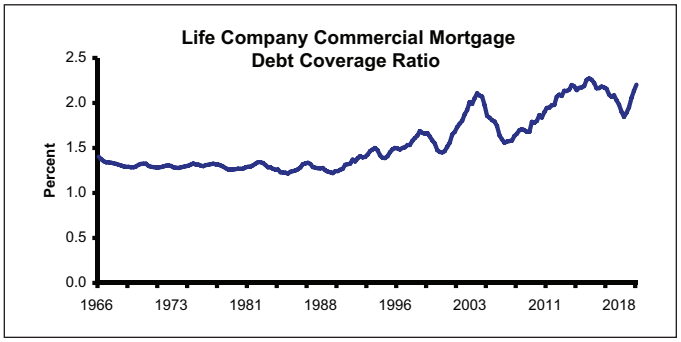

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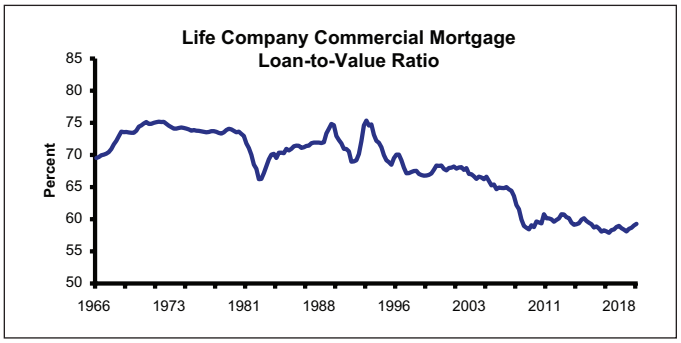

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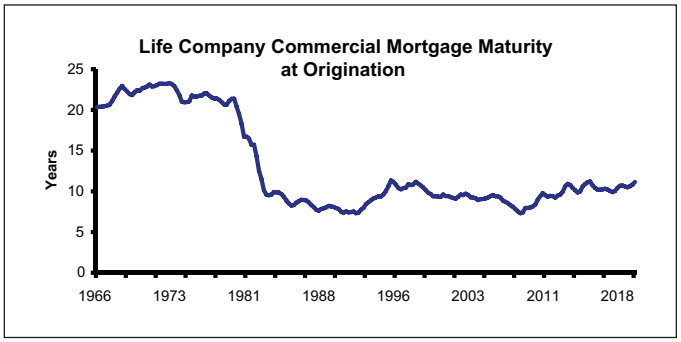


figure 296

over the last year. Bank forbearance will mitigate the downturn in real estate loans over the next two years. As earlier noted, our research demonstrates that unless lending falls, cap rates will generally hold.

Real estate lending by life insurance companies was active but disciplined. Loan generation dropped to $5.2 billion in the second quarter of 2020, down from almost $12.5 billion in the prior quarter. Life company commercial mortgage debt coverage ratios rose to 2.2x in the second quarter of 2020 and are above the 50-year historical norm of 1.6x. Currently at 59.3%, the four-quarter trailing life company commercial mortgage loan-to-value ratio is significantly below its historical norm of 68.1%. These low LTVs and high coverage ratios will help life companies to forbear, but coverage ratios will decline.

Development entered the shutdown depression around average based on monthly construction contracts measured in square footage in the second quarter of 2020. Commercial and industrial construction contracts averaged 75 million square feet per month in in the first quarter of 2020 but dropped to 43 million, 38 million, and 52 million square feet in in April through June 2020, respectively. This is in comparison to a historical norm (since 1963) of 66 million square feet per month. Restrained construction activity reflects historically high real construction costs. On an annual basis, commercial and industrial (C&I) construction contracts totaled 875 million square feet in 2019, 816 million square feet in 2018, and 821 million square feet in 2017. Aggregate trailing 12-month contracts (through June 2020) stood at 814 million square feet. This compares to the 2010 low of 315 million square feet and the long-term annual average (1963-2001) of 795 million square feet per year. After rising for the last five years, the ratio of C&I construction contract square footage-to-GDP is in line with the historical average. This will fall notably over the next 24 months. The muted construction pipeline confirms that we began the downturn from a relatively balanced (and rare) condition after the decade-plus recovery.

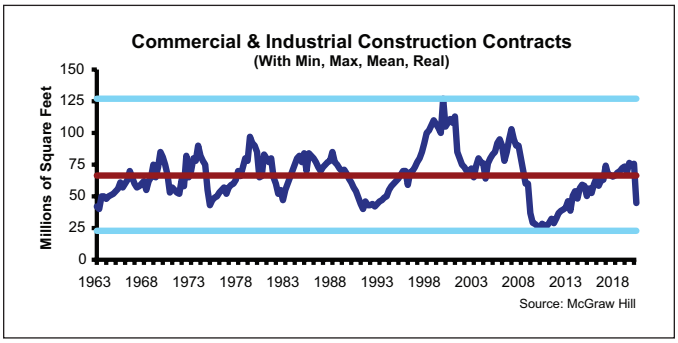
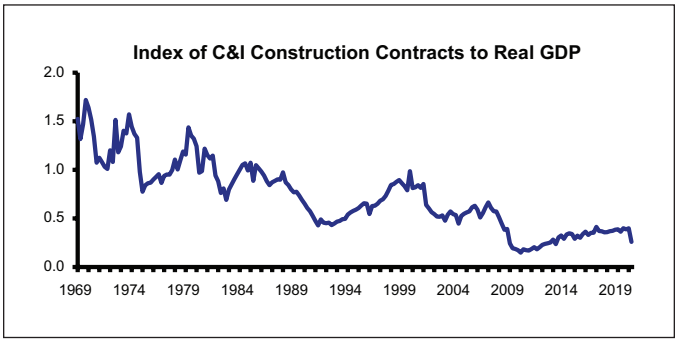


figure 297

REIT-Implied Pricing. According to Bank of America/Merrill Lynch data, the average REIT-implied cap rate peaked at 9.8% in February 2009 and fell to 5.2% through September 2020. By sector, REIT-implied cap rates hit recessionary highs of 9.9% for office properties, 9.1% for multifamily properties, 10.3% for shopping centers, 9.9% for regional malls, and 11.2% for industrial properties. Between February 2020 (pre-COVID-19 in the U.S.) and September 2020, REIT-implied cap rates rose for multifamily (+60 bps), shopping center (+30 bps), regional malls (+210 bps), and office (+60 bps) but fell for industrial (-90 bps). Current cap rates are still below 2009 levels for all sectors except regional malls.

REIT-implied cap rate spreads over the 10-year Treasury peaked in February 2009 at 695 bps for overall REITs, 630 bps for multifamily, 750 bps for shopping centers, 700 bps for both regional malls and office, and 840 bps for industrial. By comparison, September



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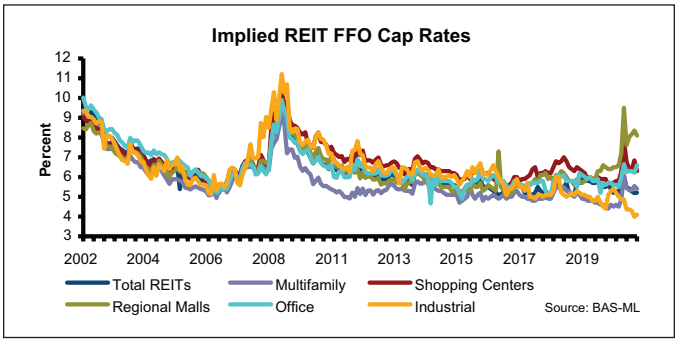

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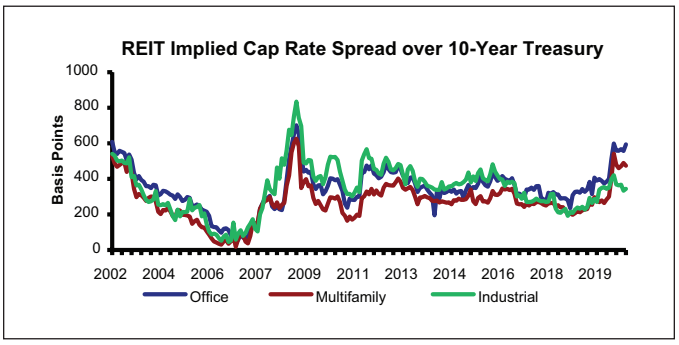

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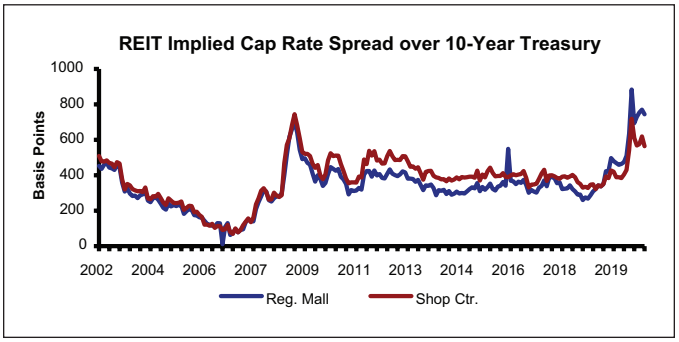

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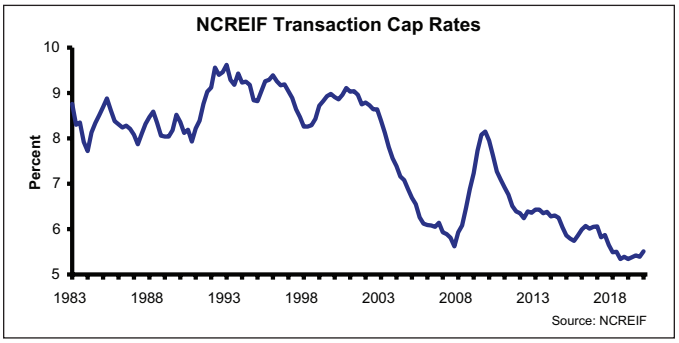

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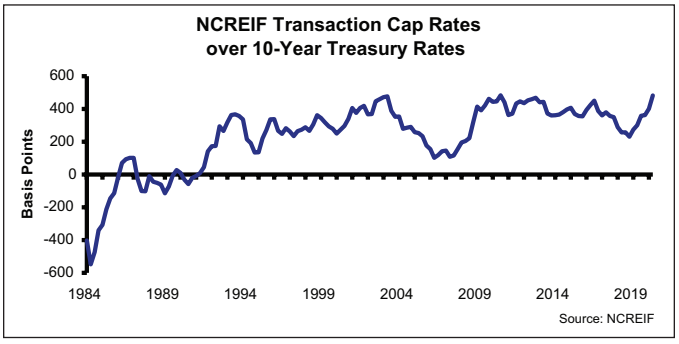


figure 303

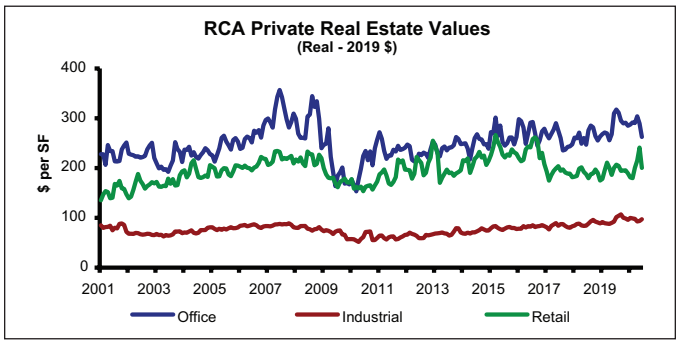
2020 cap rate spreads over the 10-year Treasury have tightened. They stood at about 450 bps for overall REITs, 470 bps for multifamily, 570 bps for shopping centers, 740 bps for regional malls, 600 for office, and 350 bps for industrial in September 2020. The current implied cap rate spreads over the 10-year Treasury rate are all above their respective long-term averages (2002-present), except for industrial which is in line with the long-term norm. Until the Butterfly Recovery normalizes, it will be difficult to gauge private pricing relative to REITs.

Pricing. Prior to the Financial Crisis, real (2019 dollars) average transaction pricing peaked at $357 per square foot for office properties, $89 per square foot for industrial properties, and $234 per square foot for retail. Real multifamily values reached $145,000 per unit, while hotels traded at an average of $183,000 per key.

Almost all markets now have excess supply due to weakened demand. The good news is that new supply is generally restrained, with retail space even experiencing net shrinkage. In aggregate, new commercial square footage being brought online is flat and about the historical norm as a percent of inventory. The supply of office and industrial space under construction is about 2.5% and 2% of existing stock, respectively, and new construction now comes to a screeching halt.

In February 2020, real values for office properties were $292 per square foot, $99 per square foot for industrial, $180 per square foot for retail, $182,400 per unit for multifamily, and $105,600 per key for hotels. In June 2020, office properties averaged $263 per square foot, implying that 9.9% of the real value had been lost to date during the pandemic depression. Real industrial and retail pricing stood at about $97 and $200 per square foot, respectively. June real industrial private pricing was down 1.7% versus February, while real retail pricing reflected a surprising increase of $20 per square foot (11.4%) over the same period, due to very thin trading volume. Real multifamily pricing was $163,600 per unit in June 2020, while hotels traded at an average of $93,600 per key. These reflect 10.3% and 11.3% real value drops versus February 2020, respectively. Multifamily pricing hit its real long-term (since 2001) high at year-end 2019 ($186,400 per unit), while hotel pricing saw a peak of $218,000 per unit in 2015.

On a year-over-year basis, real pricing growth was led by industrial (5.2%), followed by flat year-over-year



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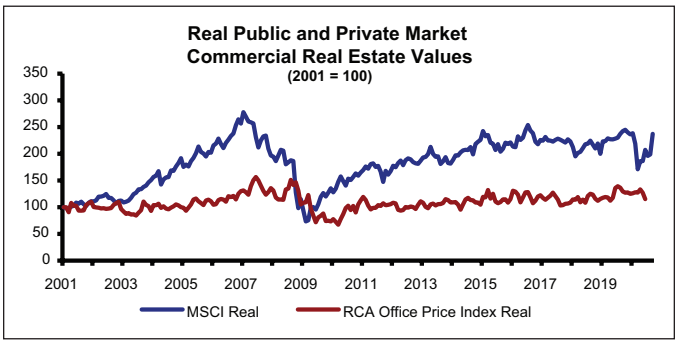

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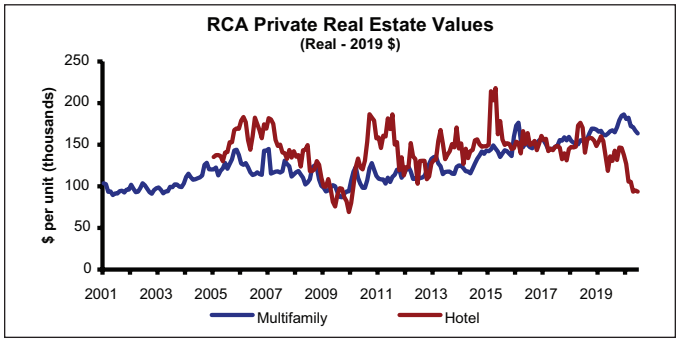

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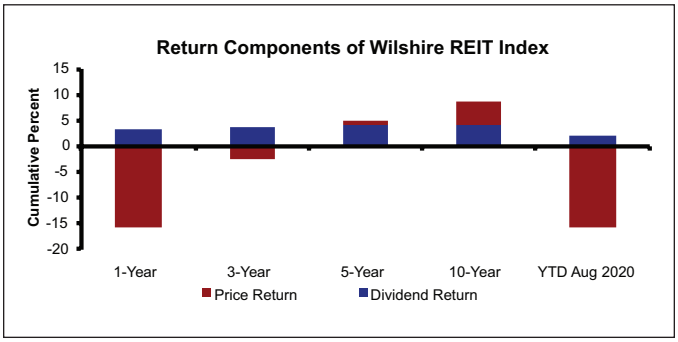
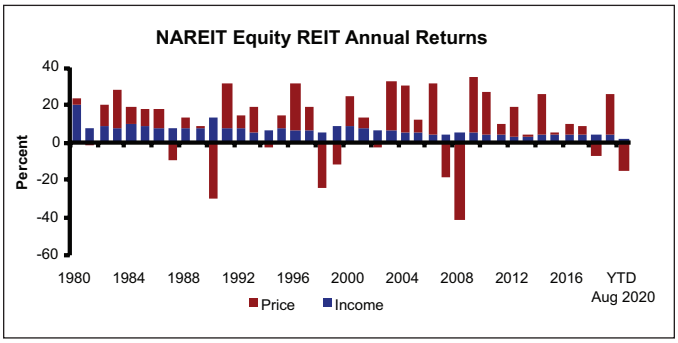


figure 307

retail pricing. Multifamily (-1.6%), office (-15.3%), and hotel (-31.2%) properties, all saw year-over-year declines through the second quarter of 2020.

The Morgan Stanley U.S. REIT Index was 1,186.5 in February 2020 and stood at 1,289.6 in mid-September 2020, meaning that nominal values are 8.7% above February 2020. However, in real terms, market values are 8.4% and 10% below the previous respective peaks for REITs and private properties (RCA). The inflation-adjusted NCREIF private pricing index in the second quarter of 2020 was near an all-time high and about 39% above the pre-recession peak. Expect some private pricing declines in the second half of 2020.

Over the past 18 months (March 2019 to September 2020), REIT-implied cap rates increased for regional malls by 210 bps, followed by increases for multifamily and office (each +60 bps) and shopping centers (+30 bps bps) but a decrease for industrial (-90 bps). These changes in REIT-implied cap rates represent corresponding changes in asset values (for constant NOI) for office (-9.1%), multifamily (-12.4%), shopping centers (-5.3%), regional malls (-34.3%), and industrial (+17.5%). Over this period, 10-year Treasury yields have fallen by 190 bps, from 2.6%. The result is massively outsized cap



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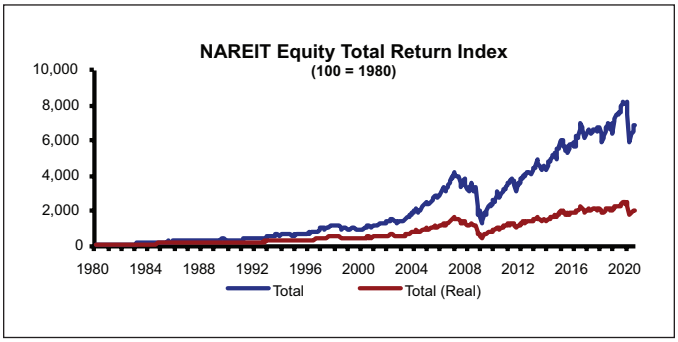

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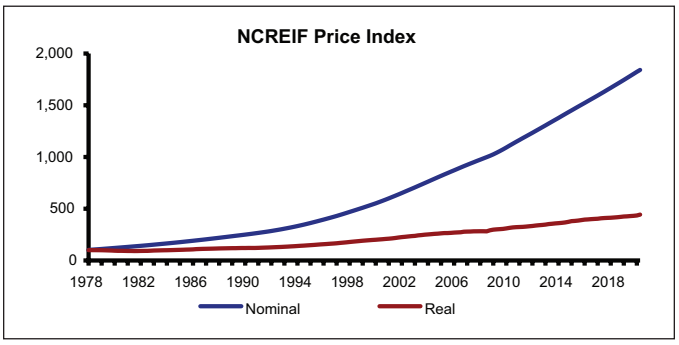
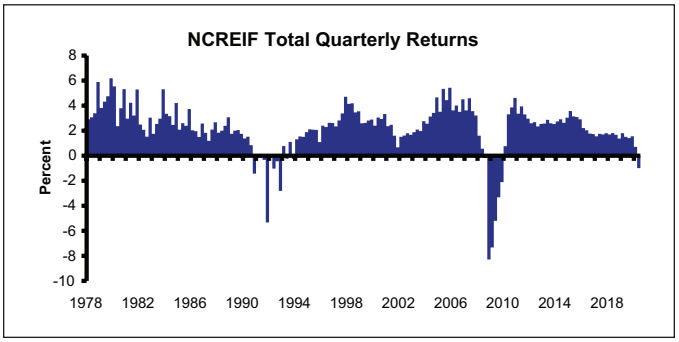


figure 310

rate spreads for all sectors. Many stories are being told that real estate no longer is relevant for office, hotels, retail, and nursing care. We believe that these are the musings of people reacting to shutdown fantasies and that in five years, the relevance of real estate will once again be restored, but until then, follow the Butterfly.

REIT price-to-NAV (net asset value) peaked at 110% in June 2011, with the highest ratio reflected in apartment sector pricing (120%). As of September 2020, price-to-NAV ratios dropped significantly to 90% for total REITs (vs. long-term average of 97%), 82% for



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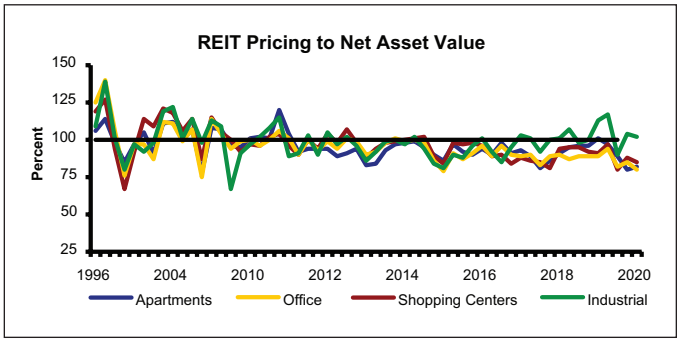

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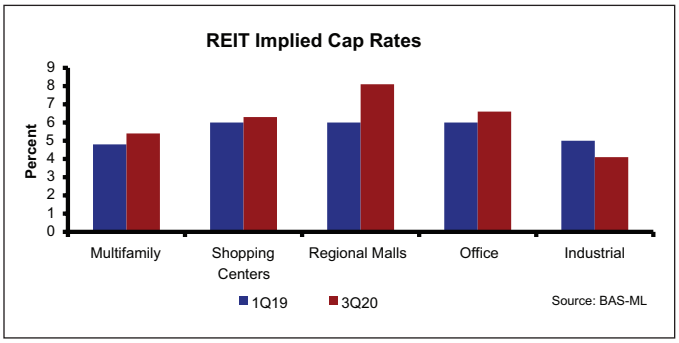

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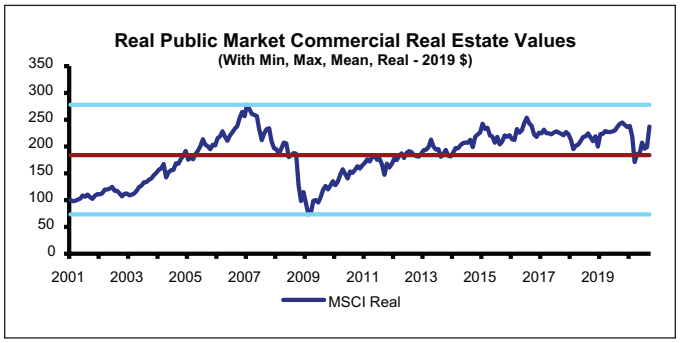

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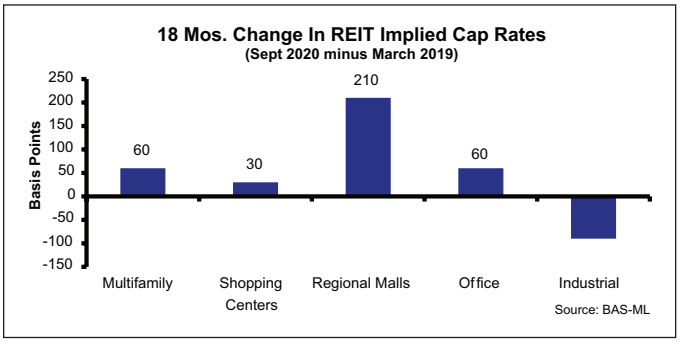

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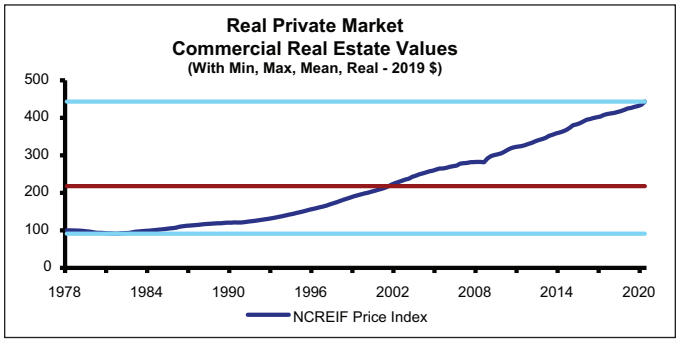
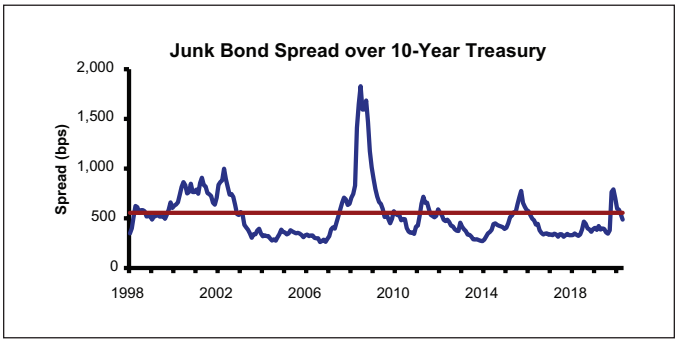


figure 316

apartments (vs. 96%), 85% for shopping centers (vs. 97%), 79% for regional malls (vs. 93%), 80% for office (vs. 96%), and 102% for industrial (vs. 99%). However, these comparative NAVs are inflated, as private pricing is largely frozen while REITs have repriced.

In evaluating the relative value of REITs, we use a long-term "beta" of 0.6 for REITs and the 10-year moving average of CPI as our proxy for long-term inflation and hence, for long-term REIT dividend growth. Using these assumptions, a capital asset pricing model indicates that REITs were under-valued by a stunning 63% in



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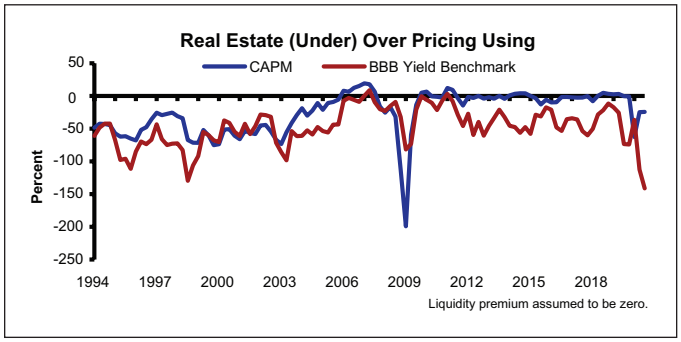

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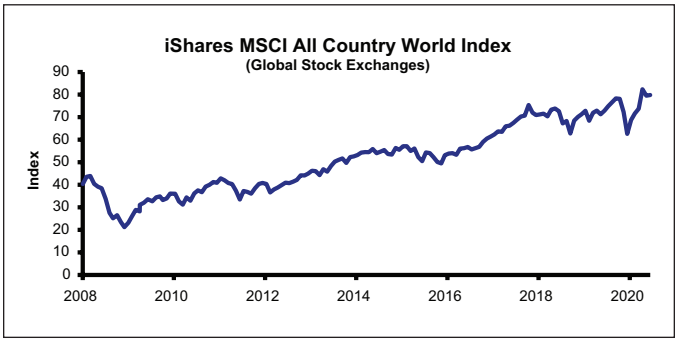

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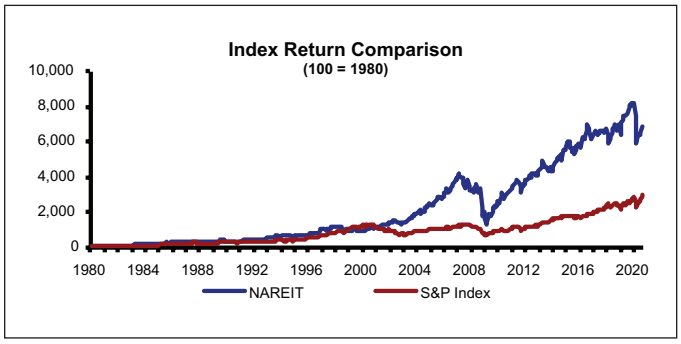

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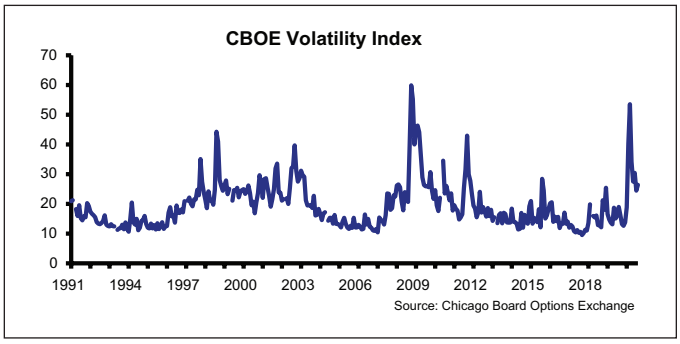

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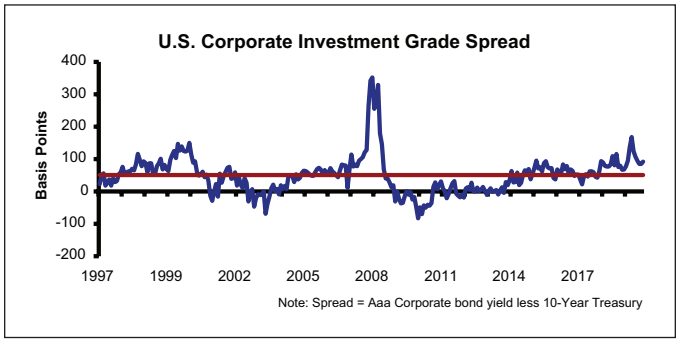


figure 319

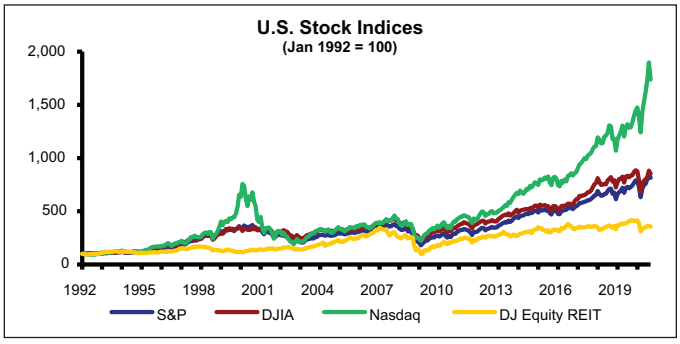


figure 323

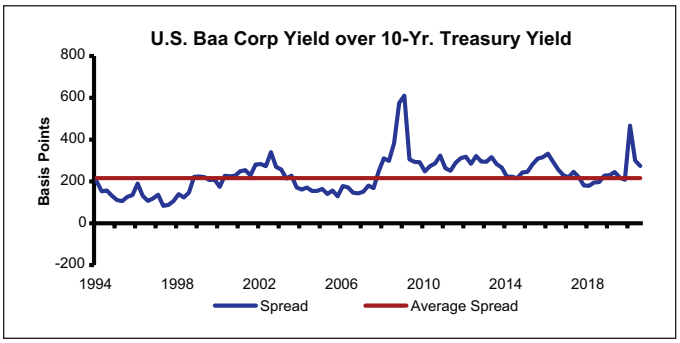
March 2020 but moderated a bit to "only" 24% undervalued in September (Figure 317). This is driven by the narratives of real estate's supposed irrelevance, the beta "jump" to 1.0, near-term cash flow declines, and investor greed turning to fear. Over time, each of these will unwind, and values will rise.

Comparing REIT dividend yields to BBB (Baa) bond yields indicates that REITs are undervalued by 141% relative to other assets. This is in comparison to 74% and 112% undervalued in both the previous year and quarter, respectively. As of September 10, 2020, the REIT dividend yield was 51 bps above the average U.S. corporate Baa bond yield of 3.4%. This is in comparison to the historical spread (since 1993) of 101 bps below the Baa yield. In September 2020, REITs traded at an adjusted funds from operations (AFFO) multiple of 19.7x, versus the historical average of 16.6x.

Real Estate (Under) Pricing as of Sept 10, 2020

BETA	Long-Term Annual Dividend Growth				
	1.50%	1.75%	2.00%	2.25%	2.50%
0.5	-6.7%	-14.6%	-23.7%	-34.4%	-47.1%
0.6	8.0%	2.2%	-4.4%	-11.9%	-20.6%
0.7	19.1%	14.6%	9.7%	4.1%	-2.2%
0.8	27.8%	24.3%	20.4%	16.1%	11.3%

figure 324



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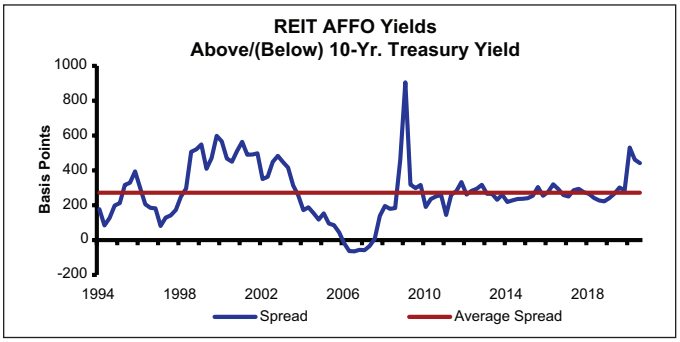

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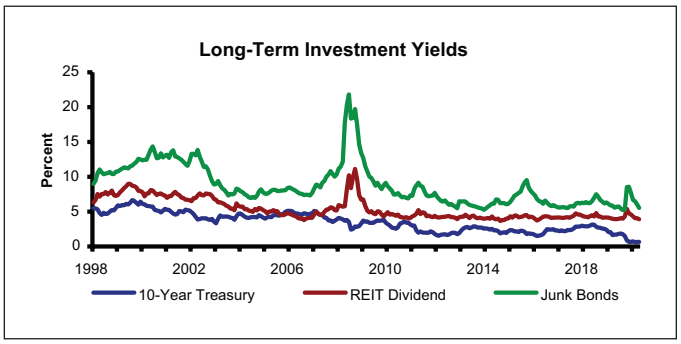

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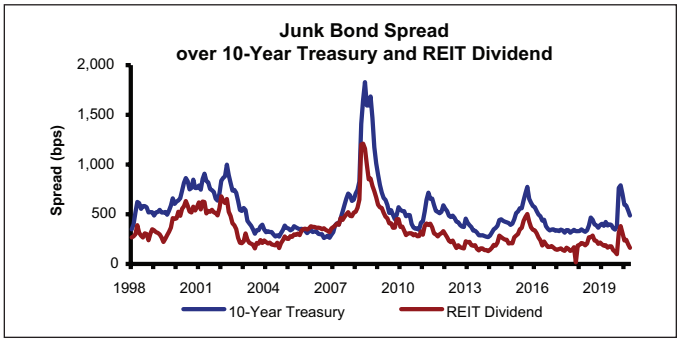

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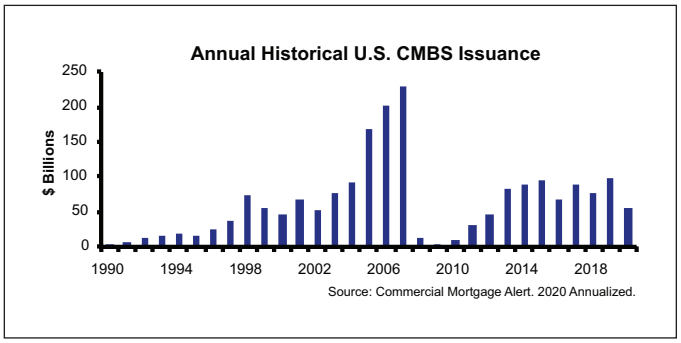

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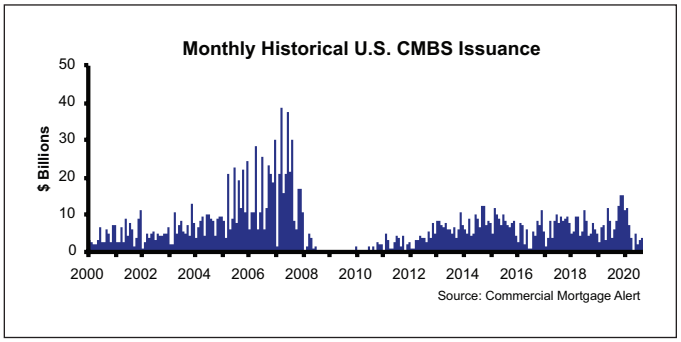

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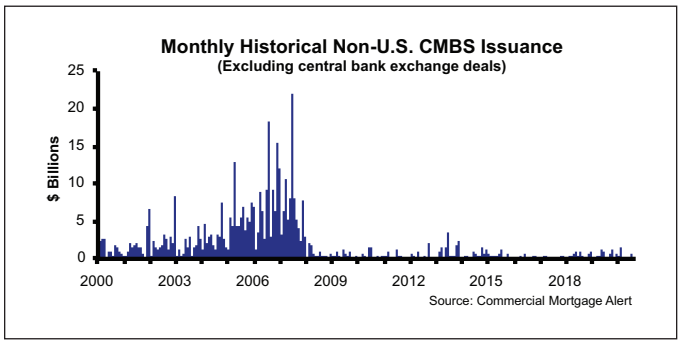
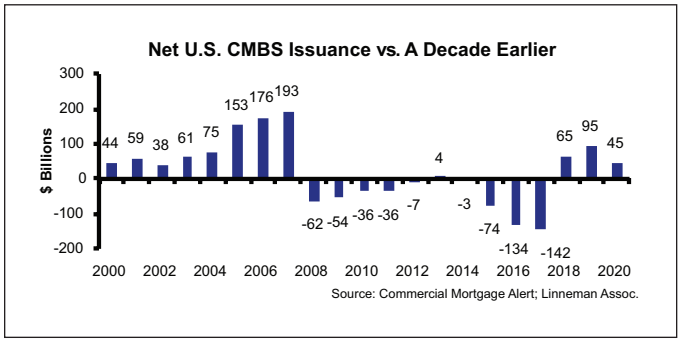


figure 331

U.S. CMBS originations were $55.9 billion on an annualized basis through August 2020. New CMBS issuance will be non-existent until underwriting becomes more transparent. Few CMBS loans are coming due as few loans were completed in 2010-2011.

Commercial bank charge-off rates for real estate loans held by all banks was 0.4% in the second quarter of 2020, compared to a high of 2.8% in 2009. The overall commercial mortgage delinquency rate peaked at 8.8% in the second quarter of 2010 and stood at 0.9% in the second quarter of 2020, up from 0.7% at year-



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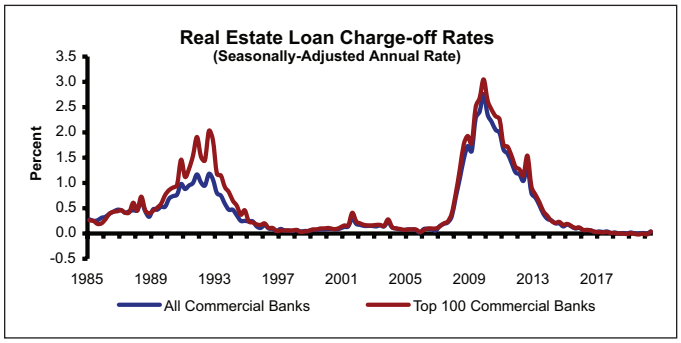

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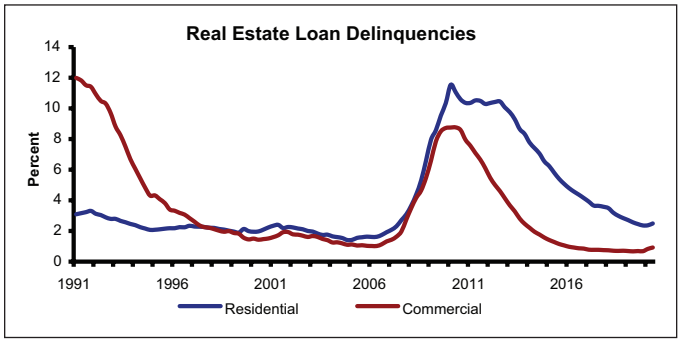

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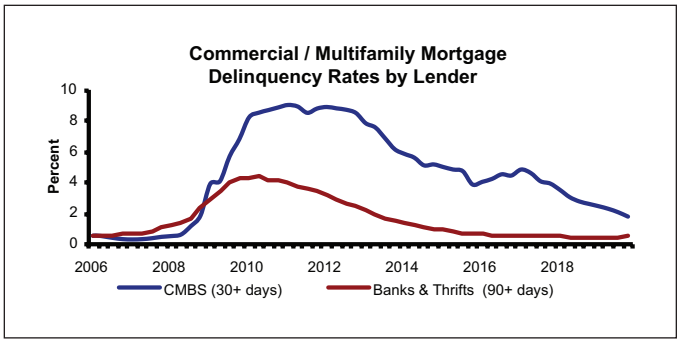

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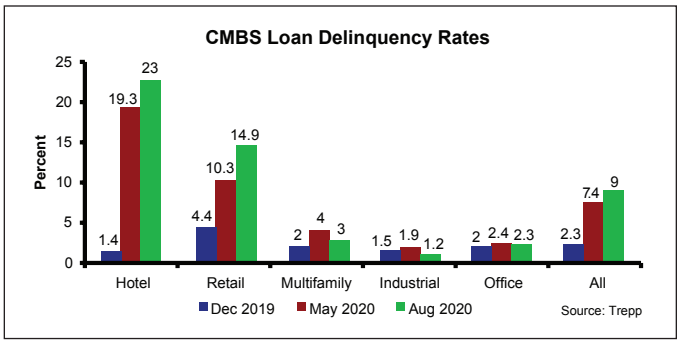

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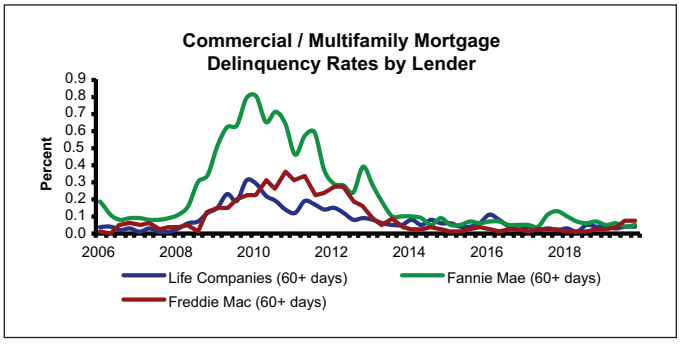

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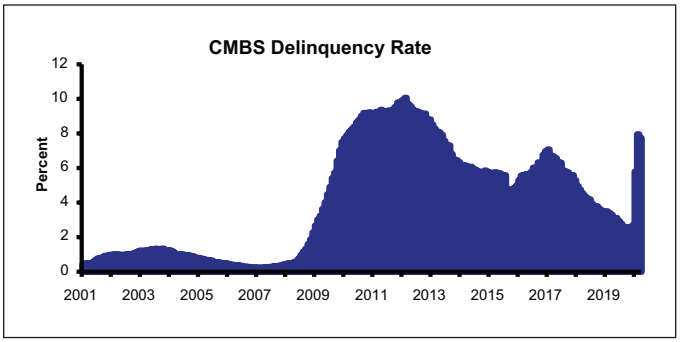

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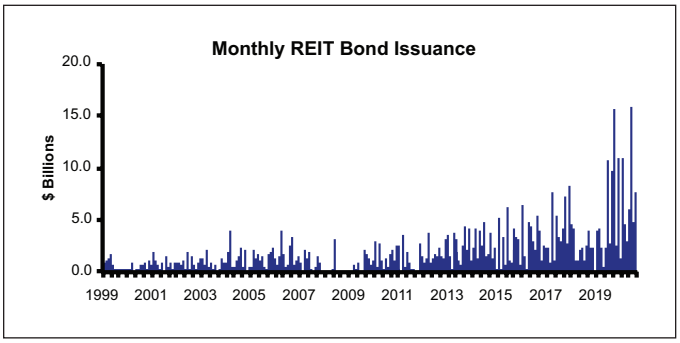

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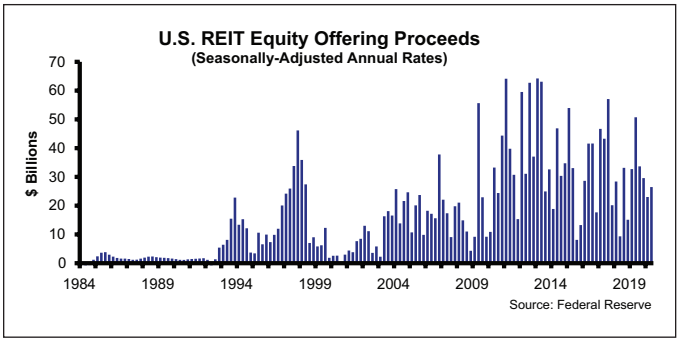

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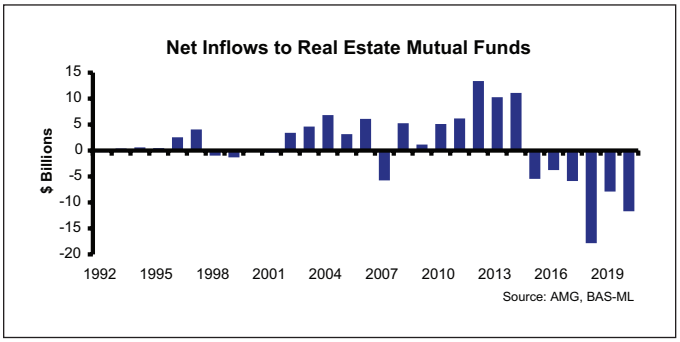


figure 341

end 2019. In comparison, residential mortgage delinquency rates hit a 2010 peak of 11.5% and stood at 2.5% in the second quarter of 2020. Delinquencies will rise as properties, especially hotels and retail, struggle in the shutdown depression.

The Mortgage Bankers Association's second-quarter 2020 commercial and multifamily delinquency rates issued by life companies (0.04%), Fannie Mae (0.05%), Freddie Mac (0.08%), and Banks and Thrifts (0.51%) remained extremely low. CMBS issuers had a 1.79% delinquency rate during the same period, but this was an improvement from 2.07% in the first quarter. Delinquency rates will deteriorate through 2020 and into 2021.

Moody's Delinquency Tracker Index peaked at 10.1% in July 2012, bottomed at 4.7% in March 2016, and rose to 7.1% in June 2017. It is nearly 8% in July 2020.

REITs raised $53.6 billion in unsecured bonds year-to-date through August 2020 and $84 billion over the trailing 12 months. REIT equity offerings totaled $28.2 billion during the trailing four quarters through the second quarter of 2020, or 14% below the $32.9 billion raised during the prior four quarters. Real estate mutual fund net flows have been negative for six consecutive years, with divestitures of $7.9 billion in 2019 and nearly $11.7 billion year-to-date through August 2020. On a cumulative basis, real estate mutual funds saw more than $52.5 billion of net outflows since 2015.

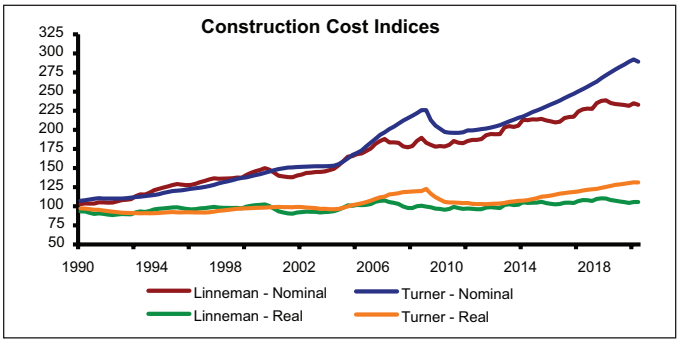
Construction Cost Trends

For some time we have warned investors not to take comfort that they are purchasing properties "well below replacement cost," because of cyclically high replacement cost. This will play out over the next 24 months as the development pipeline empties and construction costs fall 10-25%. In the second quarter of 2020, the Linneman Construction Cost Index (LCCI) was 0.4% below the real long-term trend, while the real Turner Index indicates today's construction costs are 8.7% above its long-term trend.

The LCCI reflects a hypothetical building consisting of lumber (5%), concrete (5%), gypsum (10%), iron and steel (10%), labor (50%), and land (20%). We track the costs of these components (except land) using producer price indices from the U.S. Bureau of Labor Statistics. For land, we set the 1995 base value to 100 and assume that it increases by CPI (all goods) over time. We add up all of the nominal values of the component indices to

arrive at the nominal LCCI, which is converted to a real basis using CPI.

In comparison, the Turner Building Cost Index (TBCI), published by Turner Construction, tracks the overall cost of construction on a national basis, taking into account major cost categories such as "material prices, labor rates, productivity, and the competitive condition of the marketplace." As with the LCCI, we convert the TBCI to a real basis using CPI. Applying a linear trend line to each series reveals that the TBCI is significantly above its trend, while the LCCI is in line with trend.



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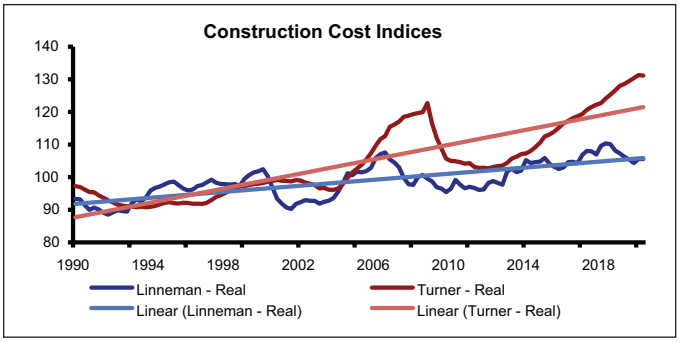


figure 343

Change in Cost Indices Through 2Q20

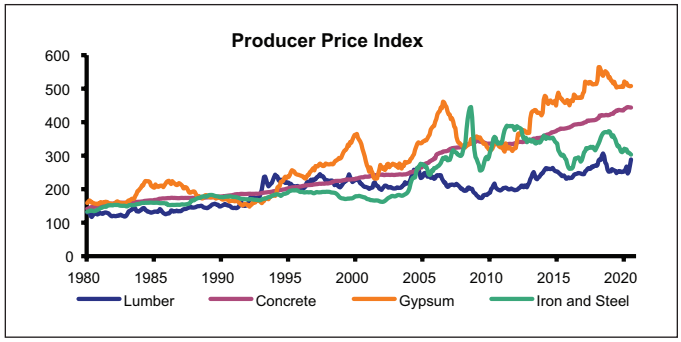
	Y/Y	Q/Q	Over 3 Yrs	20-Yr CAGR
LCCI (Nominal)	-0.2%	-0.9%	2.6%	2.3%
LCCI (Real)	-0.6%	0.0%	-2.3%	0.3%
Turner Index (Nominal)*	2.4%	-1.0%	14.2%	3.5%
Turner Index (Real)*	2.0%	-0.1%	8.7%	1.4%
Lumber	1.5%	-1.3%	-1.8%	0.8%
Concrete	2.9%	0.7%	9.9%	3.2%
Gypsum	-0.6%	-1.9%	-1.8%	2.0%
Iron & Steel	-10.9%	-3.2%	-4.4%	2.8%
Labor (Benefits + Wages)	0.6%	0.0%	2.5%	2.7%
CPI (all items)	0.4%	-0.9%	5.0%	2.0%

Source: Bureau of Labor Statistics, Linneman Associates, Turner Construction

figure 344

Over the trailing four quarters through the second quarter of 2020, iron and steel (-10.9%) and gypsum (-0.6%) pricing decreased, while concrete (+2.9%) and lumber (1.5%) prices rose. In a reversal from the first quarter, second-quarter LCCI commodity price decreases were seen in iron and steel (-3.5%), gypsum (-1.8%), and lumber (-1.3%), while concrete (+0.8%) prices rose over the quarter. Over the last three years, most LCCI commodity input prices also decreased, including iron and steel (-4.4%) and lumber and gypsum (each -1.8%). In contrast, concrete pricing increased by 9.9% over the last three years. Labor costs increased by a relatively modest 0.6% over that period.

In real terms, through the second quarter of 2020, the Turner Index increased by 8.7% over the last three years and 2% year-over-year but edged down by 0.1% quarter-over-quarter. From year-end 2008 through the second quarter of 2020, real construction costs increased by 6.1% based on the Linneman Construction Cost Index, while the Turner Index grew by 6.9% over the same period. Both the Linneman Index and the Turner Index were flat in the second quarter of 2020 versus the first quarter.



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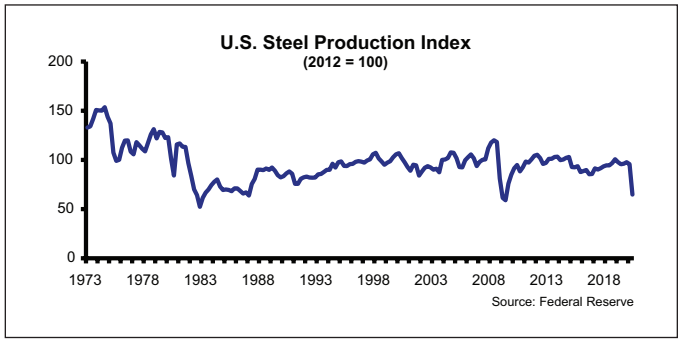


figure 346

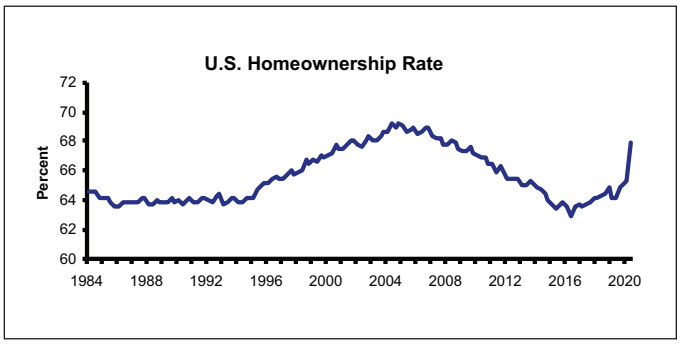
We believe the Linneman Construction Cost Index is a better benchmark for construction cost changes for typical real estate projects, while the Turner index better tracks cost changes for major urban core high-rise construction. On a real basis, the Linneman Index shows a 12-bp long-term annual growth trend, while the Turner Index trends up by 28 bps per year. This indicates that while material costs are very volatile and highly cyclical, overall construction costs still track general economy inflation. Labor (the largest component of construction costs) is very cyclical and will plunge in the presence of high unemployment and a dearth of developments during the shutdown Depression. This will cause real construction costs to fall well below trend.

Housing Market Update

The U.S. homeownership rate peaked in 2004 at 69.2%, bottomed in 2016 at 62.9% as we had earlier predicted, and stood at 67.9% in the second quarter of 2020. The latest data reflects stunning increases of 380 bps year-over-year and 260 bps over the quarter as shutdown families sought homes with space and distance from urban unrest. Demographics suggest homeownership rates should rise through 2022, but other factors include the COVID-driven urban exodus to the suburbs and – to a lesser extent – historically low interest rates. Tempering these factors are today's unimaginable unemployment rates. To buy a home, you need confidence (which is low), a job (to secure and service a mortgage), and money for a down payment (which magically appeared due to involuntary savings).

Prior to COVID-19, the undersupply of housing and strong demand, not low interest rates drove rents and home prices upwards. These increases fed sentiment for regulatory rent controls. While new and existing home sales volumes are up significantly versus a year ago, due in part to an urban exodus, home prices are growing at a slower rate. We expect sustained unemployment to negatively impact home prices in 2021.

The shortage of single-family housing production and relatively disciplined multifamily construction through July pushed real apartment rents to historical highs in most markets. In aggregate, rental payments as a percentage of real median household income were about 270 bps above historical norms, and mortgage payments were less than rents in many markets. But this will reverse as many unemployed move back home. The index of the U.S. median home price to disposable



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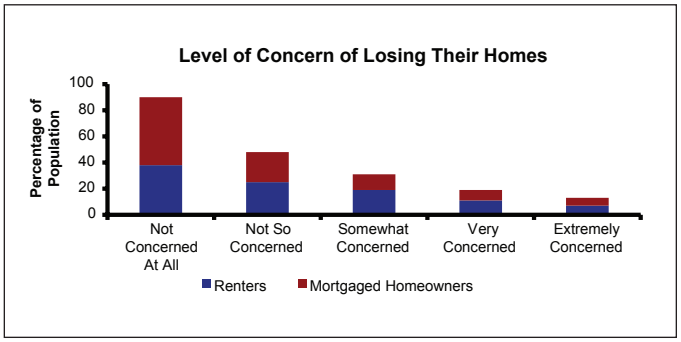

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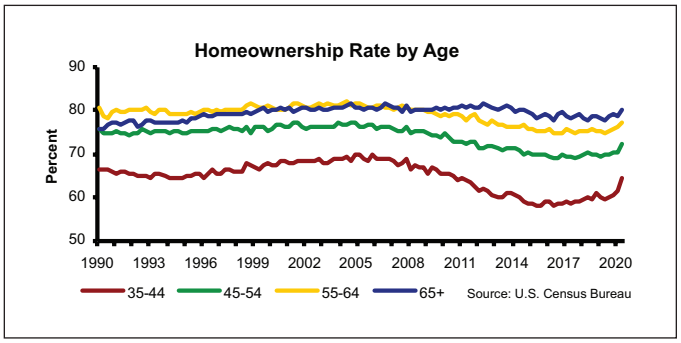

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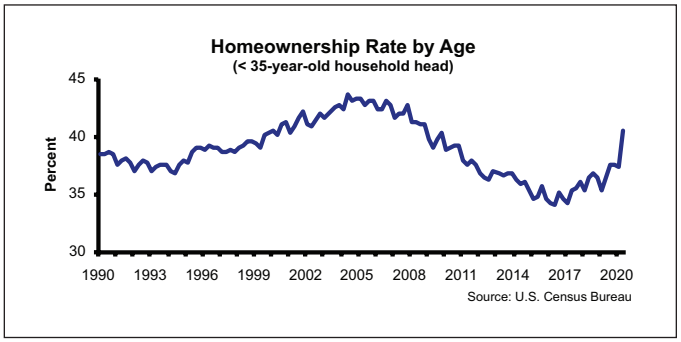


figure 350

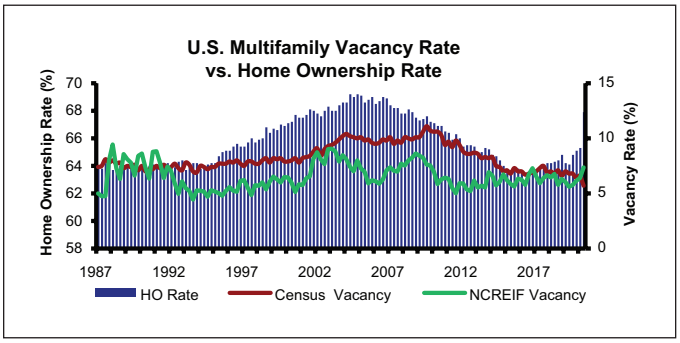
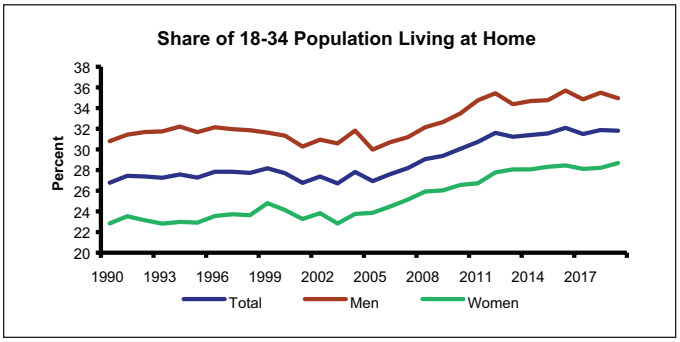


figure 351



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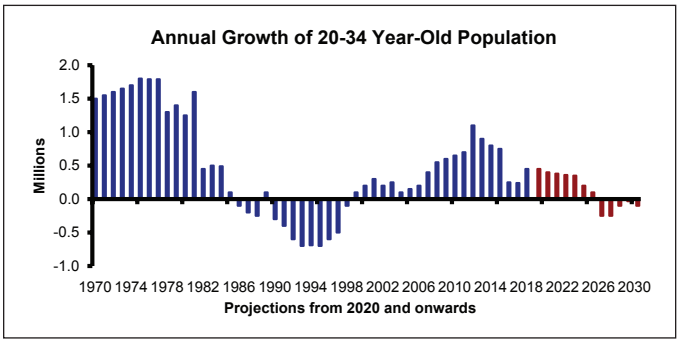

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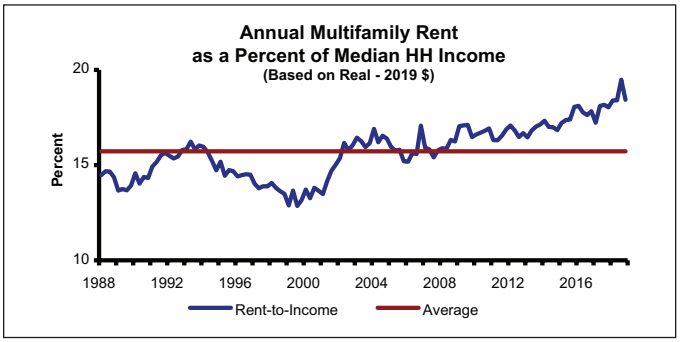
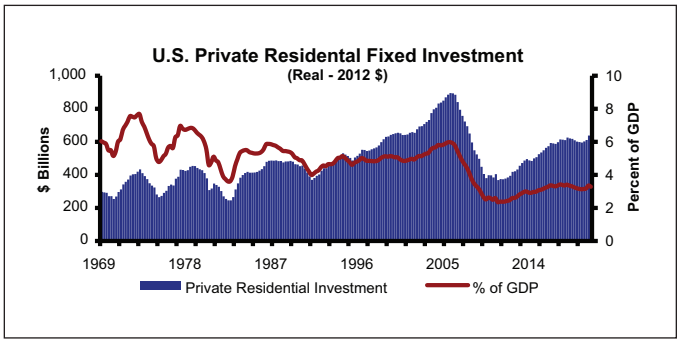


figure 354

personal income dropped to a low of 70 (versus a long-term average of 100) in March 2020 but was back up to 80 in July.

The combination of private residential construction and consumption spending on housing services has averaged 18.3% of GDP since 1959 but only 16.1% since 2000. It stood at 16.2% in the second quarter of 2020. The volatility in this metric is primarily driven by construction volume and less so by housing services. That is, since 2000, residential construction as a percent of GDP has fluctuated by about 670 bps, while housing services has exhibited a range of just 150 bps between its highest and lowest share of GDP over that period. The latter saw a 130-bp increase in the second quarter of 2020, marking the largest recorded quarterly increase since 1959. With the economy in varying degrees of shutdown, depending on location, people are spending less of their discretionary income on dining out, vacations, and classes for their kids but more on long-deferred home renovations. Low interest rates are driving an increase in mortgage re-financings and home equity loans. We expect home starts to be below norm for the remainder of 2020, rising modestly in 2021.



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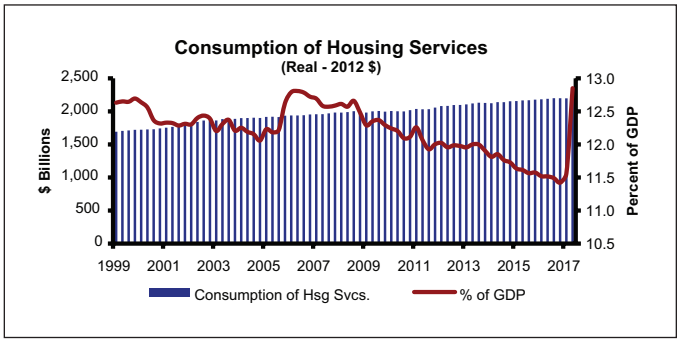

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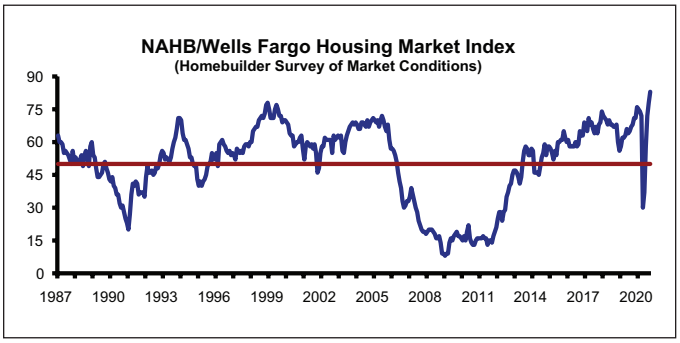

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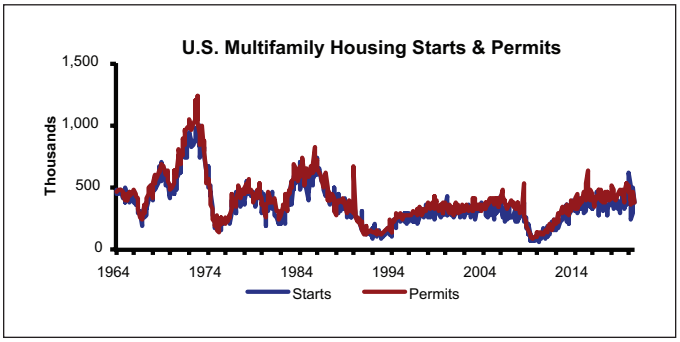

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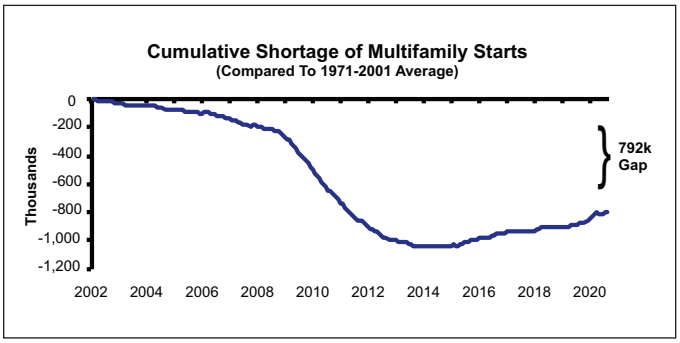

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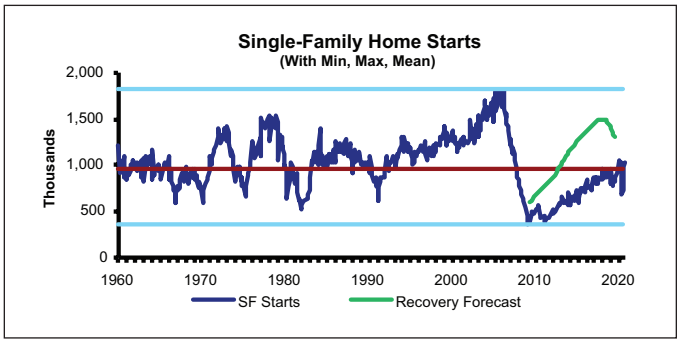


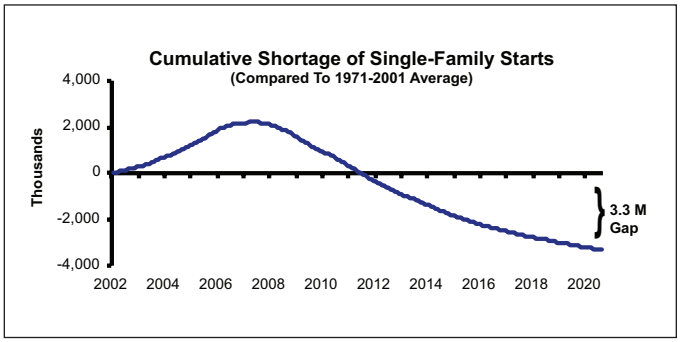
figure 360

The NAHB/Wells Fargo Housing Market Index (HMI), a homebuilder survey of market conditions, hit a 25-year low of 9% in 2008 and subsequently peaked at 76% at year-end 2019. Due to the COVID-19 shutdown, the HMI dropped precipitously, to 30% in April 2020, but rebounded sharply to 72% in July, 78% in August, and 83% in September. This is compared to an average of 51% from 1985 through today. The current level is up by 700 bps and 1,500 bps versus December 2019 and a year earlier, respectively. A reading greater than 50% indicates that there are more homebuilders with positive views of home sale market conditions than those who view the market negatively.

Large cumulative shortages (versus historical norms) of both multifamily and single-family housing starts existed as the shutdown depression began. Annualized multifamily housing starts stood at 375,000 units in August 2020, down from 451,000 units one year earlier and from 520,000 units in December 2019 but still above its historic norm of 355,000 units a year. The cumulative 18-year shortfall of multifamily housing starts (benchmarked against historical norms) peaked at over one million units in 2013 and now stands at 792,000 in August 2020.

Single-family housing starts averaged 1.1 million units between 1971 and 2011. Since hitting a low of just 434,000 units in 2011, they most recently peaked at over one million annualized units in February 2020 and stood at about the same level in August. The cumulative (since 2002) single-family production shortfall stood at 3.3 million units through August 2020.

Since the Great Recession, we have discussed the "doubling up" of households, which resulted in a peak



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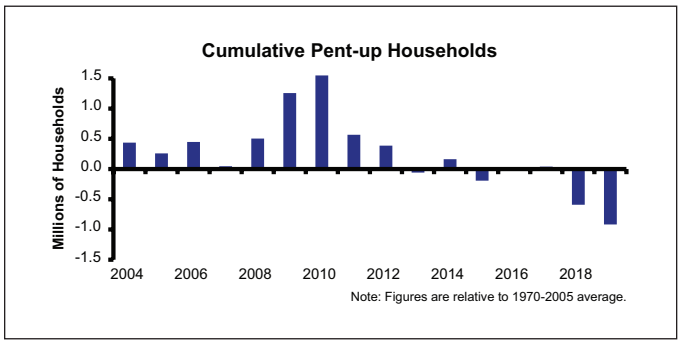

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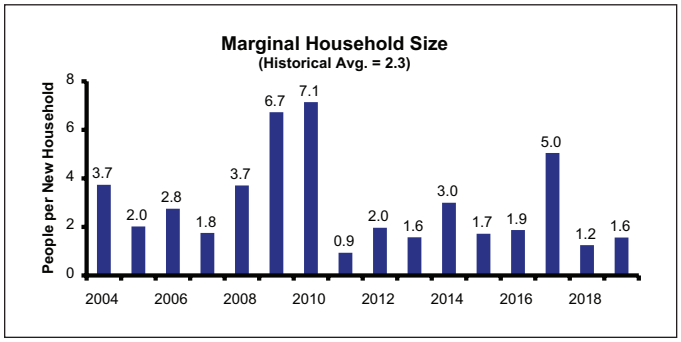

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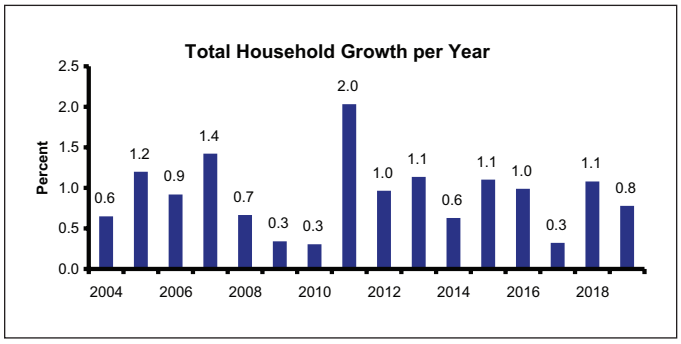

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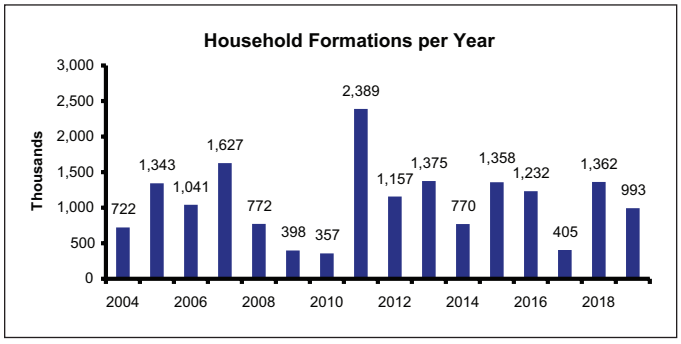


figure 365

of two million pent-up households by year-end 2010. In 2016, the pent-up or "missing" households that were delayed in forming finally "caught up" to historical norms after several years of above-average household creation. Once again we will see rapidly rising pent-up households as the unemployed move back home. Look for perhaps only 200,000 new households over the next year. Unemployment is so widespread that negative household formation may even occur.

Cumulative excess vacant housing units (those above the historical average of vacant units) peaked in 2009 at 2.1 million but stood at a growing shortage of 1.6 million units (shortages of 769,000 single-family units and 834,000 multifamily units) in the second quarter of 2020. This is roughly 2.8% of the 130 million relevant housing units. The significant shortage of vacant single-family units indicates that both professional homebuilders and speculative "amateurs" have been able to quickly sell their inventory of new homes. While the pandemic is disproportionately harming lower-income households, upper-income urban Millennials are exercising their option to move to the suburbs and beyond. The claustrophobia of city

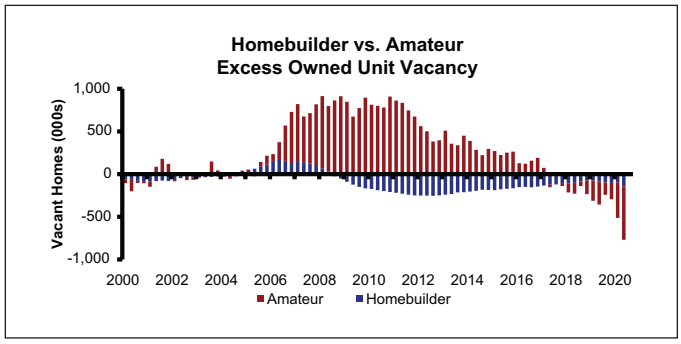
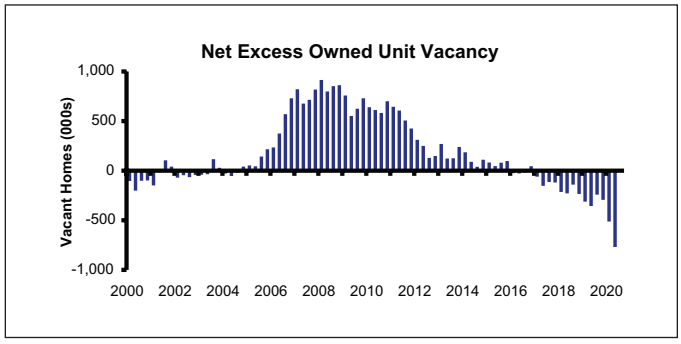


figure 366



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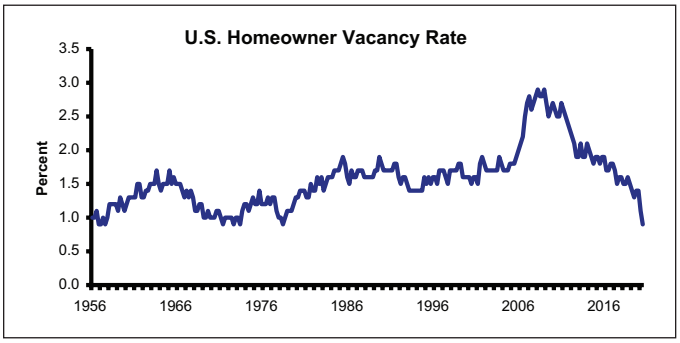


figure 368

apartments is amplified during the shutdown, driving many who would not have otherwise moved out of the city but for the impetus of the pandemic.

Annualized real (2019 dollars) single-family construction peaked at $870 billion in February 2006 and subsequently bottomed at $276 billion in December 2010. This compares to the long-term average of $488 billion since 1993. Since the 2010 low point, single-family construction peaked at $600 billion in February 2018 but fell to $540 billion as of July 2020, still 10.7% above the historical average.

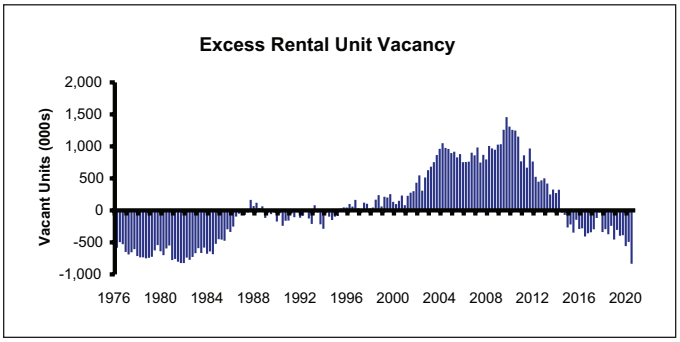
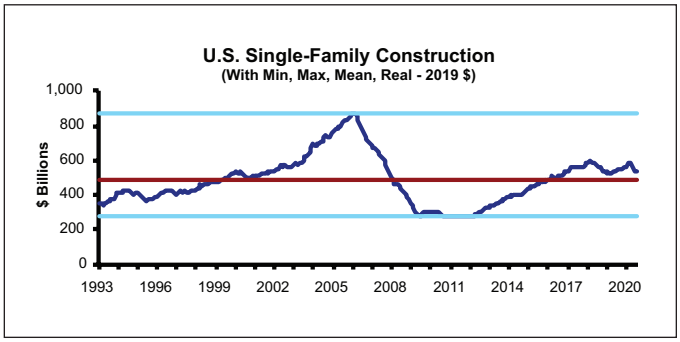


figure 369



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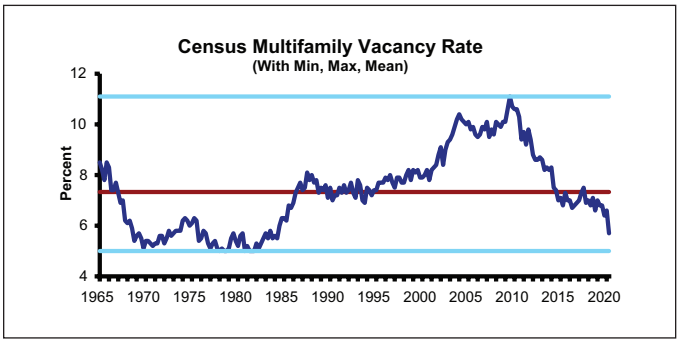

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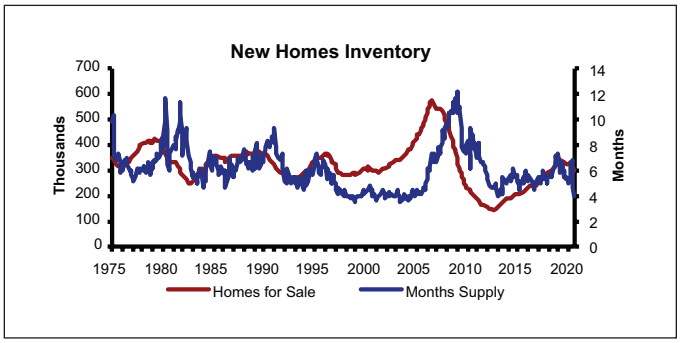

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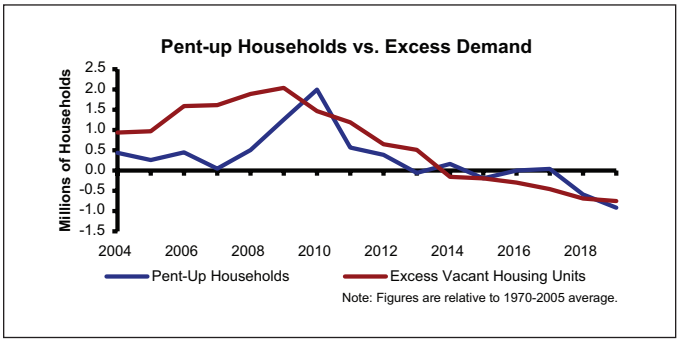

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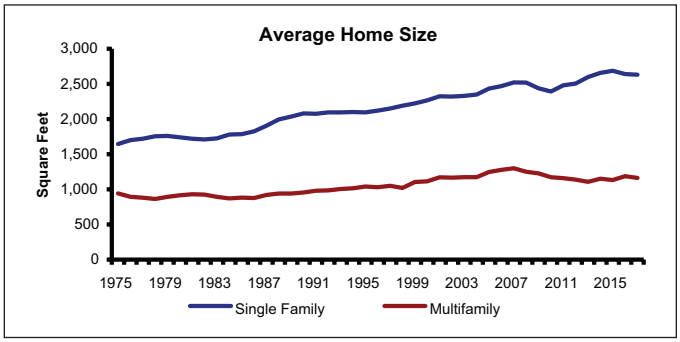


figure 374

In July 2020, new single-family homes were on the market for an average of just 4 months, which compares to the historical average (since 1972) of 6.4 months and the 2009 peak in 12.2 months. Similarly, the long-term average of new homes (since 1972) on the market is 326,000, with a peak of 572,000 in 2006. There were just 299,000 new homes for sale in July 2020. The pandemic has driven many stir-crazy and frightened urban dwellers to the suburbs in search of more space and lower density.

Between 1970 and 2010, the U.S. population grew by an average of just over 1% per year. Over the past nine years, population growth has averaged 34 bps per annum below this norm, representing about 8.5 million fewer people added to the population than normal. We estimate that the U.S. population will grow by about 2.5 million per year, or by 12.5 million people in aggregate in 2020-2024. Assuming the historical norm of 2.3 people per household and a 2-to-1 split between single-family and multifamily units, we expect single-family and multifamily demand to require about 3.5 million and 1.8 million additional housing units, respectively, through 2024. However, massive unemployment will delay these formations as people double up with friends and families.

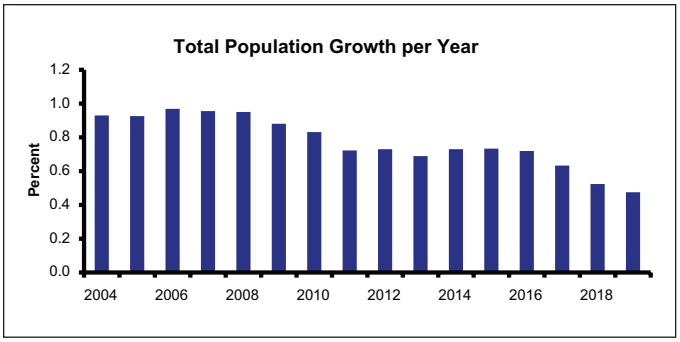


figure 375

Single-family annualized home starts were 895,000 in 2019 and stood at over one million in August 2020. Our fundamental housing forecast in Figure 376 projects that new single-family home starts will fall to 700,000 in 2020 (350,000 in the second half of the year), 800,000 in 2021, 900,000 in 2022, and one million in 2023. Given these assumptions, we expect to see a growing shortfall of single-family housing through 2021 but doubling up households will mute demand.

Our fundamental forecast is strong for the multifamily sector despite the shutdown. Using the long-term average (1976-present) multifamily vacancy rate of 7.7% as the historical norm, Linneman Associates estimates a shortage of over one million vacant multifamily units at year-end 2020. This is down from the 1.4 million-unit peak surplus in 2008. This reversal was the result of a massive under-production of new multifamily units from 2009-2013.

Affordability. In the second quarter of 2020, the NAHB/Wells Fargo Housing Opportunity Index (HOI) indicated that families earning the national median

Single-Family Home Fundamental Forecast

	2H20	2021	2022	2023	2024
Supply					
Vacant (relevant beg. bal.)	758,000	578,687	303,400	128,113	52,826
+ New	350,000	800,000	900,000	1,000,000	1,000,000
- Destroyed (1)	(166,500)	(333,000)	(333,000)	(333,000)	(333,000)
= Total	941,500	1,045,687	870,400	795,113	719,826
Demand					
Primary (2)	354,483	708,966	708,966	708,966	708,966
+ Second Homes (3)	8,330	33,321	33,321	33,321	33,321
= Total	362,813	742,287	742,287	742,287	742,287
End of Period Vacant	578,687	303,400	128,113	52,826	(22,461)
Excess Vacancy(4)	(938,497)	(1,222,002)	(1,407,267)	(1,494,292)	(1,581,317)
% Change New Starts		14%	13%	11%	0%

Source: Linneman Associates
(1) Two-thirds of 500,000 total units destroyed annually; 2/3 factor represents the proportion of destroyed units which are SF.
(2) Total Demand = Population growth HH formation: SF (66%), rental (34%).
(3) Second home demand is 4.7% of primary demand.
(4) Excess vacant units above the historical (25-year) norm of 1.8%.

figure 376

Multifamily Fundamental Forecast

	2H20	2021	2022	2023	2024
Supply					
Vacant (relevant beg. balance)	2,492,000	2,326,054	2,094,163	1,892,272	1,690,380
+ New	100,000	300,000	330,000	330,000	330,000
- Destroyed [1]	(83,333)	(166,667)	(166,667)	(166,667)	(166,667)
= Total	2,508,667	2,459,388	2,257,496	2,055,605	1,853,714
Demand					
Primary [2]	182,612	365,225	365,225	365,225	365,225
+ Second Homes	0	0	0	0	0
= Total	182,612	365,225	365,225	365,225	365,225
End of Period Vacant	2,326,054	2,094,163	1,892,272	1,690,380	1,488,489
Excess Vacancy [3]	(1,001,277)	(1,243,423)	(1,457,877)	(1,672,331)	(1,886,785)
% Change New Starts		50%	10%	0%	0%

Source: Linneman Associates
(1) One-third of 500,000 total units destroyed annually; 1/3 factor represents the proportion of destroyed units which are MF.
(2) Total Demand = Population growth HH formation: SF (66%), rental (34%).
(3) Excess vacant units above the historical (25-year) norm of 7.7%.

figure 377

income could afford to purchase 59.6% of all new and existing homes sold during the quarter, assuming the national median home price and weighted interest rate over that period. The index peaked at 78.8% in 2012 and has a long-term average of 61.7% (1992-present). It has since seen a net decline of 1,920 bps from the 2012 peak through the second quarter of 2020. The HOI will continue to decline as unemployment checks replace paychecks.

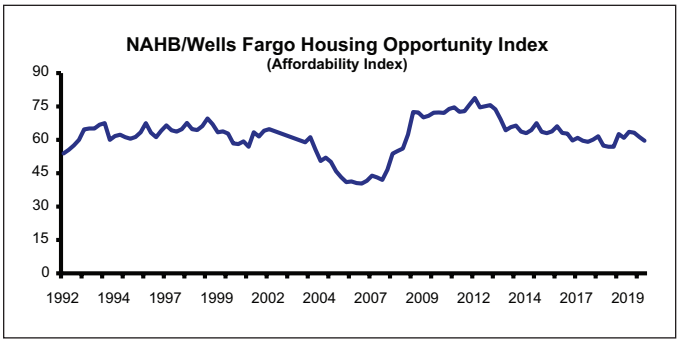


figure 378

Real total outstanding home mortgages were nearly $1.7 trillion in the second quarter of 2020. This is in comparison to the 2009 high of just over $1 trillion and the long-term average (since 1980) of just under $753 billion.

In August 2020, the average 30-year fixed mortgage rate was 2.9%, versus 3.6% one year earlier. The index of the real U.S. median home price-to-per capita disposable personal income is now 20% below the 50-year average (versus 19% below a year earlier). A

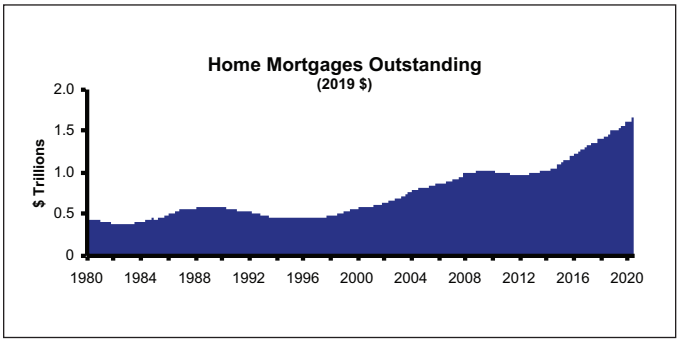


figure 379

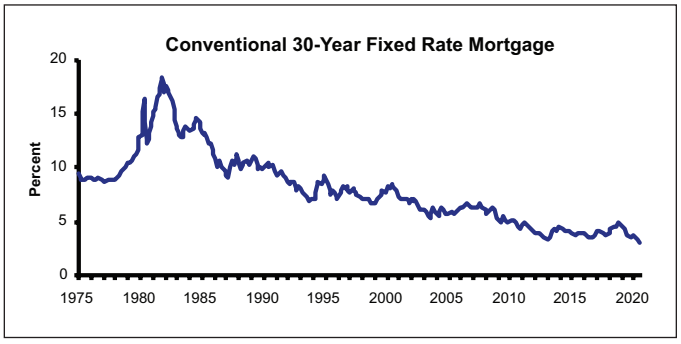


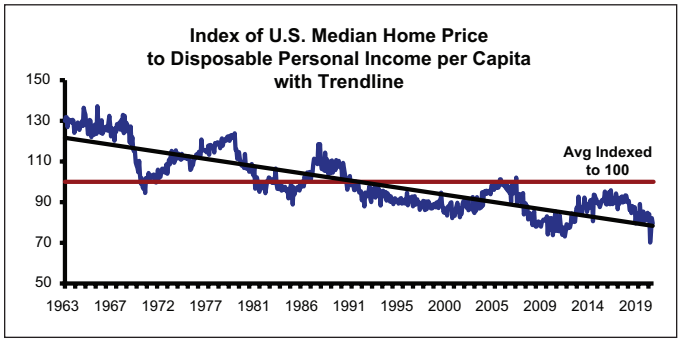
figure 380

negative trend line reflects the declining importance of housing as a share of total expenditures (versus technology and leisure) over time.

The overall residential foreclosure rate (as a percentage of inventory) dropped to 0.68% in the second quarter of 2020, compared to 4.60% in 2010. Mortgages entering the foreclosure process accounted for 0.03% of total inventory in the second quarter of 2020, down from the 2009 peak of 1.37%. The second-quarter delinquency rate jumped sharply to 8.2%, up from 4.5% the prior year and 4.4% in the last quarter. Once again, the shutdown depression may rapidly change this picture, as absent jobs, it is hard to pay your mortgage (or rent).

…the shutdown depression may rapidly change this picture, as absent jobs, it is hard to pay your mortgage (or rent).

Real seasonally-adjusted annual single-family home mortgage flows were $333 billion (real 2019 dollars) in the second quarter of 2020, up by 2.1% over the year and far from the negative flows seen during the



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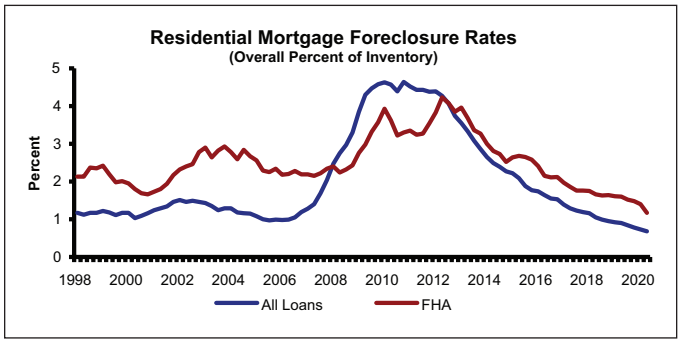

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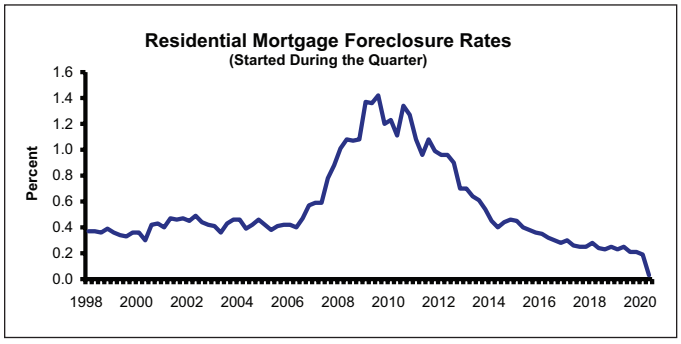


figure 383

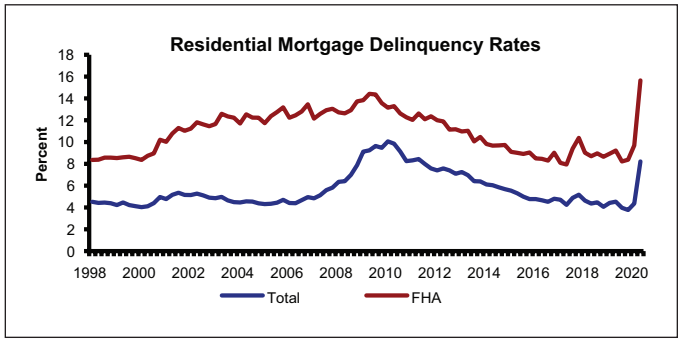


figure 384

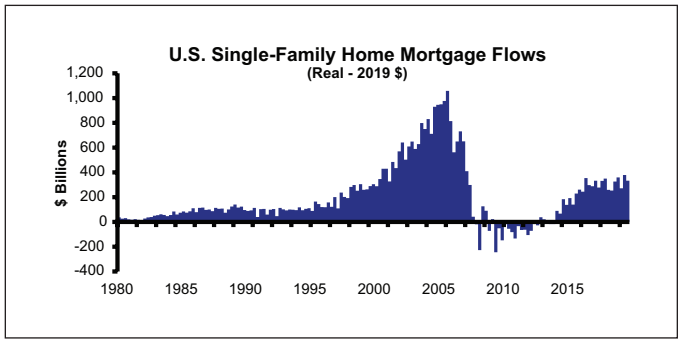


figure 385

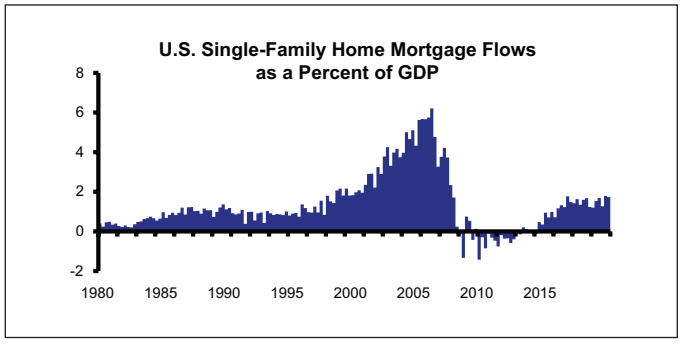


figure 386

Financial Crisis. Real single-family mortgage flows as a percent of real GDP stood at 1.7% in the second quarter of 2020, about 27% higher than the historical average (1980-present). Refinancing at a record low rate is the flavor of the day.

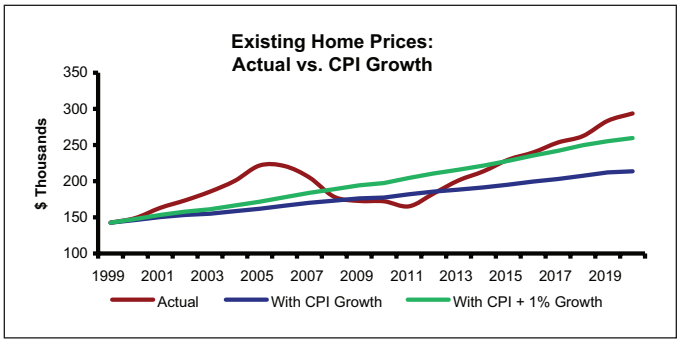
Home Prices. In July 2020, the median existing single-family nominal home price was $293,700, an increase of 8.5% from the previous year. If existing home values had simply kept pace with inflation (core CPI) since 1999, today's median home price would be $213,700. Thus, current nominal pricing is 37.5% above CPI-driven pricing. Given that over the long term, real home prices rise by roughly 1.0% annually beyond CPI inflation due to quality improvement, today's price is about 13.1% above long-term trend.

Through the second quarter of 2020, the three home price indices published by Case-Shiller, the National Association of Realtors (NAR), and the Federal Housing Finance Authority (FHFA) have all posted eight years of solid year-over-year growth. The Case-Shiller and FHFA indices also continued their long run of positive quarter-over-quarter growth, but for the first time since 2011, the NAR home price index posted negative growth (-2.2%) in the second quarter of 2020.

In the second quarter of 2020, year-over-year growth for all three indices continued, with the FHFA index (5.4%) leading the Case-Shiller (4.4%) and NAR (4.2%) indices. Quarterly home prices declined by 2.2% based on the NAR index, while the FHFA and Case-Shiller indices registered positive growth of 0.8% and 1%, respectively, in the second quarter.

The level of home buying activity has increased during the pandemic shutdown as urbanites flock to the suburbs for more space. In one camp, many higher-income urban households that had already been considering the move prior to the pandemic were given a push to act with the shutdown. Others are using their involuntary savings windfalls as down payments on suburban homes. This is true both of the actual buyers as well as their parents or grandparents. Imagine someone who could not save enough for the requisite down payment suddenly having $3,000 saved due a canceled vacation, $2,000 saved due to closed bars and restaurants, and $2,000 saved on canceled concert or theater events. This family magically saved $7,000 in a few months. And their parents/grandparents have similarly saved $10,000 (au revoir Paris). Involuntary savings allow people to put down $17,000 plus the $5,000 savings they already had. With a 10% down payment, this allows them to quickly purchase a $220,000 home. At a 3.5% interest rate on their mortgage, the monthly payment including taxes will only be about $1,200. No wonder many are suddenly rushing to buy homes.

After this initial wave of those who can afford to



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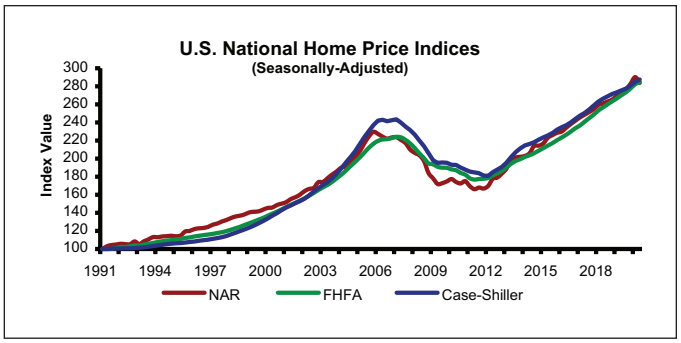

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U.S. Home Price Indices Growth Continues

	Case-Shiller		FHFA		NAR	
	Q/Q %	Y/Y %	Q/Q %	Y/Y %	Q/Q %	Y/Y %
1Q16	1.2	5.0	1.4	5.5	0.6	6.1
2Q16	1.0	5.0	1.4	5.6	1.9	4.9
3Q16	1.3	5.1	1.5	5.9	1.7	5.4
4Q16	1.6	5.2	1.6	6.0	1.6	5.9
1Q17	1.5	5.5	1.3	6.0	1.5	6.9
2Q17	1.2	5.7	1.8	6.3	1.2	6.1
3Q17	1.5	5.9	1.6	6.5	1.2	5.6
4Q17	1.7	6.1	1.6	6.4	1.3	5.3
1Q18	1.7	6.3	1.8	7.0	1.8	5.6
2Q18	1.2	6.3	1.4	6.6	0.6	5.0
3Q18	1.0	5.7	1.3	6.2	0.8	4.6
4Q18	1.0	4.9	1.3	5.9	0.8	4.1
1Q19	0.7	3.9	1.2	5.2	1.5	3.9
2Q19	0.8	3.4	1.3	5.2	1.1	4.3
3Q19	0.7	3.2	1.2	5.1	1.6	5.1
4Q19	1.2	3.4	1.5	5.4	2.3	6.6
1Q20	1.4	4.2	1.7	5.9	2.6	7.7
2Q20	1.0	4.4	0.8	5.4	-2.2	4.2

Source: Case-Shiller, Federal Housing Finance Agency, National Association of Realtors, Linneman Associates

figure 389

FHFA Home Price Index Growth

	% Gain From Min.	Q/Q % Change 3Q19	4Q19	1Q20	2Q20	Y/Y % Change 3Q19	4Q19	1Q20	2Q20
U.S.	**61.0**	**1.2**	**1.5**	**1.7**	**0.8**	**5.1**	**5.4**	**5.9**	**5.4**
Atlanta-Sandy Springs-Alpharetta, GA	103.0	1.2	2.3	1.7	0.7	4.9	6.4	6.9	6.0
Baltimore-Towson, MD	27.8	1.0	0.7	0.4	-0.4	3.0	3.7	3.0	1.8
Chicago-Joliet-Naperville, IL (MSAD)	41.2	0.1	1.2	1.0	-0.4	2.6	3.4	3.3	2.0
Cleveland-Elyria-Mentor, OH	50.3	2.1	1.6	1.4	2.4	5.3	5.6	3.9	7.8
Dallas-Plano-Irving, TX (MSAD)	86.1	1.4	1.1	0.9	0.6	4.0	4.0	4.6	4.1
Denver-Aurora-Broomfield, CO	116.4	1.4	1.9	1.4	-0.5	4.0	5.7	6.3	4.4
Newark, NJ-PA (MSAD)	29.2	0.7	2.1	0.6	-0.7	2.6	4.1	3.6	2.7
Houston-The Woodlands-Sugar Land, TX	81.2	1.8	0.2	1.0	1.4	4.0	5.0	3.5	4.4
Los Angeles-Long Beach-Glendale, CA (MSAD)	94.4	1.2	1.5	2.0	0.5	4.8	5.9	7.2	5.3
Miami-Miami Beach-Kendall, FL (MSAD)	105.8	3.4	0.8	1.9	0.4	7.6	6.1	6.5	6.6
Minneapolis-St. Paul-Bloomington, MN-WI	70.5	1.4	1.6	1.5	1.5	4.7	5.6	4.8	6.1
Nassau-Suffolk, NY (MSAD)	40.2	0.8	2.1	2.2	0.2	2.5	4.0	6.0	5.4
New York-Jersey City-White Plains, NY-NJ (MSAD)	34.7	0.9	0.7	1.0	-1.1	3.8	2.6	3.5	1.5
Oakland-Hayward-Berkeley, CA (MSAD)	126.9	0.7	0.8	2.3	-2.2	3.3	3.5	5.3	1.4
Philadelphia, PA (MSAD)	48.8	1.0	1.7	2.1	-0.8	4.7	4.3	6.4	4.0
Phoenix-Mesa-Glendale, AZ	149.7	2.1	2.1	3.3	2.8	7.6	7.6	10.1	10.7
Pittsburgh, PA	58.6	1.1	1.5	0.4	2.0	5.7	5.8	3.6	5.1
Riverside-San Bernardino-Ontario, CA	108.9	1.2	1.1	2.6	-0.1	3.3	4.2	5.9	4.9
St. Louis, MO-IL	45.9	0.9	2.2	1.6	0.3	3.6	5.9	6.8	5.1
San Diego-Carlsbad-San Marcos, CA	87.9	1.6	1.4	1.4	2.3	3.9	3.6	6.2	6.9
Santa Ana-Anaheim-Irvine, CA (MSAD)	71.6	0.4	2.8	0.9	0.5	2.1	5.1	7.5	4.6
Seattle-Bellevue-Everett, WA (MSAD)	122.1	1.5	1.8	3.2	1.2	2.2	4.6	7.9	7.9
Tampa-St. Petersburg-Clearwater, FL	118.0	2.2	2.0	1.9	1.9	8.0	8.7	7.9	8.2
Warren-Troy-Farmington Hills, MI (MSAD)	101.0	0.4	1.3	1.9	1.2	3.4	3.8	5.7	4.9
Washington-Arlington-Alexandria, DC-VA-MD-WV (MSAD)	57.5	1.1	2.2	2.4	-1.4	4.8	4.9	8.6	4.4
25 Market Average	**79.1**	**1.3**	**1.6**	**1.6**	**0.5**	**4.3**	**5.0**	**5.8**	**5.0**

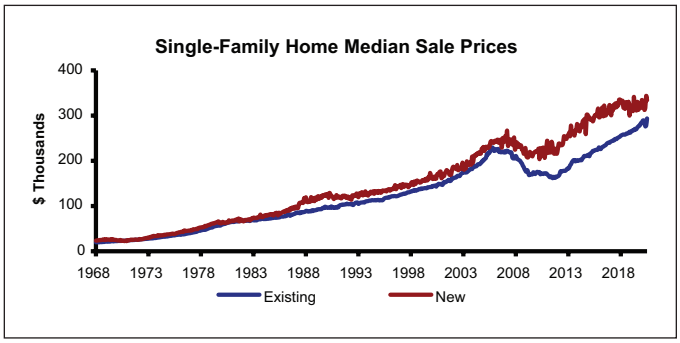
Source: Federal Housing Finance Agency, Linneman Associates

figure 390

make the move to buy homes, we believe that demand will fall and home price declines will be widespread in 2021. Whether the decline in the NAR index is the first sign of weakening or if it is an aberration will be determined in the coming quarters.

Home prices in the top 25 MSAs in the FHFA survey increased in the second quarter of 2020 by an average of 0.5%, significantly lower than the 1.3-1.6% seen in the previous three quarters. The MSAs also saw 30 consecutive quarters of year-over-year home price increases, with average growth of 5% through the second quarter of 2020. This was a surprising 90 bps higher than growth over the previous 12-month period but 80 bps less than the 12-month period ending in the first quarter of 2020. The greatest year-over-year improvements were seen in Phoenix (10.7%), Tampa (8.2%), Seattle (7.9%), Cleveland (7.8%), and San Diego (6.9%). The weakest home price growth over the last year was seen in Oakland (1.4%), NY/NJ (1.5%), Baltimore (1.8%), Chicago (2%), and NJ/PA (2.7%).

On a quarter-over-quarter basis, the FHFA seasonally-adjusted median home price indices gained an average of 0.5% across MSAs, following 1.6% in the previous quarter and 1.2% in the same quarter a year ago. Thus, the solid strength in the single-family housing market prior to COVID-19 took a hit in the second quarter but remains positive. The largest



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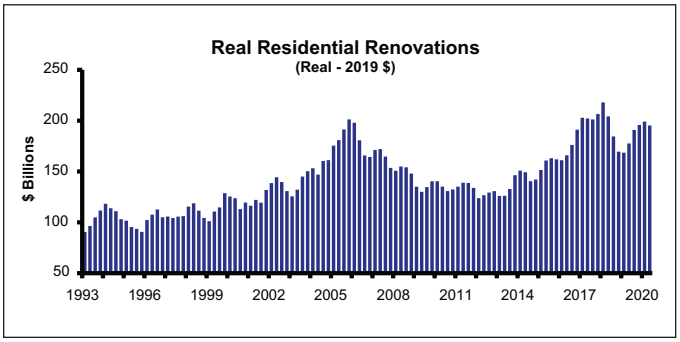
quarterly home price increases were seen in Phoenix (2.8%), Cleveland (2.4%), San Diego (2.3%), Pittsburgh (2%), and Tampa (1.9%). Nine of the top 25 markets saw home price declines in the second quarter of 2020. The largest quarterly home price declines were seen in Oakland (-2.2%), Washington, D.C. (-1.4%), NY/NJ (-1.1%), Philadelphia (-0.8%), and Denver (-0.5%).

From respective home price lows during the Financial Crisis through the second quarter of 2020, the greatest improvements were seen in Phoenix, Oakland, Seattle, Denver, Tampa, Riverside-San Bernardino, Miami, Atlanta, and Detroit, all of which saw appreciation of at least 100% (i.e., prices doubled). At just 27.8% and 29.2% above their respective recessionary home price troughs, the Baltimore and Newark,

NJ-PA metro area indices not only remain the weakest among the largest FHFA markets but further weakened in the second quarter.

Residential renovations are a leading indicator of home sales volume, as existing homeowners often pursue deferred capital improvements while preparing to put their homes on the market. We calculate the ratio of residential renovations-to-GDP, setting the 1992-2005 average to 100 as a baseline level. After ten years of below-average home renovation spending, the ratio moved above average in 2016 (based on restated data) but dipped back below in early 2019. As of the second quarter of 2020, the ratio of residential renovations-to-GDP index was 17% above the historical average. On a cumulative basis since 1993, the real renovations-to-real GDP ratio is still about 230% below the norm. Spending on renovations relative to GDP is consistent with historical norms but well short on a cumulative 10-year basis. As the partial shutdown continues, mid- to upper-income homeowners are ramping up renovations with their accidental savings.

Monthly new home sales volume jumped to 78,000 in July 2020, up by 23,000 homes (41%) compared to a year earlier, while 597,000 existing home sales in July reflected an increase of 57,000 homes (10.6%) over the same period. Since 1999, new and existing home sales have averaged 59,000 and 441,000 sales per month, respectively.



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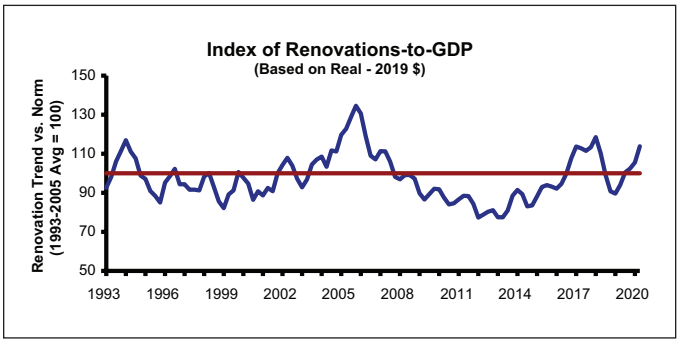

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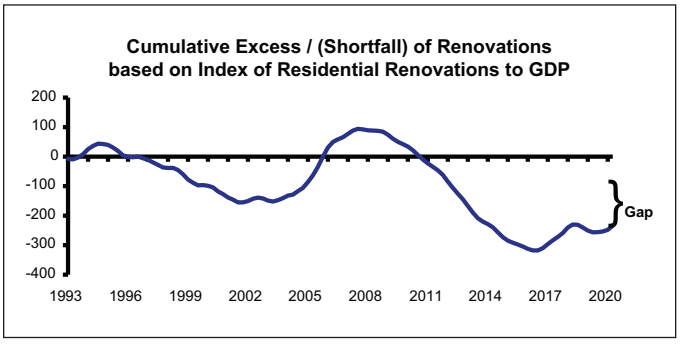

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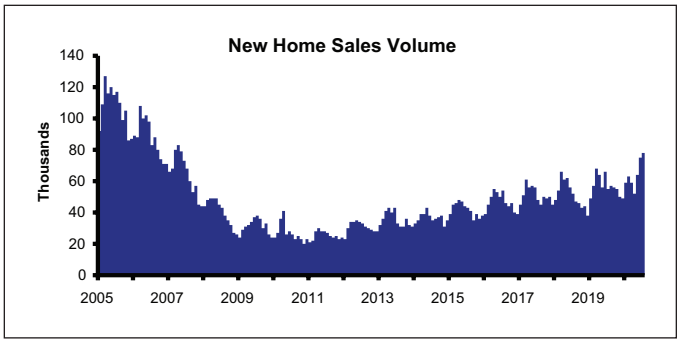

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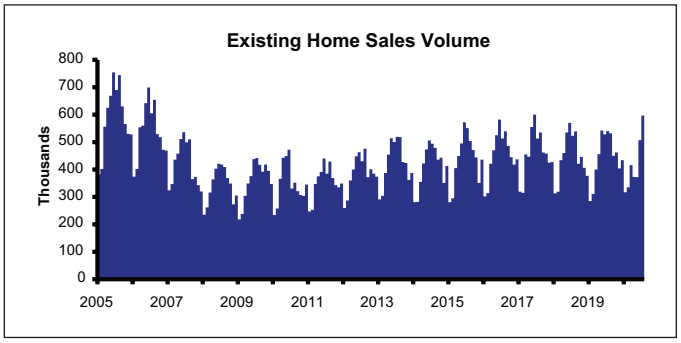

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"OK, Millennial"

As the 2020 campaign heats up, rhetoric about the horrors of "inequality" is increasing. However, we are unaware of any credible empirical study that finds a significant correlation between economic growth and income inequality. That is, greater inequality in no way impacts growth and more importantly, prior to COVID, the lower tiers of the U.S. (and world) have never in the history of mankind lived as well. Finally, the severe drop in wealth in March caused by COVID and the shutdown may have increased equality but benefitted no one except the jealous. As is always true of reality versus Marxist fantasy, this occurred by making many of the people worse off and no one better off. Furthermore, this greater equality has neither stimulated growth nor helped the worst off in our society. When we all went on voluntary house arrest during the shutdown, jobs were wiped out and income and wealth plummeted, causing metrics of equality to improve. As we have noted for years, this always happens during wars and disasters. Specifically, government-induced equalization helps almost no one and hurts many. Remember that Pol Pot basically eliminated inequality in Cambodia by making everyone destitute and subject to execution. Complete equality, the Marxist dream, would assuredly be achieved if we were all dead from coronavirus. How sad that no one would be around to enjoy it!

Few people go to sleep caring about "inequality." They care about if their family is fed, safe, housed, has medical care, etc. They are not troubled by Bill Gates' wealth, and most admire what he has created and how he has done much good through his philanthropy.

Few people… believe they are worse off because Bill Gates is extremely well off.

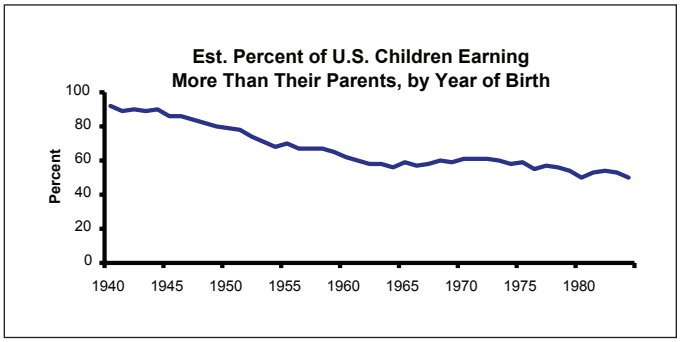
Few people, except university professors, the media, students, and politicians believe they are worse off because Bill Gates is extremely well off. Similarly, the lowest income tiers are not troubled because drug lords being rich creates inequality. Rather, they are deeply troubled that drug lords make their neighborhoods unsafe and poison their children with drugs.

We only care about the absolute well-being of the lowest tiers of the world's population. In fact, if U.S. politicians were as troubled by inequality as their rhetoric suggests, they would redirect almost all domestic redistribution to assist the world's most deprived populations. After all, even the poorest in the U.S. basically are all fed (often at restaurants), have cars, live in homes with air conditioning, Wi-Fi, phones, and TVs, and have access to quality medical care unlike any time in history. The poorest in the world have none of these things. In fact, hundreds of millions lack food, water, a roof, and basic sanitation facilities.

Even before the shutdown, you often heard that Millennials are not "doing economically better" than their parents and grandparents. But when previous generations were the age of today's Millennials, these parents and grandparents had been already working 5-7 years longer, put in more hours per week, did not have computers, iPhones, Netflix, Spotify, ride around in chauffeur-driven cars, go on annual ski and island vacations, take gap years, or participate in university global immersion experiences. And they rarely ate out or drank endless coffee shop lattes. We know this from personal experience. Yet, these are all fairly ubiquitous Millennial experiences.

Also understand that a key reason that previous generations easily economically outperformed their parents and grandparents is because their preceding generations lived so miserably, both in the U.S. and their native heritage countries. It is relatively easy to do better than people who had no bathrooms or kitchens and who did not graduate (and in many cases even attend) high school. The massive economic progress which has taken place over our 69 years means that it is harder for today's young people to systematically surpass the well-being of previous generations, but this does not mean they are not well off.

As we have discussed in previous issues, inequality is terribly measured and is, in fact, largely irrelevant as commonly calculated. The meaningful question is whether the life quality of the most disadvantaged



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improves. This has clearly occurred, even as measured inequality seems to increase and median real income appears to have gone flat. Do you think that the poorest of today would go back to the living standards of 50 years ago because it was "better" or more "equal"? Not a chance!

The meaningful question is whether the life quality of the most disadvantaged improves.

Wealth disparity in the U.S. is often touted as an indicator of capitalistic excess by opponents of free enterprise. Some studies estimate that the top 0.1% own 20% or more of U.S. wealth, and the media and many politicians posit that the disparity widens every day. However, new and better ways of measuring wealth complicate this narrative.

In a recent working paper, Matthew Smith of the Treasury Department, Owen Zidar of Princeton University, and Eric Zwick of the University of Chicago note that the rich systematically opt for investments with higher rates of return, meaning that the pool of wealth from which they derive their income is much smaller than at first glance. Using more accurate rates of return, they estimate that the top 0.1% own closer to 15% (rather than 20%) of the nation's private wealth, and that this share has remained stable since 2000.

In another working paper, Sylvain Catherine, Max Miller, and Natasha Sarin of the University of Pennsylvania note that previous studies inappropriately omit the discounted value of public pensions and social security benefits when calculating wealth, and that many individuals have notably higher wealth when these are included. With the growth of Social Security wealth over time, they note that it is increasingly essential to consider this factor in analyses of wealth inequality. They find that doing so dramatically decreases the disparity between rich and poor and that contrary to popular opinion, the wealth share of the richest has not increased over the past two decades.

A final comment on the economic status of Millennials is that many refuse to save. A common reason given is "what's the point, as global warming is going to destroy the world!" Of course, even the most pessimistic legitimate investigators of global warming dismiss this sentiment as complete nonsense, but this is what many Millennials have sadly taken away from their education. Further, many Millennials failed to study or take demanding courses from which they could have learned something productive. Yet, they wonder why they will have a hard time exceeding the economic success of previous generations.

Millennials have a decidedly different view of savings than previous generations. Unlike those whose views of the importance of work and saving were forever shaped by the Great Depression, Millennials are far from being similarly chastened by the asset value and economic collapse during the Financial Crisis. For example, a recent Wall Street Journal survey indicates 38% of Millennials (versus 28% of Boomers) believe that you are better off having what you want now rather than saving for the future. Similarly, 35% of Millennials (versus 9% of Boomers) only save so that they can travel. This attitude towards savings was fun while it lasted but left many young people completely unprepared for the shutdown depression.

Vacancy / Occupancy Rate Forecast Adjustments

As the nation slowly climbs out of the economic abyss created by the shutdown, and conditions normalize a bit, we are returning to our statistical employment forecasts (after putting them aside for two quarters) and are once again publishing our MSA vacancy and occupancy rate projection charts. However, we are not yet publishing the corresponding pipeline sensitivity analyses given the relatively high level of uncertainty that remains during the Butterfly Recovery. The truth is that nobody knows what near-term job growth will be, but these are our best estimates of job recovery nationally and within each MSA.

Forbearance of debt and rent will be a mitigating factor. Our projected vacancy rates in all property sector tables therefore reflect latent, rather than actual, vacancy. That is, they are directional indicators of vacancy pressure rather than actual forecasts. This is why adjustments based on judgment are needed. In addition to factoring in forecasted employment, historical space usage ratios, and known supply pipelines, we apply an offsetting absorption factor related to the expected increase in square footage per worker required for social distancing in the workplace. That said, the more rapid the recovery, the "flatter" the vacancy rate projection charts become.

Office Market Outlook

Office starts will be near zero (unless they are already underway), with any new activity slanting towards stronger suburban office nodes, as few landlords will have any capital available for developments. When the economy rebounds, the "hot seat, shared workspace" environment is ultimately bound for the rubbish heap. We have long predicted a shift from open floorplan offices back to more traditional layouts but expected it to result from poor worker productivity, not a virus. While it has come at a terrible expense, we welcome this change, as cognitive research tells us that open office spaces sacrifice productivity in the effort to save a little overhead.

When the economy rebounds, the "hot seat, shared workspace" environment is ultimately bound for the rubbish heap.

Many firms bedecked their offices with tightly packed butcher block tables where workers grabbed any available seat, put on their headphones (so much for creative interaction), and got to work. As social distancing will continue for some time, and sanitation standards are sharpened, this once trendy layout is instantly passé. However, until workers return in full force, there is no need for reconfigured space. While there will be a push for suburban office nodes to avoid public transportation and offset higher costs, office tenants are generally locked into long-term leases and will not quickly transition. Thus, this shift will be far less dramatic than most anticipate. One sub-sector that will see new development and retrofitting is life science lab space, where enhanced research dollars drive substantial additional demand.

For every one million new jobs created during the cyclical recoveries of the early 1990s and 2000s, the national office vacancy rate declined by 60 bps and 73 bps, respectively. Due to notably reduced square footage per worker, there was only a 27-bp reduction in office vacancy per one million jobs between the third quarter of 2013 and the first quarter of 2020, with the NCREIF (National Council of Real Estate Investment Fiduciaries) office vacancy rate declining by 410 bps and employment growing by 15.3 million jobs over that period. Everything changed, however, with the pandemic shutdown in the second quarter of 2020

Going forward, readjustments of workspace will ultimately mean increased square footage per worker, as health concerns will largely eliminate "cool" open space work layouts, offsetting much of the reduced demand for space. As such, we adjusted our MSA office vacancy rate projections by increasing the average space usage factor upward. Again, this is more art than science.

In the second quarter of 2020, Cushman and Wakefield's national office vacancy rate was 13.7%, 50 bps and 70 bps higher than the previous quarter and year, respectively. The NCREIF vacancy rate, which tracks higher-quality institutional space, indicates that the U.S. office vacancy rate stood at 10.2%, 10 bps higher than the previous quarter and 40 bps higher than the previous year. Cushman puts U.S. office vacancy above the "natural rate" of roughly 10%, while the NCREIF rate indicates a balanced market.

Vacancy versus Job Recovery

	Employment (000s)	Change (000s)	NCREIF Office Vacancy Rate %	Change (bps)	Decline in Vacancy Rate per 1 Million Jobs Gained (bps)
4Q92	109,302		15.7		
4Q97	124,997	15,695	6.3	940	60
1Q04	130,912		16.0		
4Q07	138,283	7,371	10.7	540	73
3Q10	130,402		15.5		
3Q13	136,610	6,208	14.2	131	21
3Q13	136,610		14.2		
1Q20	151,922	15,312	10.1	410	27
2Q20	133,702	-2,907	10.2	400	-138

Source: BLS, NCREIF, Linneman Associates.

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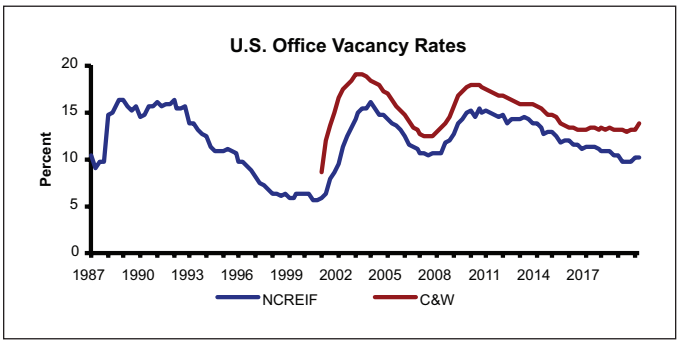

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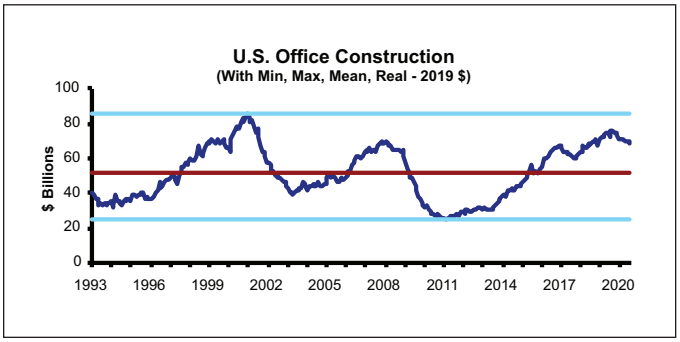

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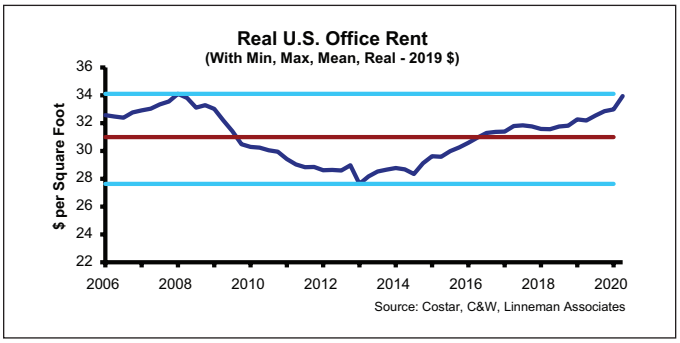

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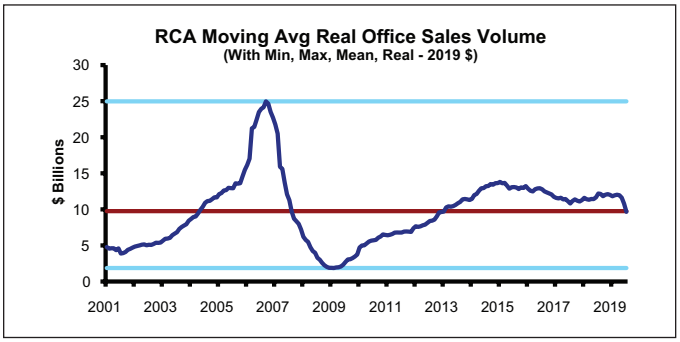


figure 402

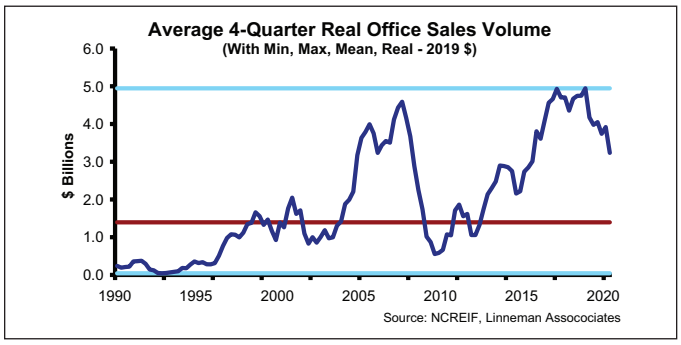
In July 2020, inflation-adjusted "real" annualized U.S. office construction spending (including spending on TIs and capex) stood at over $68.8 billion (2019 dollars). This is 32.8% above the historical mean of $51.8 billion and 175.2% above the historical low of $25.0 billion (2011) but remains 19.3% below the historical high of $85.2 billion achieved in 2000. The tightening of construction lending standards over the past 24 months has tempered new development. In large part, these elevated outlays reflect high construction costs rather than excess square footage. Construction activity will fall well below average by year-end as pipelines empty and few new projects are started.

Estimated real (2019 dollars) average office rent was $33.94 per square foot (psf) in the second quarter of 2020, 9.4% above the long-term average (since 2006) of $31.00. The current rate is 0.5% below the 2008 high of $34.11 per square foot and 22.8% above the 2013 low of $27.63, but this will soften.

Examining Real Capital Analytics' 12-month rolling inflation-adjusted sales volume (2019 dollars), the office sector is the third-most active (after multifamily and industrial) but is still 84% below its previous peak. In June 2020, the sector saw nearly $9.7 billion of real sales, compared to a moving average peak of $25 billion per month in late 2006. June 2020 real office sale transaction levels are up by 135% from the early 2010 trough but are down by 21% year-over-year. We expect few transactions in the third quarter due to large bid-ask spreads.

NCREIF tracks trailing four-quarter sales volume of institutional properties in its coverage universe. While the NCREIF series does not represent the entire market, it is useful to compare the trends between the two series, as well as the relative levels within each series. While RCA sales volume dropped by 93% during the recession, NCREIF sales volume similarly dropped by 88%. On the upside, RCA four-quarter sales volume rebounded by more than 550% through the second quarter of 2019 but subsequently dropped by 20.8% over the next year. Similarly, NCREIF sales volume increased by 792% from the Financial Crisis bottom, to $5 billion in the fourth quarter of 2018, but since declined by 34.6% through the second quarter of 2020. We expect 80-90% drops in sales volumes as rent, occupancy, and valuation uncertainty creates large bid-ask spreads.

The 12-month trailing real average office sale price stood at $293 per square foot in June 2020, according



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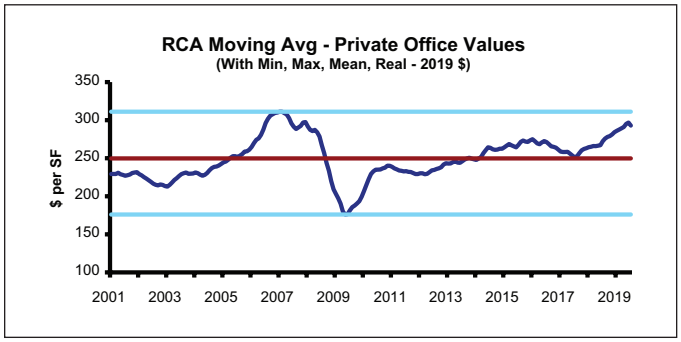

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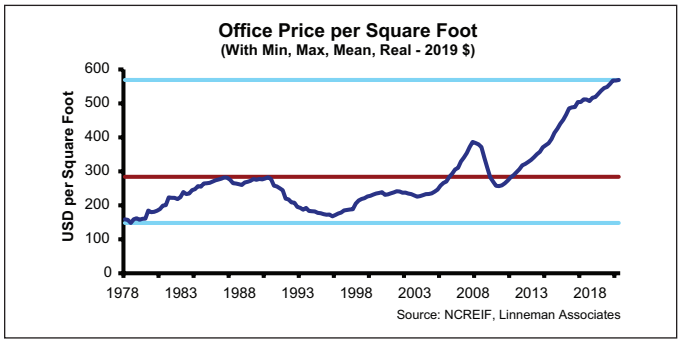

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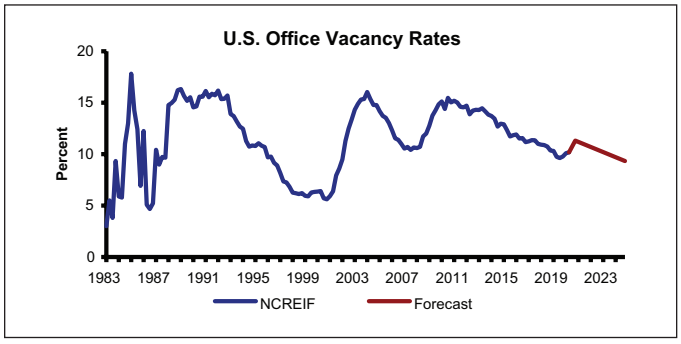


figure 406

to Real Capital Analytics. This is 5.9% below the 2007 peak of $311 per square foot but 17.3% above the historical mean of $249 per square foot. In comparison, NCREIF office prices per square foot begin in 1978 and follow a similar trend for coincident RCA data points. However, the current real NCREIF office pricing ($569 psf) is significantly higher than what RCA reports and is now at the historical peak. This is perhaps due to the dearth of transactions, with only a few trophy properties trading. We believe that this will fall well below trend by year-end, though tenant demand for "social distancing" space will buffer the decline.

Sustained job growth is the ultimate driver of office demand. Linneman Associates examined the historical relationship between employment growth and commercial property vacancy rates and determined that over the long term, for every 100-bp (1%) increase in U.S. employment, the U.S. office vacancy rate declines by 43 bps. Given our forecast of three million net new jobs from year-end 2019 through 2024, we anticipate that the U.S. office vacancy rate will be 80 bps below the fourth-quarter 2019 level at year-end 2024. However, in 2020, we expect that 10-30% of all tenants will not pay their rent.

In the second quarter of 2020, 32 of the 43 U.S. office markets we cover registered higher vacancy rates than the previous quarter, two were unchanged, and nine decreased. Most will fall by year-end 2021. Columbus and Charlotte (each +260 bps), San Francisco (+226 bps), Austin (+210 bps), and Orlando (+180 bps) saw the largest increases in vacancy rates, while Memphis (-100 bps), Houston (-60 bps), West Palm Beach (-40 bps), Indianapolis (-30 bps), and Orange County (-20 bps) saw the greatest vacancy declines during the quarter.

The highest vacancy rates at the end of the quarter were in Fairfield County, Westchester County, Houston, Dallas, Atlanta, and Chicago, while Cleveland, Inland Empire, Charleston, Raleigh-Durham, Boston, and Seattle displayed the lowest vacancy rates. By year-end 2021, we expect the weakest markets to be Fairfield County, Houston, Austin, Westchester County, Chicago, Cincinnati, Columbus, Atlanta, Miami, and Washington, D.C.

Using a benchmark of 10% vacancy to proxy a relatively balanced market, only seven MSAs (Seattle, San Francisco, Raleigh-Durham, Inland Empire, Charleston, Boston, and Cleveland) were in balance in the

second quarter of 2020. We expect West Palm Beach, Fort Lauderdale, Los Angeles, Raleigh-Durham, Inland Empire, Charleston, Orlando, Boston, and Cleveland to be in balance at year-end 2021, while Seattle and San Francisco are expected to fall out of balance over the same period.

Office Vacancy Rates - Base Case Pipeline

Market	2Q20	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	18.7%	22.8%	20.2%	19.0%	18.7%
Austin	12.1%	19.4%	22.3%	23.9%	24.4%
Baltimore	12.8%	18.0%	13.4%	9.0%	7.0%
Boston	9.5%	11.1%	5.9%	6.3%	7.4%
Charleston	8.2%	14.0%	9.2%	6.2%	5.0%
Charlotte	10.9%	17.5%	13.0%	11.3%	10.9%
Chicago	18.4%	21.9%	21.0%	20.8%	20.6%
Cincinnati	17.7%	23.0%	21.0%	17.7%	14.0%
Cleveland	6.5%	13.5%	9.5%	8.4%	7.8%
Columbus	17.9%	23.2%	20.4%	17.7%	15.5%
Dallas	19.4%	22.2%	19.1%	16.4%	14.6%
Denver	14.7%	17.8%	14.5%	13.1%	12.6%
Detroit	12.1%	20.0%	16.5%	14.0%	11.9%
Fairfield County	27.8%	34.5%	32.7%	29.6%	26.7%
Fort Lauderdale	12.7%	11.6%	6.1%	5.9%	5.7%
Fort Worth	12.0%	15.0%	11.9%	9.3%	7.1%
Fresno	12.0%	16.4%	12.8%	10.4%	8.6%
Houston	23.2%	27.0%	24.3%	22.2%	20.7%
Indianapolis	17.8%	21.4%	18.8%	16.7%	15.0%
Inland Empire	6.9%	9.9%	5.8%	5.3%	4.9%
Long Island	11.3%	17.7%	16.2%	14.4%	11.9%
Los Angeles	14.9%	16.9%	8.8%	9.0%	9.3%
Memphis	12.5%	16.0%	14.0%	12.2%	10.9%
Miami	13.4%	19.6%	19.4%	19.2%	18.6%
Minneapolis	18.2%	19.4%	15.8%	15.8%	15.9%
Nashville	12.3%	19.2%	16.9%	14.4%	12.8%
New York City	11.9%	20.5%	15.4%	11.1%	9.1%
North & Central NJ	17.3%	19.8%	13.2%	10.2%	8.1%
Orange County	12.0%	19.1%	15.3%	11.1%	7.7%
Orlando	11.2%	16.3%	9.1%	7.4%	6.5%
Philadelphia	14.1%	19.5%	17.2%	15.3%	13.9%
Phoenix	17.3%	18.3%	14.9%	13.9%	12.8%
Portland	11.8%	13.8%	10.2%	9.9%	9.5%
Raleigh-Durham	8.6%	13.5%	8.8%	6.0%	4.4%
St. Louis	11.8%	16.3%	15.6%	15.2%	14.8%
San Diego	13.6%	19.2%	13.3%	9.4%	7.6%
San Francisco	9.6%	16.7%	14.8%	13.6%	12.2%
San Jose	10.5%	16.2%	13.5%	11.1%	9.2%
Seattle	9.8%	15.4%	11.9%	9.8%	8.7%
Tampa Bay	13.4%	17.9%	16.8%	15.8%	15.1%
Washington, D.C.	17.5%	21.7%	19.2%	17.1%	15.2%
Westchester County	23.4%	31.8%	21.5%	15.1%	9.8%
West Palm Beach	13.7%	16.1%	8.7%	8.7%	8.7%

Highlighted entries indicate market at supply-demand balance, or better.

** Inland Empire = Riverside/San Bernardino Metropolitan Area*

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

figure 407

Industrial Market Outlook

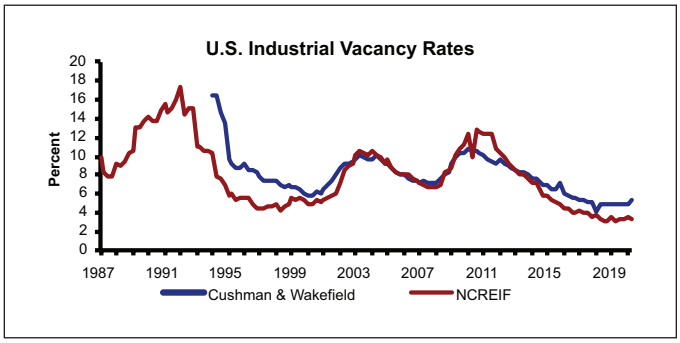
Prior to the shutdown, demand for industrial space was very strong, driven by a strong economy and the rapid expansion of online retail sales. Faced with the COVID-19 shutdown, the industrial sector is relatively insulated in the short term, though will be negatively impacted on a lagged basis, as in an economy with an implied unemployment rate of 12-16% (including those who left the labor force), most tenants do not expand, many downsize, some disappear, and others fail to pay rent. We continue to caution landlords that most online retailers are money-losing endeavors, and the demise of the weakest may be (ironically) accelerated as a result of greater sales.

There will be selective construction of last-mile online logistics facilities over the next 24 months. In addition, some traditional warehouse facilities will be converted into online distribution facilities, but even this activity will be limited. Warehouses and distribution facilities dependent on international trade (near major ports and airports) will be particularly hard hit, as plunging international trade (due to both lower incomes and increased nationalism) crushes import/export throughput.

Viable online sellers will absorb more square footage than usual to accommodate the increased demand for online goods. Non-viable online sellers will remain largely unchanged in the short term, but if funding for unprofitable companies declines, they will be unable to afford warehouse space.

Warehouses servicing grocery items will not experience much change, as grocery stores will adapt to the virus. On the other hand, warehouses that service restaurants and small businesses will struggle because these will take much longer to come back. The businesses that permanently closed during the shutdown will eventually be replaced, but this process will take time.

Cushman and Wakefield data indicate that the U.S. industrial vacancy rate increased since last year through the second quarter of 2020, standing at 5.3%. The current level reflects a 40-bp increase over the quarter, against a total inventory of about 14 billion square feet of industrial space nationwide. In comparison, NCREIF's U.S. industrial vacancy rate (primarily institutional-quality properties) increased by 20 bps over the year but decreased by 10 bps over the quarter, to 3.4 % in the second quarter of 2020. The



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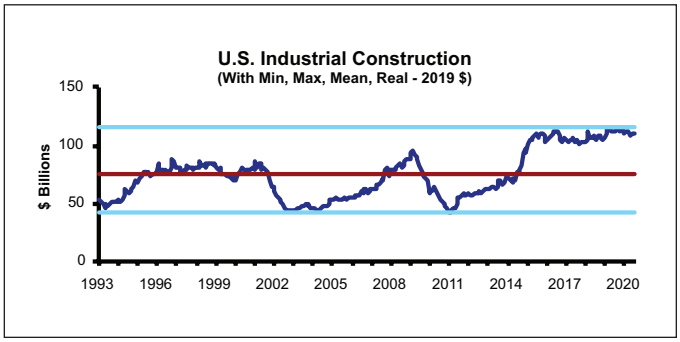

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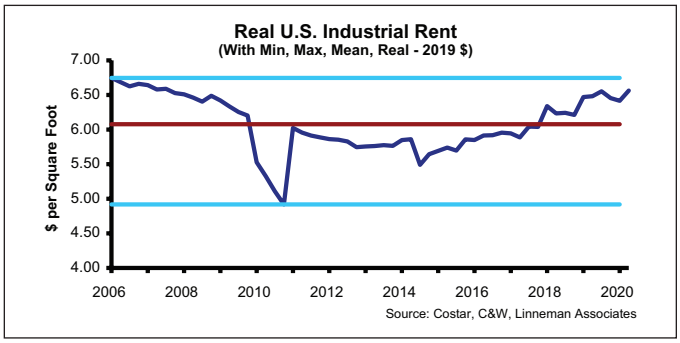

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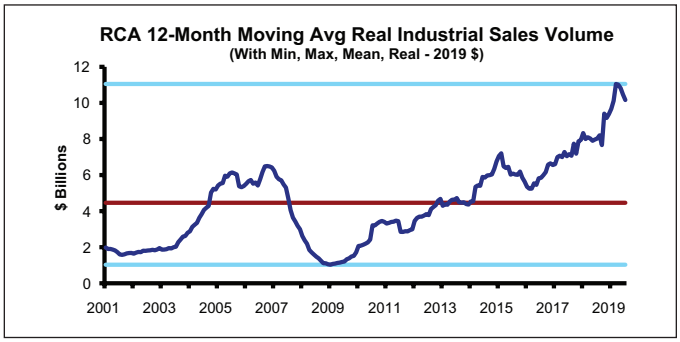


figure 411

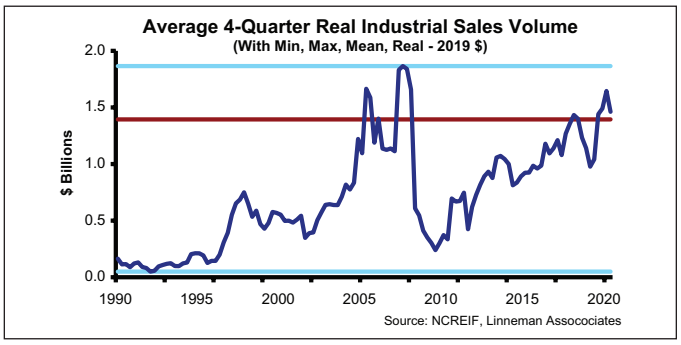
current level is well below the historic (1987-present) average of 8.1% but will rise.

In June 2020, real annualized U.S. industrial construction spending stood at over $106 billion, 157% above the historical (since 1993) low of $41.4 billion (2011) and 42.2% above the long-term average of $74.8 billion but 8% below the historical high of $115.8 billion. Construction spending decreased by roughly $5.9 billion (5.2%) over the last 12 months, driven by both online and brick-and-mortar retailers competing to provide ever-faster online order fulfilment. Improvements in supply chain technology improve productivity, delivery times, and demand for well-located distribution warehouses. Construction activity will fall well below average by year-end, as pipelines empty and few new projects are started in a very weak economy.

The estimated real (2019 dollars) average annual industrial rent of $6.56 per square foot in the second quarter of 2020 was 5.5% and 30.5% above the long-term average (since 2006) of $6.07 and the recessionary low of $4.92, respectively, but was 4.9% below the pre-recessionary high of $6.75 per square foot. Real rents will fall in 2020.

Standing at $10.2 billion in June 2020, rolling 12-month real monthly industrial sales transaction volume was up by 163% from the Financial Crisis bottom but is modestly lower than the 2006 historical high. In comparison, NCREIF tracks trailing four-quarter sales volume of institutional properties in its coverage universe. While the NCREIF series does not represent the entire market, it is useful to compare the trends between the two series, as well as the relative levels within each series. While RCA sales volume dropped by 84% during the recession, NCREIF sales volume similarly dropped by 87%. On the upside, RCA sales volume rebounded by 975% through the first quarter of 2020 but, not surprisingly, dropped in the second quarter of 2020 due to the shutdown, by 8%. Similarly, NCREIF sales volume increased by 587% from the bottom, through the first quarter of 2020, but declined by 11.2% in the second quarter. We expect 80-90% drops in sales volumes as rent, occupancy, and valuation uncertainty creates large bid-ask spreads.

According to Real Capital Analytics, the real trailing 12-month average value of industrial properties sold in June 2020 was $99 per square foot, 15.1% above the pre-recession high of $86 per square foot and well above the historical mean of $76 per square foot. Industrial



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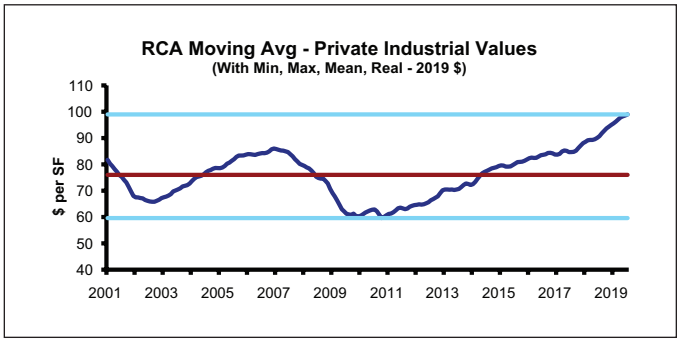

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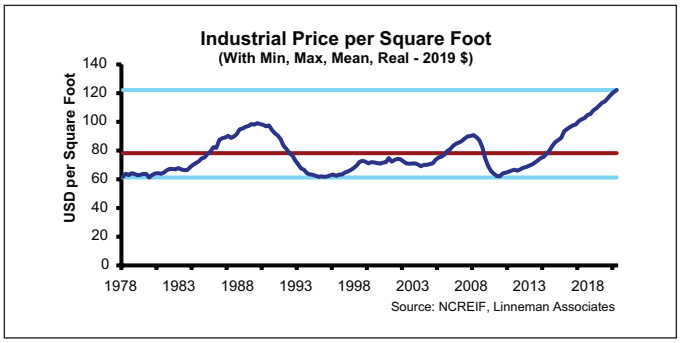

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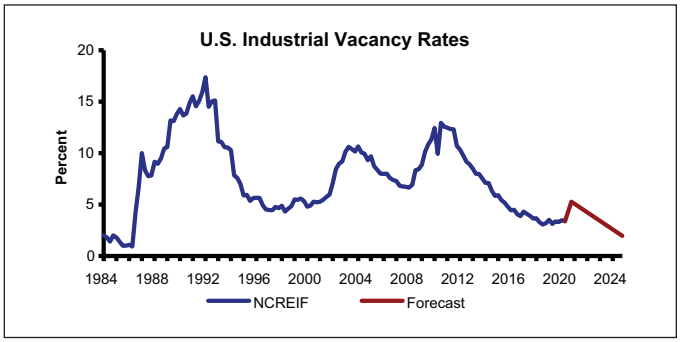


figure 415

pricing bottomed at $60 per square foot in 2010 and has been above the long-term average since 2014. In comparison, NCREIF industrial prices per square foot begin in 1978 and follow a similar trend for coincident RCA data points. However, current real NCREIF industrial pricing ($122 psf) is about 23% higher than what RCA reports. We believe that this will fall below trend by year-end, though on few transactions.

Linneman Associates estimates that for every 100 bps of growth in U.S. employment, the industrial vacancy rate declines by 72 bps. Given our forecast of three million net new jobs from year-end 2019 through 2024, we anticipate that the U.S. industrial vacancy rate will be 140 bps below the second-quarter 2020 level at year-end 2024. If we show vacancy rates approaching or below zero, it means that given the scheduled supply and expected demand, sufficient demand pressure exists to more than absorb all available space. In reality, additional development will occur to offset the excess demand pressure.

In the second quarter of 2020, 24 markets saw increased vacancy, three were flat, and five saw decreased vacancy rates. Most will see worsening by year-end. The greatest improvements occurred in Columbus (-100 bps), Philadelphia (-50 bps), and Atlanta, Detroit, and Austin (each -10 bps). Charlotte (+750 bps), Orlando (+130 bps), Fort Lauderdale (+110 bps), and Baltimore and Seattle (each +90 bps) saw the greatest increases in vacancy over the quarter.

In the second quarter of 2020, the highest vacancy rates were in Charlotte (11.7%), Houston (10.7%), Orlando (8.2%), Austin (7.5%), and Minneapolis (7.4%),

Industrial Vacancy Rates - Base Case Pipeline

Market	2Q20	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	7.0%	10.8%	6.6%	4.0%	2.5%
Austin	7.5%	12.3%	11.9%	10.2%	7.2%
Baltimore	7.2%	15.2%	7.5%	-2.2%	-9.3%
Charlotte	11.7%	15.0%	9.5%	5.5%	2.8%
Chicago	5.3%	8.7%	6.8%	5.7%	4.7%
Cincinnati	5.0%	10.8%	8.0%	3.5%	-1.3%
Cleveland	4.0%	11.1%	-1.0%	-6.1%	-9.1%
Columbus	4.8%	10.8%	10.4%	6.1%	2.5%
Dallas-Fort Worth	6.1%	7.3%	3.7%	2.3%	0.9%
Denver	6.1%	9.0%	4.8%	2.6%	1.4%
Detroit	3.2%	11.7%	7.6%	4.5%	1.9%
Fort Lauderdale	6.2%	9.1%	-1.6%	-3.1%	-4.8%
Houston	10.7%	14.8%	11.1%	8.2%	6.0%
Indianapolis	4.7%	9.9%	6.0%	2.7%	0.0%
Inland Empire*	4.2%	7.0%	2.1%	0.6%	-1.0%
Las Vegas	5.1%	16.7%	13.0%	9.5%	6.2%
Long Island	5.2%	12.1%	10.5%	8.5%	5.8%
Los Angeles	2.8%	3.9%	-3.9%	-4.5%	-5.1%
Miami	4.7%	10.2%	8.3%	6.3%	3.8%
Minneapolis	7.4%	8.1%	3.0%	2.2%	1.3%
Nashville	2.6%	6.9%	3.0%	-1.1%	-4.5%
North & Central NJ	3.1%	6.0%	-1.8%	-5.3%	-7.8%
Orlando	8.2%	10.8%	6.2%	2.6%	0.6%
Philadelphia	3.1%	9.0%	6.1%	3.7%	1.7%
Phoenix	7.1%	7.5%	5.4%	4.6%	3.8%
Portland	3.8%	6.2%	-0.8%	-2.5%	-4.1%
St. Louis	5.8%	9.9%	8.3%	7.0%	5.8%
San Diego	5.4%	10.6%	2.9%	-2.7%	-6.0%
San Francisco	5.1%	5.9%	4.6%	2.9%	1.3%
Seattle	4.7%	9.3%	3.8%	-0.3%	-3.2%
Tampa Bay	6.9%	8.7%	7.4%	6.1%	4.9%
Washington, D.C.	6.6%	11.7%	7.3%	3.3%	-0.5%

Highlighted entries indicate market at supply-demand balance, or better.

** Inland Empire = Riverside/San Bernardino Metropolitan Area*

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

figure 416

while the lowest were in Nashville (2.6%), Los Angeles (2.8%), Philadelphia and North/Central NJ (each 3.1%), Detroit (3.2%), and Portland (3.8%).

By year-end 2021, the strongest industrial markets are expected to be Los Angeles, North/Central NJ, Fort Lauderdale, Cleveland, Portland, Inland Empire, San Diego, Minneapolis, Nashville, and Dallas-Fort Worth, while the weakest are expected and Las Vegas, Austin, Houston, Long Island, Columbus, Charlotte, St. Louis, Miami, Cincinnati, and Detroit.

Using a 6% benchmark vacancy rate to proxy supply-demand balance for industrial markets, Atlanta, Austin, Baltimore, Charlotte, Dallas-Fort Worth, Denver, Fort Lauderdale, Houston, Minneapolis, Orlando, Phoenix, Tampa Bay, and Washington, D. C. were out of balance in the second quarter of 2020, while all other covered MSAs were balanced. We project that 17 of our 32 covered markets will be out of balance at year-end 2021. Nine markets that were in balance in the second quarter of 2020 will fall out of balance at least through 2021.

Multifamily Market Outlook

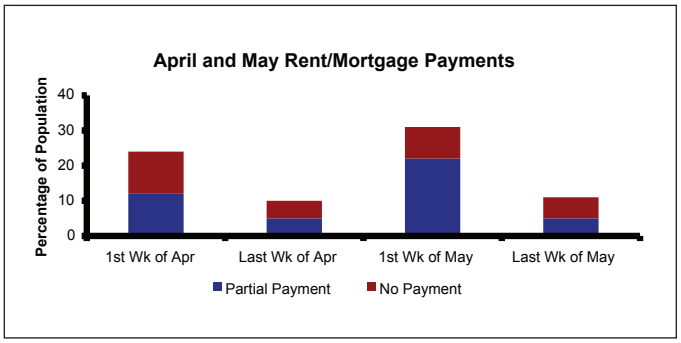
The multifamily sector remains solid in the short term because people have to live somewhere, though many unemployed tenants will move home to live with their parents if they do not find jobs by year-end. Multifamily starts have held up through July and August 2020, though some projects underway (particularly high-rise properties) may be halted if vacancies soften significantly. Class B and C properties will see rising vacancies, resulting in only essential renovations as owners hoard cash.

The supply of new rental units could fall to a run rate of 270,000 per year by year-end. The near-term supply is soft, and we may destroy more units than we build over the next year. As jobs come back, multifamily rental rates will roar back because of the decreased shutdown supply. As people get jobs, they will not rush to buy homes but will more likely rush to get out of their parents' home to rent. This is because they will not have enough wealth for a purchase down payment.

While apartments will not lose many tenants to single-family ownership, the lack of new tenants to replace the move-outs will increase vacancy. This is especially true because the Class of 2020 and returning military will opt to live at home or with friends because they do not have jobs, nor do they qualify for unemployment benefits. Apartments could go from a 5-6% vacancy rate to 8-10% because of the lack of jobs. According to the NMHC Apartment Payment Tracker, only 76.4% of apartment households paid September rent as of the sixth day of the month, rising to 86.2% by the thirteenth. The compares to 81.2% who paid by September 6, 2019. Landlords giving rental relief should assume that they will not be repaid, as many renters live paycheck-to-paycheck.

The suburbs will gain attractiveness, as they are drive-to-work environments with lots of parking and easier access to open space. This will be seen most rapidly among apartment renters, who are not restricted by long-term leases.

The Census Bureau's quarterly Housing Vacancy Survey indicates that the U.S. multifamily vacancy rate decreased by 110 bps, to 5.7%, in the second quarter of 2020. This is 120 bps below the 1976-2001 long-term average of 6.9%. The series peaked at 11.1% in the fourth quarter of 2009 and is at the lowest point since 1985. In comparison, at 7.4 % in the second quarter of 2020, NCREIF's institutional quality multifamily vacancy rate increased by 180 bps over the year and 100 bps



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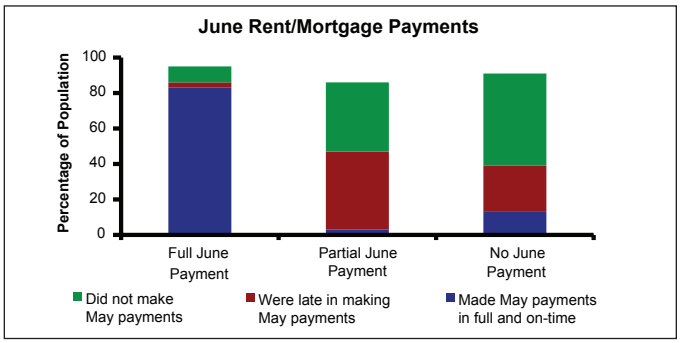

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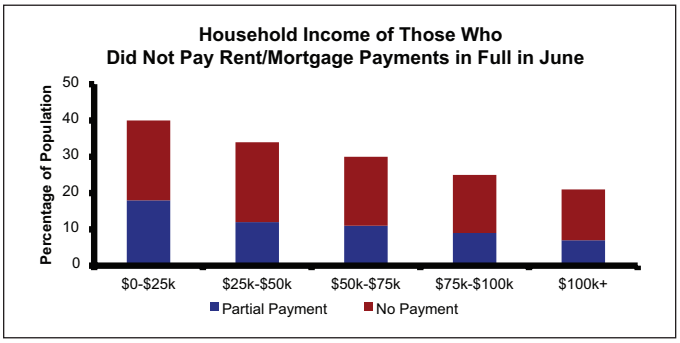

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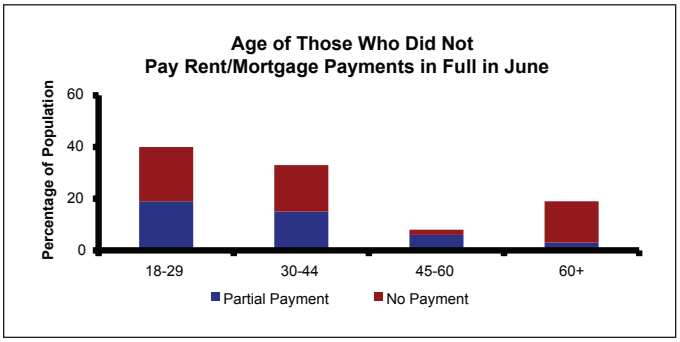

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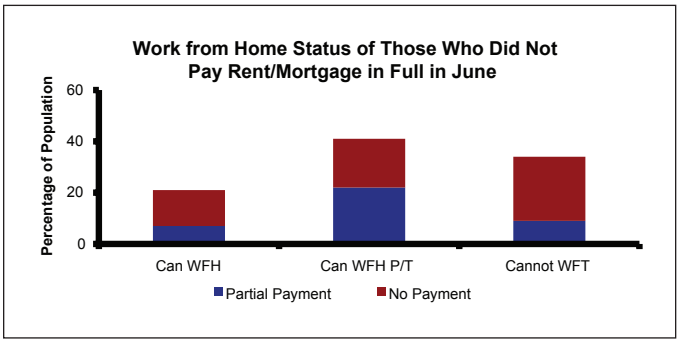

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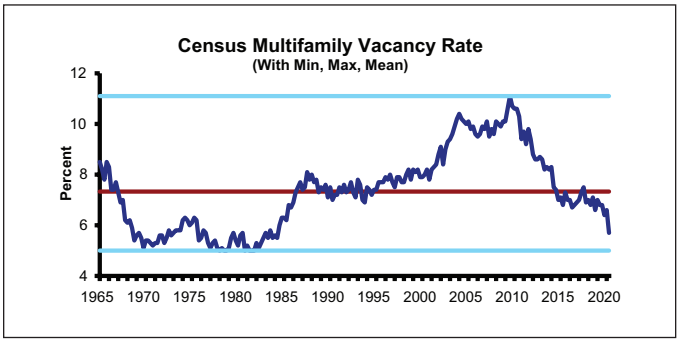
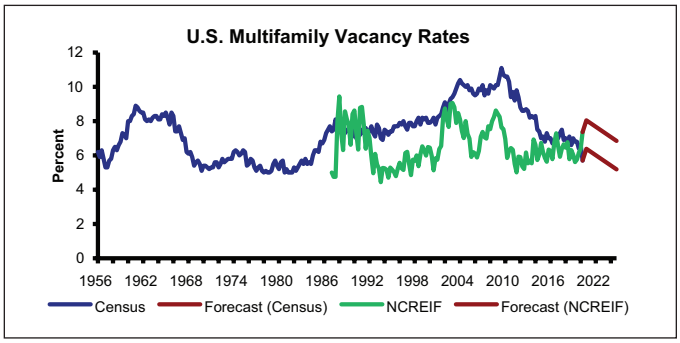


figure 422

during the quarter. The current level reflects a 120-bp decline from the 2008 peak. On average since 1987, NCREIF vacancy rates have been 170 bps below Census vacancy rates, but this has recently flipped, with the latest NCREIF vacancy rate being 170 bps above the Census figure.

Linneman Associates' research indicates that for every 100 bps of growth in U.S. employment, the multifamily vacancy rate declines by 26 bps. Given our forecast of three million net new jobs from year-end 2019 through 2024, we anticipate that the U.S. multifamily vacancy rate will be about 50 bps below the fourth-quarter 2019 level at year-end 2024. In the interim, however, there will be increases in vacancy, to as high as perhaps 8-10%. This is because absent jobs, many potential renters will return to their parents' homes. In addition, some will see large numbers of tenants failing to pay rents.

The 40th Percentile Rent or Fair Market Rent (FMR), as published by the Department of Housing and Urban Development (HUD), is the dollar amount below which the lowest 40% of the standard-quality rental housing units are rented. In the U.S., the real average monthly



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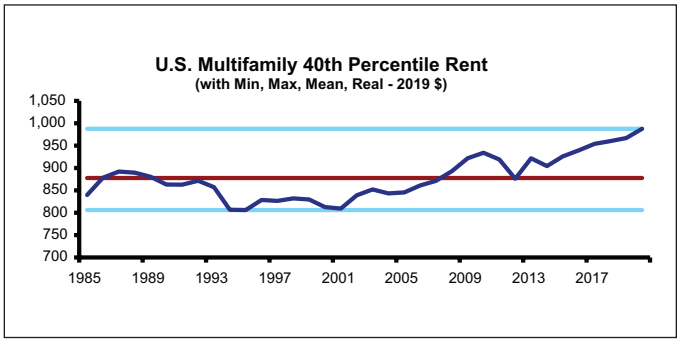

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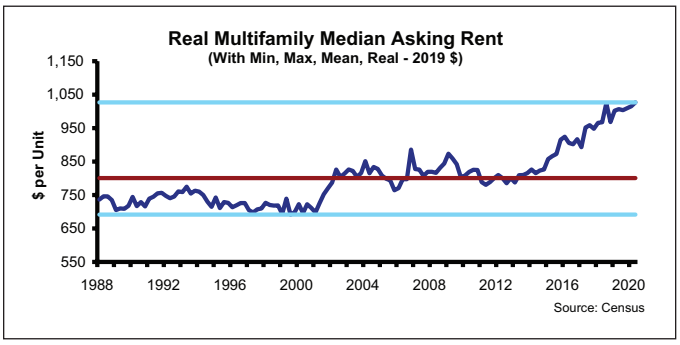

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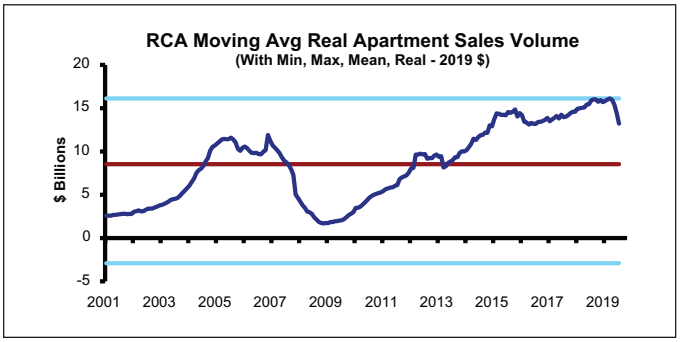

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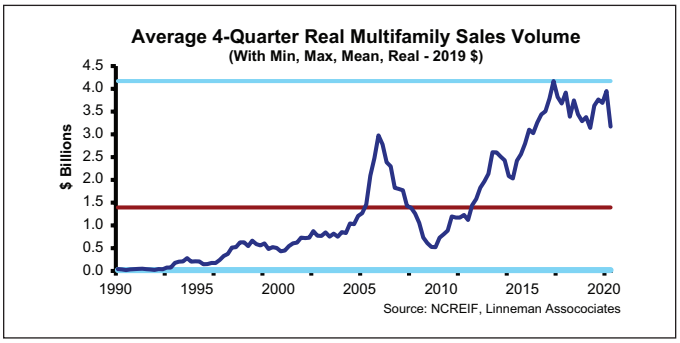


figure 427

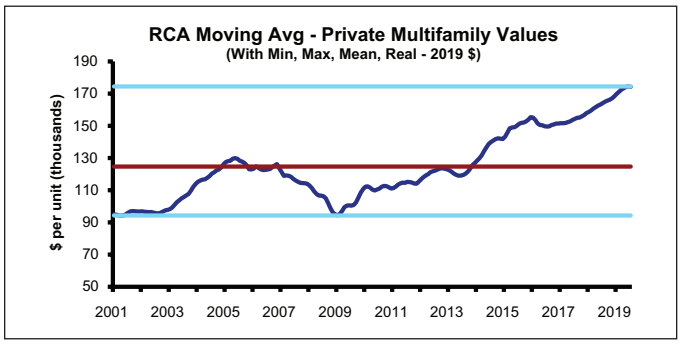
40th percentile rent is estimated to be $988 per unit in 2020, up by 2% from 2019. Reflective of a historical peak, the current level is 12% and 20% above its long-term average (since 1983) of $878 and the 1995 trough of $806 per unit, respectively. Volatility, measured by the range between the low and high values as a percent of the long-term average, is 20.5% for the nation.

Real median multifamily rent (2019 dollars) published by the Census tells a similar story. The long-term (1988-present) average real rent is $800 per unit, while the second-quarter 2020 rent stood at $1,027, putting today's real rent 28% above its mean. The current level is at an all-time high, surpassing the pre-Crisis high of $886 per unit. The real low of $691 per unit occurred in 1999. Real median multifamily rents were up 2% year-over-year through the second quarter of 2020, though they will fall the remainder of 2020.

We expect real effective apartment rents to decline for the next 18 months due to shutdown uncertainties. Only an effective vaccine, treatment, or widespread testing indicating a sharp slow-down of the virus will rapidly restore consumer confidence. This means that real NOI will decline and vacancy will rise. Most planned projects will be cancelled or delayed. Maturing Millennials will put home buying on hold. With extremely low interest rates, the ability of households to assemble the down payments necessary to purchase homes will be greatly harmed.

Rolling 12-month real monthly multifamily sales transaction volumes stood at about $13 billion in June 2020, or 18% below the previous peak and up by 681% from the Financial Crisis bottom. In comparison, NCREIF tracks trailing four-quarter sales volume of institutional properties in its coverage universe. While the NCREIF series does not represent the entire market, it is useful to compare the trends between the two series, as well as the relative levels within each series. While RCA sales volume dropped by 83% during the recession, NCREIF sales volume similarly dropped by 82%. On the upside, RCA sales volume rebounded by 847% at the highest point in 2019, while NCREIF sales volume increased by 607% over the same period. Through the second quarter of 2020, four-quarter rolling sales volume dropped from the respective 2019 peaks as measured by both RCA (-16.9%) and NCREIF (-12.7%). We expect notable drops in sales volume as rent, occupancy, and valuation uncertainty creates large bid-ask spreads. In addition, lender forbearance and large pre-payment penalties will slow the flow of properties brought to market by 70-80%.

According to Real Capital Analytics, the real trailing 12-month average multifamily sale price was at a 19-year high of about $164,000 per unit in June 2020. This is 13% above the pre-recession peak of $130,000 and 31% above the historical mean of $123,000 per unit. NCREIF reports multifamily valuations on a price-per-square-foot basis, beginning in 1979. As with RCA, NCREIF pricing is at an all-time high. We believe that this will fall below trend by year-end.



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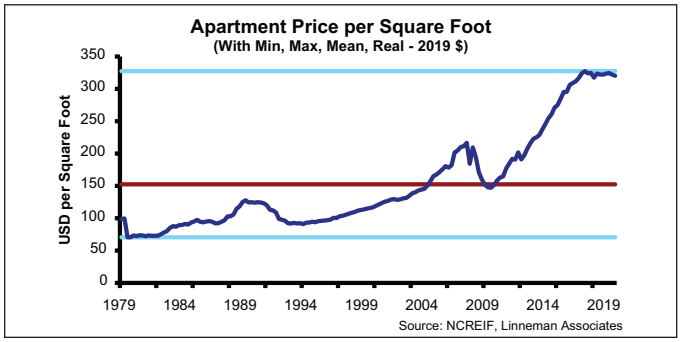


figure 429

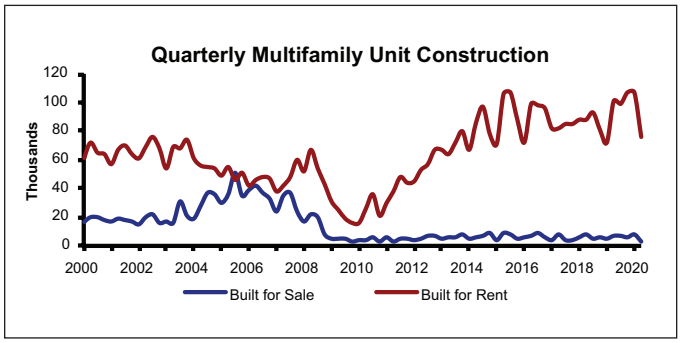
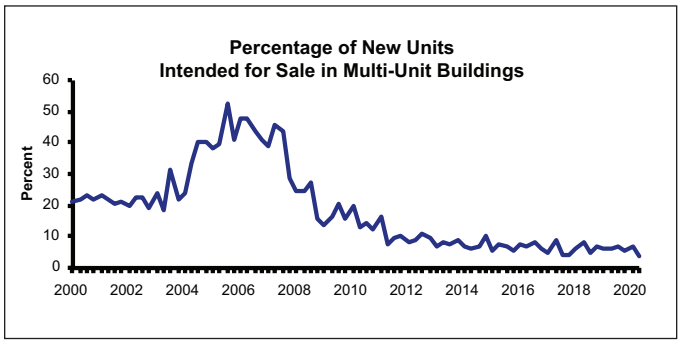


figure 430

Multifamily units built with the intention of renting (versus condominiums) have increased significantly, from a staggering low of 91,000 per year in 2009, to 379,000 units in 2019 and 183,000 units over the trailing four quarters through the second quarter of 2020. Today, 96% of all multifamily units are built as rentals, versus in 2006, when rentals accounted for just 46% of all units built.

Multifamily starts (5+ units) hit a stunning low of 62,000 units (annualized) in February 2010 and peaked at an annualized rate of 513,000 units in September 2015. After registering 381,000 multifamily housing starts in 2016, 345,000 in 2017, and 362,000 in 2018, 2019 annualized multifamily housing starts jumped to 391,000 units. This production level is in comparison to the 40-year (1970-2010) and long-term (1964-present) averages of 355,000 and 394,000 units per year, respectively. December 2019 (520,000 annualized starts), January 2020 (619,000), and February 2020 (514,000) all saw robust above-average multifamily production on a unit basis, but the shutdown has changed this trajectory. March (376,000 units) and April (240,000 units) 2020 production dropped sharply (as expected) due to economic shutdowns across the nation but surprisingly rose in July (503,000 units) and August (375,000 units). As the nation re-opens in phases, housing starts may have hit bottom. Multifamily demand will fall as high unemployment causes millions to live at home, rather than rent.

In July 2020, real annualized U.S. multifamily construction spending stood at $76.4 billion, well above both the historical low of $15.3 billion (2010) and the historical mean of $48.4 billion. It rose sharply from 2011 through early 2016, subsequently plateaued, but most recently dipped by 5.4% over the last year through July 2020. Multifamily construction spending



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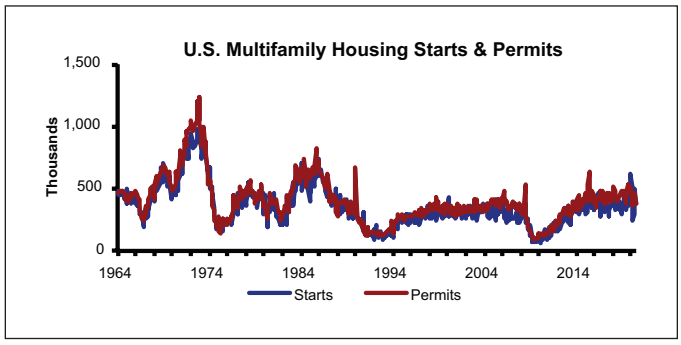


figure 432

is 10% short of the all-time high of $69.7 billion seen in early 2019.Today's high construction spending is mostly attributable to cyclically high construction costs rather than volume of activity. Construction activity will fall well below average by year-end as pipelines empty and few new projects are started.

From 2020 through 2024, we expect multifamily demand growth to be 1.8 million units in aggregate. We expect the market to have a shortage of about 710,000 vacant units (below normal vacancy levels) by year-end 2020. Our fundamental forecast projection indicates a growing shortage of vacant multifamily units through 2024. Over the next year, demand will notably weaken as both newly unemployed renters and jobless Class of 2020 graduates live at home.

In the second quarter of 2020, all but six of our covered multifamily markets saw increased vacancy. Vacancy rate improvements during the quarter were

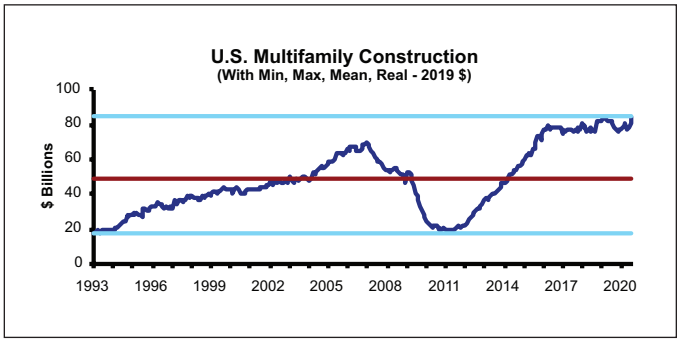


figure 434

Multifamily Vacancy Rates - Base Case Pipeline

Market	2Q20	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	8.2%	13.3%	11.4%	10.3%	9.7%
Austin	5.9%	11.5%	12.1%	11.0%	8.5%
Baltimore	5.0%	18.5%	18.9%	16.9%	12.5%
Boston	4.3%	15.9%	13.3%	7.6%	8.7%
Charleston	6.7%	14.4%	12.4%	7.2%	4.7%
Charlotte	5.1%	12.2%	8.2%	5.2%	3.1%
Chicago	4.6%	9.5%	9.7%	10.0%	9.9%
Cincinnati	3.9%	10.6%	9.1%	7.3%	5.5%
Cleveland	4.3%	12.4%	7.1%	5.7%	4.9%
Columbus	4.4%	11.6%	10.1%	7.7%	5.6%
Dallas-Fort Worth	8.8%	11.4%	10.2%	10.3%	9.9%
Denver	5.6%	10.7%	9.7%	9.6%	9.7%
Detroit	3.9%	13.0%	9.9%	7.5%	5.5%
Houston	11.2%	16.1%	13.7%	11.7%	10.0%
Indianapolis	5.3%	9.9%	7.6%	6.1%	5.4%
Inland Empire*	3.6%	6.9%	5.0%	4.7%	4.2%
Los Angeles	4.6%	6.9%	4.4%	4.9%	5.0%
Louisville	5.5%	12.3%	9.0%	8.2%	7.5%
Miami	4.9%	12.4%	13.3%	13.2%	12.2%
Minneapolis	3.8%	6.4%	4.1%	5.1%	5.3%
Nashville	5.0%	13.2%	11.9%	9.2%	6.8%
New York City	3.6%	12.8%	6.9%	4.6%	3.2%
Orange County	4.2%	12.6%	10.0%	8.4%	6.7%
Orlando	4.9%	14.0%	10.1%	6.9%	5.4%
Philadelphia	3.8%	11.0%	10.0%	9.0%	7.9%
Phoenix	4.5%	7.5%	6.3%	6.6%	6.3%
Portland	5.2%	8.7%	5.2%	5.3%	4.9%
Raleigh-Durham	5.6%	11.8%	8.8%	6.6%	5.0%
St. Louis	5.1%	9.7%	8.9%	8.0%	7.1%
San Diego	4.1%	10.5%	6.3%	4.7%	3.8%
San Francisco	5.1%	12.0%	9.4%	7.4%	5.8%
San Jose	4.7%	11.5%	9.9%	7.7%	5.5%
Seattle	4.5%	11.1%	8.6%	6.6%	5.1%
Tampa Bay	5.0%	9.8%	8.6%	6.9%	5.3%
Washington, D.C.	4.4%	10.3%	9.2%	7.6%	5.8%

Highlighted entries indicate market at supply-demand balance, or better.

** Inland Empire = Riverside/San Bernardino Metropolitan Area*

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

figure 433

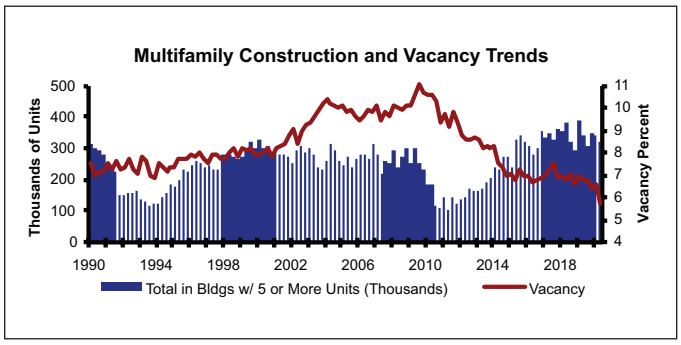


figure 435

seen in Chicago (-40 bps) and Indianapolis, Inland Empire, and Baltimore (each -10 bps), while Columbus and Louisville saw no vacancy rate change over the quarter. The greatest weakening in vacancy rates occurred in Atlanta (+280 bps), New York City (+140 bps), San Francisco (+120 bps), San Jose (+110 bps), and Miami (+90 bps) over the same period.

The highest vacancy rates in the second quarter of 2020 were in Houston, Dallas-Fort Worth, Atlanta, Charleston, Austin, and Denver, while New York City, Inland Empire, Philadelphia, and Minneapolis experienced the lowest rates. By year-end 2021, the weakest markets are expected to be Baltimore, Houston, Miami, Boston, and Charleston, while the strongest will be Minneapolis, Los Angeles, Inland Empire, Portland, and Phoenix.

Using a 5% vacancy rate proxy for supply-demand balance, 23 of our 35 multifamily markets were in balance in the second quarter of 2020. By year-end 2021, we expect less than 20% of our covered markets to be in balance due to significant pipelines and a slowdown in job growth due to COVID-19.

Retail Market Outlook

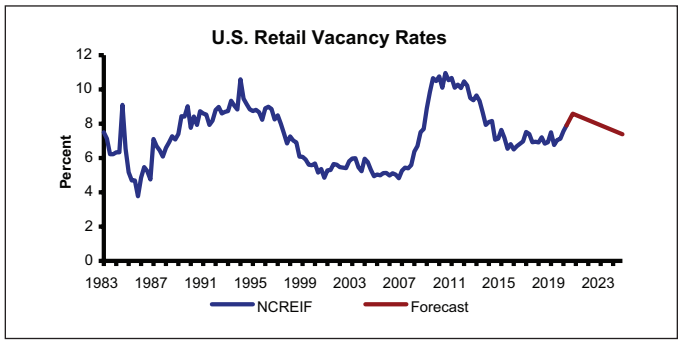
Much of today's vacant retail space is economically irrelevant but still counted as vacant. This space is hopeless and will be expunged by COVID-19. The meager sales of these centers will finally gravitate to strong centers. However, high unemployment will weaken sales. Weak retail centers will disappear, but this is not synonymous with the demise of brick retail.

A major problem which has plagued retail real estate over the past 20 years has been the popularity of retail LBOs that left many retailers unable to invest in their stores. At the same time, the growing importance of online sales forces retailers to expand their online presence with their very limited capital expenditure capacity. The shutdown has made debt service impossible for many retailers. Some will reorganize under Chapter 11 and emerge with fewer stores, while others will disappear. Either way, there will be fewer stores for several years. Meanwhile, online sales growth continues, though the shutdown proved effective widespread online grocery sales are not (yet) possible, as consumers experienced supply shortages and extreme bottlenecks which prevented many from even placing an order, while sales resulted in heavy losses.

Real monthly retail sales (2019 dollars) peaked at $414 billion in November 2007, dropped to $351 billion in March 2009, and peaked at $458 billion in January 2020. It bottomed at $382 million in April during the shutdown but ended August 2020 at $475 billion. Due to COVID-19, estimated real quarterly sales from brick retail dropped 9.8% ($119.8 billion) in the second quarter of 2020 compared to the same quarter in 2019. In contrast real online quarterly sales rose by an estimated 43.9% ($63.4 billion) during the same period.

NOI for brick retail centers declined by a seasonally-adjusted annual rate (SAAR) of 2.3% over the trailing three years through the second quarter of 2020, according to the latest National Council of Real Estate Investment Fiduciaries (NCREIF) survey. Neighborhood, community, and "other" retail centers were relatively unscathed, with 0%, 0.2%, and -0.5% average annual NOI growth over the last three years, respectively. Regional and super regional malls saw respective average annual declines of 8.3% and 3.2% in NOI over the last three years.

NCREIF's second-quarter 2020 retail vacancy rate rose by 30 bps over the quarter, to 7.9%, reflecting a 110-bp annual increase. The retail vacancy rate had



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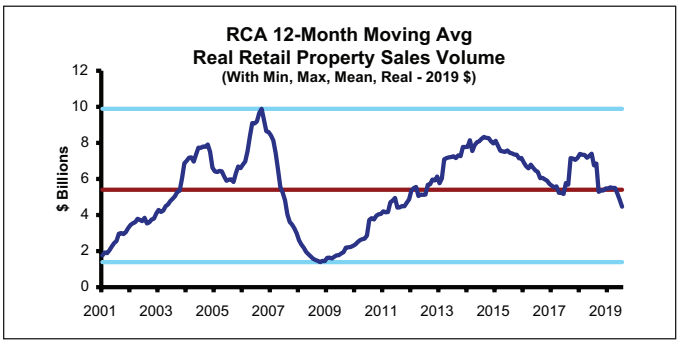

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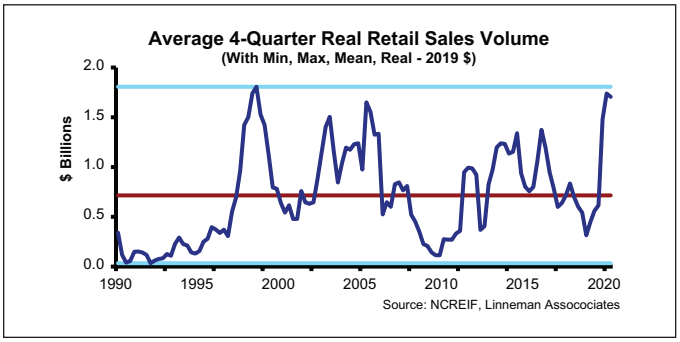

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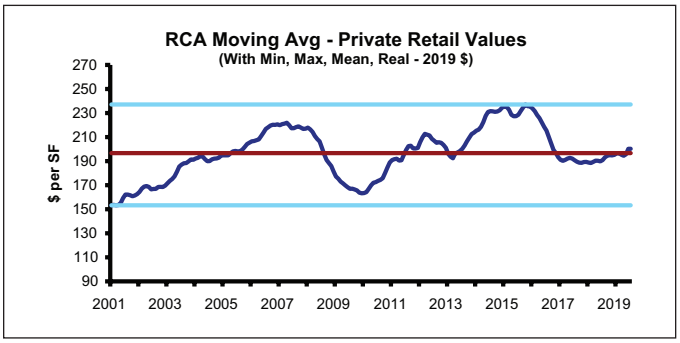

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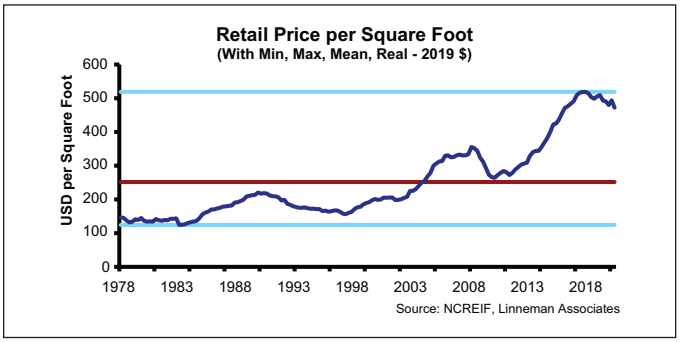


figure 440

previously peaked at 11% in 2010 and subsequently bottomed at 6.5% in the first quarter of 2016 before rising to the current level.

Linneman Associates' research indicates that for every 100 bps of growth in U.S. employment, the retail vacancy rate declines by 26 bps. Given our forecast of three million net new jobs from year-end 2019 through 2024, we anticipate that the U.S. retail vacancy rate will be about 50 bps below the year-end 2019 level at year-end 2024.

Rolling 12-month real retail property sales transaction volumes stood at $4.5 billion in June 2020, or about 55% below the previous peak and up by 221% from the bottom. In comparison, NCREIF sales volume, which tracks a smaller universe of properties spiked up by 14.3% from the bottom through the first quarter of 2020 but decreased by 2% in the second quarter. We expect notable drops in sales volumes as rent, occupancy, and valuation uncertainty creates large bid-ask spreads.

Real Capital Analytics data indicate the June 2020 real 12-month trailing average private transaction value for retail properties rose to $200 per square foot, on par with the historic average of $197 but below the all-time high of $237 set in early 2015. A low of $153 per square foot was seen in 2001. Real NCREIF retail prices per square foot begin in 1978 and are down by 4.4% over the latest quarter, standing at $427 per square foot in the second quarter of 2020. NCREIF pricing is significantly higher than RCA pricing. We believe that this will fall well below trend by year-end.

The Conference Board Consumer Confidence Index saw a sharp shutdown-related drop in 2020 after a 13-year upward trend. The August 2020 level of 84.8 is about 34% below both the previous quarter and year. The current level is now modestly below the long-term

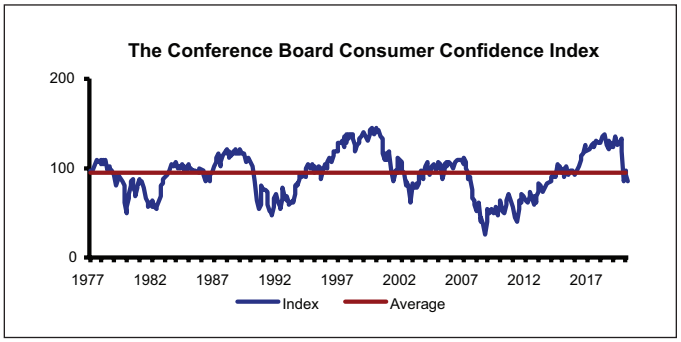


figure 441

historical average of 94.2. The University of Michigan Consumer Sentiment Index shows a similar pattern.

Monthly annualized real retail construction declined steadily from its September 2007 peak of $81.2 billion to a low of $26.6 billion in early 2011. It subsequently peaked near the long-term average of $51.1billion in August 2018 and has been on the decline for the last two years, standing at $33.6 billion in July 2020. The current level reflects a decline of 8.4% over the last year, through July 2020. Thus, while demand for brick retail is slower than in the pre-online era, supply expansion is minimal. Construction activity will fall well below average by year-end as the construction pipeline empties and few new projects are started. In fact, there will be a notable decline in total retail space over the next 3 years.

New retail and hotel construction will be effectively zero except for projects already underway, and some projects may halt mid-construction as lenders stop putting good money after bad. Further, both of these sectors will see renovation expenditures only to the extent that they are necessary to protect the asset (leaking roofs and broken windows), as owners simply will not have the money to fund anything else through 2021.

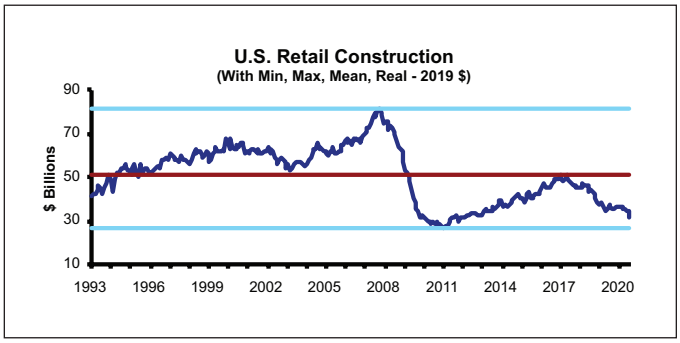


figure 443

As of the second quarter of 2020, the lowest retail vacancy rates were in Boston (4.1%), Miami (4.3%),

Retail Vacancy Rates - Base Case Pipeline

Market	2Q20	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	6.8%	9.7%	6.7%	5.0%	5.0%
Austin	5.7%	9.7%	10.1%	9.6%	9.6%
Boston	4.1%	11.5%	-2.2%	-7.0%	-7.0%
Charlotte	6.6%	10.2%	4.6%	0.7%	0.7%
Chicago	9.2%	11.7%	10.4%	9.7%	9.7%
Cincinnati	7.6%	11.8%	9.9%	6.7%	6.7%
Cleveland	6.5%	16.4%	7.6%	3.9%	3.9%
Columbus	5.3%	9.4%	6.3%	3.2%	3.2%
Dallas-Fort Worth	8.0%	9.0%	6.6%	5.8%	5.8%
Denver	6.9%	9.1%	6.1%	4.6%	4.6%
Detroit	7.9%	16.0%	12.2%	9.3%	9.3%
Houston	7.5%	10.9%	8.4%	6.5%	6.5%
Indianapolis	6.6%	12.4%	9.8%	7.7%	7.7%
Los Angeles	5.9%	7.2%	0.0%	-0.1%	-0.1%
Miami	4.3%	9.0%	8.7%	8.4%	8.4%
Minneapolis	5.8%	6.3%	2.5%	1.8%	1.8%
Nashville	4.8%	9.4%	6.5%	3.4%	3.4%
New York City	6.7%	13.0%	8.1%	3.9%	3.9%
Orlando	6.6%	10.9%	4.3%	-0.5%	-0.5%
Philadelphia	7.1%	11.4%	9.4%	7.8%	7.8%
Phoenix	8.7%	9.4%	6.5%	5.6%	5.6%
Portland	5.5%	6.1%	6.6%	7.0%	7.0%
St. Louis	6.3%	9.4%	8.2%	7.3%	7.3%
San Diego	5.4%	9.4%	3.6%	-0.4%	-0.4%
San Francisco	5.4%	10.3%	8.1%	6.5%	6.5%
San Jose	5.1%	9.0%	6.3%	3.7%	3.7%
Seattle	4.4%	13.8%	3.1%	-4.8%	-4.8%
Tampa Bay	6.8%	9.7%	8.0%	6.3%	6.3%
Washington, D.C.	4.9%	8.2%	5.7%	3.4%	3.4%

Highlighted entries indicate market at supply-demand balance, or better.

Note on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

figure 442

Seattle (4.4%), Nashville (4.8%), and Washington, D.C. In contrast, the highest vacancy rates were found in Chicago (9.2%), Phoenix (8.7%), Dallas-Fort Worth (8.0%), Detroit (7.9%), and Cincinnati (7.6%)

By year-end 2021, about two-thirds of our covered markets, are projected to register increasing vacancy rates compared to the second quarter of 2020. The greatest increases through 2021 are expected in Miami, Austin, Detroit, Indianapolis, Chicago, Philadelphia, and Cincinnati.

Using 8.5% vacancy as a benchmark for a balanced market, 27 of our 29 markets were in balance in the second quarter of 2020. Only seven of our covered MSAs are projected to be in balance at year-end 2021.

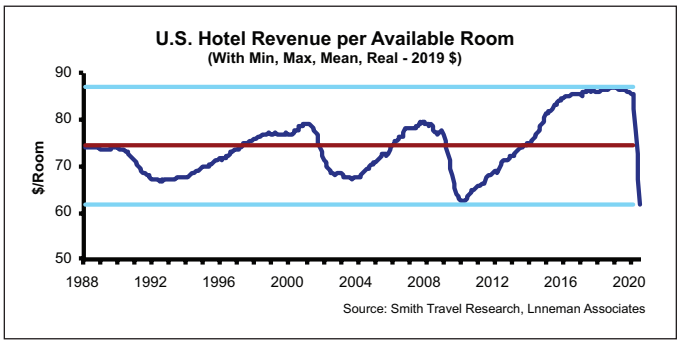
Hotel Market Outlook

The average U.S. hotel occupancy rate declined by 1,090 bps between February and July 2020, to 52.8%. We do not expect any significant improvement until late 2021, when virus uncertainties (hopefully) have receded.

STR reports that the 12-month rolling average U.S. hotel occupancy rate peaked in September of 2006 at 63.7% and subsequently declined to 54.6% in early 2010. During the Financial Crisis recovery, the 12-month rolling national hotel occupancy rate rose to a historical (1988-present) high of 66.3% in May 2019 but dropped sharply to 52.8% in July 2020. The real 12-month rolling average revenue per available room (RevPAR) peaked at $78.94 (2019 dollars) in 2008 and subsequently dropped to $62.41 by early 2010. It stood at $62.53 in July 2020, representing a 27.7% decrease from a year earlier and a 19% discount to the long-term (since 1988) average of $77.17 per key. The real 12-month rolling U.S. average daily rate (ADR) stood at $118.40 per room in July 2020, down 9.4% versus one year earlier.

Linneman Associates' research indicates that for every 100 bps of growth in U.S. employment, the hotel occupancy rate increases 52 bps. Given our forecast of three million net new jobs from year-end 2019 through 2024, we anticipate that the U.S. hotel occupancy rate will be about 100 bps above the year-end 2019 level at year-end 2024.

In July 2020, real annualized U.S. lodging construction spending stood at $26.8 billion, which is 28.7% above its historical average of $20.8 billion and 39.5% below the 2008 high of $44.3 billion. Lodging construction rose in 2016-2018 but declined by 14.9% over



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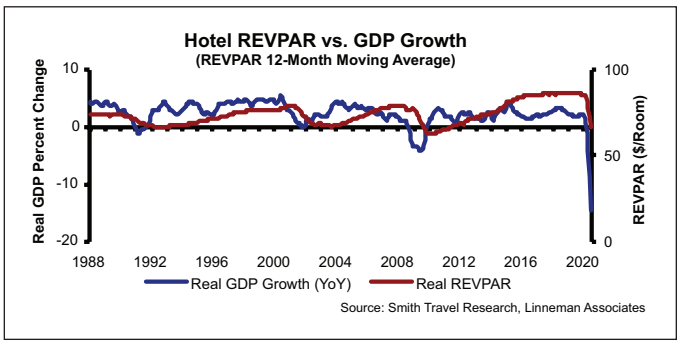

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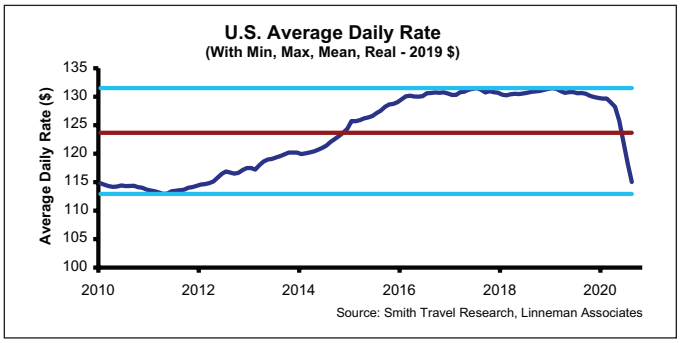

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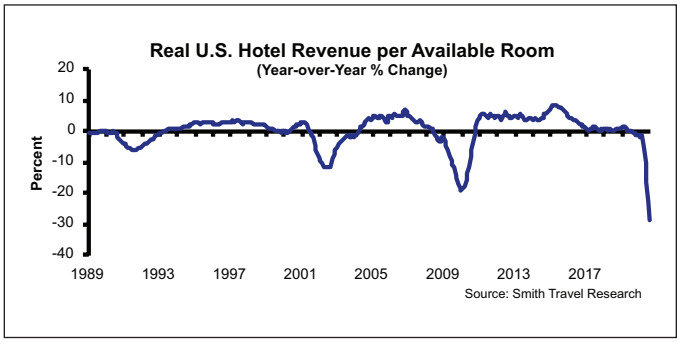

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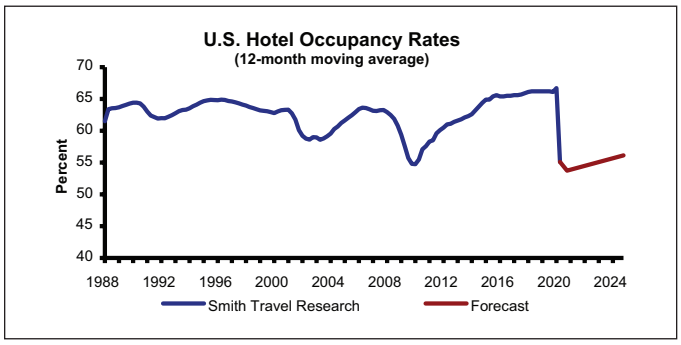

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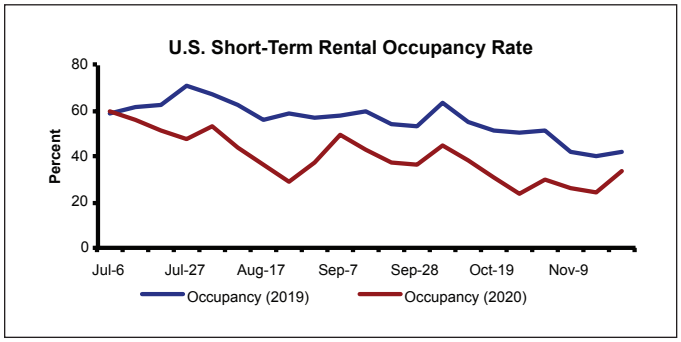

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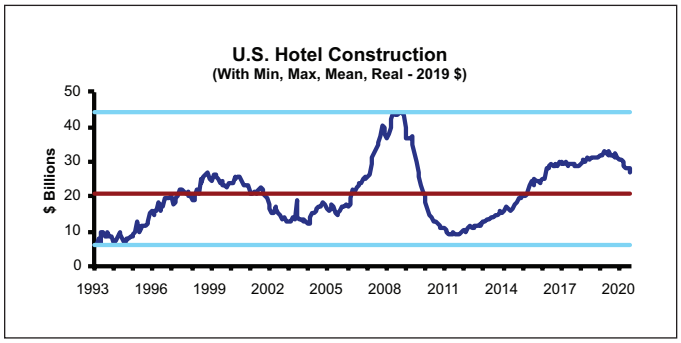

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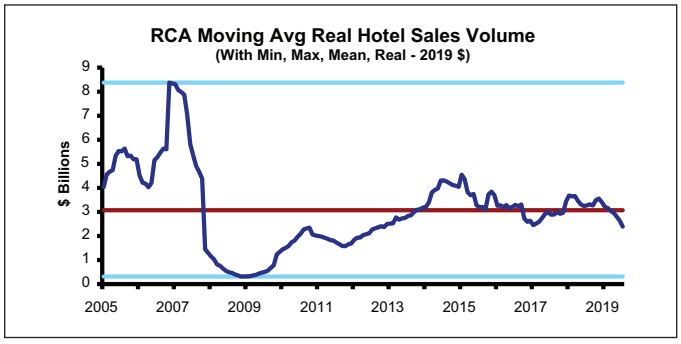

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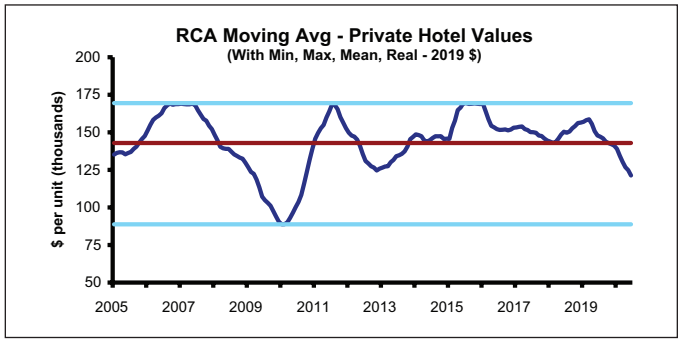


figure 452

the trailing 12 months through July 2020. Construction activity will fall well below average by year-end as pipelines empty and few new projects are started. Construction will not only cease, but some projects will never re-open and will either be leveled or converted to apartments.

Twelve-month rolling real monthly hotel property sale transaction volumes stood at $2.4 billion in June 2020, or 71.5% below the previous peak and up by 662.4% from the bottom. We expect notable drops in sales volumes as rent, occupancy, and valuation uncertainty creates large bid-ask spreads. According to Real Capital Analytics, the real trailing 12-month average hotel sale price in June 2020 dropped below the historical average of $144,000 per room, to $121,296, but is still well above the all-time low of $88,000 per room (2009). Pricing briefly spiked in 2015 at $170,000 per room but will continue to drop for the duration of COVID-19 uncertainty. We believe that pricing will fall substantially below trend through year-end.

As new supply outpaced demand, all 24 of our covered hotel markets weakened in the second quarter of 2020, as exhibited by declining occupancy rates. Boston (-1,220 bps), Washington, D. C. and Nashville (each -1,200 bps), and Minneapolis (-1,160 bps) experienced the greatest declines, while Las Vegas (-630 bps), Phoenix (-770), Detroit (-770 bps), Houston (-820 bps), Miami (-820 bps), and Atlanta (-870 bps) registered the smallest occupancy rate declines. At the end of the second quarter of 2020, New York City, Los Angeles, San Francisco, Anaheim, and Miami had the highest occupancy rates, while Minneapolis, St. Louis, Houston, Dallas, and Detroit had the lowest.

Hotel Occupancy Rates - Base Case Pipeline

Market	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Anaheim	58.5%	60.8%	63.9%	66.8%
Atlanta	54.1%	55.6%	56.8%	57.6%
Austin	53.0%	51.6%	52.1%	53.6%
Boston	57.6%	65.5%	67.0%	67.5%
Chicago	53.2%	53.8%	54.3%	54.8%
Dallas	52.8%	54.2%	56.1%	57.7%
Denver	56.3%	57.6%	58.5%	59.1%
Detroit	49.5%	50.6%	51.9%	53.2%
Houston	49.5%	51.1%	52.5%	53.8%
Las Vegas**	52.4%	53.9%	55.9%	57.8%
Los Angeles	63.2%	68.5%	68.6%	69.0%
Miami	58.5%	58.0%	58.7%	60.0%
Minneapolis	51.6%	49.1%	48.6%	48.2%
Nashville	53.1%	54.5%	57.0%	59.4%
New York City	64.0%	67.1%	70.8%	73.2%
Orlando	57.9%	63.1%	67.4%	70.0%
Philadelphia	52.9%	53.9%	55.0%	56.1%
Phoenix	57.6%	59.1%	59.8%	60.6%
St. Louis	48.9%	49.3%	49.8%	50.4%
San Diego	59.5%	63.7%	67.1%	69.2%
San Francisco	60.2%	61.8%	63.3%	65.3%
Seattle	55.2%	57.5%	59.6%	61.3%
Tampa Bay	56.8%	57.7%	59.1%	60.4%
Washington, D.C.	52.1%	54.2%	56.4%	58.5%

Highlighted entries indicate market at supply-demand balance, or better.
** Source: Smith Travel Research.*
*** LV sample accounts for less than 15% of LV market.*

figure 453

By year-end 2021, hotel occupancy rates in all of our covered markets except Orlando, Los Angeles, and Boston are expected to be below second quarter 2020 levels. By year-end 2021, New York City, Los Angeles, San Diego, Boston, Orlando, San Francisco, Anaheim, and Phoenix are expected to register the highest occupancy rates, while Minneapolis, St. Louis, Detroit, Houston, Austin, Chicago, Philadelphia, and Las Vegas are projected to be the worst performing markets. Using a 70% occupancy rate to proxy market balance, none of our markets will be in balance at year-end 2021.

Seniors Housing and Care Market Outlook

Representing the greatest tragedy and highest mortality rates of the COVID-19 pandemic, the nursing home sector is seriously challenged in the near term. In addition, the demand outlook for seniors housing is demographically misunderstood. Since demand for seniors housing generally starts around age 77, Boomers (defined as births beginning in 1947) will not turn 77 until 2024. Only thereafter will there be a 25-30% demand surge created by aging Boomers. Thus, in addition to the sector's near-term COVID challenges, the Baby Dearth generation associated with low World War II births will result in weak demographics for seniors housing over the next five years.

All current and historical seniors housing market statistics are provided by the National Investment Center for the Seniors Housing and Care Industry (NIC) through its NIC MAP database. From this data, we generate our five-year occupancy forecasts for independent living (IL) and assisted living (AL) for NIC's top 31 MSAs.

NIC MAP measures occupancy, revenue per available room (RevPAR), supply, demand, and other metrics for the following property types: majority independent living (IL) and majority assisted living (AL). The memory care segment and majority of memory care properties are included under the majority AL property type. A majority IL property is any property that has a majority of IL units. Majority IL properties include freestanding IL, combination IL (such as IL/AL, IL/AL/Memory Care), and continuing care retirement communities (CCRC), which provide the entire continuum of care segments.

In the second quarter of 2020, the overall occupancy rate for seniors housing in the U.S. declined

by 280 bps, to 84.9%. Over the quarter, occupancy in the independent living segment declined by 240 bps, to 87.4%, a level not seen since 2013. Similarly, the assisted living occupancy rate dropped by 320 bps, to 82.1%, during the second quarter.

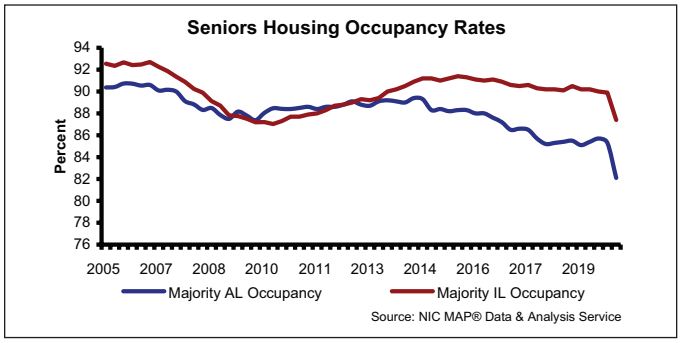


figure 454

Independent Living

Although nursing facilities are where more than half the COVID deaths occurred, other parts of seniors housing have been tarnished. During the second quarter of 2020, eight of the 31 markets we cover experienced increasing occupancy rates in the independent living sector compared to the previous quarter. Of the strengthening markets, Las Vegas' occupancy rate increased the most during the quarter by 470 bps, followed by Phoenix (+220 bps), Sacramento (+180 bps), Atlanta (+170 bps), and Pittsburgh, and San Diego (each +90 bps). San Jose (93.5%), Baltimore (93.0%), Minneapolis (92.9%), Boston (92.8%), and Sacramento (92.5%) registered the highest second-quarter 2020 occupancy rates. The lowest occupancy rates in the second quarter were in Houston (81.7%), Inland Empire (83.4%), Orlando (84.2%), San Antonio (84.5%), and Miami (85.7%).

Independent Living Occupancy Rates - Base Case Pipeline

Market	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	80.0%	80.7%	82.6%	83.9%
Baltimore	76.3%	90.7%	109.7%	123.7%
Boston	85.1%	98.2%	103.5%	104.4%
Chicago	85.2%	85.9%	86.6%	87.3%
Cincinnati	84.3%	86.9%	91.1%	95.6%
Cleveland	80.5%	89.1%	93.3%	95.9%
Dallas	82.2%	84.2%	87.5%	90.1%
Denver	83.1%	85.4%	87.2%	88.3%
Detroit	79.7%	83.0%	85.7%	88.0%
Houston	74.6%	74.9%	77.0%	79.0%
Inland Empire	80.1%	83.5%	84.7%	86.0%
Kansas City	81.3%	80.8%	83.5%	86.7%
Las Vegas	78.2%	81.7%	85.0%	88.1%
Los Angeles	88.4%	96.4%	96.9%	97.7%
Miami	79.4%	80.0%	81.6%	83.7%
Minneapolis	90.4%	93.6%	94.3%	95.2%
New York City	80.3%	85.2%	90.6%	94.0%
Orlando	77.1%	83.4%	89.3%	92.9%
Philadelphia	83.5%	85.4%	87.5%	89.2%
Phoenix	86.4%	88.9%	90.2%	91.7%
Pittsburgh	84.9%	86.9%	87.9%	88.5%
Portland	88.6%	92.6%	93.6%	94.7%
Sacramento	80.8%	79.0%	80.9%	82.8%
St. Louis	82.3%	82.4%	83.4%	84.5%
San Antonio	81.3%	84.0%	88.7%	93.0%
San Diego	82.9%	88.9%	93.8%	96.9%
San Francisco	85.8%	89.2%	91.9%	94.9%
San Jose	88.4%	92.4%	96.3%	99.7%
Seattle	84.5%	89.2%	93.0%	95.7%
Tampa Bay	85.6%	87.4%	89.8%	92.0%
Washington, D.C.	85.3%	87.7%	90.6%	93.4%

Highlighted entries indicate market at supply-demand balance, or better.
**Source: The National Investment Center for the Seniors Housing & Care Industry*

Note on occupancy greater than 100%: In order to calculate estimated occupancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show 100%+ occupancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, 100%+ occupancy cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of 100%+ occupancy should be viewed as a strong excess demand indicator.

figure 455

By year-end 2021, only six IL markets are expected to improve in comparison to the second quarter of 2020. Boston (+540 bps) is projected to lead the pack, followed by Los Angeles (+490 bps), Portland (+210 bps), and Minneapolis (+70 bps). The highest occupancy rates at year-end 2021 are expected to be in Boston (98.2%), Los Angeles (96.4%), Minneapolis (93.6%), Portland (92.6%), and San Jose (92.4%). At year-end 2021, the lowest occupancy rates are expected to be in Houston (74.9%), Sacramento (79.0%), Miami (80.0%), Atlanta (80.7%), and Kansas City (80.8%). If we show occupancy rates approaching or above 100%, it means that given the scheduled supply and expected demand, sufficient demand pressure exists to more than absorb all available space. In reality, additional development will occur to offset the excess demand pressure.

The markets with the greatest number of IL units under construction as a percent of inventory include Sacramento (24.1%), Houston (15.4%), Atlanta (15.1%), Cleveland (11%), Orlando (9.7%), and Dallas (9.2%). San Francisco and Las Vegas do not have any independent living units currently under construction, and pipelines in Cincinnati, San Jose, Seattle, Portland, Detroit, and Chicago are less than 3.0% of inventory. Construction activity will fall well below average by year-end as the construction pipeline empties and few new projects are started.

Using a 95% occupancy rate to proxy market balance, only Los Angeles and Boston are expected to be in balance at year-end 2021. Baltimore and San Jose are expected to come into balance the following year.

Assisted Living Occupancy Rates - Base Case Pipeline

Market	YE 2020 Est	YE 2021 Est	YE 2022 Est	YE 2023 Est
Atlanta	74.0%	75.8%	77.7%	78.9%
Baltimore	79.7%	82.8%	87.4%	90.8%
Boston	79.0%	87.7%	91.5%	92.1%
Chicago	80.5%	80.2%	80.6%	81.2%
Cincinnati	79.2%	79.9%	82.0%	84.3%
Cleveland	79.2%	85.8%	88.6%	90.3%
Dallas	78.8%	81.0%	83.4%	85.3%
Denver	79.6%	81.3%	82.6%	83.3%
Detroit	71.3%	72.5%	73.9%	75.1%
Houston	74.5%	76.0%	77.9%	79.5%
Inland Empire	79.0%	79.4%	80.2%	81.3%
Kansas City	82.4%	82.5%	84.3%	86.4%
Las Vegas	75.4%	76.4%	78.2%	79.9%
Los Angeles	84.2%	90.3%	90.7%	91.2%
Miami	79.3%	77.5%	78.3%	79.6%
Minneapolis	86.7%	88.7%	89.1%	89.6%
New York City	79.2%	82.1%	86.1%	88.7%
Orlando	80.8%	85.6%	89.7%	92.1%
Philadelphia	78.5%	79.0%	80.3%	81.5%
Phoenix	78.7%	79.0%	79.7%	80.6%
Pittsburgh	80.1%	81.5%	82.3%	82.8%
Portland	85.0%	87.9%	88.7%	89.5%
Sacramento	78.1%	77.4%	78.8%	80.2%
St. Louis	78.7%	77.8%	78.3%	78.9%
San Antonio	73.7%	75.4%	78.8%	82.0%
San Diego	81.9%	86.8%	90.4%	92.6%
San Francisco	82.7%	85.3%	87.5%	90.0%
San Jose	83.8%	85.3%	88.3%	91.1%
Seattle	80.8%	83.2%	85.5%	87.2%
Tampa Bay	81.5%	81.9%	83.6%	85.2%
Washington, D.C.	78.2%	77.6%	79.1%	80.8%

Highlighted entries indicate market at supply-demand balance, or better.
**Source: The National Investment Center for the Seniors Housing & Care Industry*

Note on occupancy greater than 100%: In order to calculate estimated occupancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show 100%+ occupancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, 100%+ occupancy cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of 100%+ occupancy should be viewed as a strong excess demand indicator.

figure 456

Assisted Living

During the second quarter of 2020, ten of our 31 covered markets saw increasing assisted living occupancy rates, compared to the previous quarter, including Washington D.C. (+350 bps), Cleveland (+320 bps), Cincinnati (+160 bps), Philadelphia (+140 bps), and Miami (+130 bps). In contrast, Seattle (-360 bps), San Diego (-330 bps), Sacramento (-310 bps), San Antonio (-270 bps), and San Jose (-260 bps) showed the greatest occupancy declines during the quarter.

In the second quarter of 2020, San Jose (90.1%) boasted the highest occupancy rate, followed by Minneapolis (88%) San Francisco (87.9%), New York City (87.8%), and Portland (87.1%). Meanwhile, San Antonio (76.5%), Houston (78.5%), Atlanta (79.1%), Detroit (79.8%), and Dallas (81.3%) exhibited the lowest occupancy rates in the quarter.

By year-end 2021, seven of the 31 MSAs we cover will see increasing occupancy rates compared to the second quarter of 2020. The best performers in terms of rising occupancy rates through 2021 are expected to be Los Angeles (+360 bps), Boston (+260 bps), Cleveland and San Diego (each +140 bps), and Orlando (+100 bps). The highest occupancy rates at year-end 2021 are projected to be in Los Angeles (90.3%), Minneapolis (88.7%), Portland (87.9%), Boston (87.7%), and San Diego (86.8%). Occupancy projections approaching or in excess of 100% indicate expected excess demand given existing inventory and assumed pipeline. The lowest 2021 occupancy rates are expected to be in Detroit (72.5%), San Antonio (75.4%), Atlanta (75.8%), Houston (76%), and Las Vegas (76.4%).

Significant construction pipelines primarily drive expected weakness in these markets. The markets with the greatest number of AL units under construction as a percent of inventory include Inland Empire (17.6%), Miami (15.1%), Washington, D.C. (14.4%), Sacramento (13.7%), Phoenix (10.3%), and New York City (10%). Construction pipelines in San Diego, San Francisco, Cleveland, and Baltimore are less than 3.0% of inventory. Construction activity will fall well below average by year-end as pipelines empty and few new projects are started.

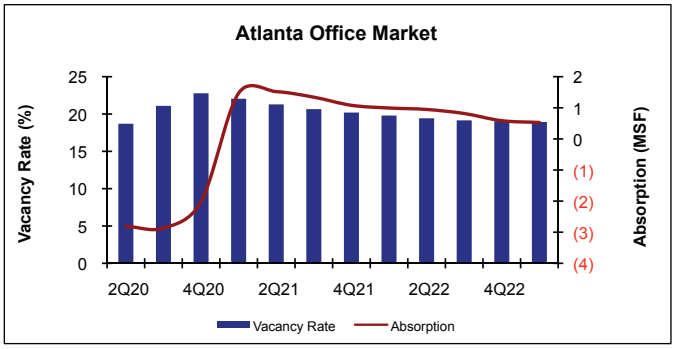
Using a 95% occupancy rate to proxy market balance, no AL markets were in balance as of the second quarter of 2020, and none are expected to achieve balance by 2022.

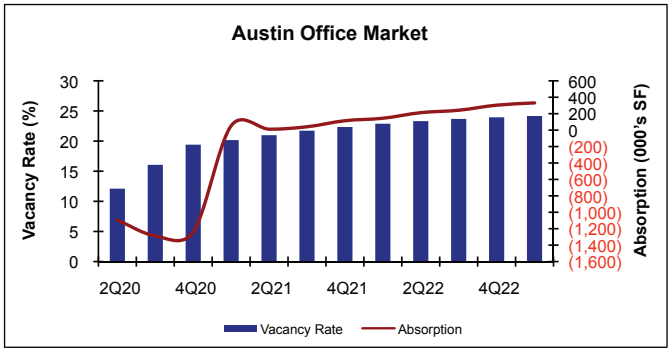
THE LINNEMAN LETTER
Volume 20, Issue 3 Fall 2020

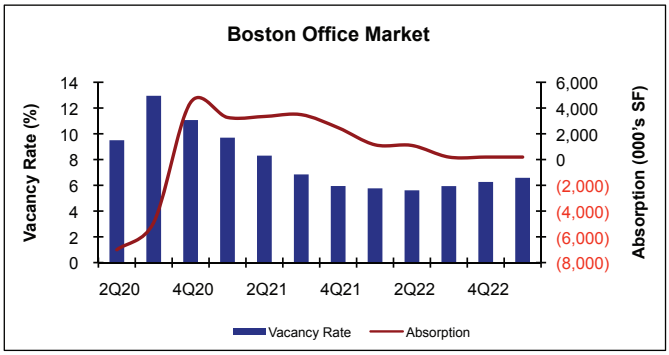
Office Market Vacancy and Absorption Projections

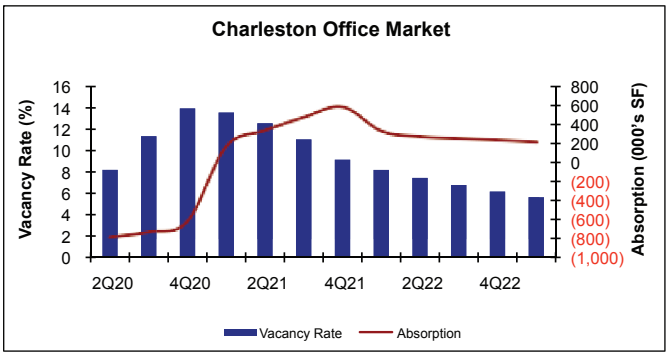
We are in a period of unprecedented global market circumstances as a result of the COVID-19 pandemic. We remind our readers of the limitations of statistical forecasting models (which rely on historical trends) in such atypical circumstances and urge you to read our fundamental insights in the first article of this issue.

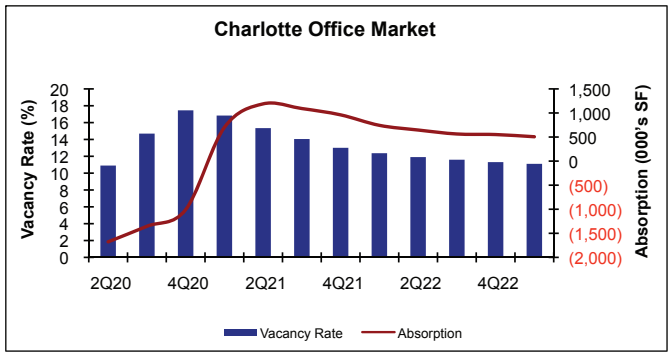
Notes on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

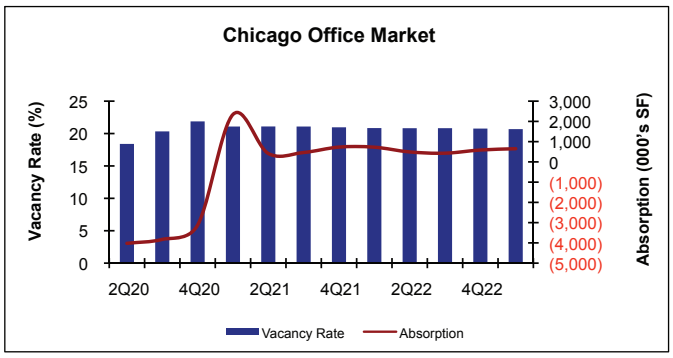




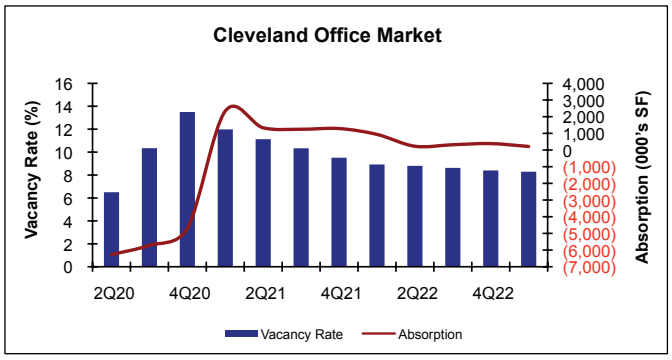


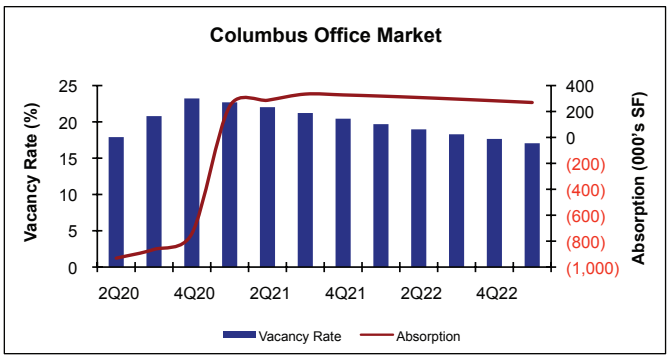


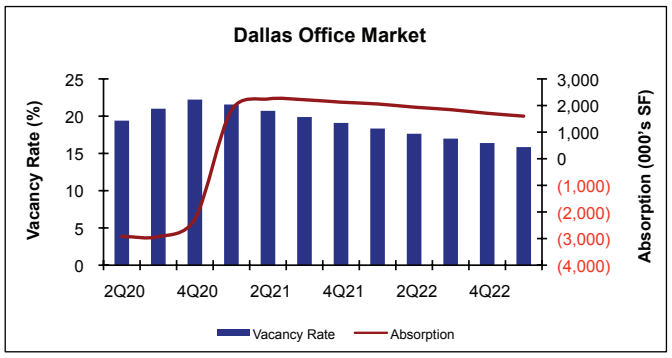


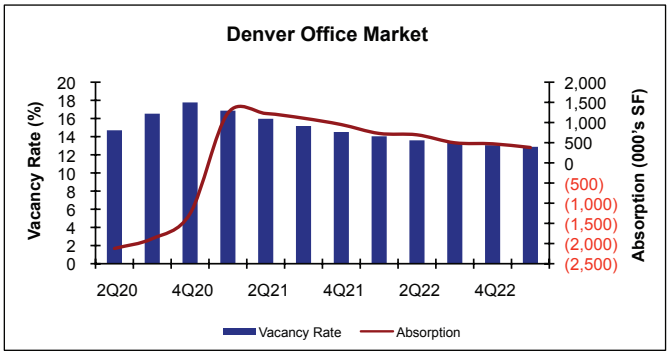


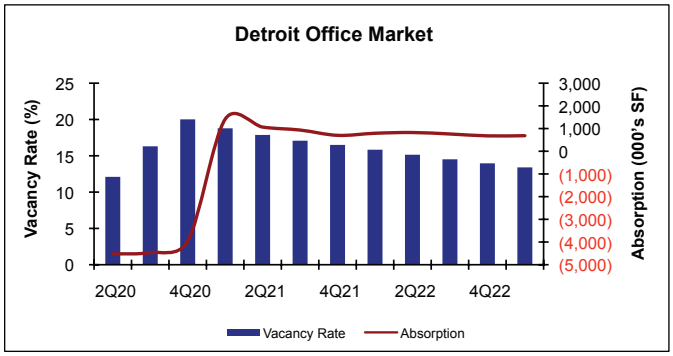
Office Market Vacancy and Absorption Projections (cont.)

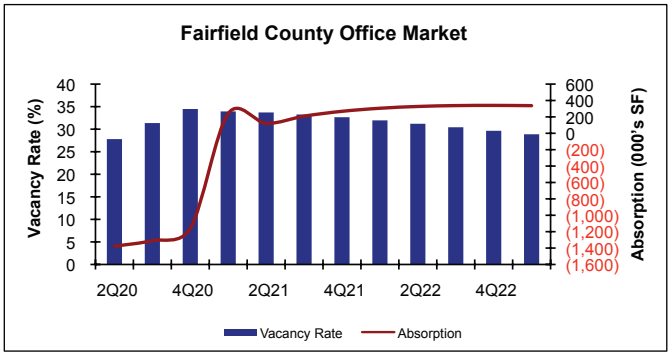


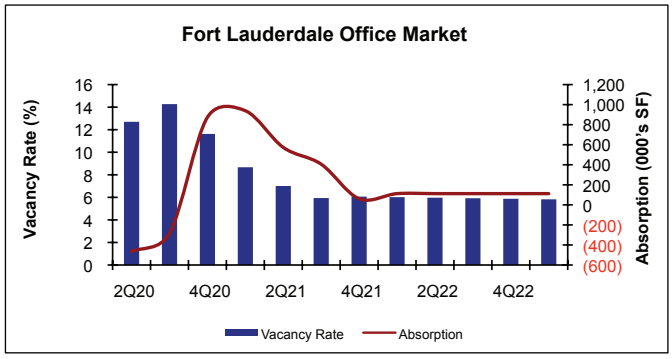


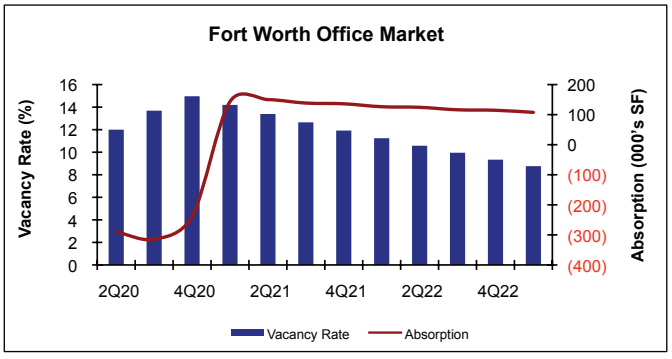












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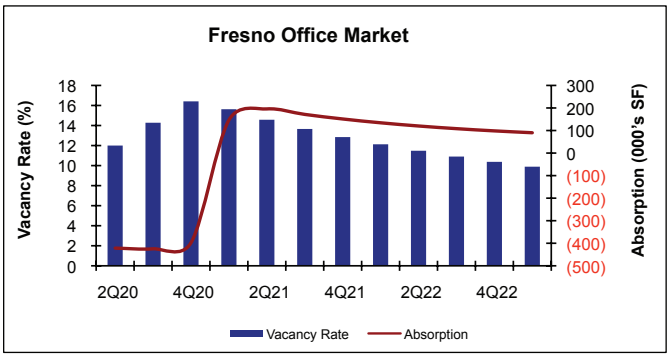

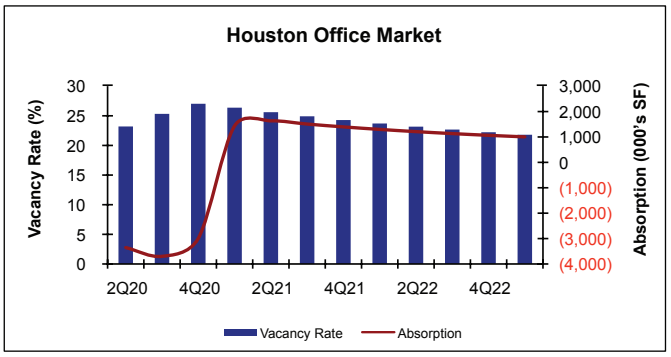

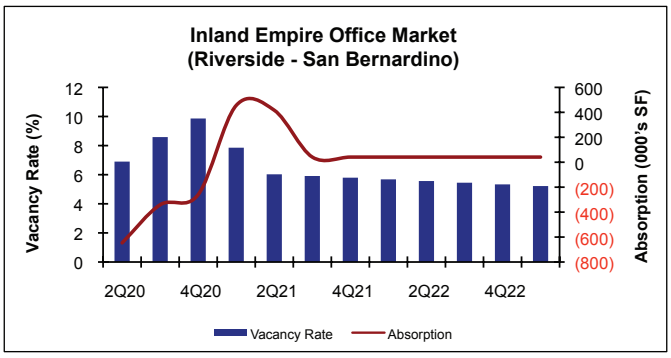

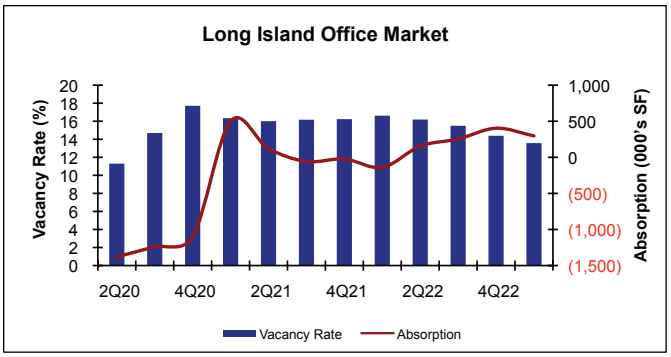

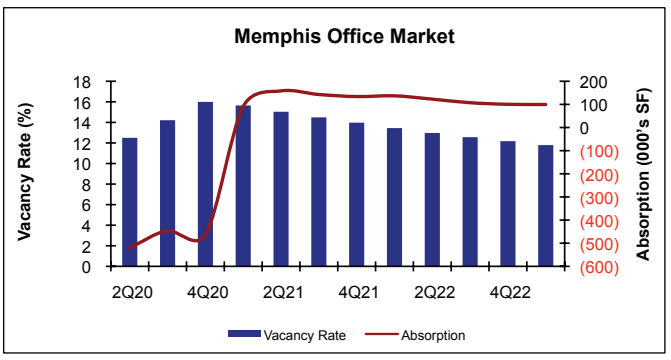

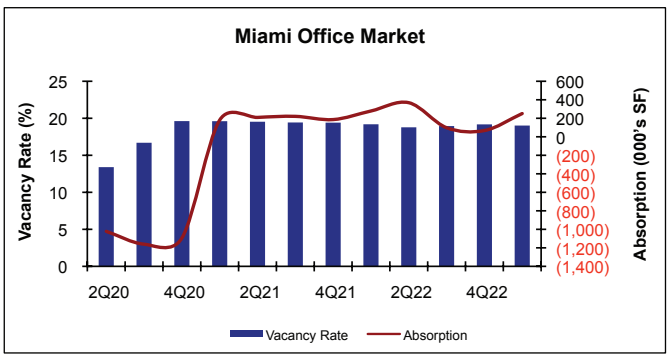

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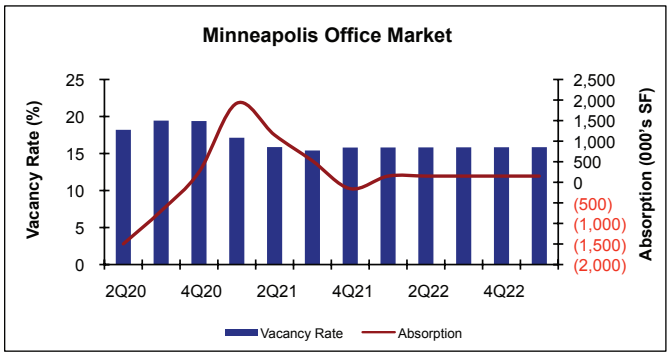
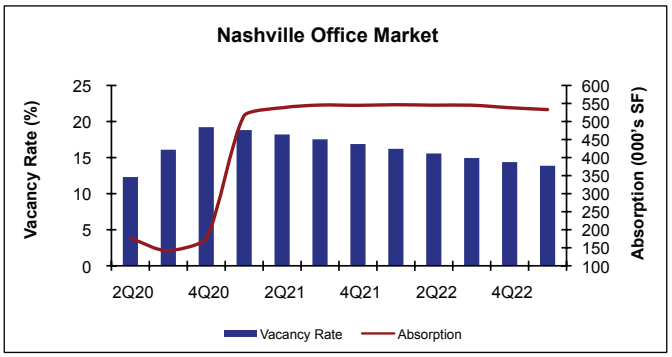
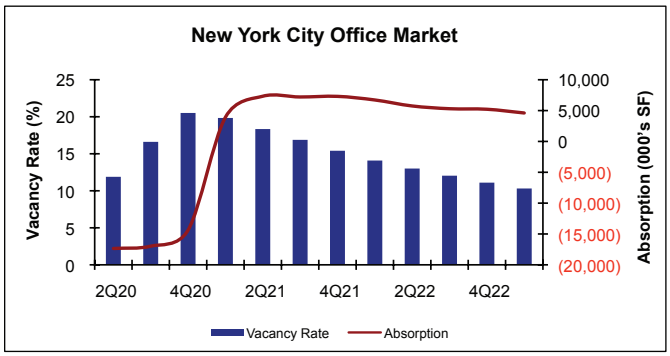
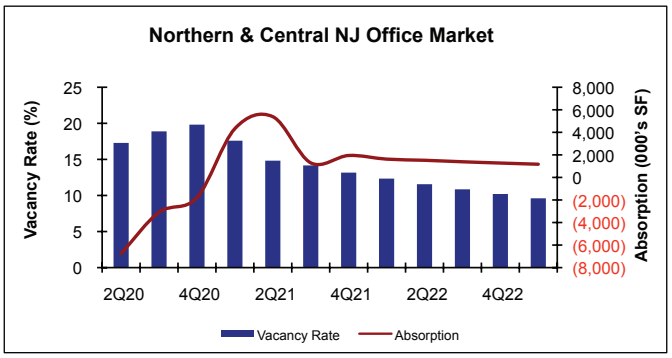
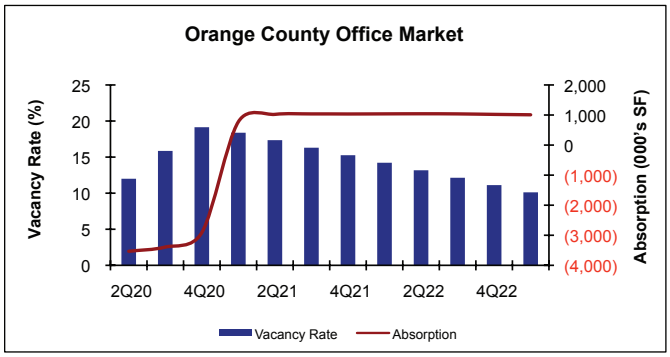
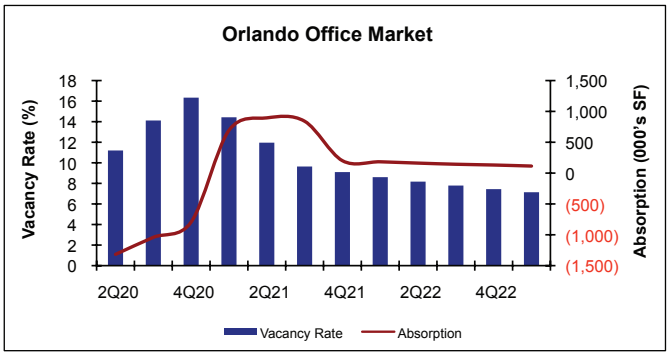


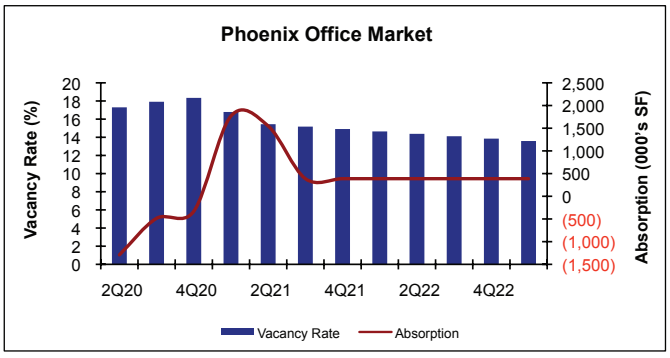




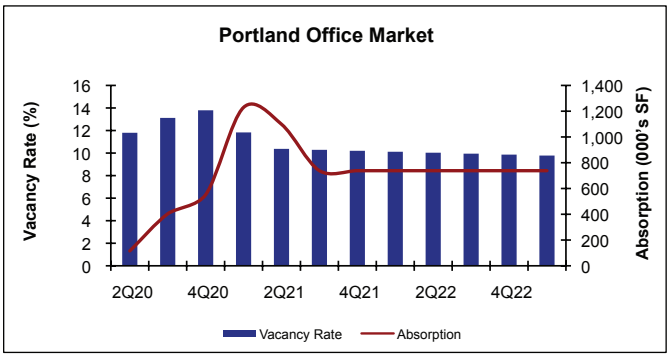


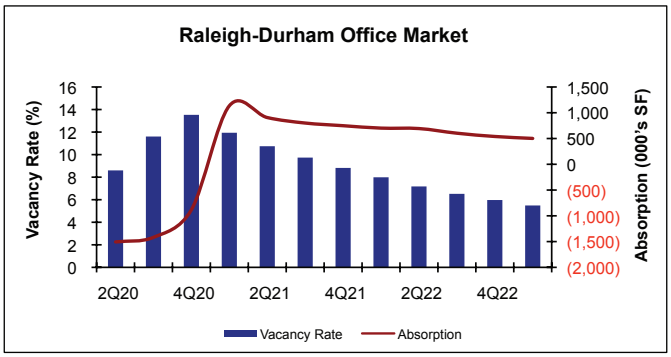


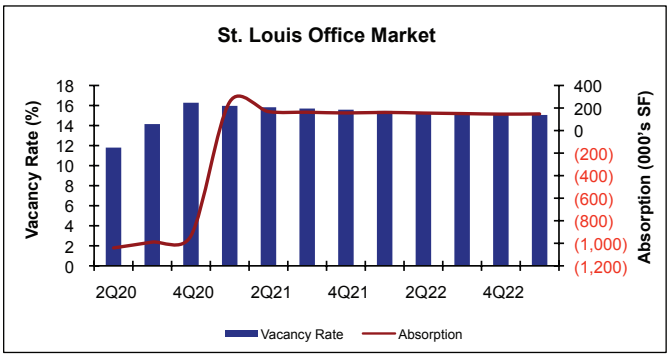


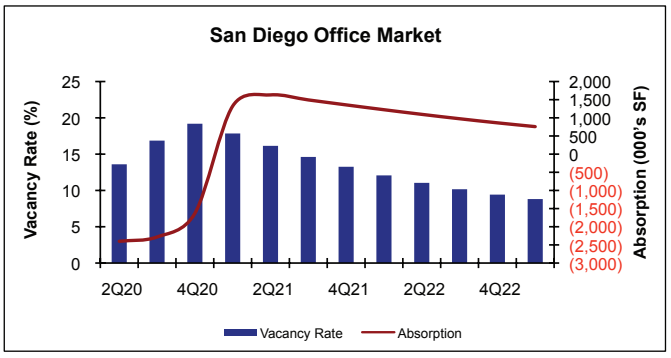


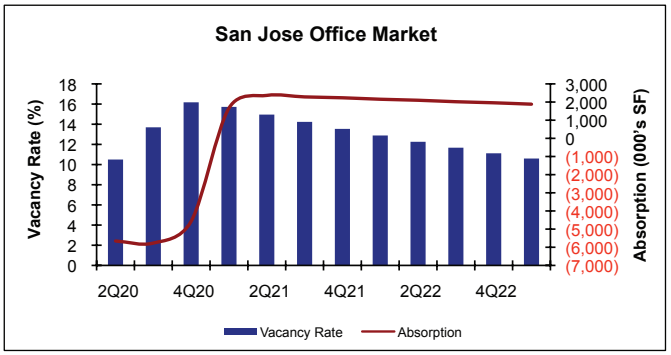
Office Market Vacancy and Absorption Projections (cont.)

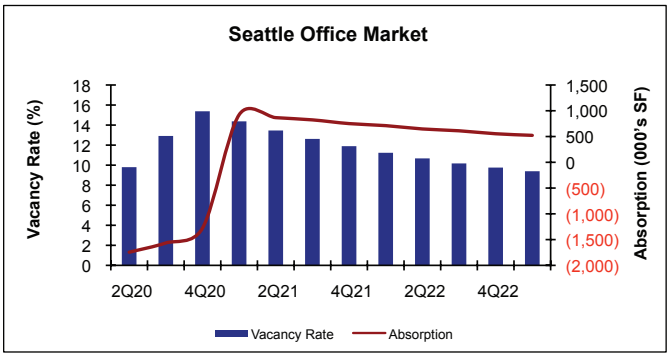


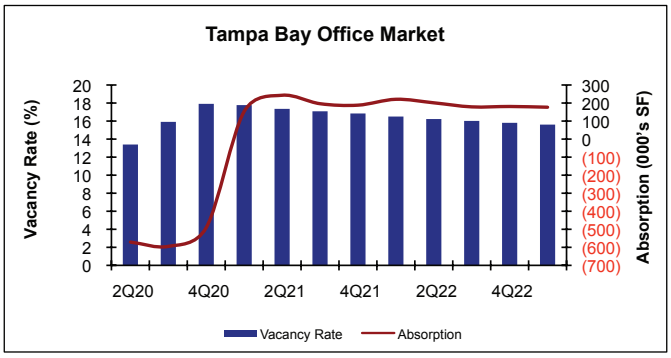




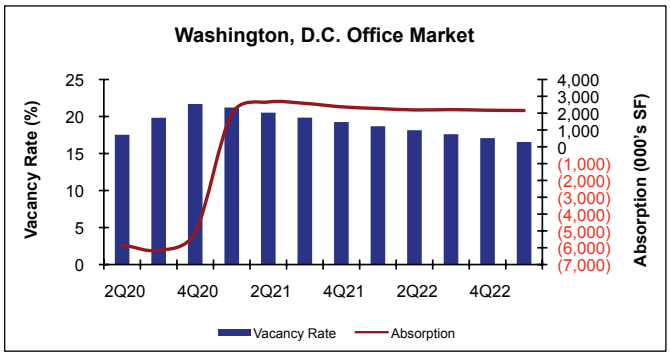


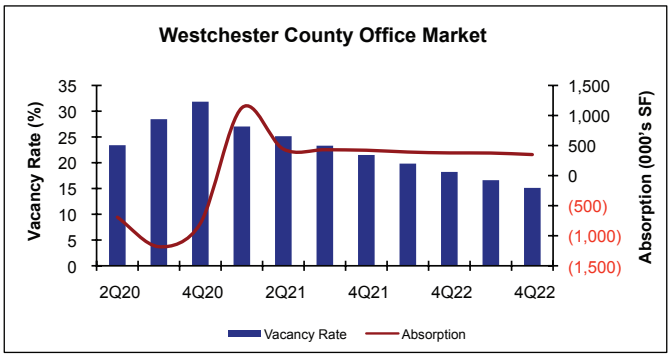


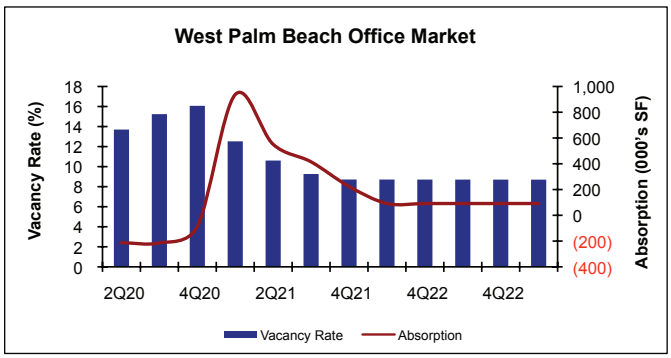




Office Market Vacancy and Absorption Projections (cont.)







THE LINNEMAN LETTER
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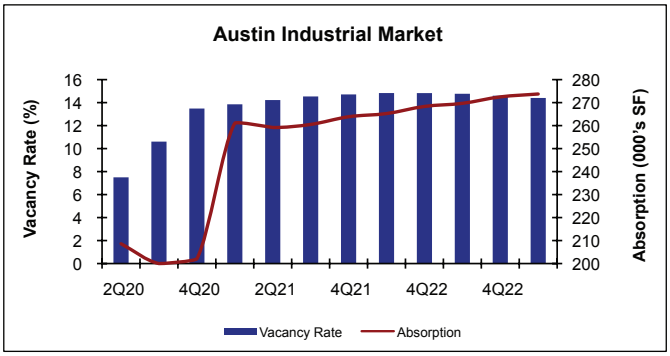
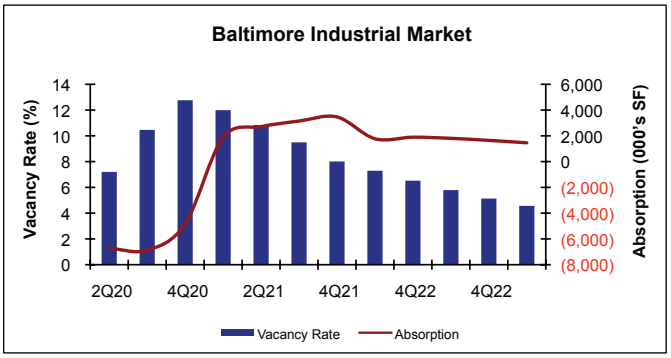
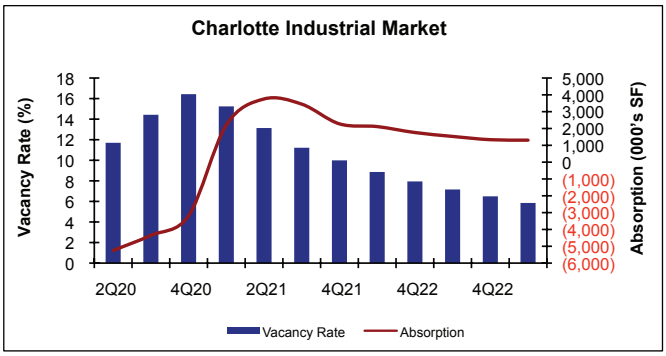
Industrial Market Vacancy and Absorption Projections

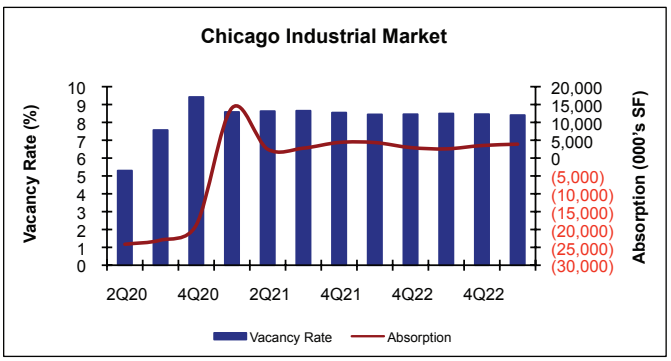
We are in a period of unprecedented global market circumstances as a result of the COVID-19 pandemic. We remind our readers of the limitations of statistical forecasting models (which rely on historical trends) in such atypical circumstances and urge you to read our fundamental insights in the first article of this issue.

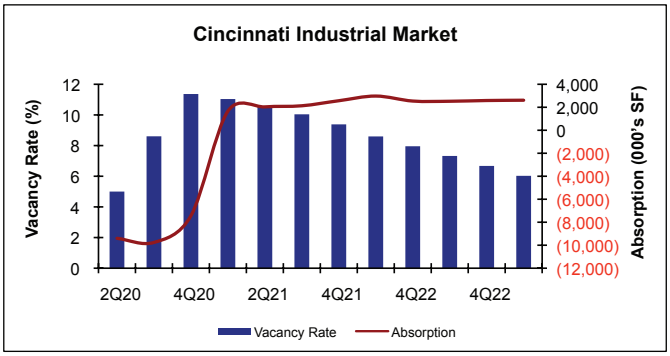
Notes on Negative Vacancy: In order to calculate estimated vacancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show negative vacancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, negative vacancies cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of negative vacancy should be viewed as a strong excess demand indicator.

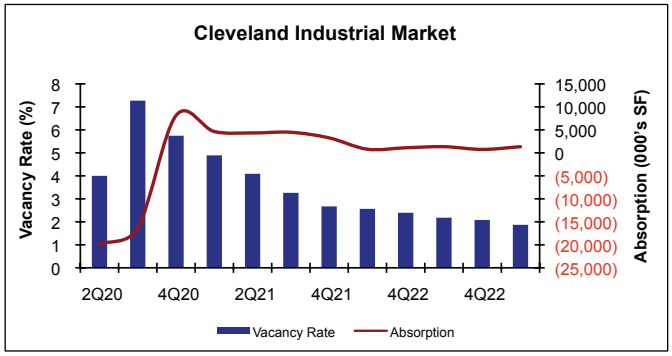


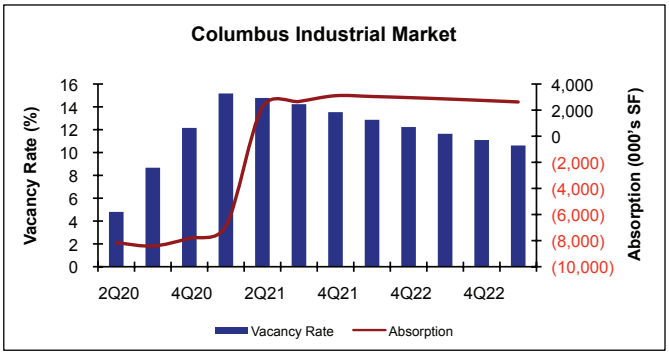




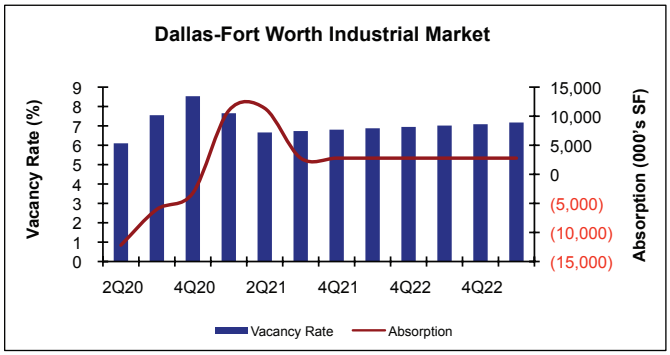


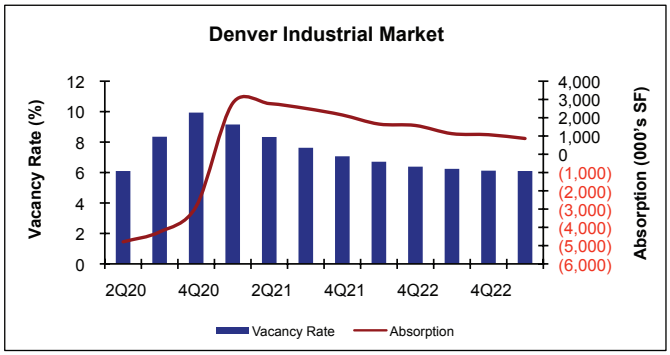


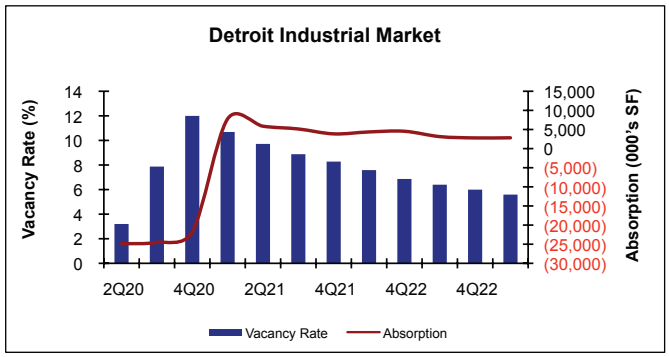


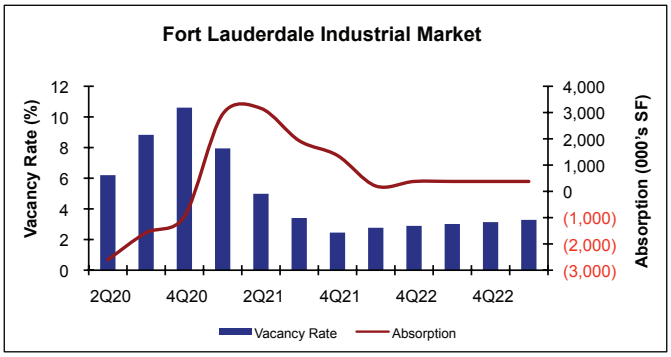


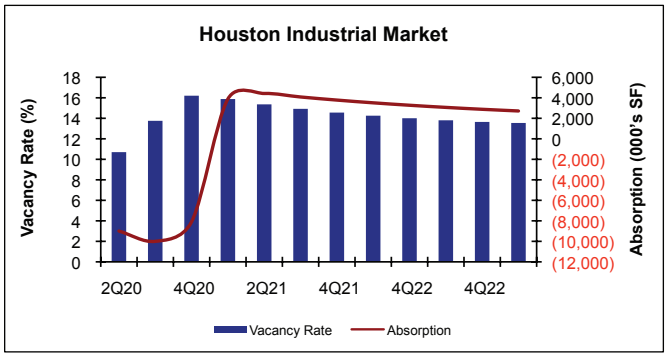
Industrial Market Vacancy and Absorption Projections (cont.)

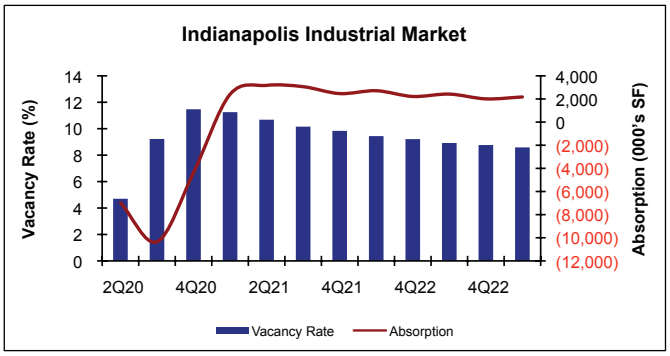


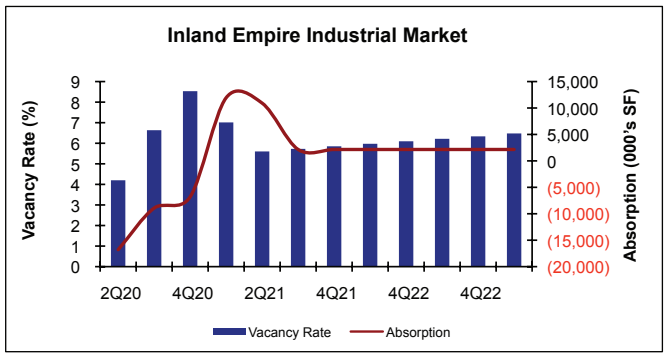


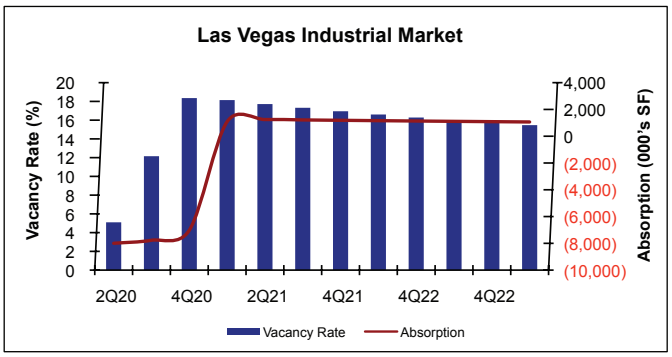




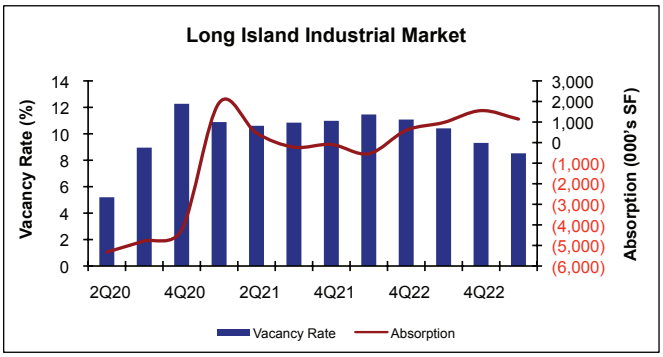


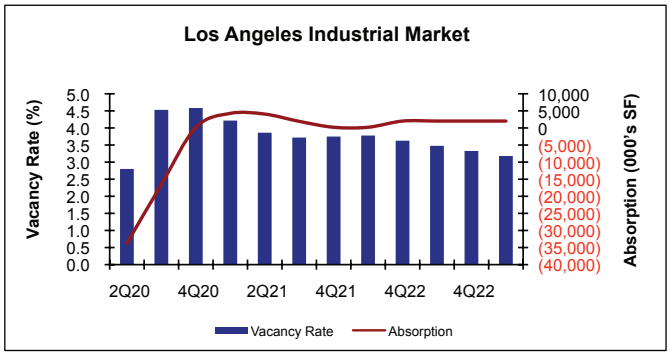


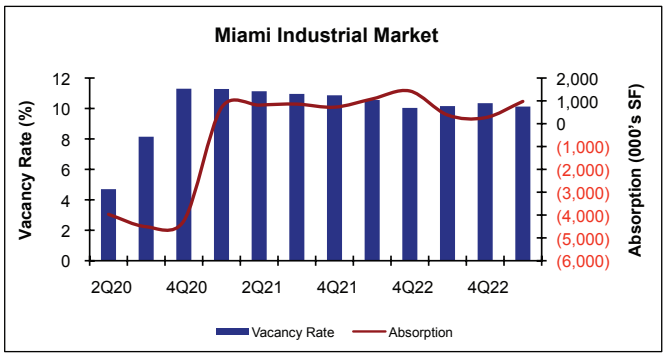


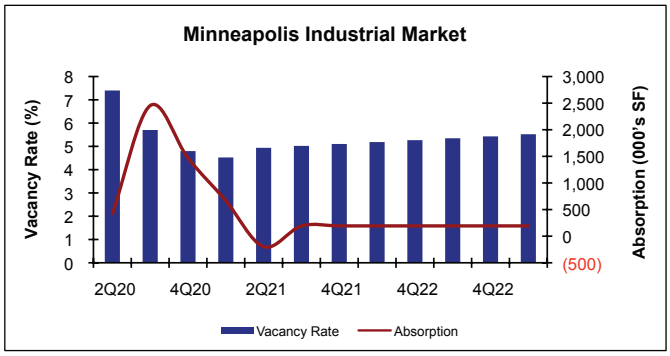


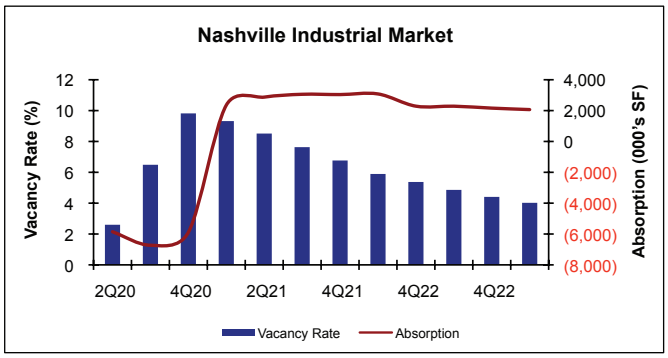
Industrial Market Vacancy and Absorption Projections (cont.)

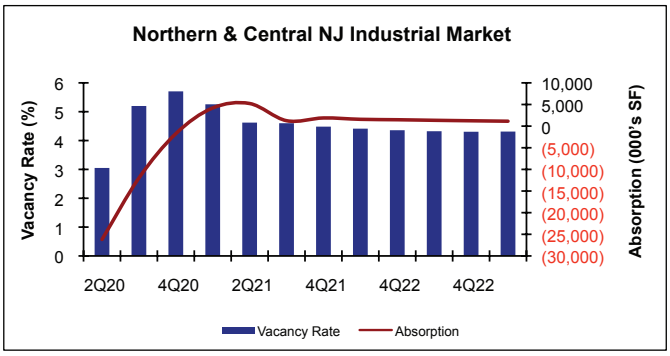


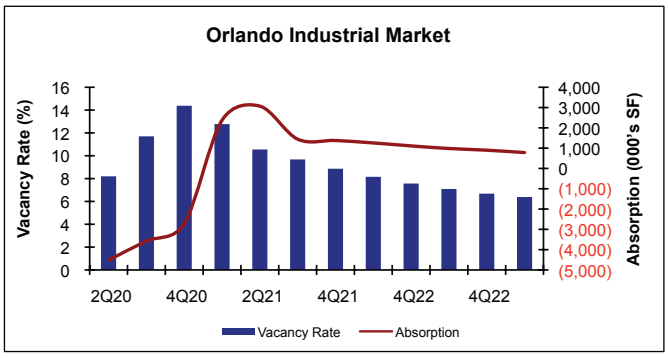


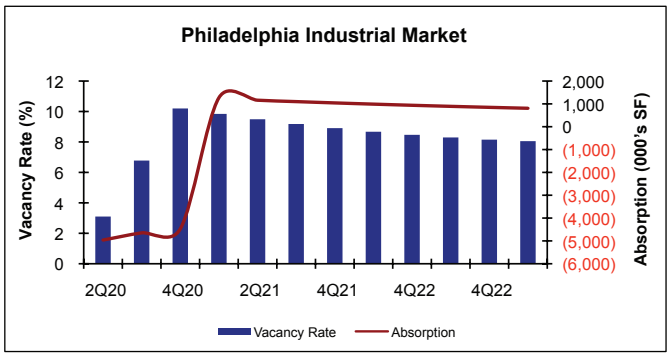












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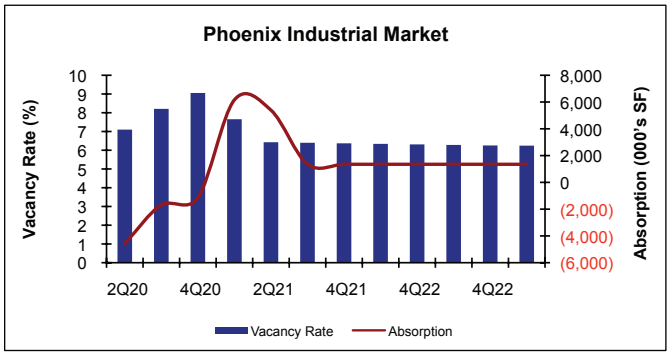

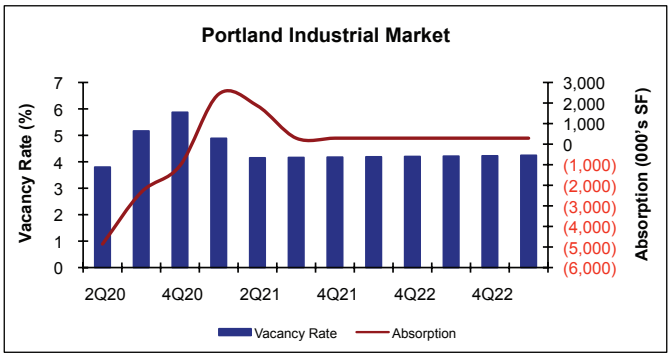

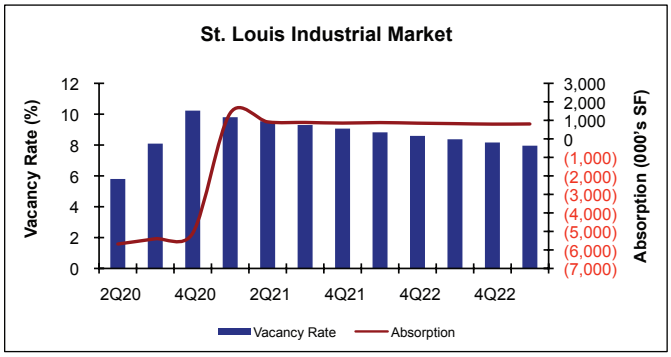

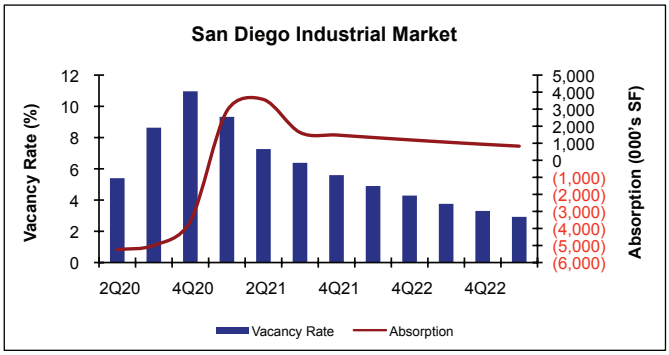

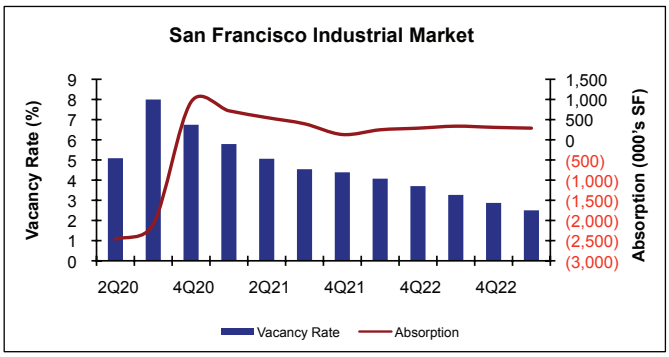

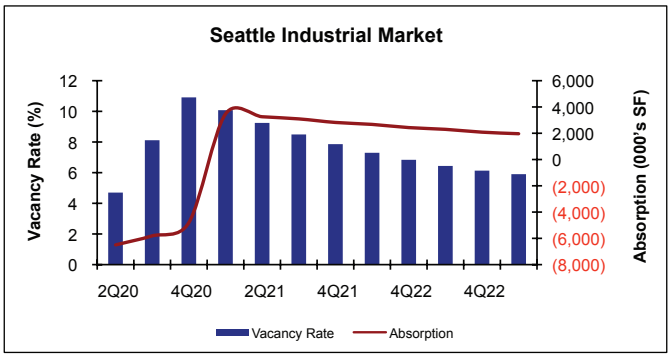

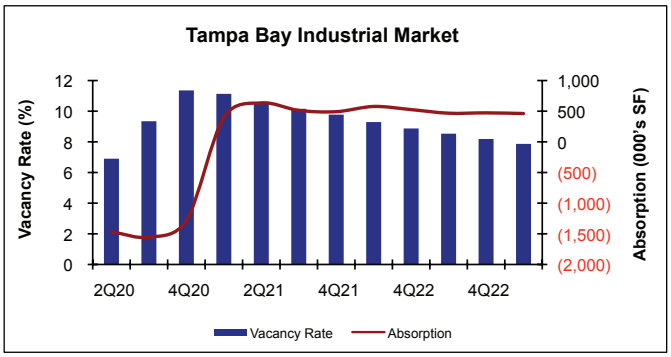

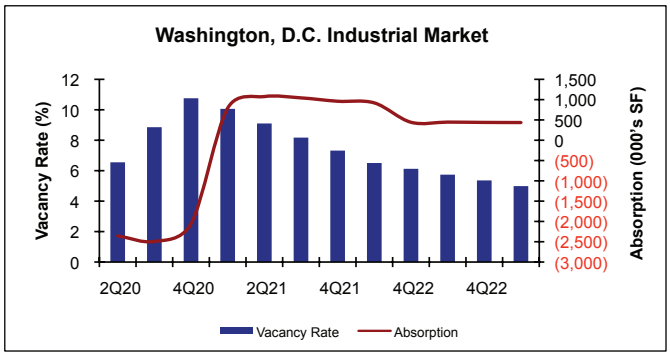

THE LINNEMAN LETTER
Volume 20, Issue 3 Fall 2020

Multifamily Market Vacancy and Absorption Projections

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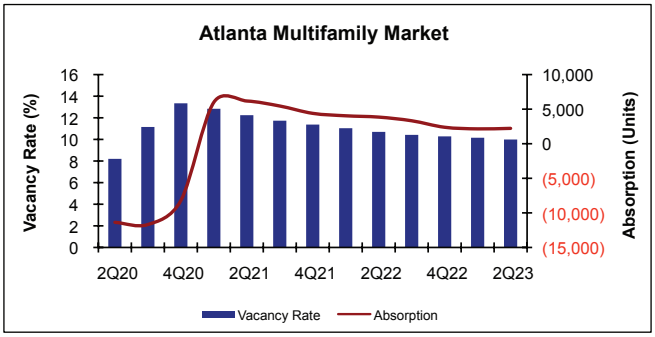
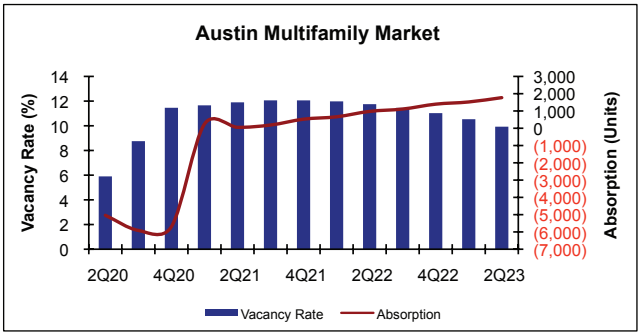
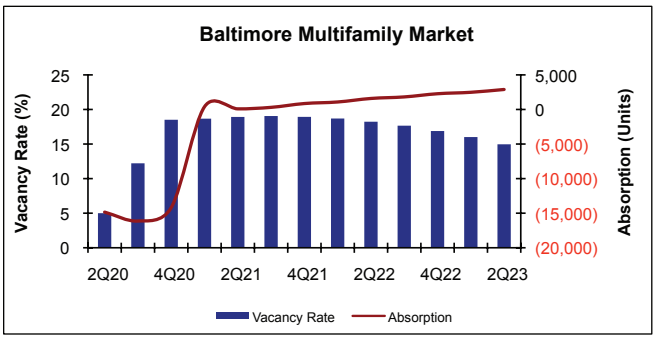
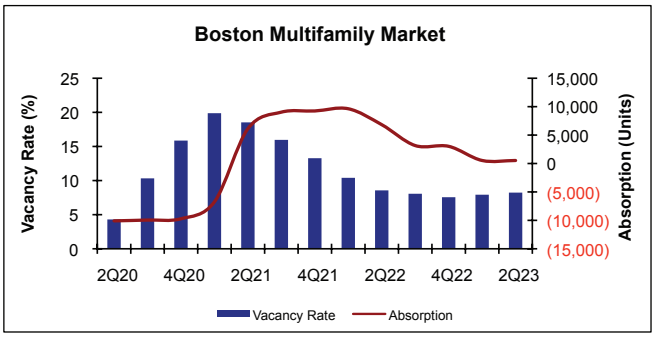
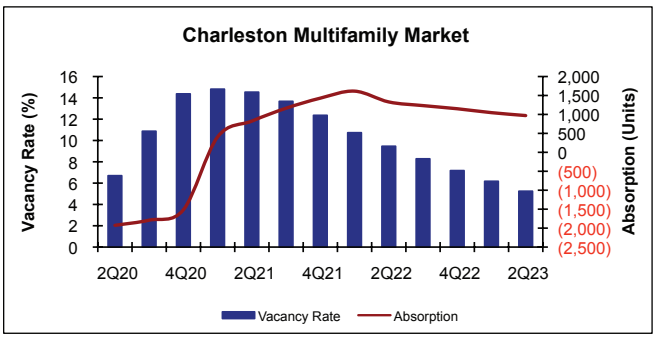
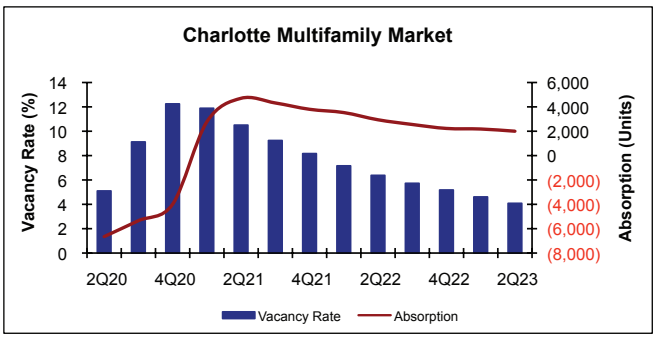


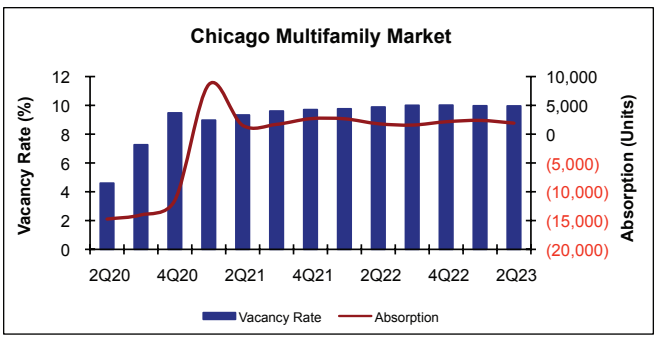


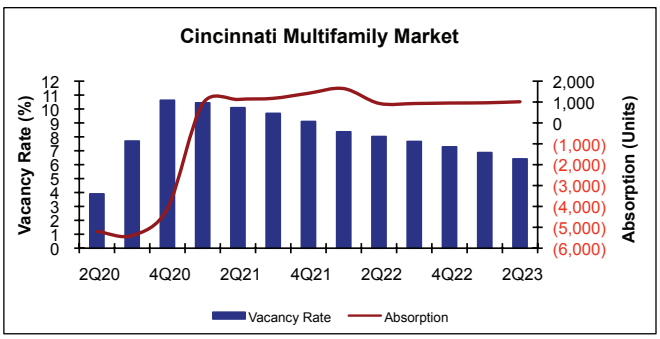




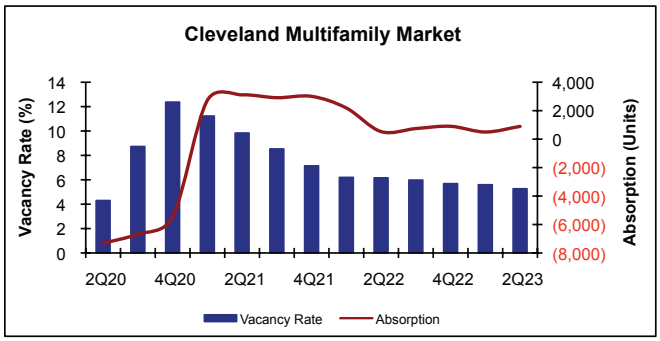


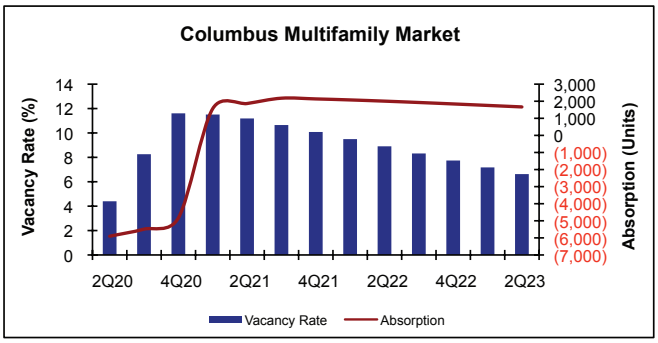


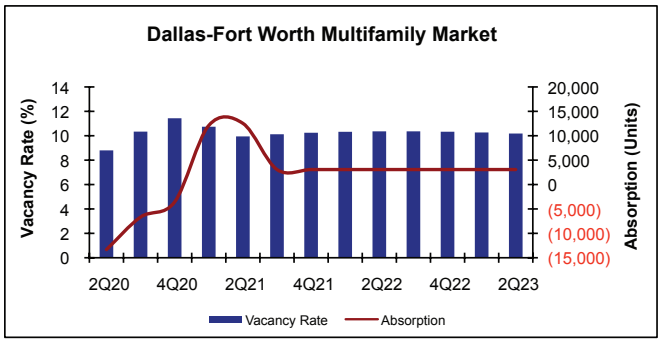


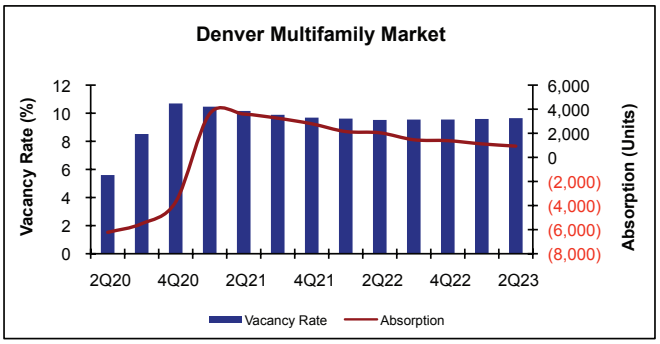


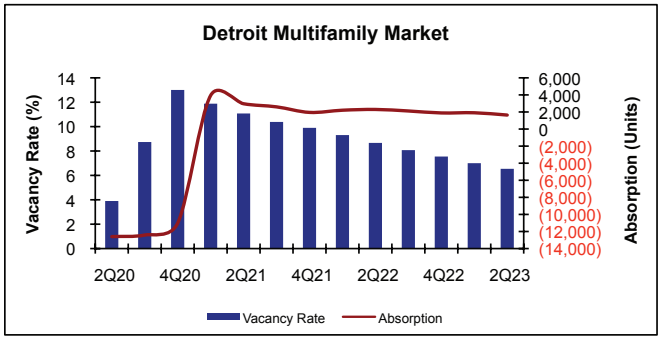
Multifamily Market Vacancy and Absorption Projections (cont.)

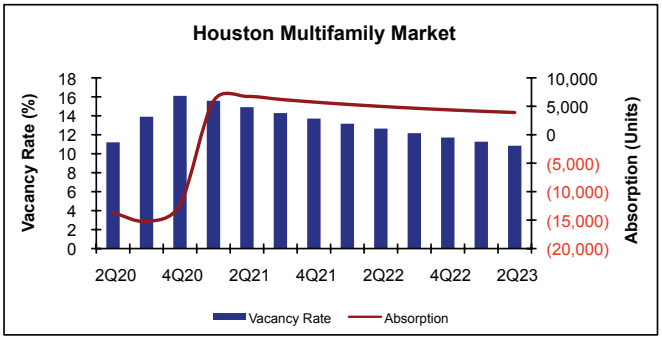


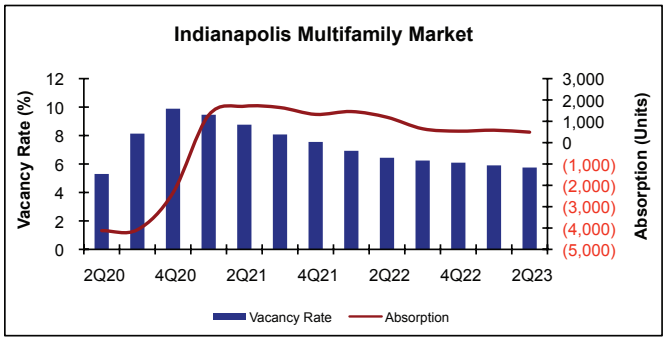


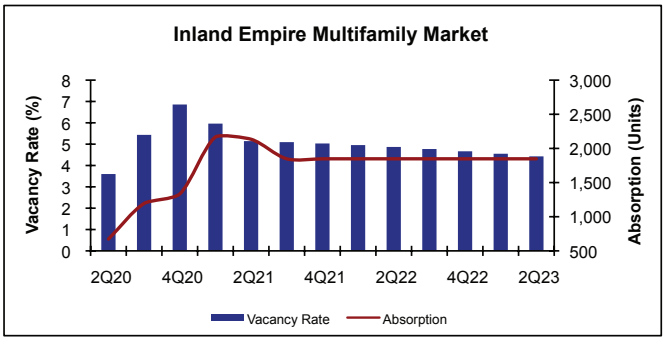




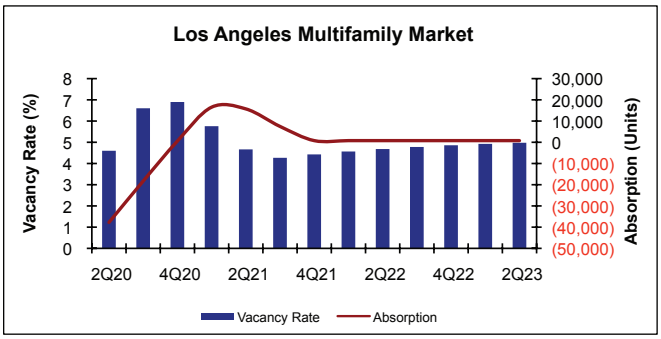


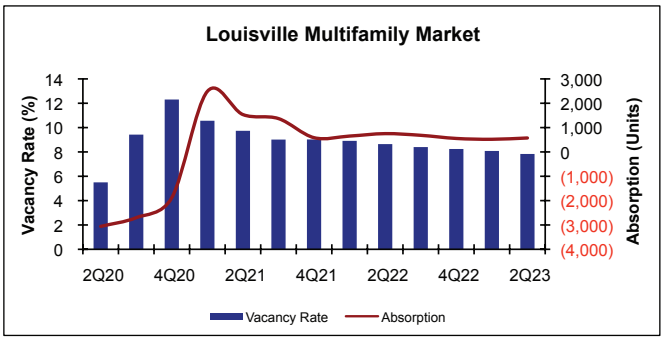


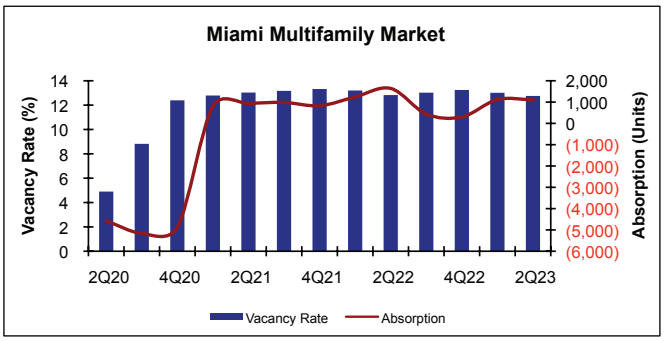


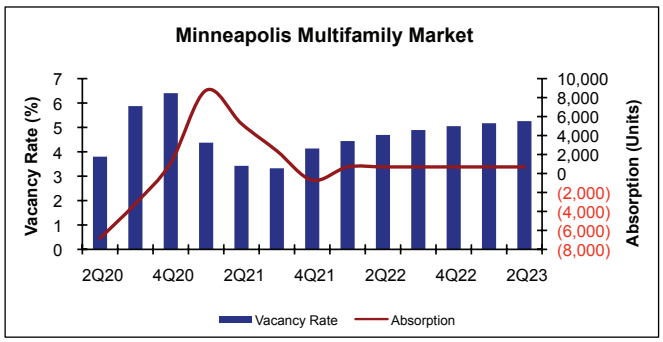


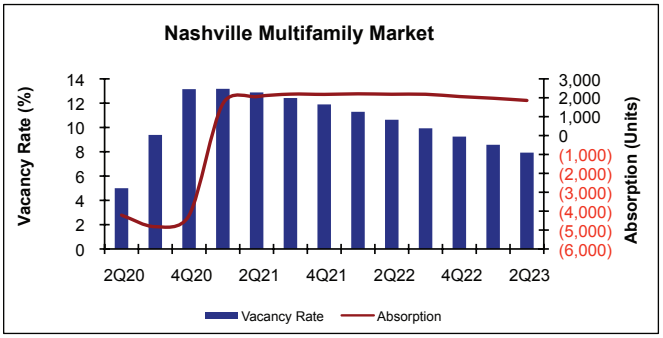
Multifamily Market Vacancy and Absorption Projections (cont.)

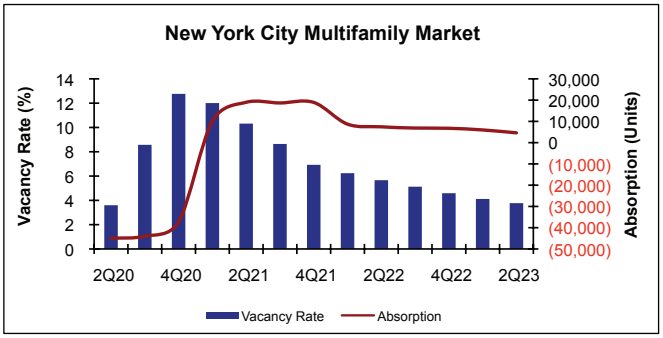


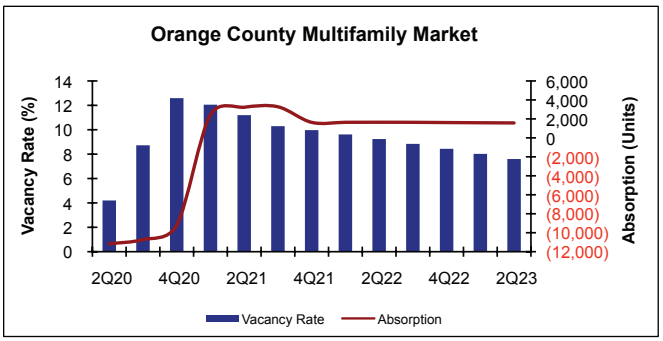


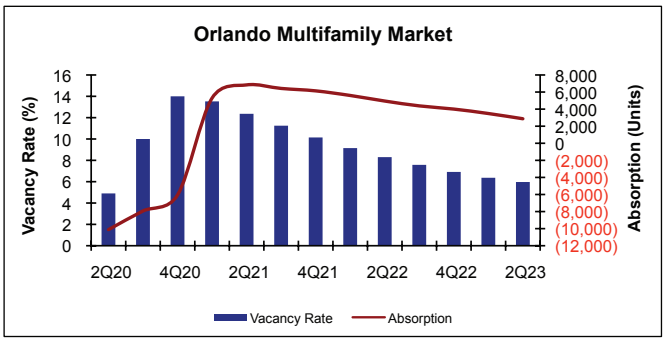




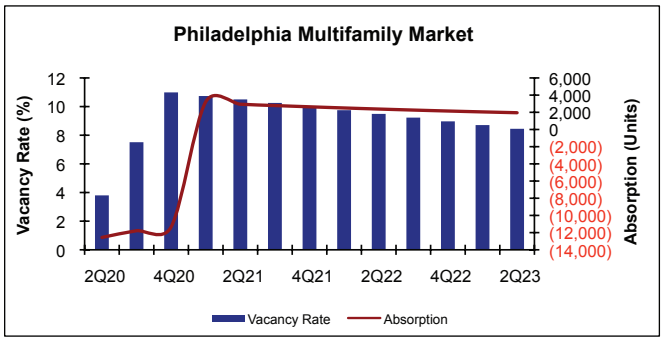


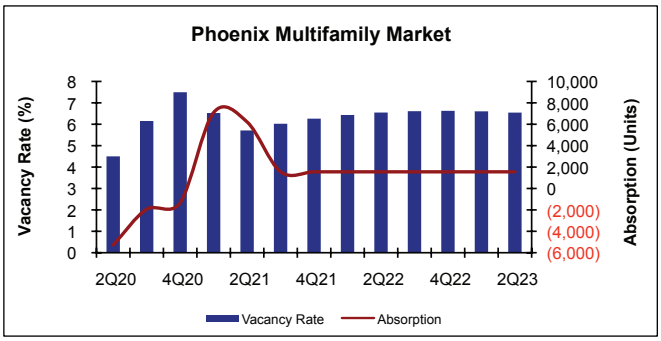


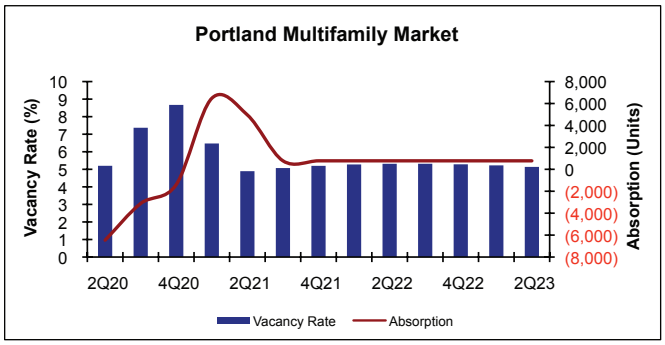


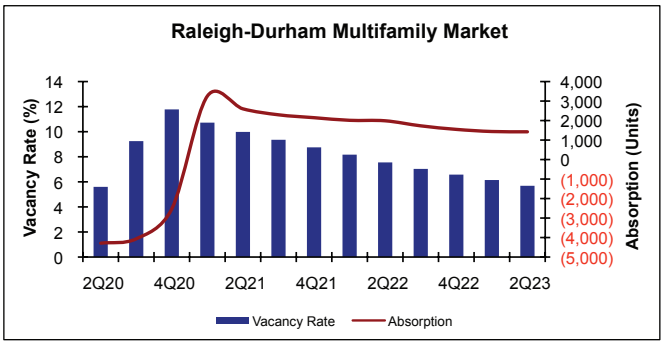


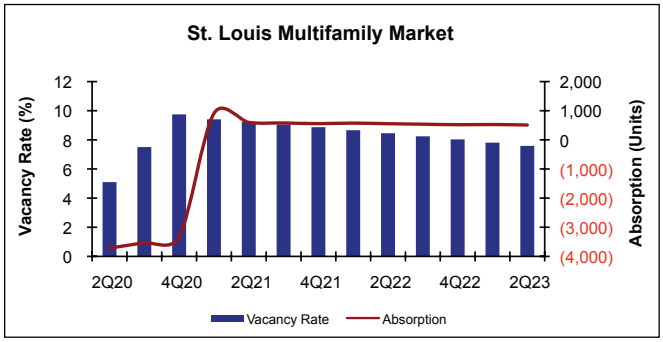
Multifamily Market Vacancy and Absorption Projections (cont.)

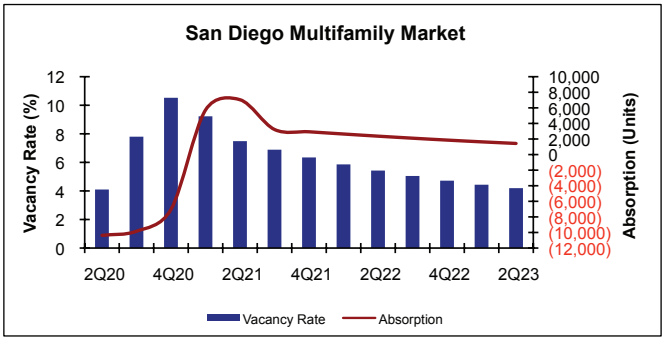


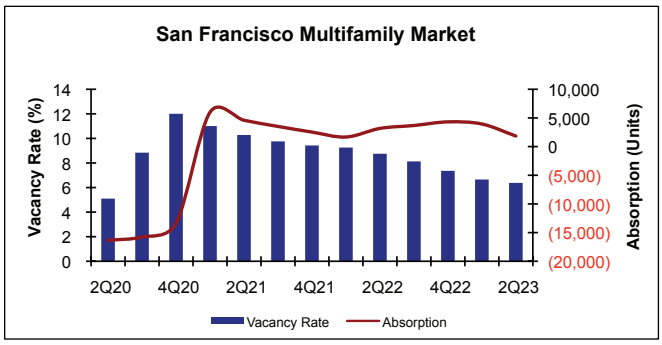


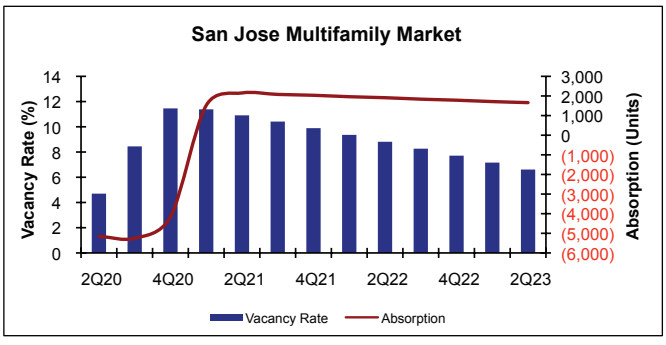












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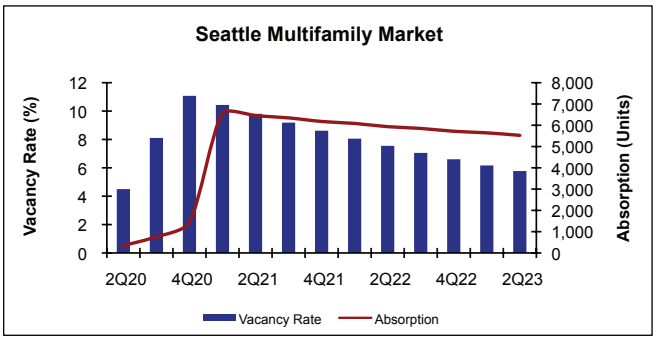

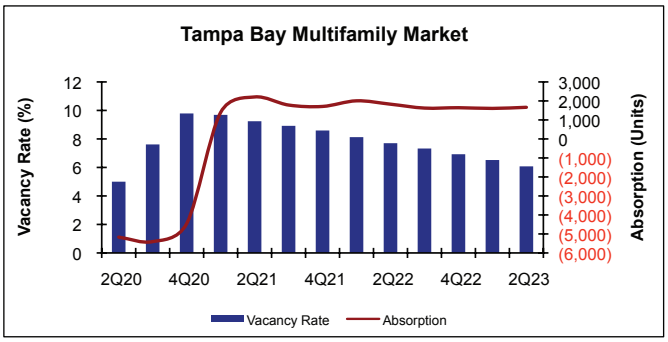

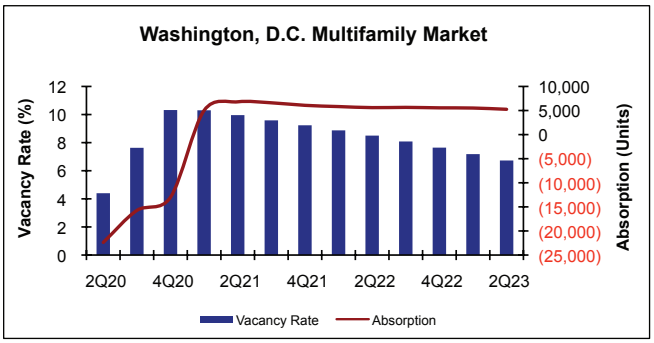

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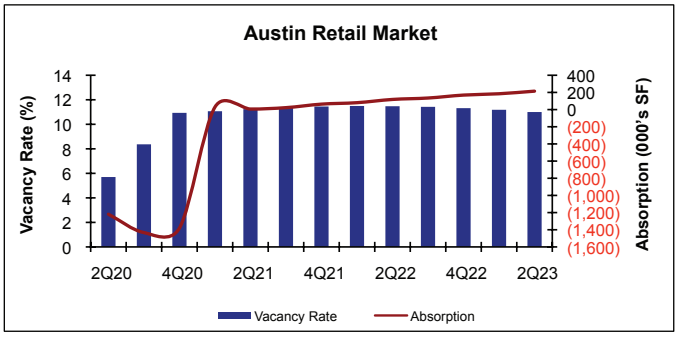
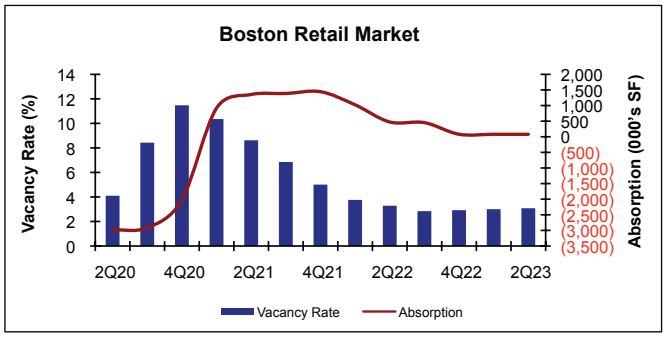
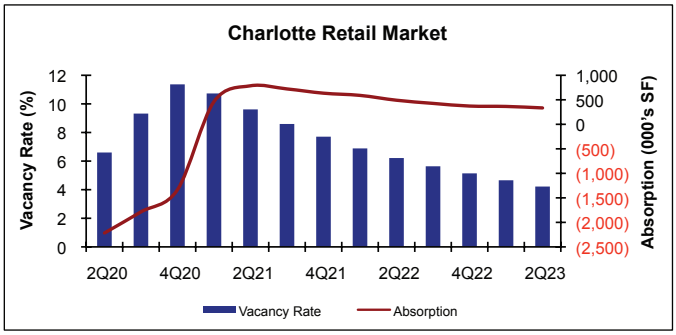
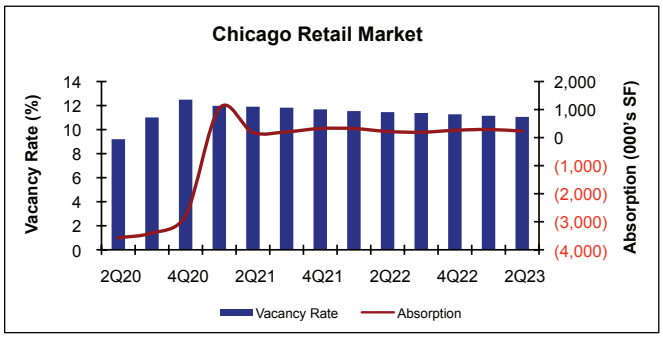
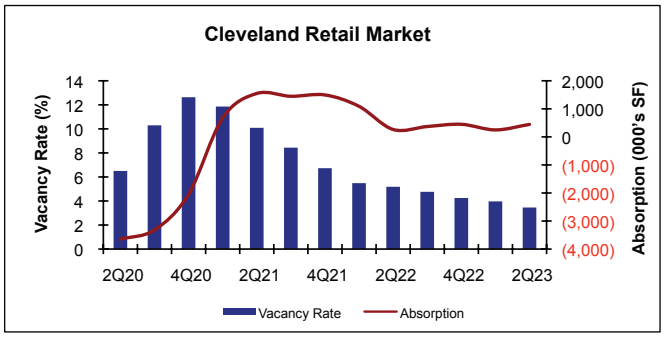
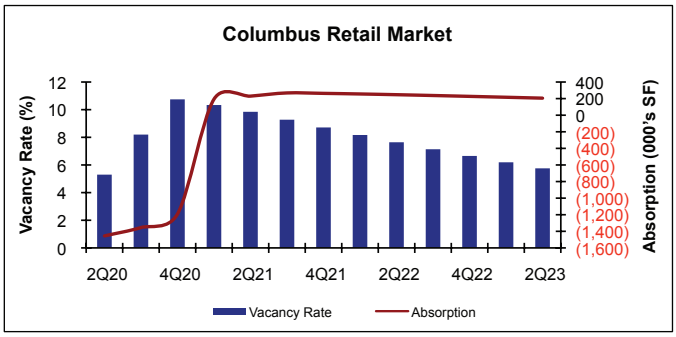




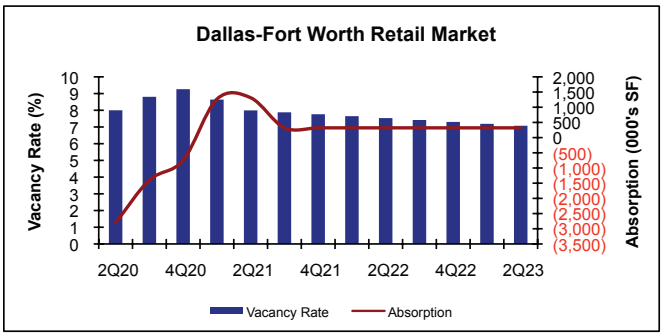


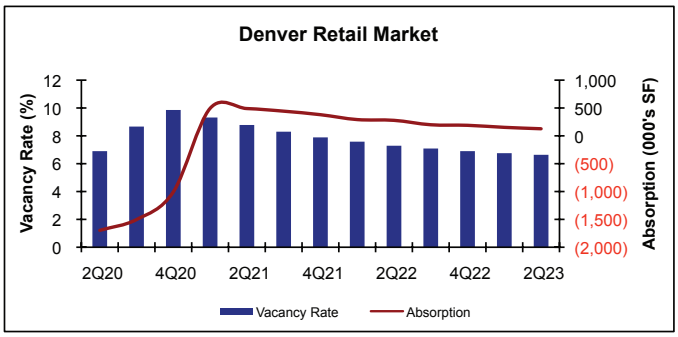


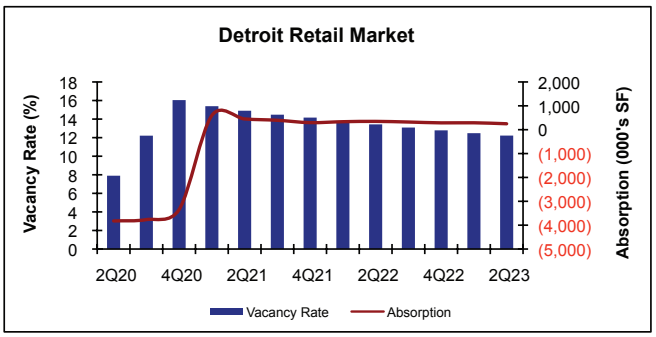


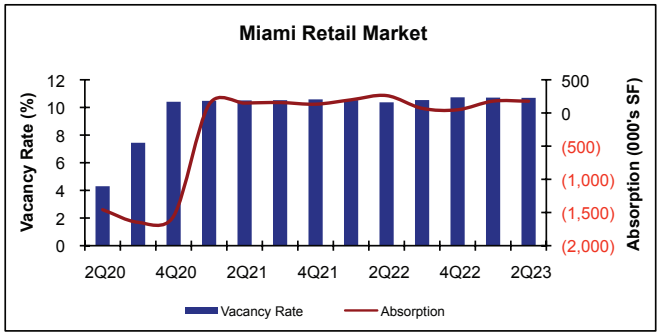


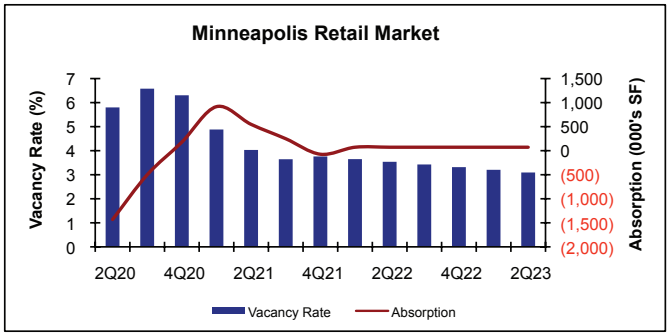
Retail Market Vacancy and Absorption Projections (cont.)











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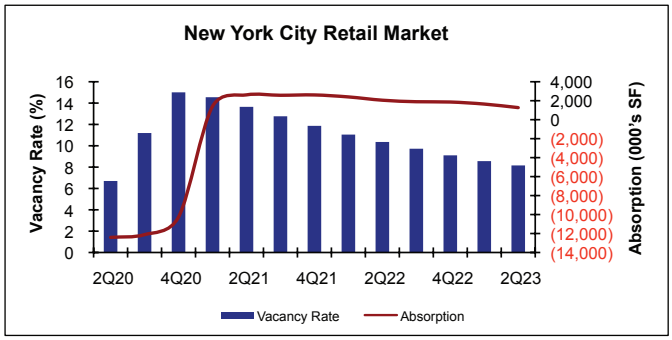
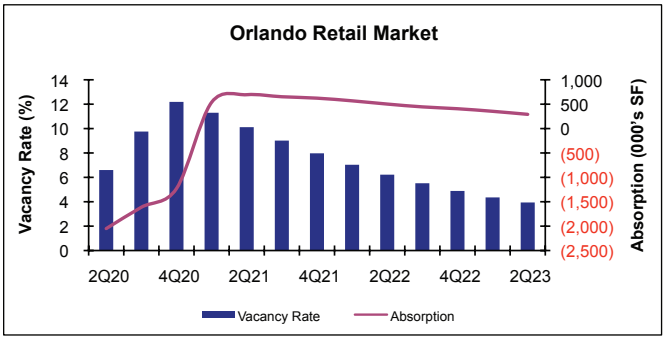
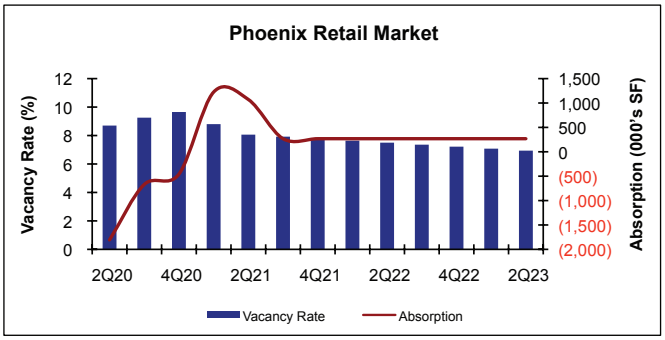
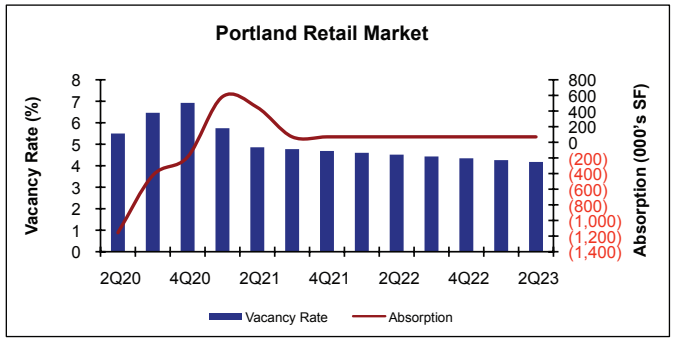
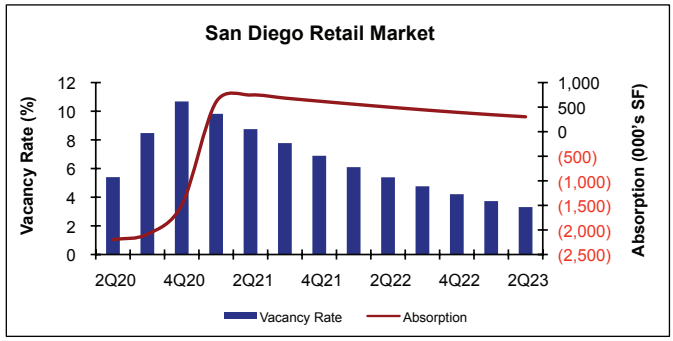


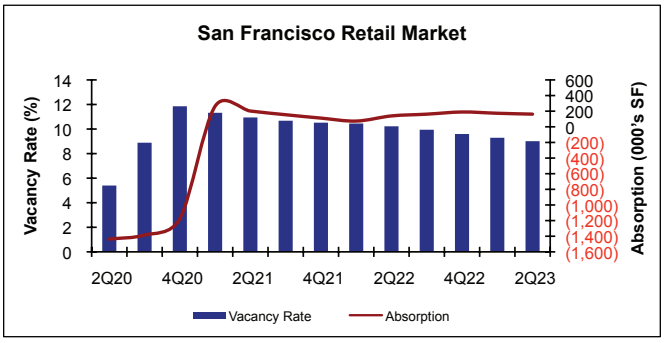


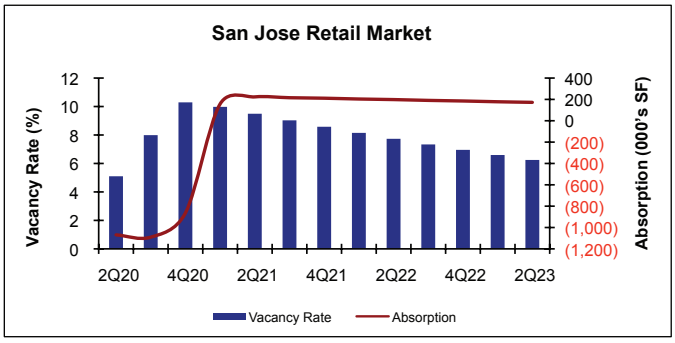


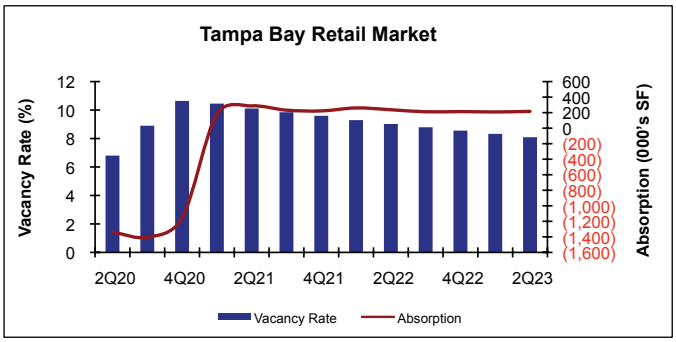


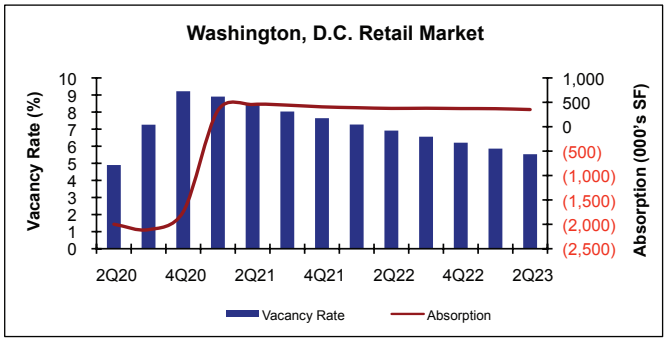


Retail Market Vacancy and Absorption Projections (cont.)









THE LINNEMAN LETTER
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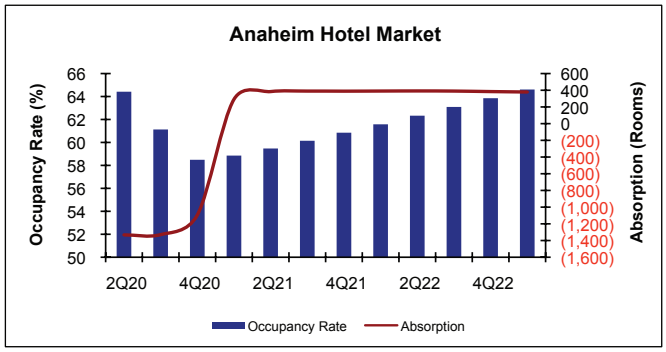
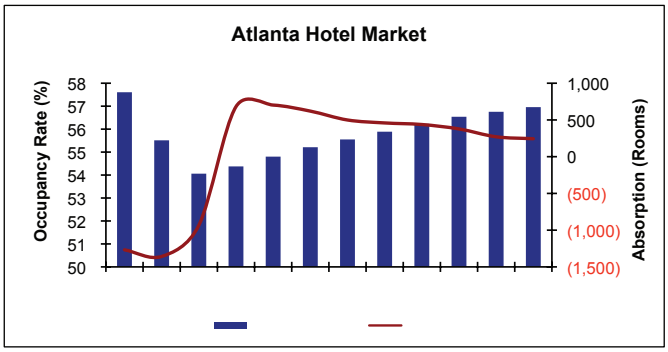
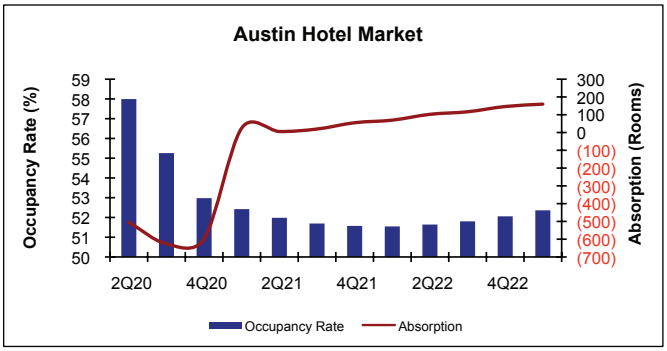
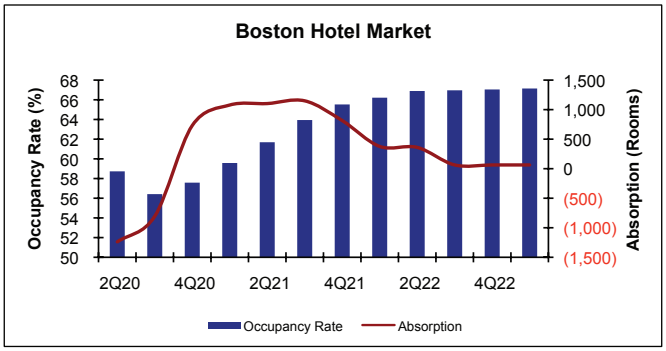
Hotel Market Occupancy and Absorption Projections

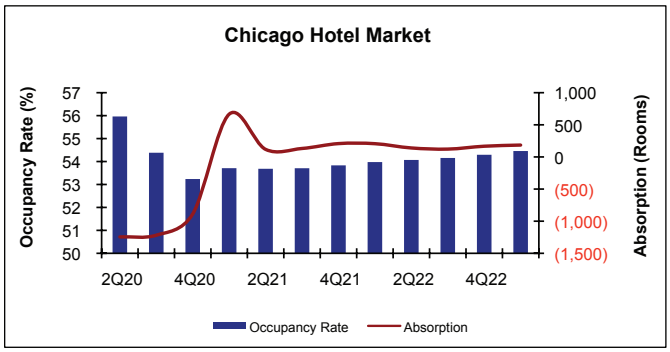
We are in a period of unprecedented global market circumstances as a result of the COVID-19 pandemic. We remind our readers of the limitations of statistical forecasting models (which rely on historical trends) in such atypical circumstances and urge you to read our fundamental insights in the first article of this issue.

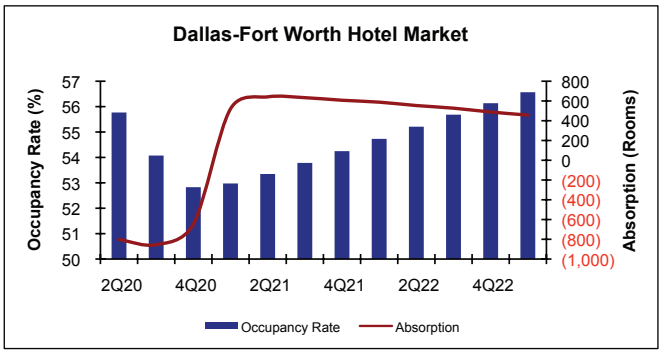


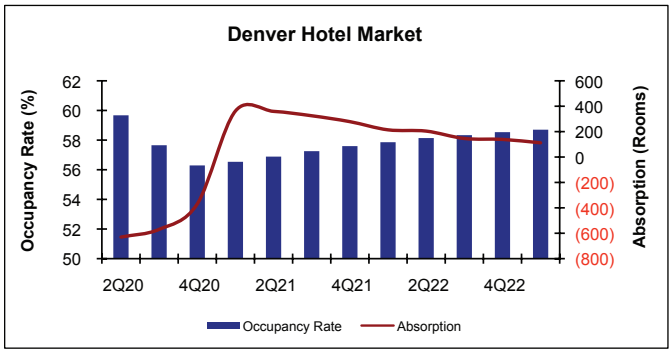


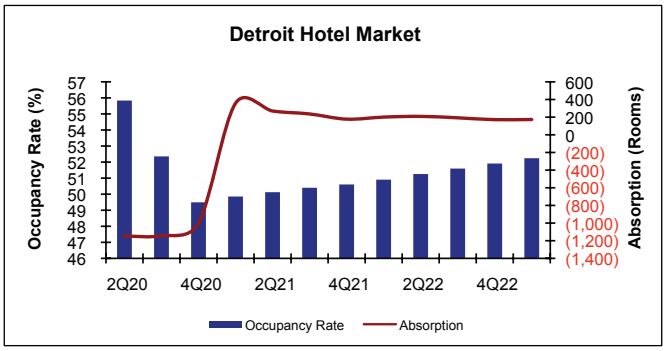




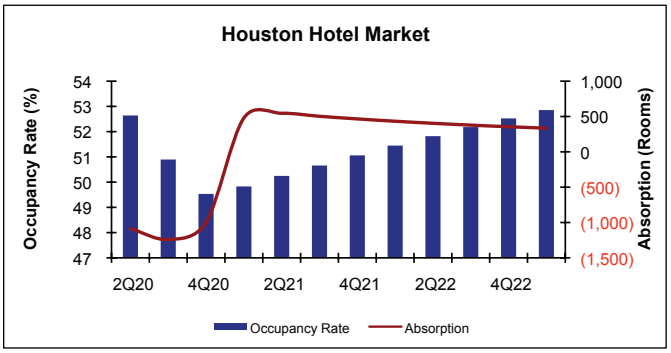


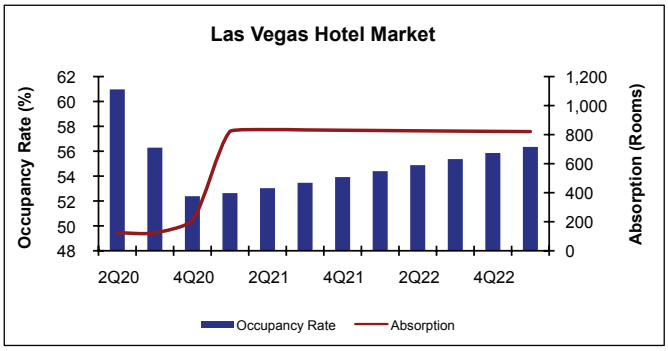


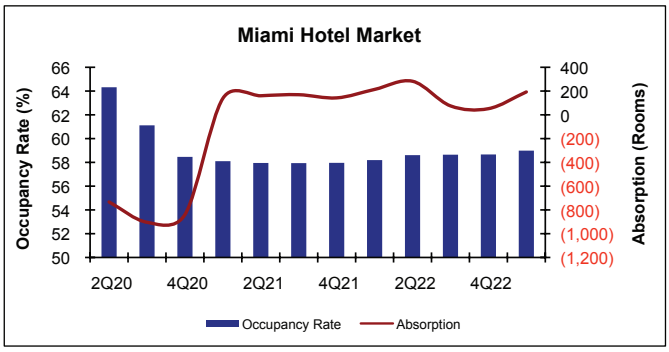


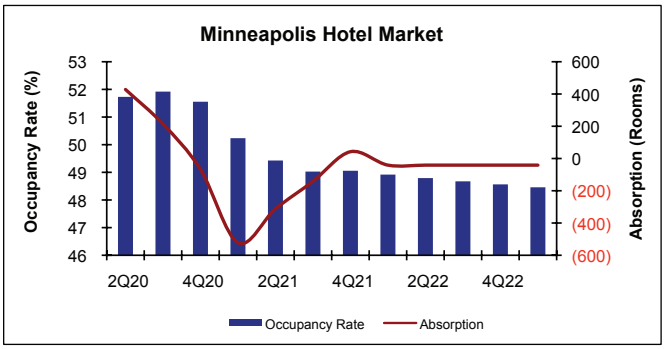


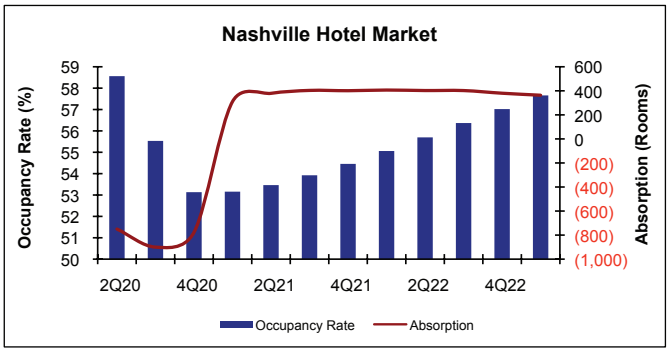
Hotel Market Occupancy and Absorption Projections (cont.)

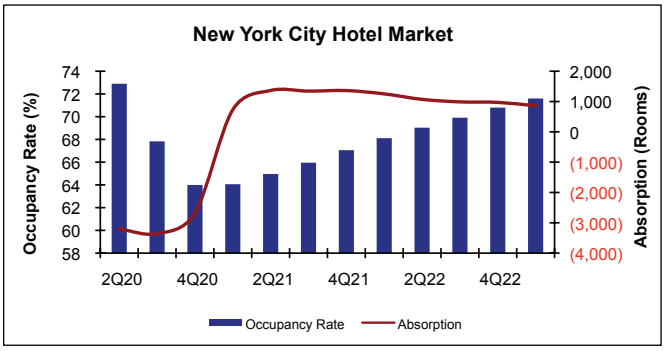


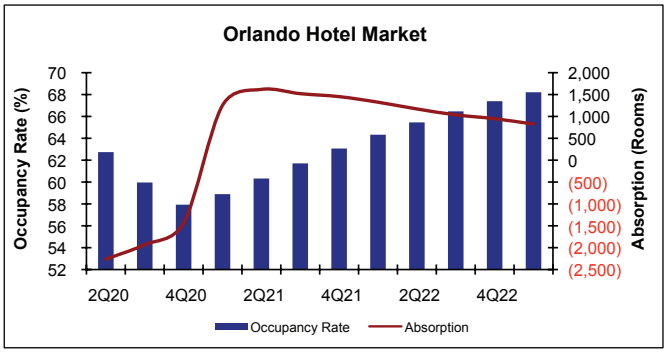




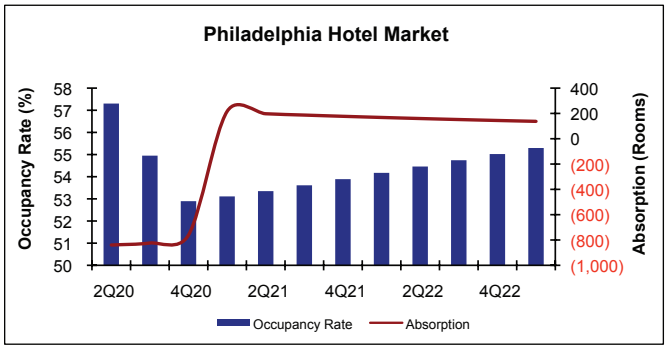


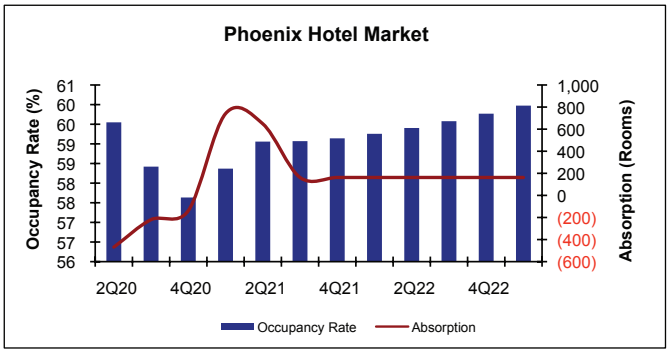


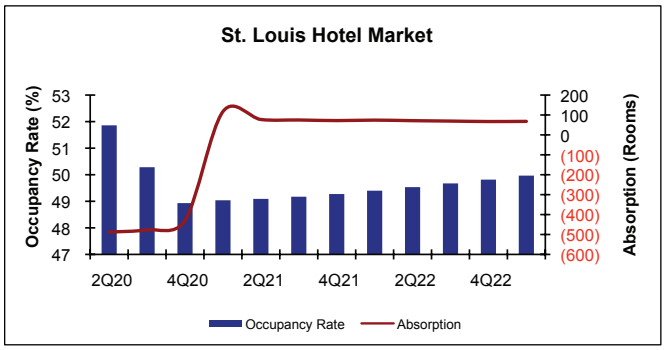


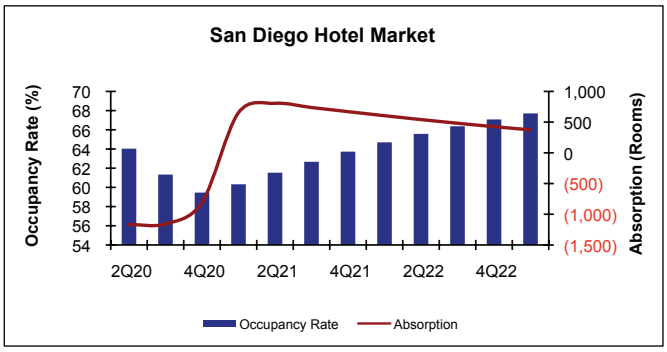


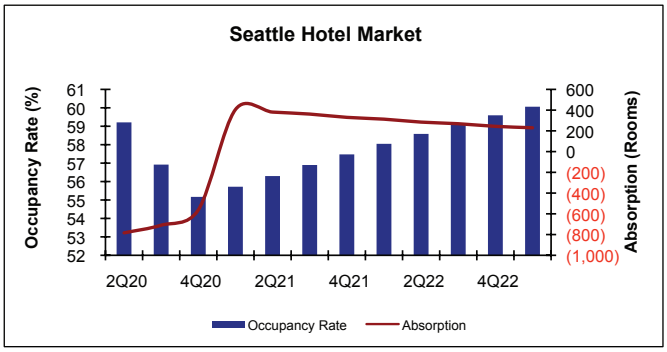
Hotel Market Occupancy and Absorption Projections (cont.)

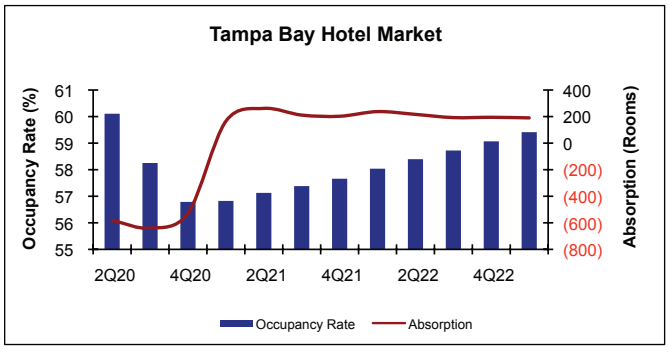


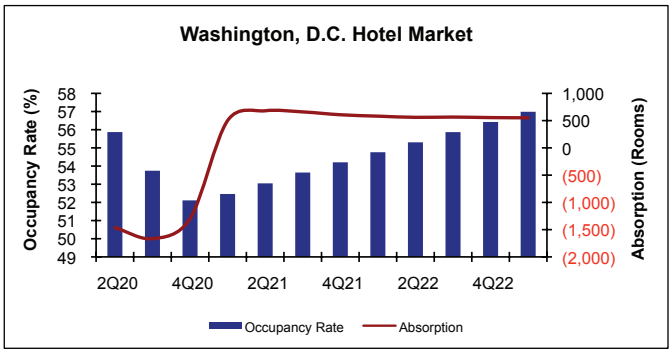












THE LINNEMAN LETTER
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Independent Living Market Occupancy and Absorption Projections

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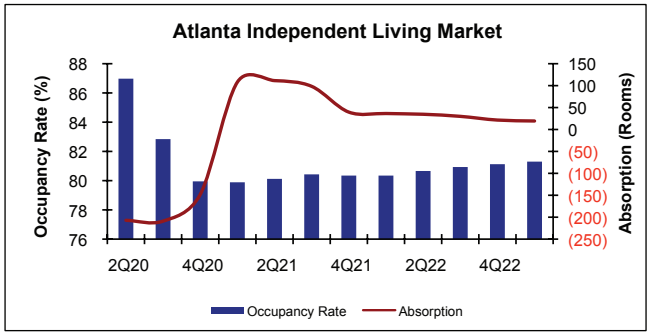
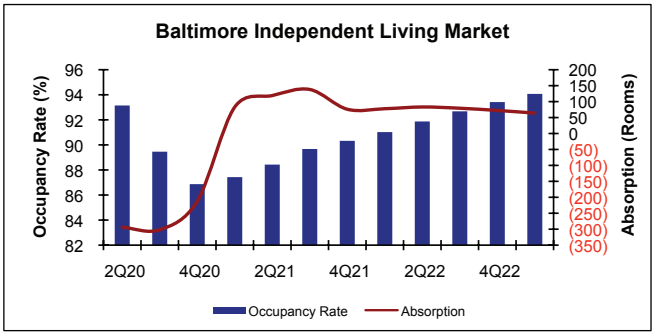
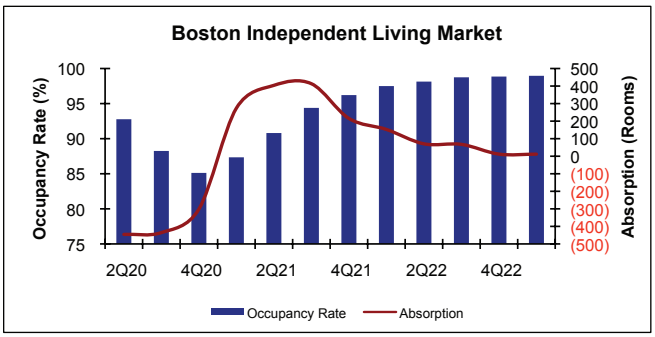
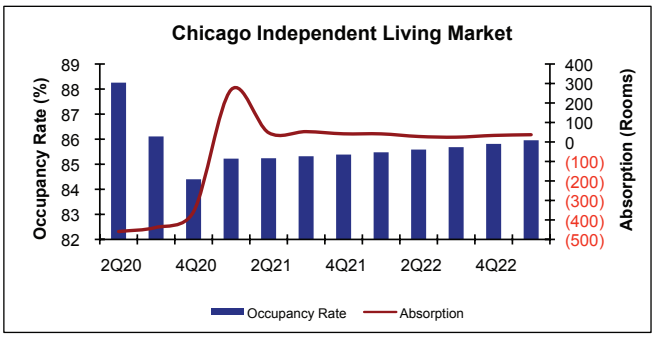
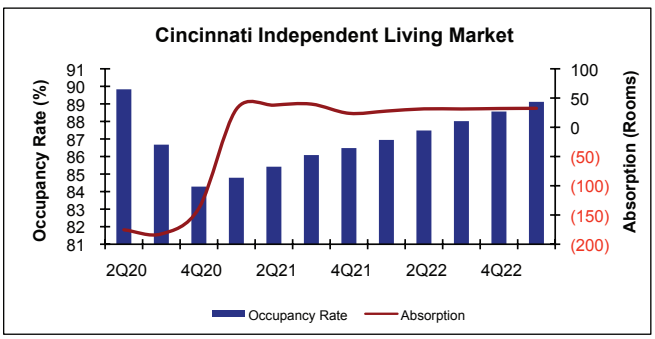
Note on occupancy greater than 100%: In order to calculate estimated occupancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show 100%+ occupancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, 100%+ occupancy cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of 100%+ occupancy should be viewed as a strong excess demand indicator.

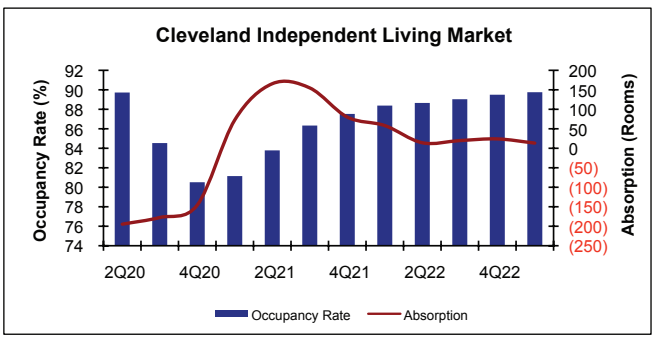


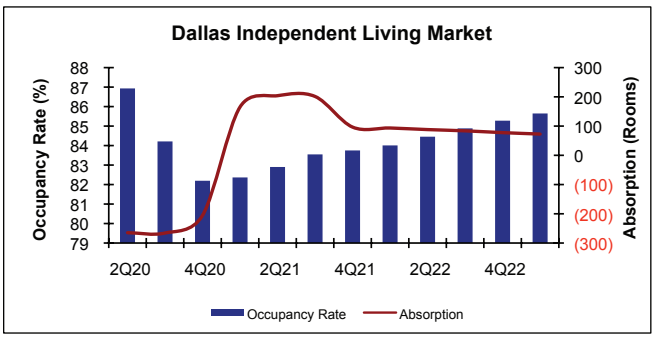


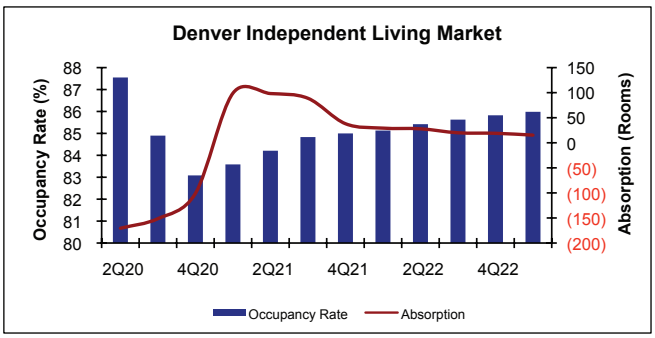












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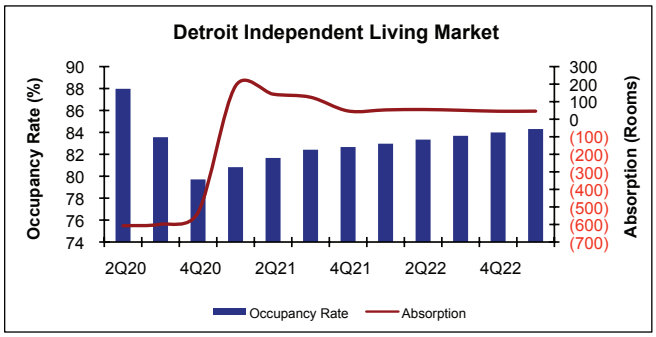
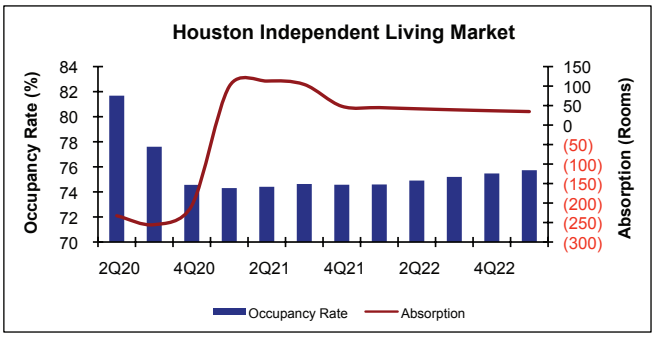
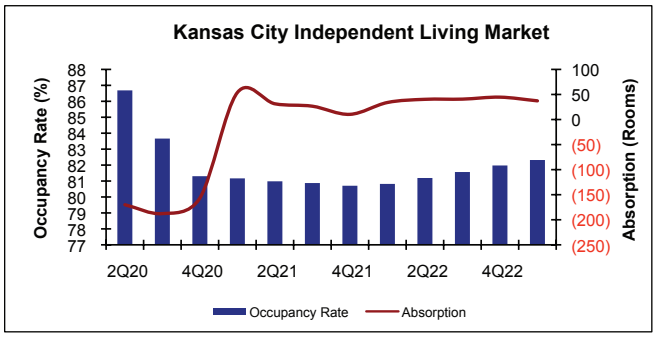
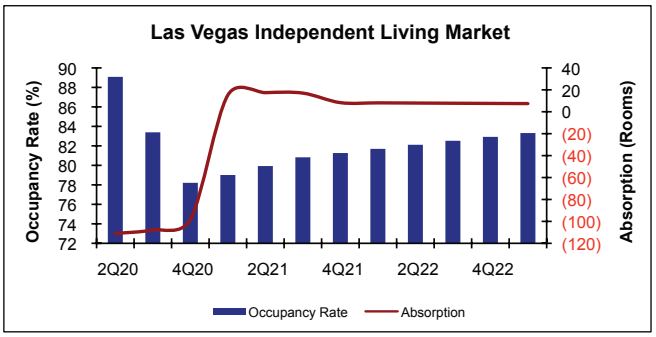
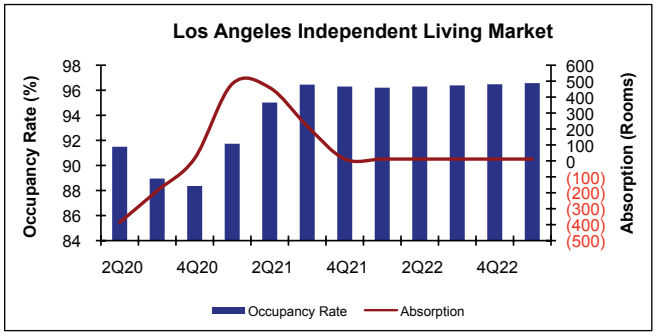
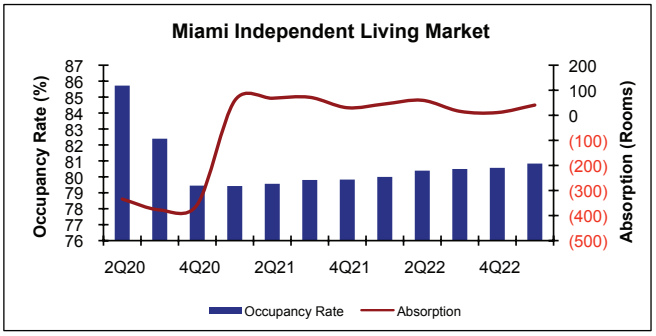


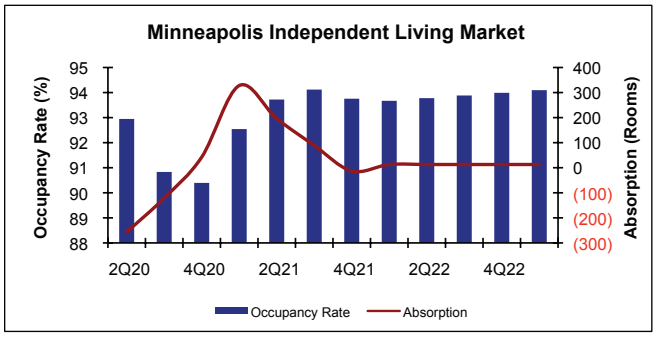


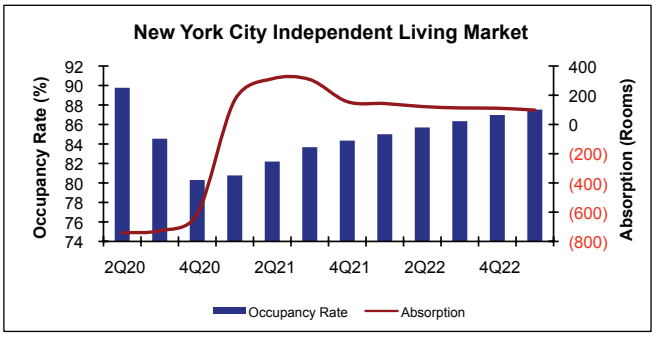




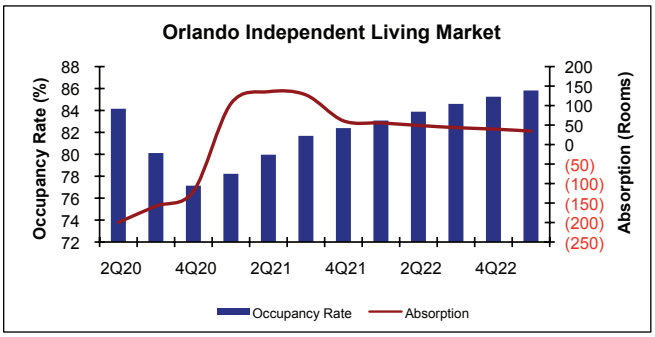


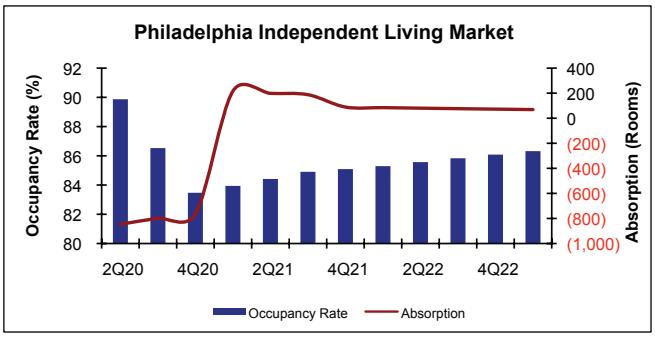


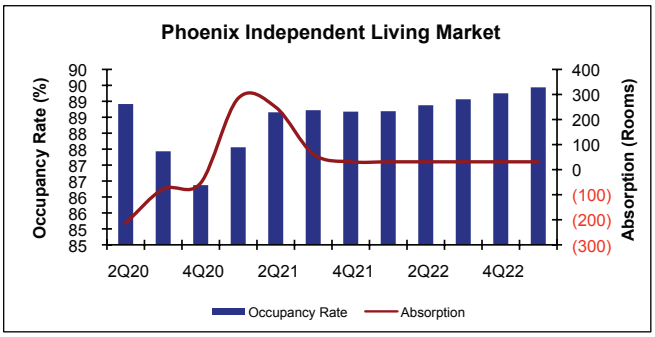


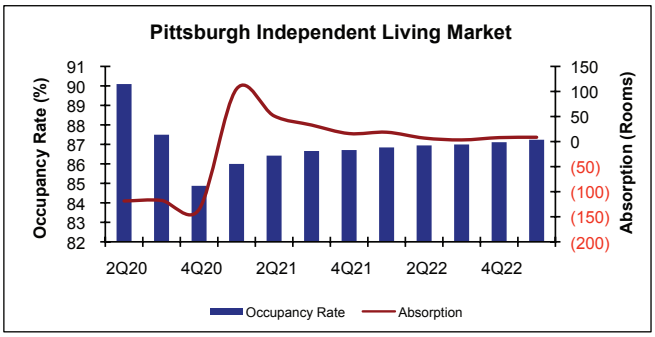


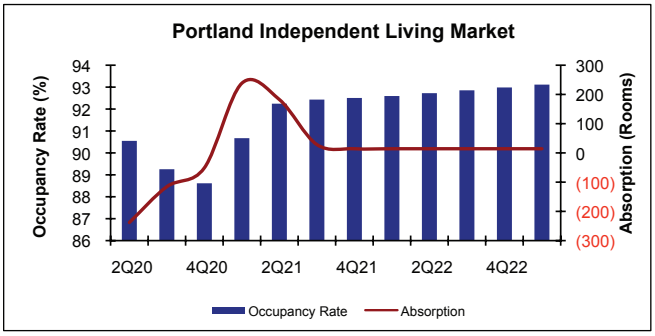
Independent Living Market Occupancy and Absorption Projections (cont.)

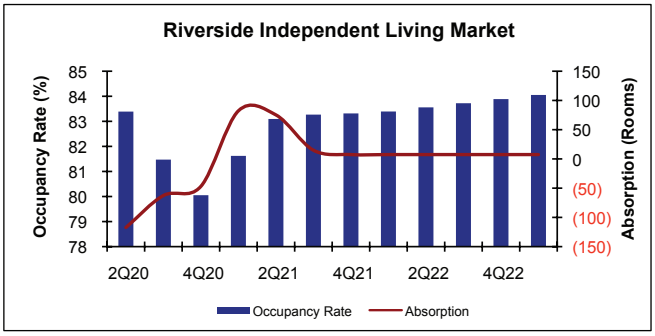


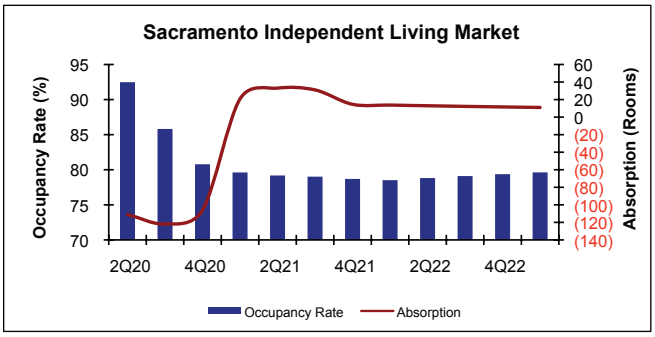


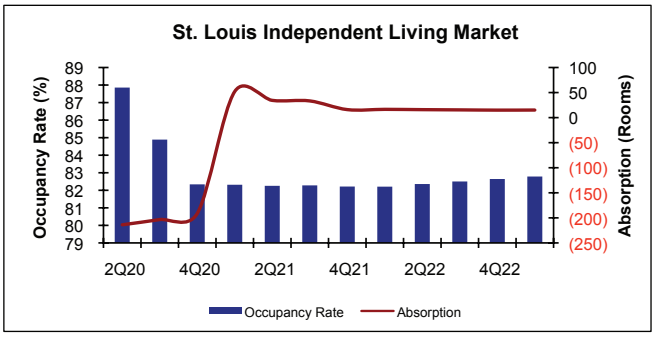




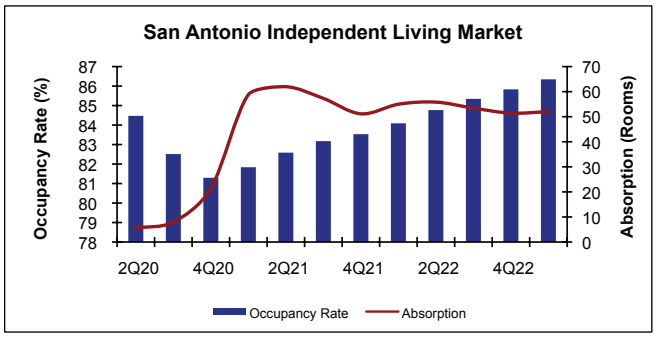


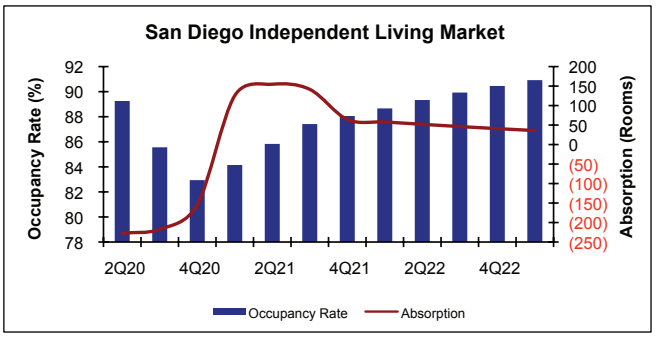


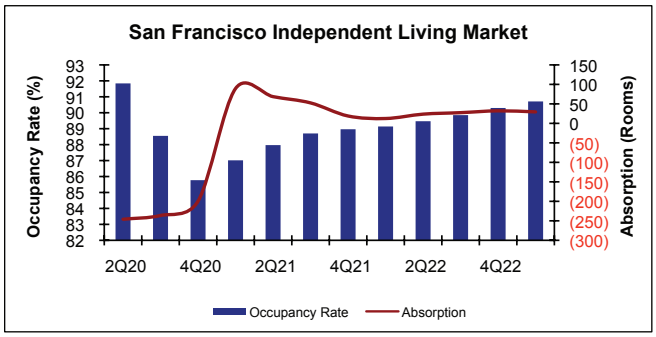


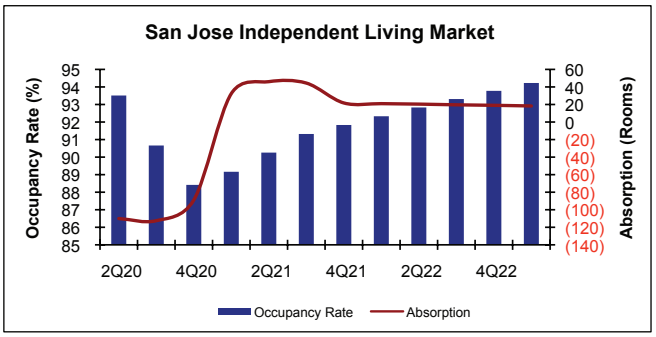


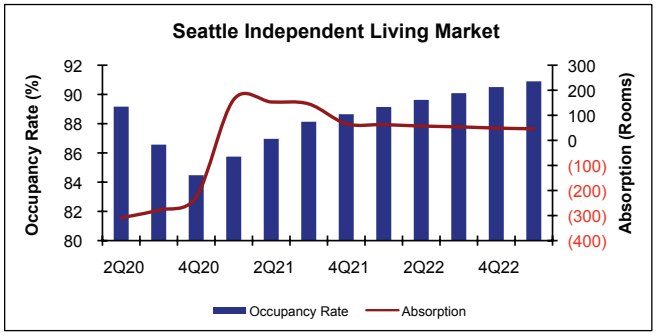
Independent Living Market Occupancy and Absorption Projections (cont.)

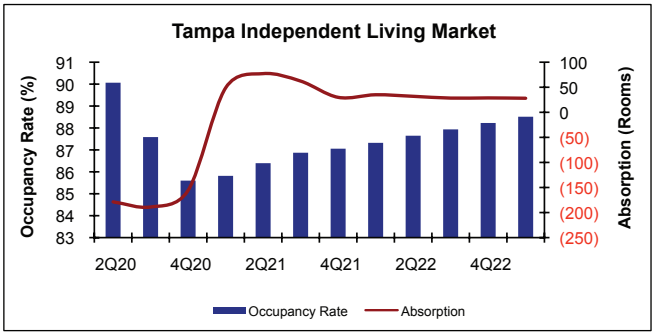


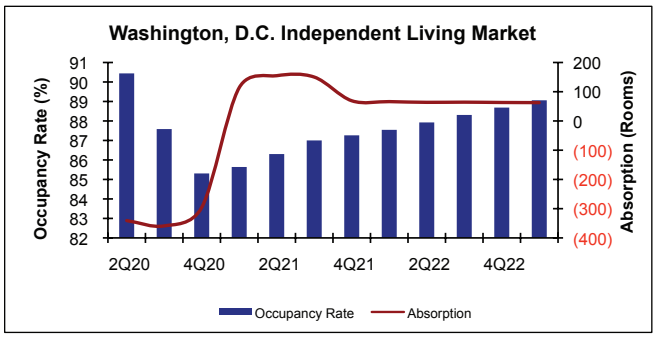










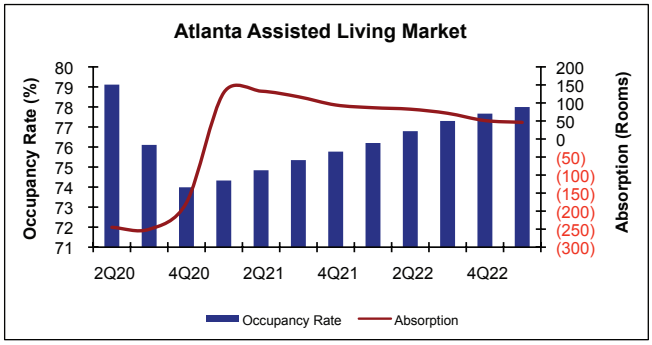


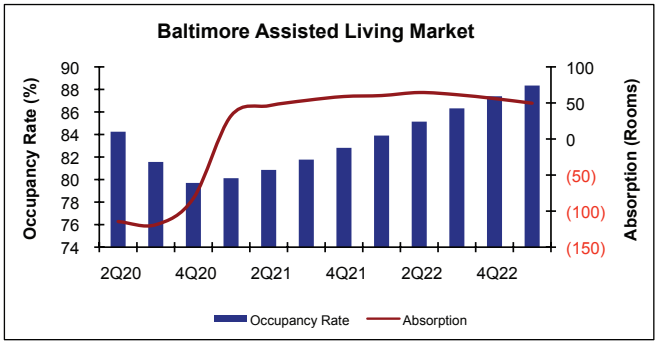
THE LINNEMAN LETTER
Volume 20, Issue 3 Fall 2020

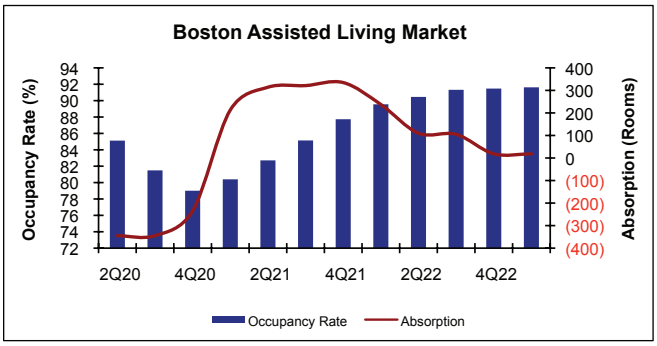
Assisted Living Market Occupancy and Absorption Projections

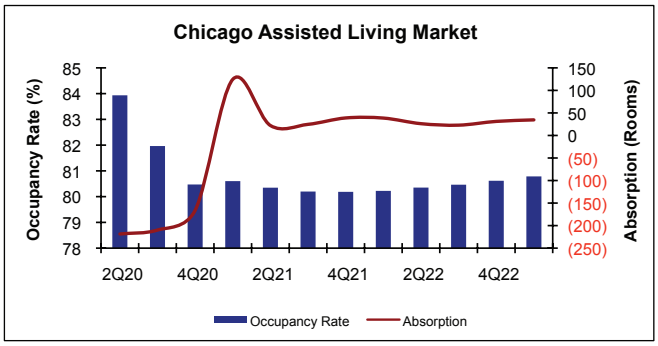
We are in a period of unprecedented global market circumstances as a result of the COVID-19 pandemic. We remind our readers of the limitations of statistical forecasting models (which rely on historical trends) in such atypical circumstances and urge you to read our fundamental insights in the first article of this issue.

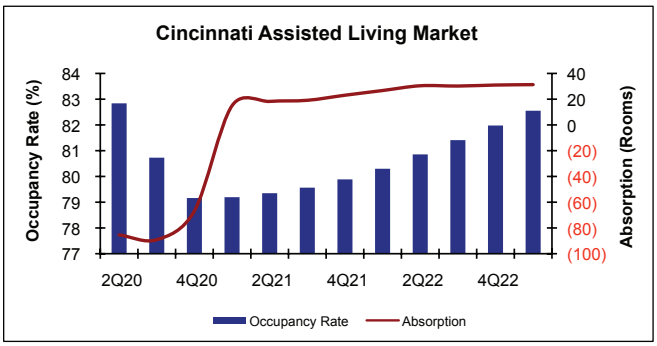
Note on occupancy greater than 100%: In order to calculate estimated occupancy rates, we adjust beginning inventory for new construction completions and compare that to net absorption (including sublease space). If we show 100%+ occupancy rates, it simply means that given the scheduled supply and growth in expected demand, sufficient demand pressure exists to more than absorb all available space. Of course, 100%+ occupancy cannot occur, as in the face of such demand pressure additional development will occur and rents will increase in order to dampen demand. Therefore, forecasts of 100%+ occupancy should be viewed as a strong excess demand indicator.

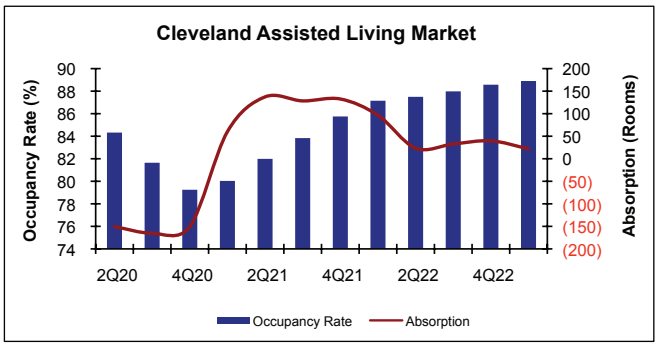


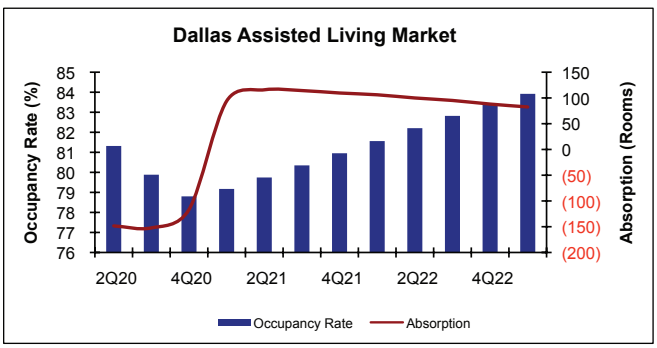


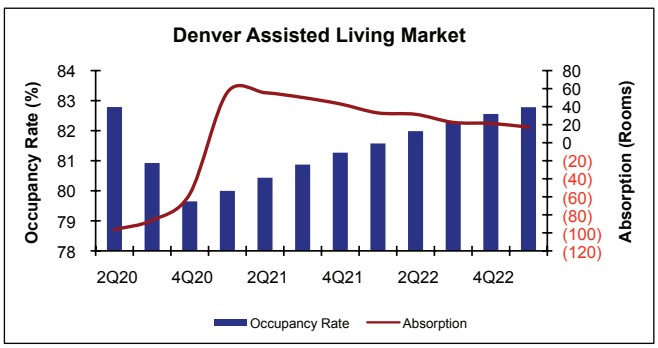




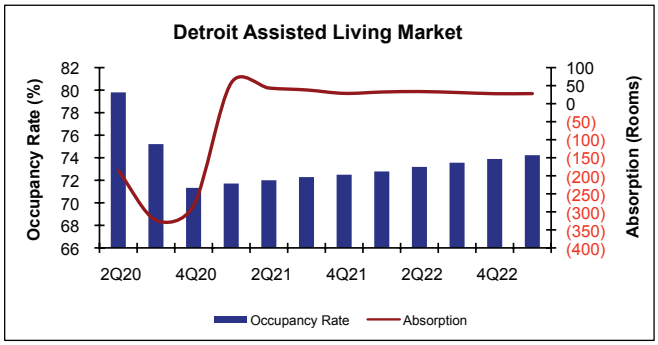


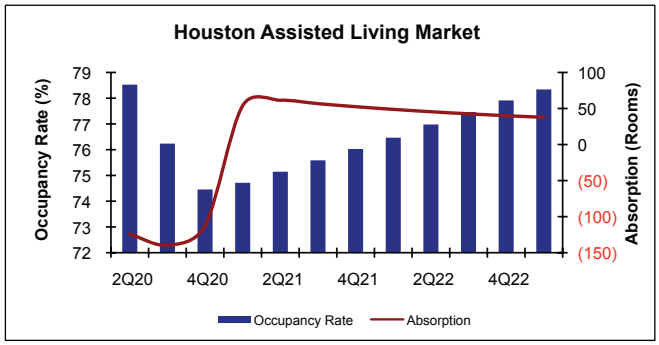


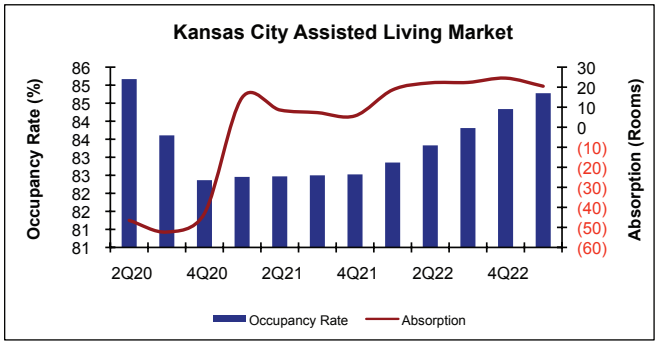


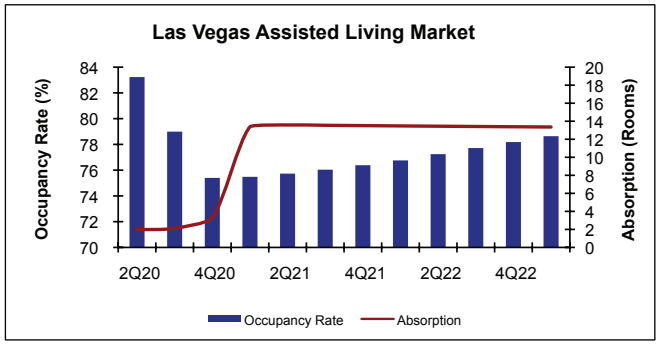


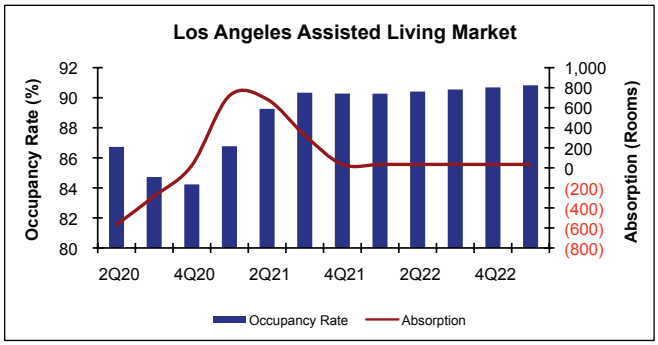
Assisted Living Market Occupancy and Absorption Projections (cont.)

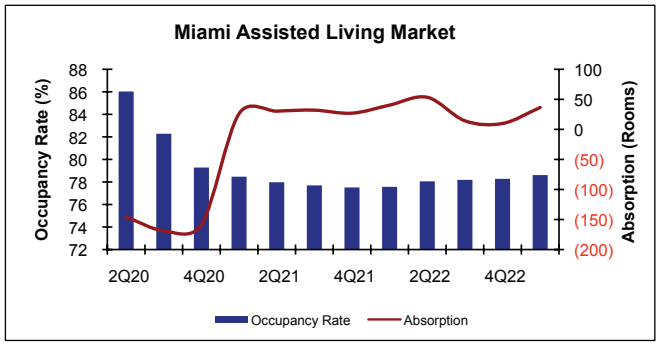


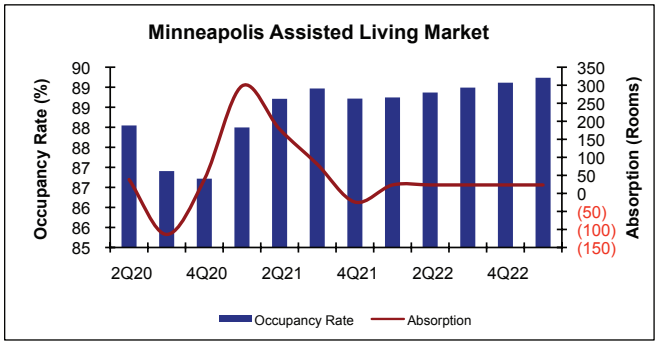


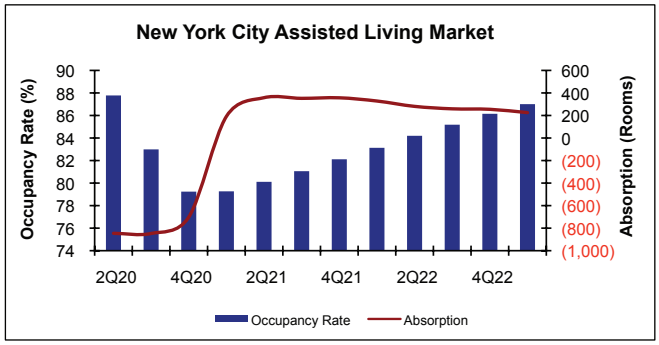












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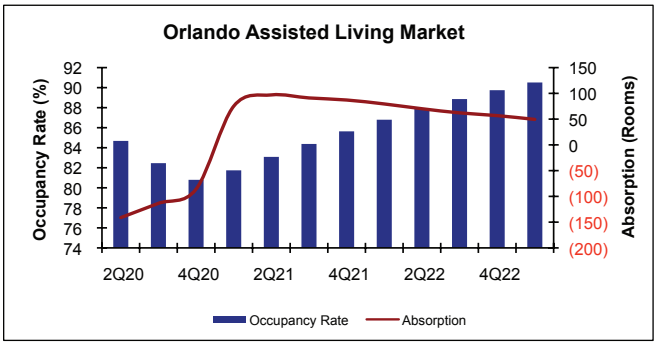

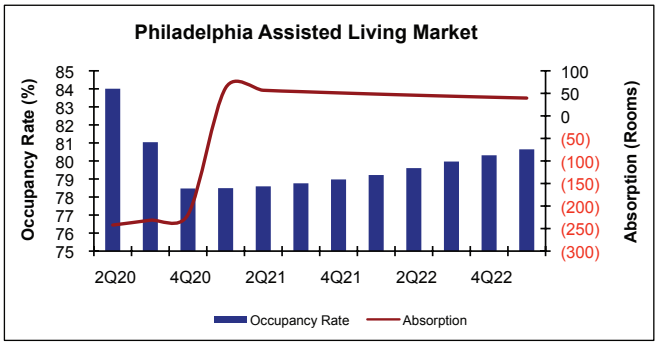

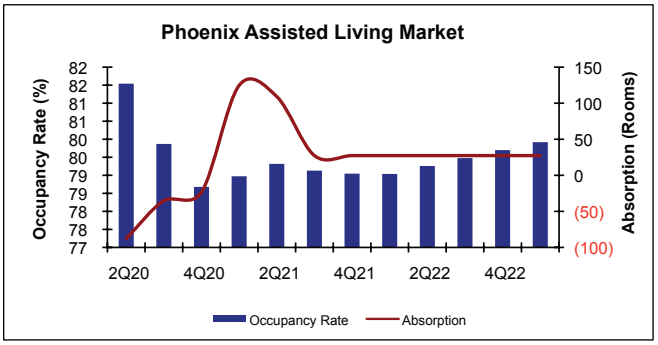

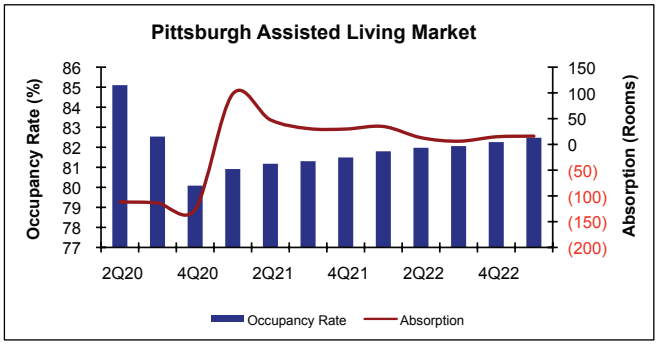

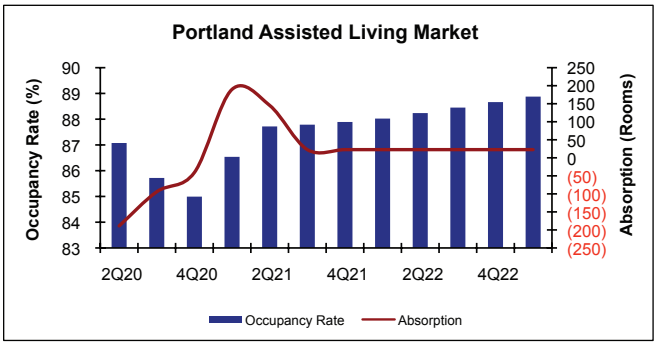

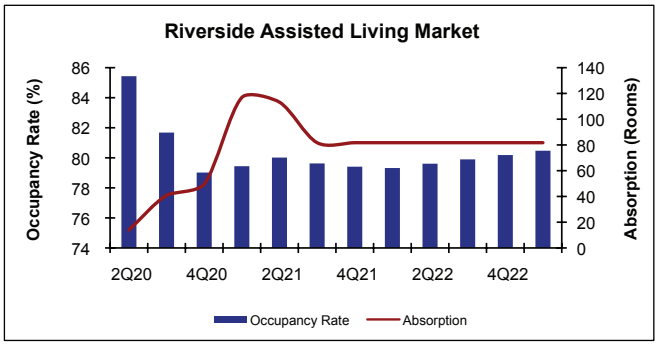

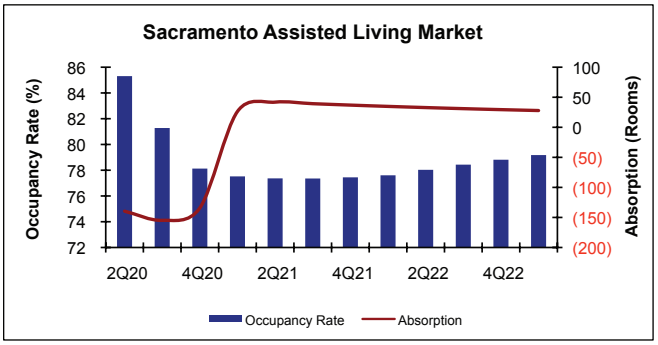

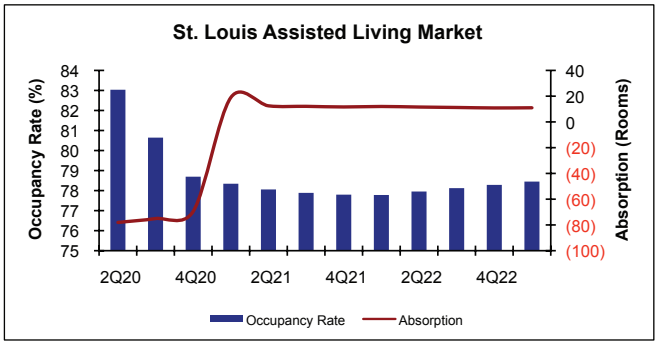

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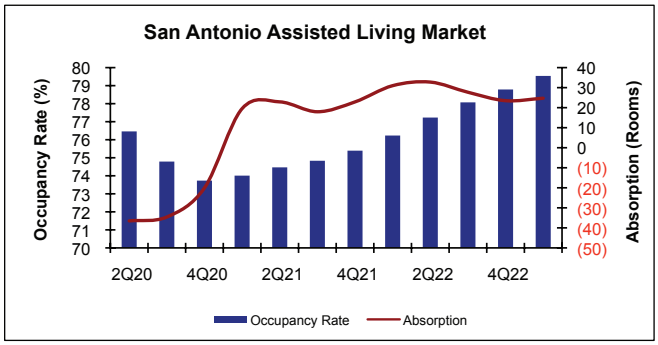

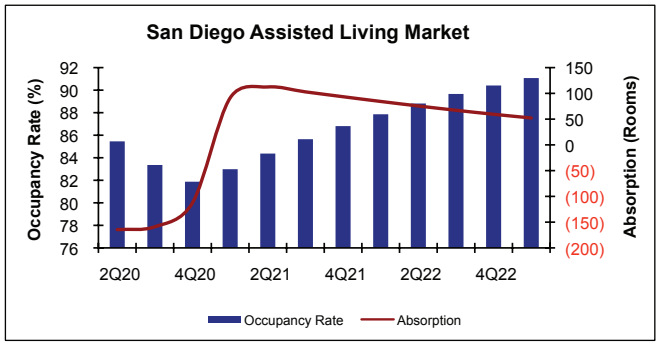

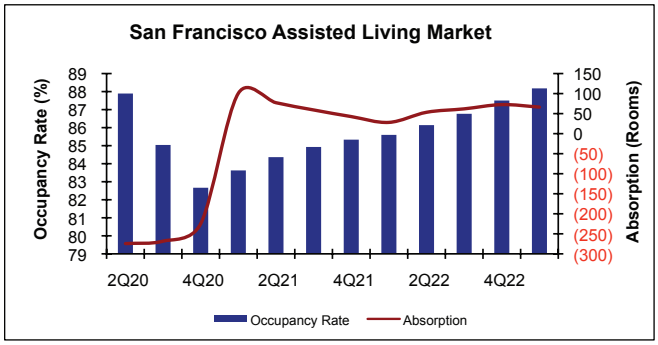

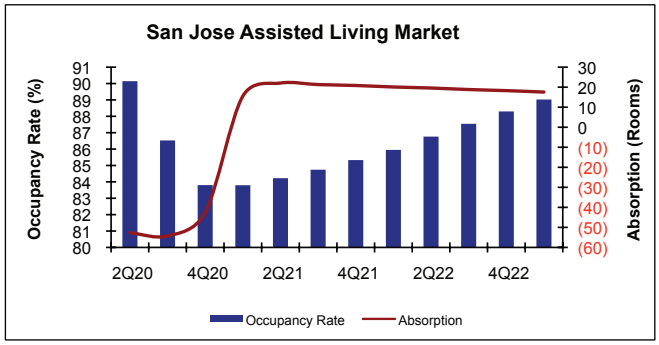

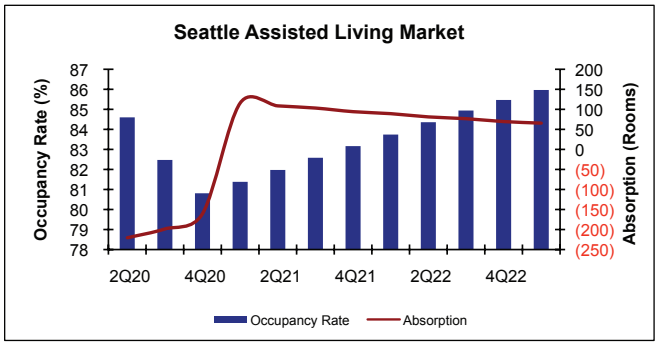

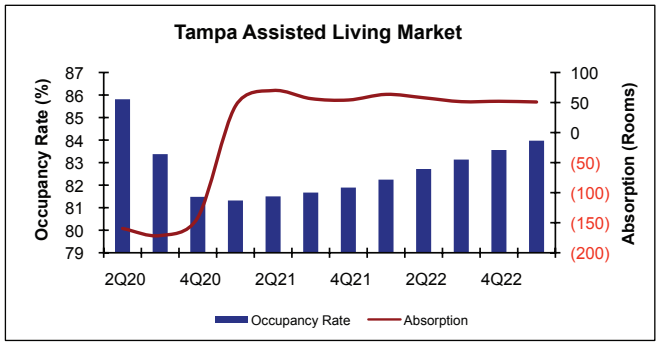

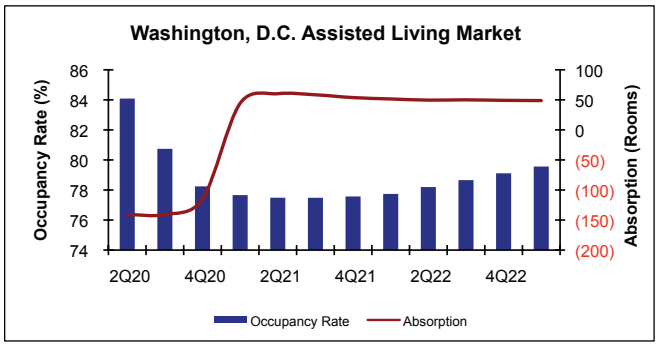

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Dr. Linneman is the author of the leading real estate finance textbook, *Real Estate Finance and Investments: Risks and Opportunities*, now in its fifth edition. His teaching and research focuses on real estate and investment strategies, mergers and acquisitions, and international markets. He has published over 100 articles during his career. He is widely recognized as one of the leading strategic thinkers in the real estate industry.

He also served as the Albert Sussman Professor of Real Estate, Finance, and Business and Public Policy at the Wharton School of Business at the University of Pennsylvania until his retirement in 2011. A member of Wharton's faculty since 1979, he served as the founding chairman of Wharton's Real Estate Department and the Director of Wharton's Zell-Lurie Real Estate Center for 13 years. He is the founding co-editor of *The Wharton Real Estate Review*.

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