

Cornell Hotel Indices: Second Quarter 2020:

Are All Crises the Same?

by Crocker H. Liu, Adam D. Nowak, and Robert M. White, Jr.

Although the Great Recession is useful in offering insights into how hotel performance might fare during a crisis, we show that the current crisis is much worse in terms of risk and the loss of relative wealth. Not surprisingly while the price of hotels in all regions continue to exhibit negative price momentum, hotels in the Middle Atlantic and New England regions were particularly hard hit. Hotels in gateway cities experienced less price decline relative to those in non-gateway cities. Both our moving average trendlines and standardized unexpected price performance metrics indicate a hemorrhaging in the price of both large and small hotels. The cost of debt financing spiked in this quarter with financing available only on refi deals in general. The relative risk premium that lenders require for hotels over and above other commercial real estate has also increased on these refi deals. Our tea leaves suggest that both large and small hotels should continue to decline in price. This is report number 35 of the index series.

ABOUT THE AUTHORS

Crocker H. Liu is a professor of real estate at the School of Hotel Administration at Cornell where he holds the Robert A. Beck Professor of Hospitality Financial Management. He previously taught at New York University's Stern School of Business (1988-2006) and at Arizona State University's W.P. Carey School of Business (2006-2009) where he held the McCord Chair. His research interests are focused on issues in real estate finance, particularly topics related to agency, corporate governance, organizational forms, market efficiency and valuation. Liu's research has been published in the *Review of Financial Studies*, *Journal of Financial Economics*, *Journal of Business*, *Journal of Financial and Quantitative Analysis*, *Journal of Law and Economics*, *Journal of Financial Markets*, *Journal of Corporate Finance*, *Review of Finance*, *Real Estate Economics*, *Journal of Urban Economics*, *Regional Science and Urban Economics*, *Journal of Real Estate Research*, and the *Journal of Real Estate Finance and Economics*. He is the former co-editor of *Real Estate Economics*, the leading real estate academic journal. He continues to be on the editorial board of *Real Estate Economics*. He is also an associate editor of *Financial Review*. He previously served on the editorial boards of the *Journal of Real Estate Finance and Economics*, the *Journal of Property Research*, and the *Journal of Real Estate Finance*. He is a past president of AREUEA (2019), the leading real estate academic organization. Professor Liu earned his BBA in real estate and finance from the University of Hawaii, an M.S. in real estate from Wisconsin under Dr. James A. Graaskamp, and a Ph.D. in finance and real estate from the University of Texas under Dr. Vijay S. Bawa.



Adam D. Nowak is an associate professor of economics at West Virginia University. He earned degrees in mathematics and economics at Indiana University–Bloomington in 2006 and a degree in near-east languages and cultures that same year. He received a Ph.D. from Arizona State University. He was the research analyst in charge of constructing residential and commercial real estate indices for the Center for Real Estate Theory and Practice at Arizona State University. Nowak's research has been published in the *Review of Financial Studies*, *American Economic Review: Insights*, *Economic Inquiry*, *Journal of Urban Economics*, *Regional Science and Urban Economics*, *Journal of Applied Econometrics*, *Real Estate Economics*, and the *Journal of Real Estate Research*.



Robert M. White, Jr., CRE, is the founder and president of Real Capital Analytics Inc., an international research firm that publishes the Capital Trends Monthly. Real Capital Analytics provides real time data concerning the capital markets for commercial real estate and the values of commercial properties. Mr. White is a noted authority on the real estate capital markets with credits in the *Wall Street Journal*, *Barron's*, *The Economist*, *Forbes*, *New York Times*, and *Financial Times*, among others. He is the 2014 recipient of the James D. Landauer/John R. White Award given by The Counselors of Real Estate. In addition, he was named one of National Real Estate Investor Magazine's "Ten to Watch" in 2005, Institutional Investor's "20 Rising Stars of Real Estate" in 2006, and Real Estate Forum's "10 CEOs to Watch" in 2007. Previously, Mr. White spent 14 years in the real estate investment banking and brokerage industry and has orchestrated billions of commercial sales, acquisitions and recapitalizations. He was formerly a managing director and principal of Granite Partners LLC and spent nine years with Eastdil Realty in New York and London. Mr. White is a Counselor of Real Estate, a Fellow of the Royal Institution of Chartered Surveyors and a Fellow of the Homer Hoyt Institute. He serves on the board of directors for the Pension Real Estate Association and the advisory board for the Real Estate Research Institution. He is also a member of numerous industry organizations and a supporter of academic studies. Mr. White is a graduate of the McIntire School of Commerce at the University of Virginia. White's research has been published in the *Journal of Real Estate Finance and Economics*.



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Cornell Hotel Indices: Second Quarter 2020

Are All Crises the Same?

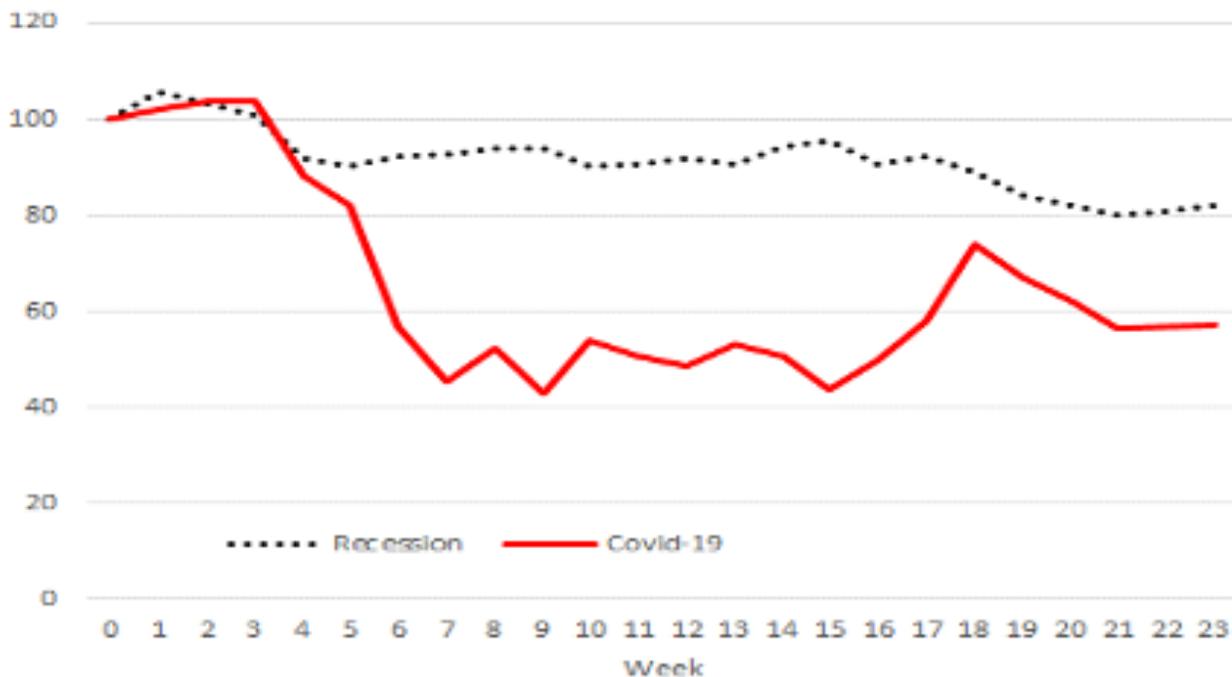
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Using the Great Recession as a Comparison Benchmark

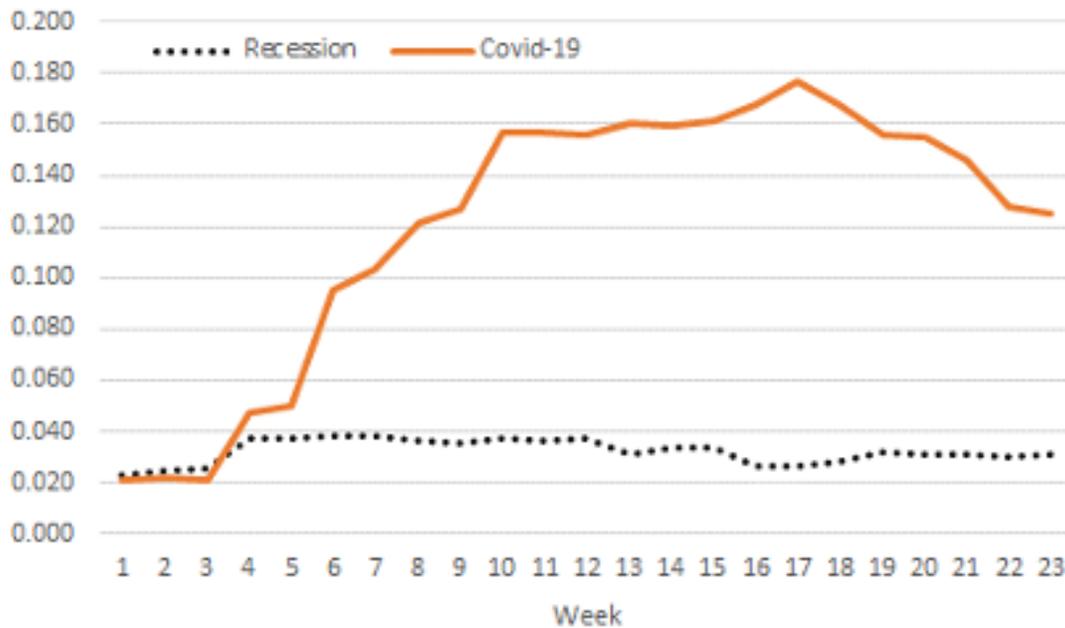
It isn't necessarily *déjà vu*. As the point of departure for this quarter's analysis, we first consider the extent to which the Great Recession is useful in offering insights into hotel performance during this pandemic. In the process, we look at several salient metrics. Exhibit 1 compares the relative wealth effect from investing \$100 in a portfolio of hotel REITs during the Great Recession versus holding the same hotel REIT portfolio during the pandemic.

EXHIBIT 1

Relative wealth from investing in hotel REITs



Volatility associated with a portfolio of hotel REITs



Sources: NAREIT, Cornell Center for Real Estate and Finance

While it isn't surprising that an investor suffers a loss in wealth over either time period, holding the portfolio during the current period results in a wealth decline of \$42.75 (\$100-\$57.25). In contrast, the investor experiences a

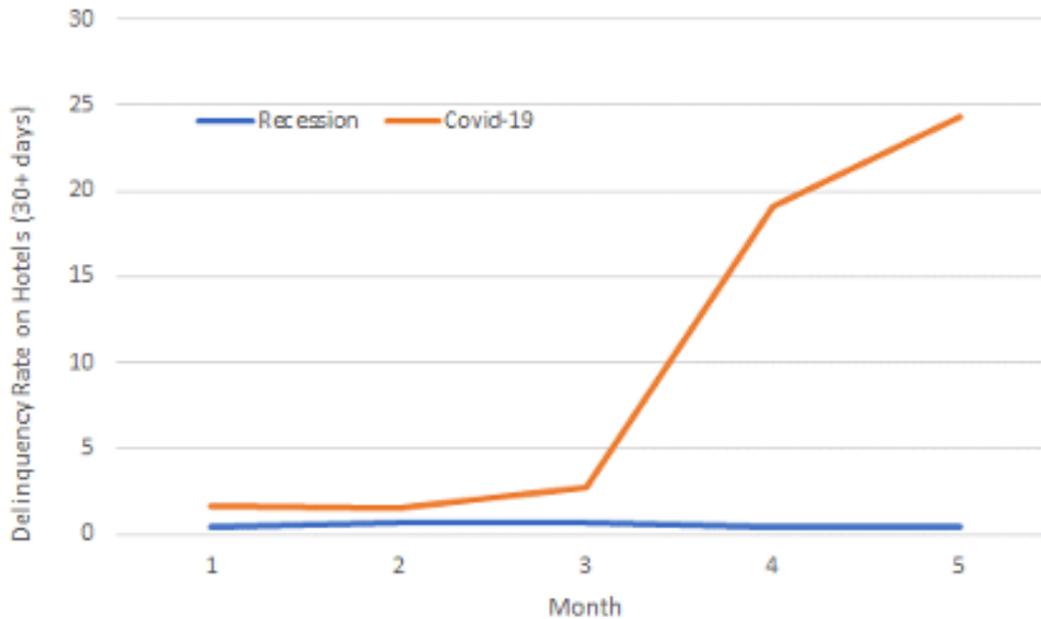
lower loss of \$18 (decline from \$100 to \$81.94) if this same portfolio is held for the first 23 weeks of the Great Recession. Exhibit 2 shows the corresponding volatility associated with holding this hotel REIT portfolio over the first 23

ABOUT THE CORNELL HOTEL INDICES

In our inaugural issue of the Cornell Hotel Index series, we introduced three new quarterly metrics to monitor real estate activity in the hotel market. These are a large hotel index (hotel transactions of \$10 million or more), a small hotel index (hotels under \$10 million), and a repeat sales index (RSI) that tracks actual hotel transactions. These indices are constructed using the CoStar and RCA commercial real estate databases. The large and small hotel indices are similar in nature and construction to the consumer price index (CPI), while the repeat sale hotel index is analogous to the retail concept of same store sales. Using a similar logic process for hotels, we compare the sales and resales of the same hotel over time for that index. All three measures provide a more accurate representation of the current hotel real estate market conditions than does reporting the average transaction prices, because the average-price index doesn't account for differences in the quality of the hotels, which also is averaged. A more detailed description of these indices is found in the first edition of this series, "Cornell Real Estate Market Indices," which is available at no charge from the Cornell Center for Real Estate and Finance. Starting with our 2018Q1 issue, we introduced the Gateway Cities Index as a new metric in our hotel analytics arsenal.¹ Starting in 2019, we included 30+ days delinquent data for hotel loans that have been securitized into CMBS from Trepp to offer further insights to our readers on hotel trends. We now have introduced our new Regional Indices to add further granularity to hotel performance. We also present updates and revisions to our hotel indices along with commentary and supporting evidence from the real estate market, together with an examination of the effects of the corona virus epidemic.

¹ Cities that we define as gateway cities include Boston, Chicago, Honolulu, Los Angeles, Miami, New York, San Francisco, and Washington DC. For a general discussion on what constitutes a gateway city, please see Corgel, J.B. (2012), What is a Gateway City?: A Hotel Market Perspective, Center for Real Estate and Finance Reports, Cornell University School of Hotel Administration (<https://scholarship.sha.cornell.edu/cgi/viewcontent.cgi?article=1007&context=crefpubs>). The study of Corgel, J. B., Liu, C., & White, R. M. (2015). Determinants of hotel property prices. *Journal of Real Estate Finance and Economics*, 51, 415-439 finds that a significant driver of hotel property prices is whether a hotel is located in a gateway city. The presumption is that hotels (and other real estate) in gateway cities exceed other cities as IRR generators in part due to a generally stronger economic climate as a result of higher barriers to entry, tighter supply, and/or relatively stronger performance in terms of revenue per available room than other top cities that are not gateways.

CMBS delinquency rate (30+ days) for lodging



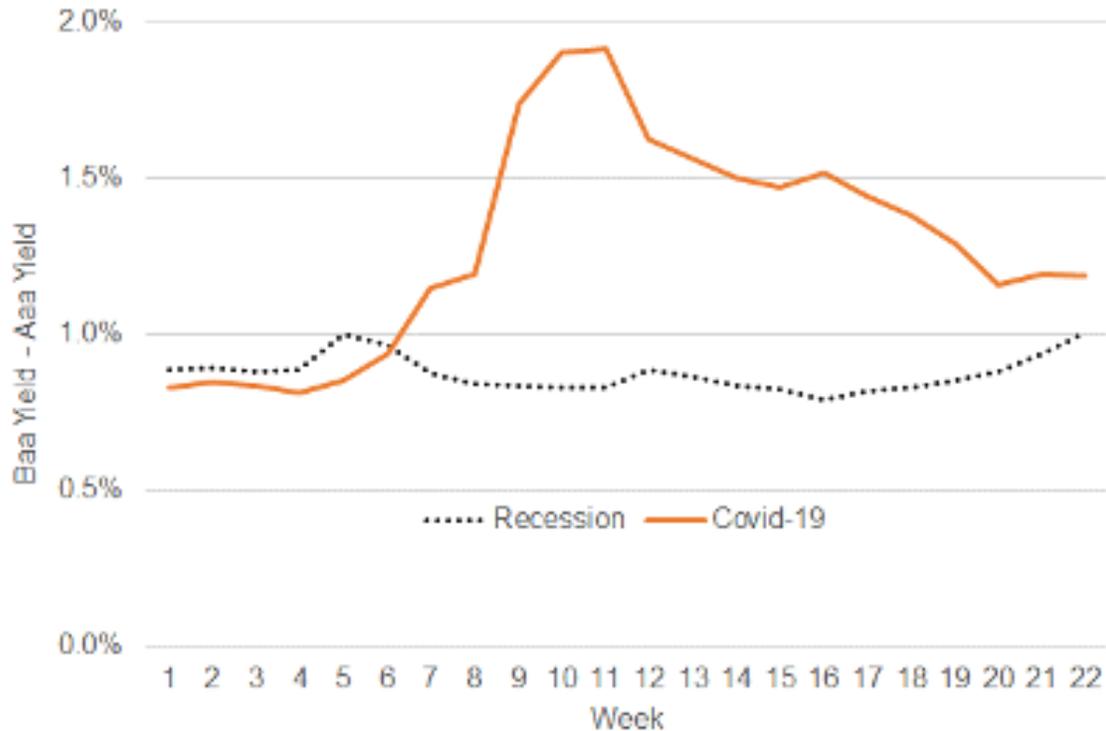
Sources: Trepp, Cornell Center for Real Estate and Finance

weeks of the two crises. This exhibit shows that the hotel REIT portfolio is more volatile during the current period (i.e., riskier relative to holding the same portfolio during the recession over the same 23-week window). On average, the weekly volatility is 3.2 percent for the recession versus 12.1 percent for the pandemic period.

The higher relative risk for hotel properties during the pandemic is also reflected in the CMBS delinquency

rate (30+ days) for lodging properties from Trepp, shown in Exhibit 3. For the first three months of the financial crisis and pandemic, the delinquency rates were relatively low. However, in the fourth month of the pandemic the delinquency rate for hotels rose from 2.7 percent to 19.1 percent, compared to a decline in hotel delinquencies from .66 percent to .47 percent during the recession. This delinquency rate rose further, from 19.1 percent to 24.3

Corporate credit spread: Baa–Aaa



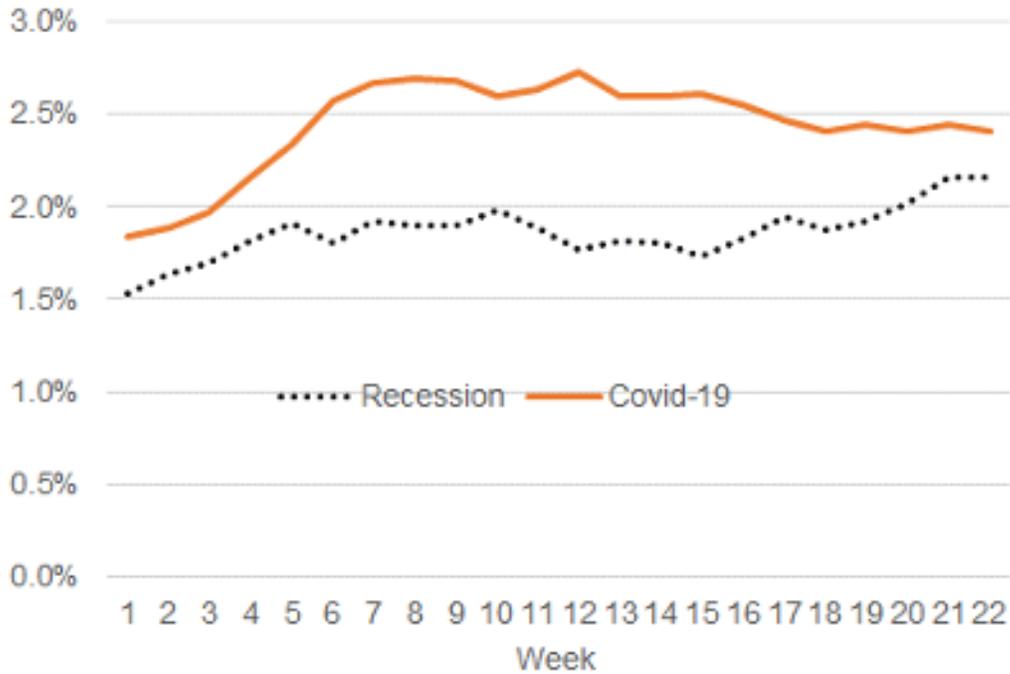
Sources: St Louis Fed, Cornell Center for Real Estate Finance

percent, in June 2020, while it remained constant during the fifth month of the recession. The Baa–Aaa corporate credit spread provides further evidence that the market perceives the pandemic as a relatively riskier event (Exhibit 4). In good economic times, the credit spread between Baa and Aaa firms is small. As the likelihood of poorer economic conditions increases, however, the probability of default rises more for Baa firms compared to Aaa firms. This in turn results in a wider corporate credit spread. For the first six weeks of the pandemic, the corporate credit spread was similar to that for the recession over the same time window. Starting in the seventh week, the corporate

credit spread for the COVID-19 crisis (1.15%) was greater than during the recession (.88%). By the eleventh week of the pandemic, the credit spread stood at 1.91 percent, compared to a .83 percent during the recession. Since then, the credit spread has narrowed. Currently, the corporate credit spread is 1.2 percent (compared to 1.01 percent during the recession). With respect to the behavior of the default premium in the real estate market, since new originations on commercial mortgages have ceased except for refinancing, we look at loan originations in the single-family housing market. Subtracting the interest rate on fixed-rate 30-year mortgages from the constant maturity yield on the 10-year

EXHIBIT 5

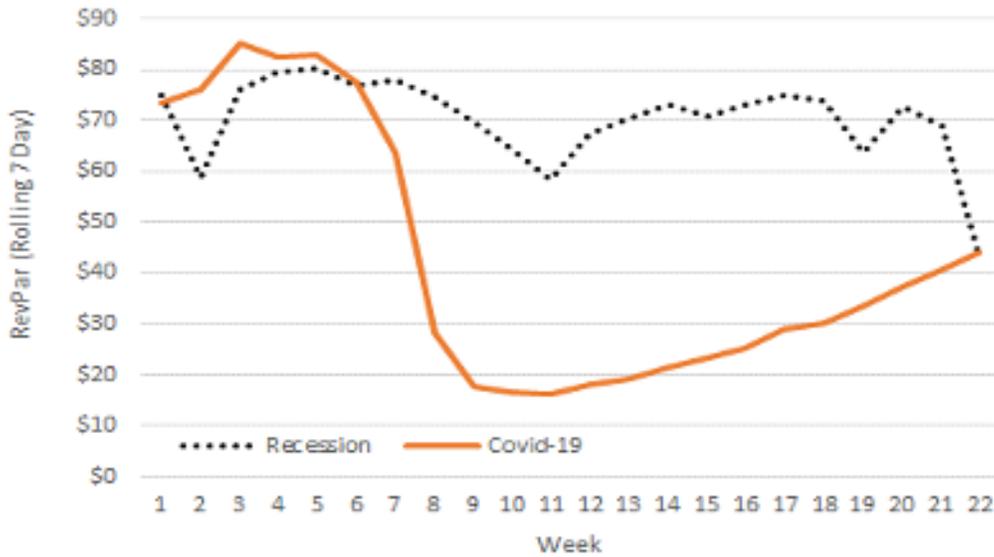
Default premium on single family home loans



Sources: St Louis Fed, Cornell Center for Real Estate Finance

EXHIBIT 6

Comparison of RevPAR for the U.S.: financial crisis versus pandemic



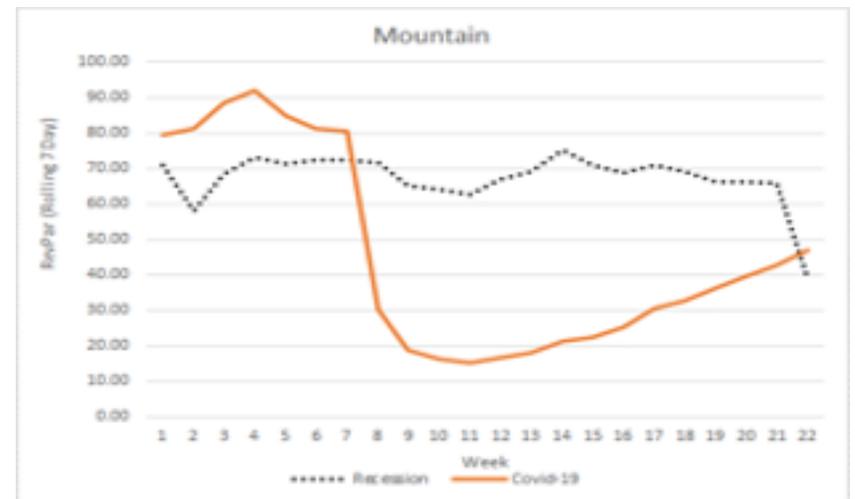
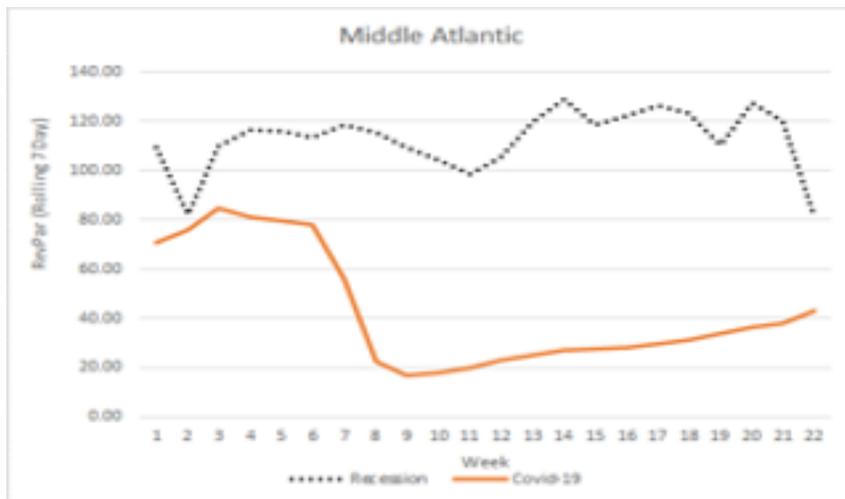
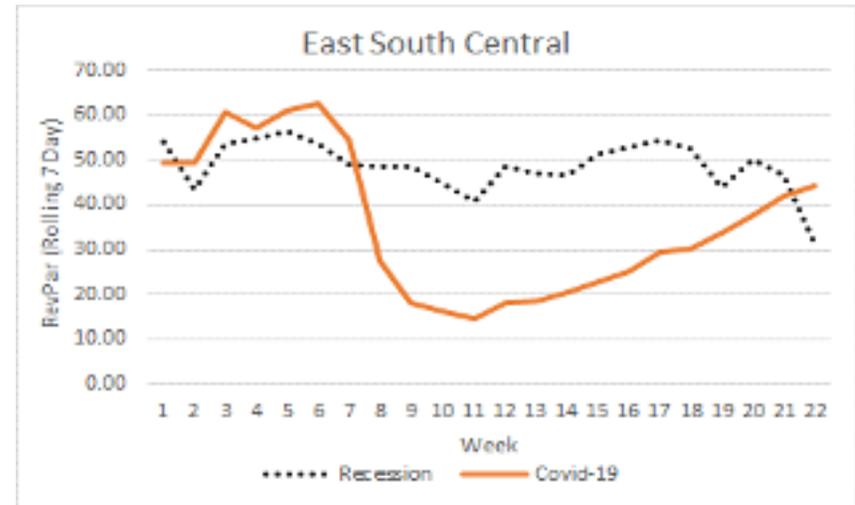
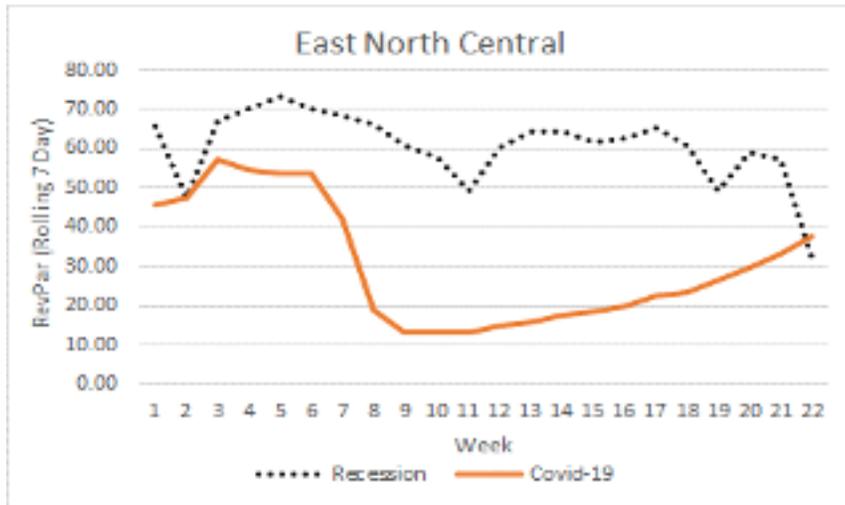
Sources: STR, Cornell Center for Real Estate Finance

Treasury bond (default premium), Exhibit 5 reveals that the default premium during the pandemic is 50 basis points higher on average than the default premium over the same time period during the financial crisis.

In terms of the relative performance of hotels over these two crisis periods, Exhibit 6 shows that hotel performance was initially similar until about the sixth week, using RevPAR data from STR. Subsequent to this, hotels on

EXHIBIT 7

Comparison of RevPAR for the various regions: financial crisis versus the pandemic

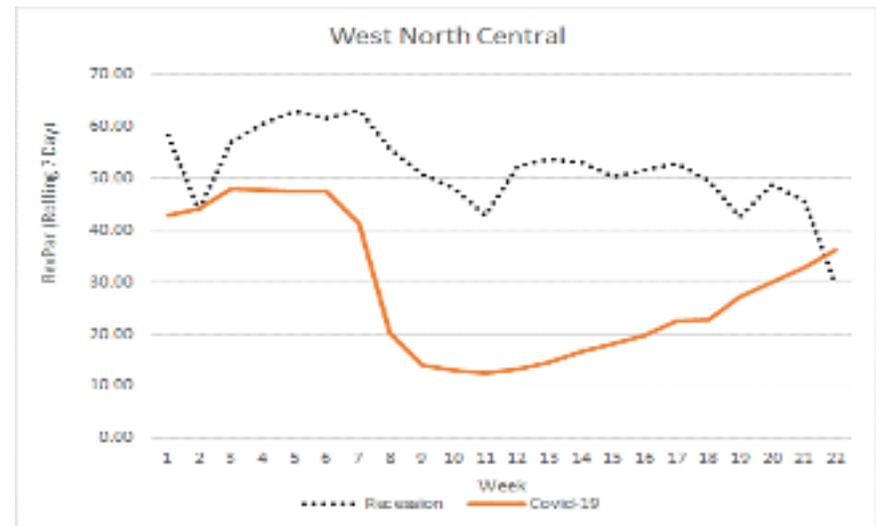
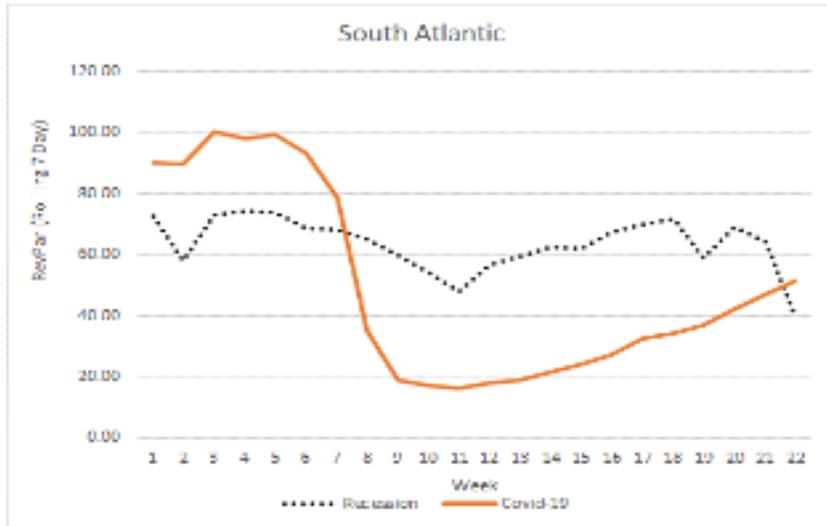
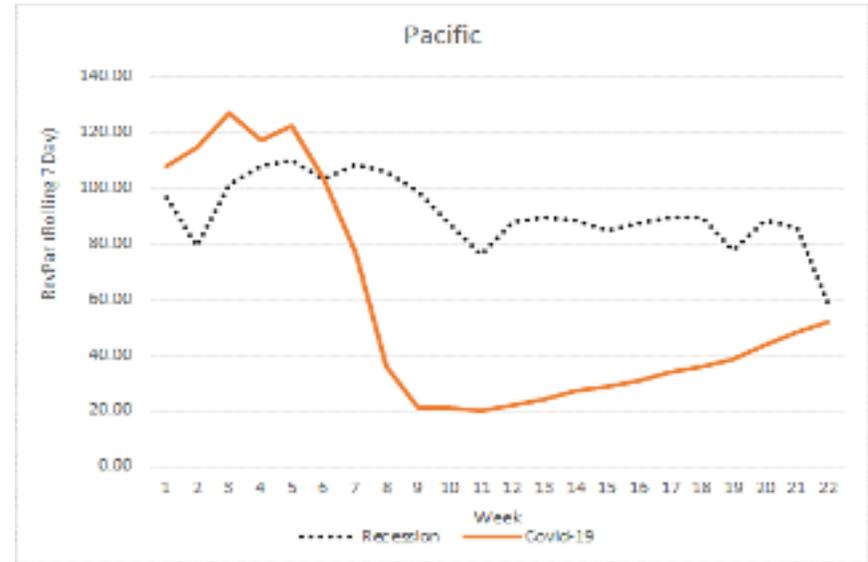
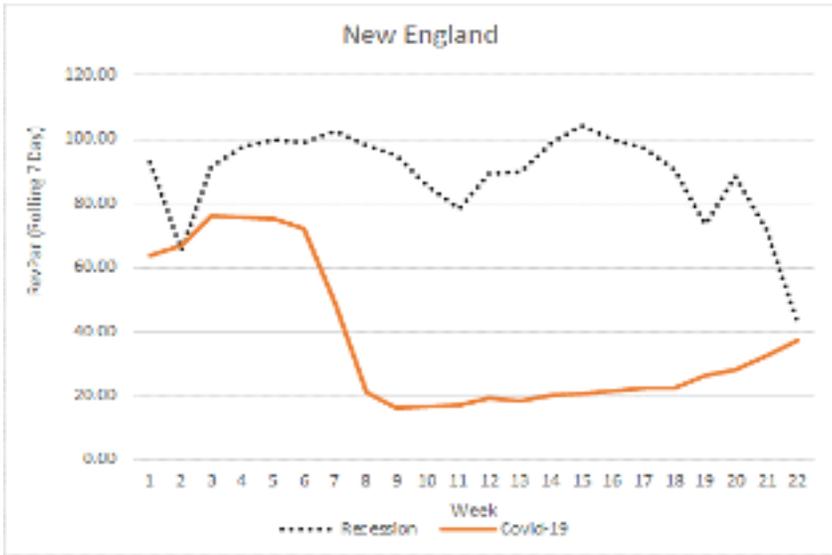


Sources: STR, Cornell Center for Real Estate Finance

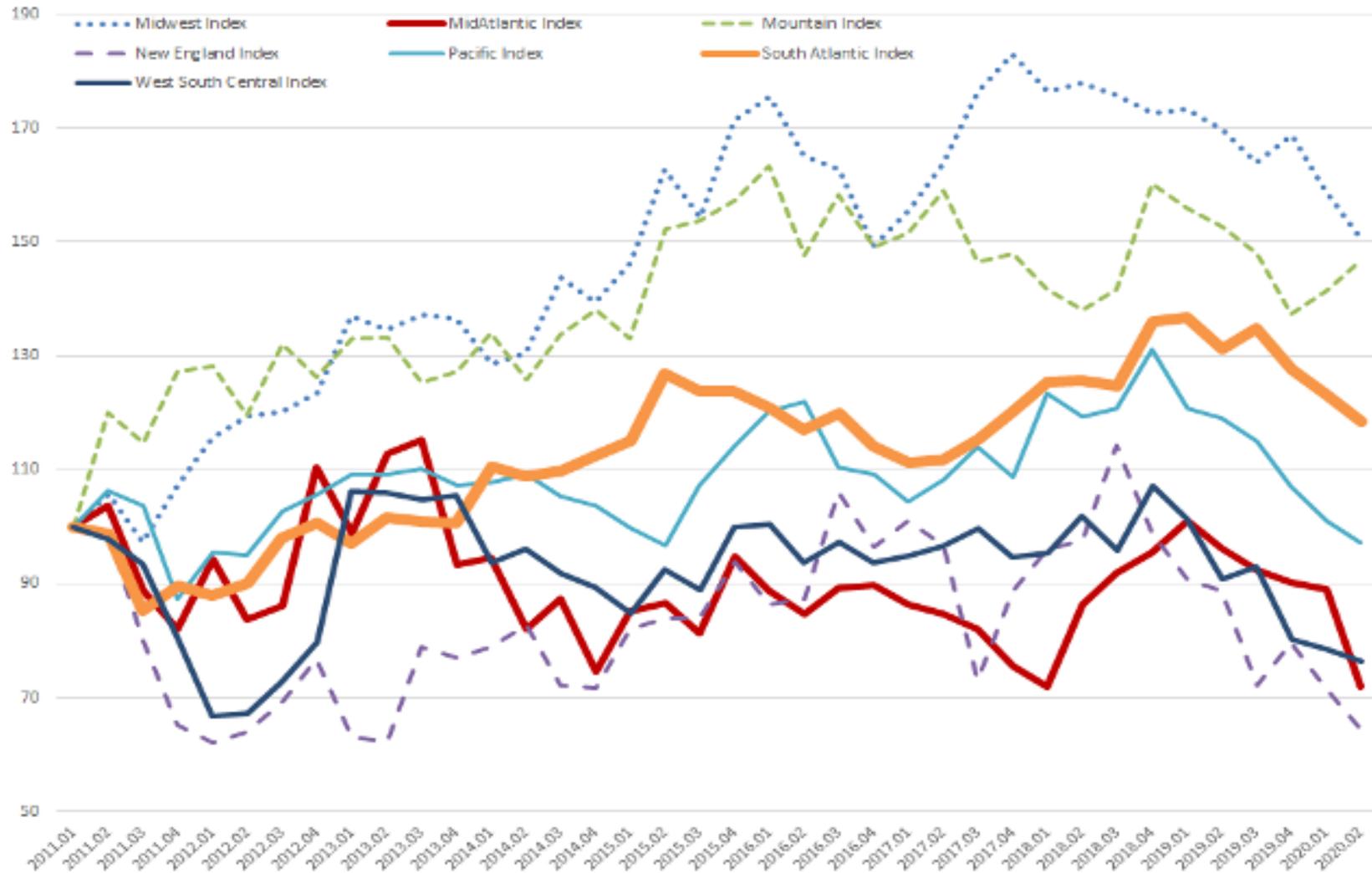
average took a deep hit during the pandemic, although RevPAR has continued to rise since week 11 (April 11, 2020). As of June 27, 2020 (22nd week), RevPAR is

approximately similar during both periods of crisis. Hotel RevPAR performance is also similar for various census regions, as displayed in Exhibits 7a and 7b.

Comparison of RevPAR for the various regions: financial crisis versus the pandemic (concluded)



Time series hotel performance for seven regions (post-recession)



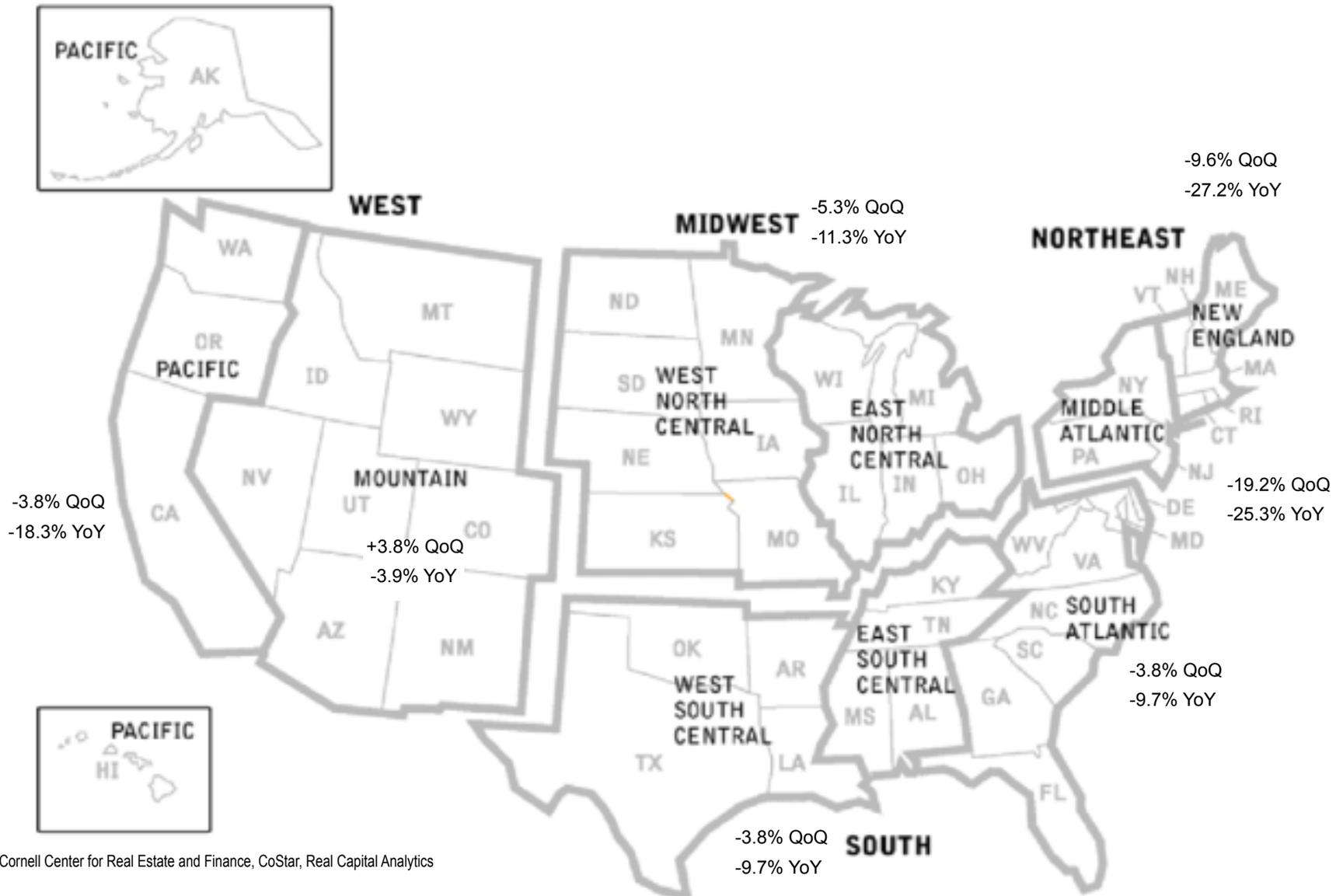
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Analysis of Indices through Q2, 2020

Hotels in all regions continue to exhibit negative price momentum. For the most recent quarter (2020Q2), Exhibits 8a and 8b show that hotels in the Middle

Atlantic region (i.e., New Jersey, New York, and Pennsylvania) had the worst price performance, with the New England region (hotels in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) following close behind. Mid-Atlantic hotels declined 19.2 percent quarter over quarter, with a

Cross-section hotel performance for seven regions (post-recession)

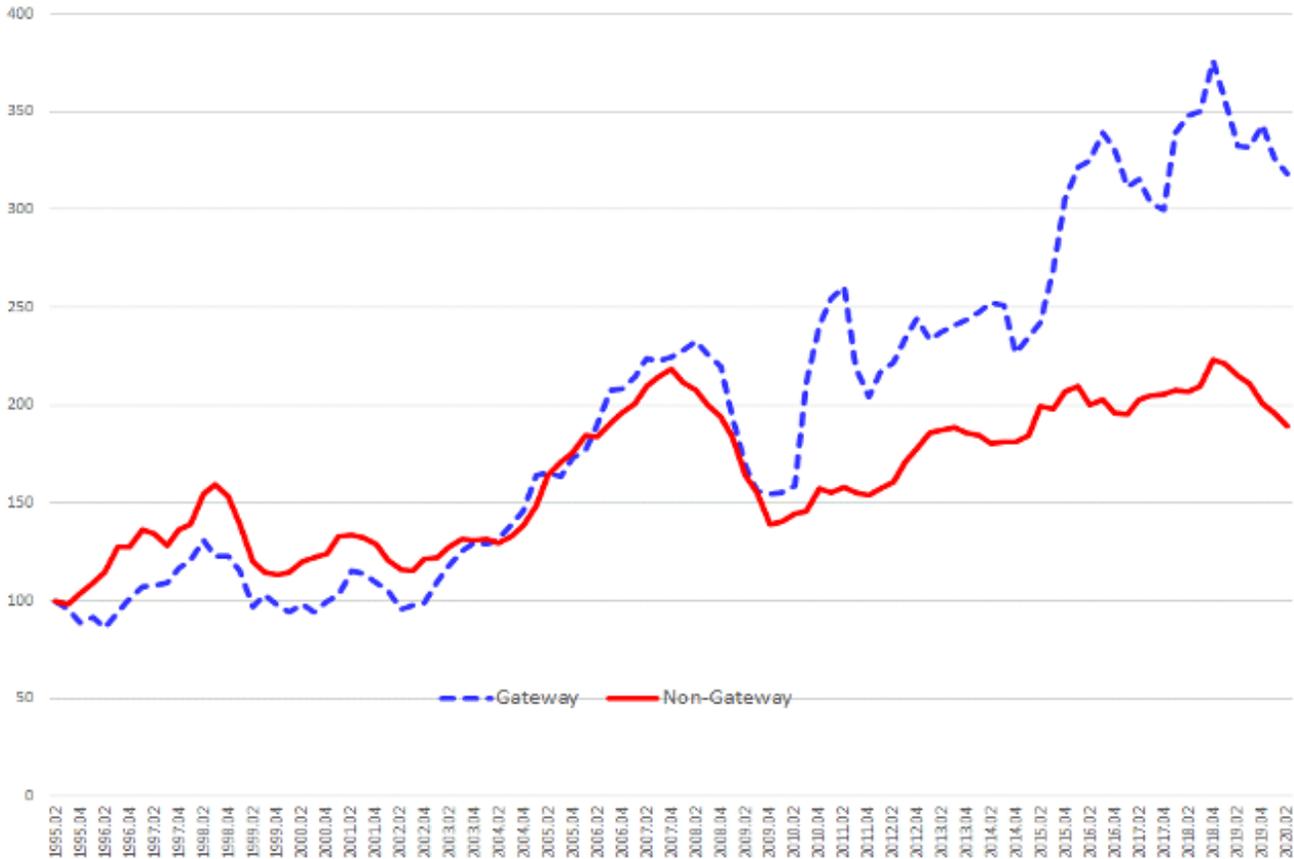


Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

25.3 percent fall year over year, while the price of New England hotels decreased 9.6 percent quarter over quarter and 27.2 percent year over year. Although hotels in the Mountain states were the only region that experienced a positive price

performance (3.8%) for the quarter, all hotels experienced price declines year over year, continuing the downward trend from the previous period.

Hotel performance for gateway cities versus non-gateway cities



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

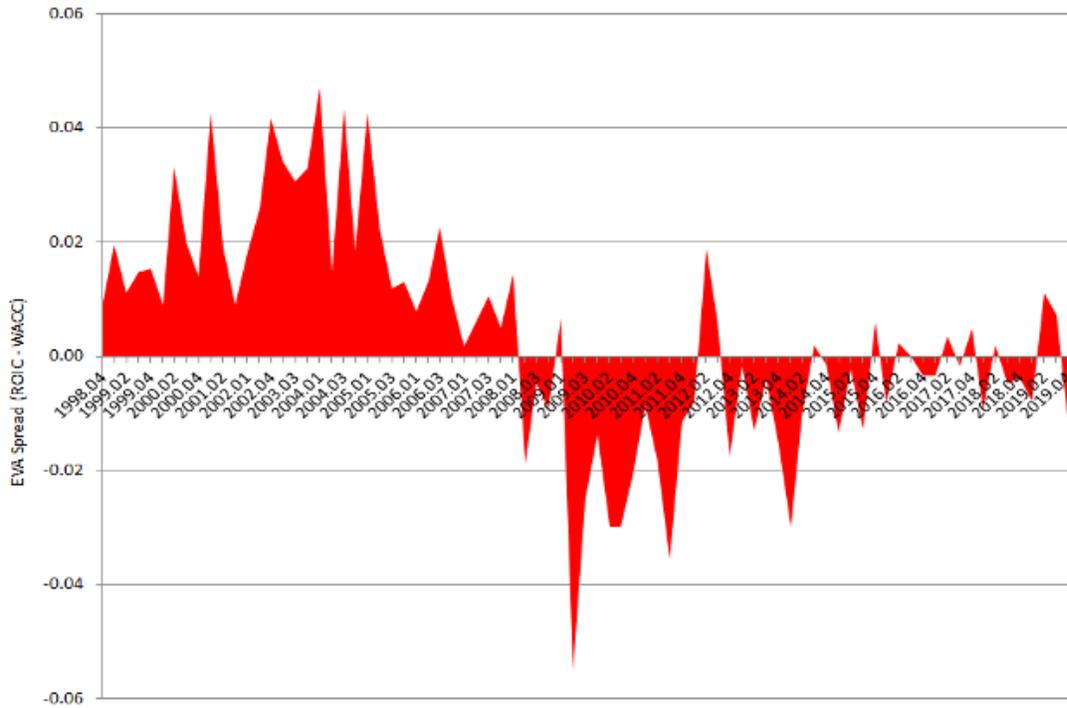
Performance of hotels in gateway cities declined less than those in non-gateway cities. Exhibit 9 shows that the price performance of hotels in gateway cities fell 2.6 percent, compared to the 3.4-percent decline of hotels in non-gateway cities quarter over quarter. Year over year, the price of hotels in gateway cities fell 4 percent, and it dropped 12 percent in non-gateway cities, continuing the negative momentum in the prior year-over-year period (-8.3% for gateways, and -11.4% for non-gateway cities, in 2020Q1).

Hotel investment based on operating performance was positive for the first quarter of 2020. Our economic value added (EVA) indicator in Exhibit 10 turned positive at .9 percent in the first quarter of 2020, the latest quarter for which data for the calculation of EVA are available. This

is primarily the result of a rise in the return on invested capital (ROIC, aka cap rate) from 5.11 percent in the previous quarter (2019Q4) to 8.14 percent in 2020Q1. This increase was relatively greater than the rise in the weighted average cost of capital (WACC), which rose 100 basis points, from 6.2 percent to 7.2 percent. Taken from a slightly different perspective (no equity financing considered), the cost of debt financing as measured by the mortgage constant rose from 5 percent to 6.8 percent over the same period. Thus, Exhibit 11 shows that leverage is positive in 2020Q1, the latest quarter for which ACLI data are available. This means that the return that an investor received from operations exceeded his or her borrowing cost (cost of debt financing).

EXHIBIT 10

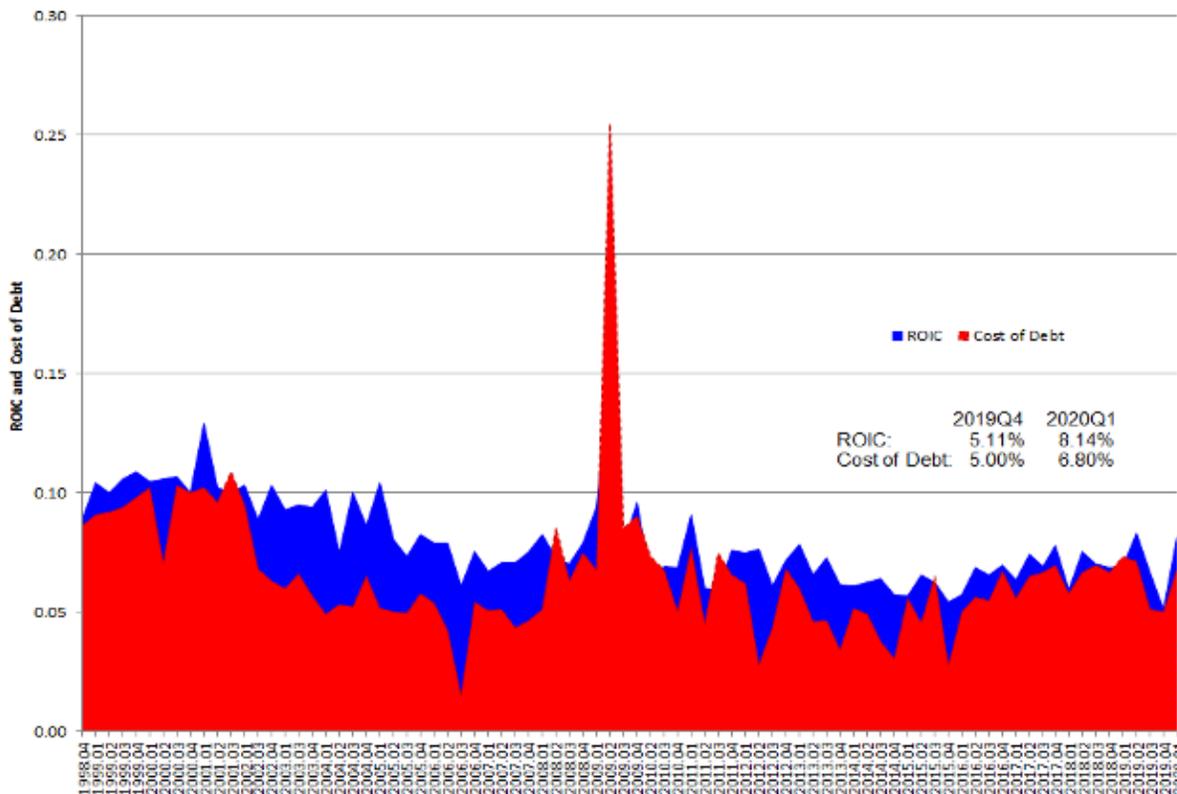
Economic value added (EVA) for hotels



Sources: ACLI, Cornell Center for Real Estate and Finance, NAREIT, Federal Reserve

EXHIBIT 11

Return on investment capital versus cost of debt financing



Sources: ACLI, Cornell Center for Real Estate and Finance

Transaction volume (observed) and median sale price

Year	Qtr	Full Sample		Big			Small			Gateway			Non-Gateway						
		Median Sale Price	Obs	Median Sale Price (High Priced Hotels)	Obs	% Total Sales	Median Sale Price (Low Priced Hotels)	Obs	% Total Sales	Median Sale Price (Gateway Hotels)	Obs	% Total Sales	Median Sale Price (Non-Gateway Hotels)	Obs	% Total Sales				
1995	1	\$2,357,500	20				1995.01	\$2,357,500	20	100.00%	1995.01	\$3,400,000	7	35.00%	1995.01	\$2,100,000	13	65.00%	
1995	2	\$3,150,000	29	1995.02	\$15,712,500	6	20.88%	1995.02	\$2,670,000	23	79.31%	1995.02	\$3,800,000	12	41.37%	1995.02	\$2,905,150	17	58.62%
1995	3	\$2,562,500	44	1995.03	\$12,400,000	4	9.09%	1995.03	\$2,378,000	40	90.90%	1995.03	\$3,500,000	20	45.45%	1995.03	\$2,000,000	24	54.54%
1995	4	\$3,400,000	41	1995.04	\$27,750,000	10	24.39%	1995.04	\$2,625,000	31	75.60%	1995.04	\$5,075,000	14	34.14%	1995.04	\$3,100,000	27	65.85%
1996	1	\$2,500,000	39	1996.01	\$14,475,000	8	20.51%	1996.01	\$1,700,000	31	79.48%	1996.01	\$2,500,000	13	33.33%	1996.01	\$2,687,500	26	68.66%
1996	2	\$2,925,000	43	1996.02	\$29,150,000	12	27.90%	1996.02	\$2,500,000	31	72.09%	1996.02	\$3,200,000	15	34.88%	1996.02	\$2,730,000	28	65.11%
1996	3	\$6,500,000	57	1996.03	\$17,740,000	20	35.08%	1996.03	\$3,000,000	37	64.91%	1996.03	\$5,500,000	25	43.85%	1996.03	\$6,890,500	32	56.14%
1996	4	\$2,735,000	58	1996.04	\$19,000,000	17	29.31%	1996.04	\$2,200,000	41	70.68%	1996.04	\$4,650,000	27	46.55%	1996.04	\$2,400,000	31	53.44%
1997	1	\$5,053,250	74	1997.01	\$16,635,500	23	31.08%	1997.01	\$3,500,000	51	68.91%	1997.01	\$8,300,000	29	39.18%	1997.01	\$4,075,000	45	60.81%
1997	2	\$2,862,500	72	1997.02	\$17,750,000	17	23.61%	1997.02	\$2,150,000	55	76.38%	1997.02	\$2,445,000	24	33.33%	1997.02	\$3,047,350	48	66.66%
1997	3	\$3,437,500	90	1997.03	\$19,000,000	21	23.33%	1997.03	\$2,400,000	69	76.66%	1997.03	\$5,140,000	38	42.22%	1997.03	\$2,550,000	52	57.77%
1997	4	\$4,330,950	78	1997.04	\$17,000,000	27	34.61%	1997.04	\$2,300,000	51	65.38%	1997.04	\$10,435,445	27	34.61%	1997.04	\$3,600,000	51	65.38%
1998	1	\$4,698,800	92	1998.01	\$20,000,000	31	33.69%	1998.01	\$3,100,000	61	66.30%	1998.01	\$6,353,000	33	35.86%	1998.01	\$4,600,000	59	64.13%
1998	2	\$3,630,000	96	1998.02	\$23,765,000	21	21.87%	1998.02	\$3,000,000	75	78.12%	1998.02	\$3,998,240	28	29.16%	1998.02	\$3,575,000	68	70.83%
1998	3	\$2,961,059	92	1998.03	\$16,740,000	12	13.04%	1998.03	\$2,690,550	80	86.95%	1998.03	\$2,255,000	30	32.60%	1998.03	\$3,365,000	62	67.39%
1998	4	\$2,550,000	84	1998.04	\$35,000,000	15	17.85%	1998.04	\$2,375,000	69	82.14%	1998.04	\$4,225,000	30	35.71%	1998.04	\$2,500,000	54	64.28%
1999	1	\$2,425,000	88	1999.01	\$24,638,095	10	11.36%	1999.01	\$2,125,000	78	88.63%	1999.01	\$3,500,000	32	36.36%	1999.01	\$2,300,000	56	63.63%
1999	2	\$2,100,000	95	1999.02	\$67,000,000	5	5.26%	1999.02	\$1,950,000	90	94.73%	1999.02	\$2,067,500	28	29.47%	1999.02	\$2,100,000	67	70.52%
1999	3	\$2,500,000	99	1999.03	\$20,711,100	10	10.10%	1999.03	\$2,130,000	89	89.89%	1999.03	\$1,800,000	19	19.19%	1999.03	\$2,522,500	80	80.80%
1999	4	\$2,440,000	87	1999.04	\$18,190,000	14	16.09%	1999.04	\$2,090,000	73	83.90%	1999.04	\$2,210,000	23	26.43%	1999.04	\$2,575,000	64	73.56%
2000	1	\$2,400,000	110	2000.01	\$23,253,895	10	9.09%	2000.01	\$2,300,000	100	90.90%	2000.01	\$2,325,000	44	40.00%	2000.01	\$2,428,500	66	60.00%
2000	2	\$2,450,000	88	2000.02	\$14,500,000	9	10.22%	2000.02	\$2,275,000	79	89.77%	2000.02	\$2,325,000	24	27.27%	2000.02	\$2,450,000	64	72.72%
2000	3	\$2,600,000	95	2000.03	\$20,346,875	16	16.84%	2000.03	\$2,250,000	79	83.15%	2000.03	\$2,925,000	24	25.26%	2000.03	\$2,525,000	71	74.73%
2000	4	\$2,475,000	101	2000.04	\$18,050,000	14	13.86%	2000.04	\$2,300,000	87	86.13%	2000.04	\$4,500,000	26	25.74%	2000.04	\$2,350,000	75	74.25%
2001	1	\$2,970,650	104	2001.01	\$28,437,500	18	17.30%	2001.01	\$2,422,500	86	82.69%	2001.01	\$2,650,000	29	27.88%	2001.01	\$3,000,000	75	72.11%
2001	2	\$2,800,000	110	2001.02	\$23,795,000	12	10.90%	2001.02	\$2,687,150	98	89.09%	2001.02	\$5,825,000	25	22.72%	2001.02	\$2,684,300	85	77.27%
2001	3	\$2,700,000	87	2001.03	\$16,000,000	6	6.89%	2001.03	\$2,500,000	81	93.10%	2001.03	\$3,150,000	21	24.13%	2001.03	\$2,600,000	66	75.86%
2001	4	\$2,400,000	73	2001.04	\$20,500,000	5	6.84%	2001.04	\$2,300,000	68	93.15%	2001.04	\$2,800,000	17	23.28%	2001.04	\$2,300,000	56	76.71%
2002	1	\$2,125,000	70	2002.01	\$11,518,052	5	7.14%	2002.01	\$2,000,000	65	92.85%	2002.01	\$1,700,000	17	24.28%	2002.01	\$2,200,000	53	75.71%
2002	2	\$2,400,000	106	2002.02	\$18,125,000	10	9.43%	2002.02	\$2,287,500	96	90.56%	2002.02	\$3,125,000	33	31.13%	2002.02	\$2,300,000	73	68.86%
2002	3	\$2,355,400	81	2002.03	\$12,750,000	5	6.17%	2002.03	\$2,237,500	76	93.82%	2002.03	\$2,197,500	24	29.62%	2002.03	\$2,470,000	57	70.37%
2002	4	\$2,907,500	100	2002.04	\$23,500,000	16	16.00%	2002.04	\$2,575,000	84	84.00%	2002.04	\$2,907,500	34	34.00%	2002.04	\$2,862,500	66	66.00%
2003	1	\$2,530,000	94	2003.01	\$13,000,000	9	9.57%	2003.01	\$2,425,000	85	90.42%	2003.01	\$3,850,000	21	22.34%	2003.01	\$2,425,000	73	77.65%
2003	2	\$2,750,000	110	2003.02	\$18,500,000	10	9.09%	2003.02	\$2,509,500	100	90.90%	2003.02	\$3,160,000	31	28.18%	2003.02	\$2,600,000	79	71.81%
2003	3	\$3,333,000	141	2003.03	\$14,359,286	28	19.85%	2003.03	\$2,600,000	113	80.14%	2003.03	\$3,680,000	45	31.91%	2003.03	\$3,032,500	96	68.08%
2003	4	\$2,600,000	149	2003.04	\$16,375,000	18	12.08%	2003.04	\$2,425,000	131	87.91%	2003.04	\$2,950,000	35	23.48%	2003.04	\$2,500,000	114	76.51%
2004	1	\$2,925,000	166	2004.01	\$22,875,250	24	14.45%	2004.01	\$2,536,756	142	85.54%	2004.01	\$3,450,000	41	24.68%	2004.01	\$2,894,000	125	75.30%
2004	2	\$2,700,000	195	2004.02	\$16,280,000	28	14.35%	2004.02	\$2,450,000	167	85.64%	2004.02	\$4,500,000	39	20.00%	2004.02	\$2,540,000	156	80.00%
2004	3	\$3,491,122	216	2004.03	\$19,350,000	45	20.83%	2004.03	\$2,610,000	171	79.16%	2004.03	\$4,600,000	51	23.61%	2004.03	\$3,306,500	165	76.38%
2004	4	\$4,000,000	177	2004.04	\$20,475,000	47	26.55%	2004.04	\$3,085,500	130	73.44%	2004.04	\$8,850,000	36	20.33%	2004.04	\$3,600,000	141	79.66%

Transaction volume (observed) and median sale price (continued)

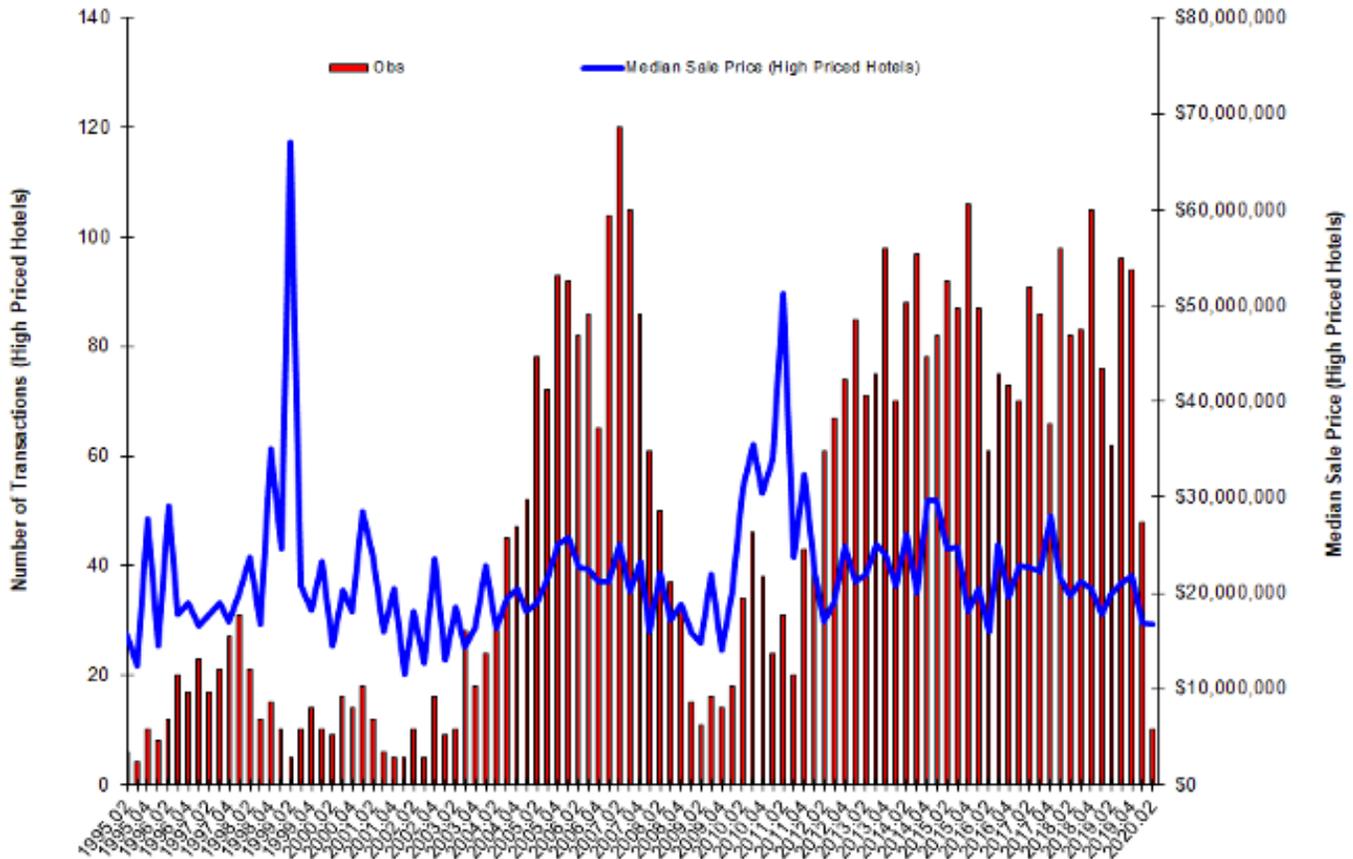
Year	Qtr	Full Sample		Big			Small			Gateway			Non-Gateway						
		Median Sale Price	Obs	Median Sale Price (High Priced Hotels)	Obs	% Total Sales	Median Sale Price (Low Priced Hotels)	Obs	% Total Sales	Median Sale Price (Gateway Hotels)	Obs	% Total Sales	Median Sale Price (Non-Gateway Hotels)	Obs	% Total Sales				
2005	1	\$4,330,000	231	2005.01	\$18,100,000	52	22.51%	2005.01	\$3,300,000	179	77.48%	2005.01	\$6,687,500	40	17.31%	2005.01	\$3,800,000	191	82.68%
2005	2	\$4,568,250	316	2005.02	\$18,958,812	78	24.68%	2005.02	\$3,255,150	238	75.31%	2005.02	\$8,475,000	68	21.51%	2005.02	\$4,385,000	248	78.48%
2005	3	\$4,150,000	273	2005.03	\$21,475,000	72	26.37%	2005.03	\$3,100,000	201	73.62%	2005.03	\$6,100,000	61	22.34%	2005.03	\$3,750,000	212	77.65%
2005	4	\$4,425,000	300	2005.04	\$25,000,000	93	31.00%	2005.04	\$3,150,000	207	68.99%	2005.04	\$11,200,000	65	21.68%	2005.04	\$4,000,000	235	78.33%
2006	1	\$5,300,000	301	2006.01	\$25,750,000	92	30.56%	2006.01	\$3,800,000	209	69.43%	2006.01	\$18,000,000	64	21.26%	2006.01	\$4,943,744	237	78.73%
2006	2	\$4,750,000	313	2006.02	\$22,750,000	82	26.19%	2006.02	\$3,500,000	231	73.80%	2006.02	\$6,175,000	56	17.89%	2006.02	\$4,500,000	257	82.10%
2006	3	\$5,000,000	285	2006.03	\$22,500,000	88	30.17%	2006.03	\$3,650,000	199	69.82%	2006.03	\$7,000,000	59	20.70%	2006.03	\$4,705,399	226	79.29%
2006	4	\$4,587,500	248	2006.04	\$21,200,000	65	26.20%	2006.04	\$3,550,000	183	73.79%	2006.04	\$8,093,750	56	22.58%	2006.04	\$4,270,000	192	77.41%
2007	1	\$6,155,805	286	2007.01	\$21,225,000	104	36.36%	2007.01	\$3,700,000	182	63.63%	2007.01	\$9,500,000	63	22.02%	2007.01	\$5,700,000	223	77.97%
2007	2	\$5,650,000	385	2007.02	\$25,125,000	120	31.16%	2007.02	\$3,750,000	265	68.83%	2007.02	\$9,000,000	67	17.40%	2007.02	\$5,450,000	318	82.59%
2007	3	\$5,450,000	330	2007.03	\$20,100,161	105	31.81%	2007.03	\$3,900,000	225	68.18%	2007.03	\$8,325,000	53	16.06%	2007.03	\$5,011,554	277	83.93%
2007	4	\$4,680,000	249	2007.04	\$23,250,000	88	34.53%	2007.04	\$3,150,000	163	65.46%	2007.04	\$9,375,000	36	14.45%	2007.04	\$4,500,000	213	85.54%
2008	1	\$5,000,000	255	2008.01	\$16,000,000	61	23.92%	2008.01	\$3,985,000	194	76.07%	2008.01	\$5,990,000	46	18.03%	2008.01	\$4,650,000	209	81.96%
2008	2	\$5,062,900	228	2008.02	\$22,150,000	50	21.92%	2008.02	\$3,890,000	178	78.07%	2008.02	\$8,725,000	38	16.66%	2008.02	\$4,800,000	190	83.33%
2008	3	\$4,190,500	172	2008.03	\$17,133,333	37	21.51%	2008.03	\$3,350,000	135	78.48%	2008.03	\$5,500,000	27	15.69%	2008.03	\$3,900,000	145	84.30%
2008	4	\$4,050,000	159	2008.04	\$18,850,000	32	20.12%	2008.04	\$3,500,000	127	79.87%	2008.04	\$4,972,500	27	16.98%	2008.04	\$3,920,000	132	83.01%
2009	1	\$4,150,000	81	2009.01	\$15,800,000	15	18.51%	2009.01	\$3,600,000	66	81.48%	2009.01	\$7,375,000	16	19.75%	2009.01	\$3,700,000	65	80.24%
2009	2	\$3,090,231	86	2009.02	\$14,722,500	11	12.79%	2009.02	\$2,864,310	75	87.20%	2009.02	\$5,410,250	16	18.60%	2009.02	\$3,000,000	70	81.39%
2009	3	\$3,400,000	90	2009.03	\$22,000,000	16	17.77%	2009.03	\$3,000,000	74	82.22%	2009.03	\$4,608,750	14	15.55%	2009.03	\$3,195,271	76	84.44%
2009	4	\$3,562,500	84	2009.04	\$14,100,000	14	16.66%	2009.04	\$3,010,250	70	83.33%	2009.04	\$4,520,000	12	14.28%	2009.04	\$3,400,000	72	85.71%
2010	1	\$3,900,000	89	2010.01	\$20,162,500	18	20.22%	2010.01	\$2,825,000	71	79.77%	2010.01	\$8,450,000	15	16.85%	2010.01	\$3,825,000	74	83.14%
2010	2	\$3,700,000	138	2010.02	\$30,833,449	34	24.63%	2010.02	\$3,000,000	104	75.36%	2010.02	\$15,400,000	34	24.63%	2010.02	\$3,100,000	104	75.36%
2010	3	\$4,912,500	120	2010.03	\$35,500,000	48	38.33%	2010.03	\$2,850,000	74	61.66%	2010.03	\$25,000,000	37	30.83%	2010.03	\$3,117,000	83	69.16%
2010	4	\$3,988,800	100	2010.04	\$30,353,182	38	38.00%	2010.04	\$2,420,000	62	62.00%	2010.04	\$38,500,000	23	23.00%	2010.04	\$3,265,000	77	77.00%
2011	1	\$4,200,000	85	2011.01	\$34,050,000	24	28.23%	2011.01	\$2,795,500	61	71.76%	2011.01	\$12,275,000	15	17.64%	2011.01	\$3,775,000	70	82.35%
2011	2	\$4,200,000	97	2011.02	\$51,200,000	31	31.95%	2011.02	\$2,250,000	66	68.04%	2011.02	\$15,600,000	23	23.71%	2011.02	\$3,175,000	74	76.28%
2011	3	\$3,350,000	73	2011.03	\$23,772,500	20	27.39%	2011.03	\$2,800,000	53	72.60%	2011.03	\$3,700,000	17	23.28%	2011.03	\$3,275,000	56	76.71%
2011	4	\$5,000,000	157	2011.04	\$32,400,000	43	27.38%	2011.04	\$3,229,250	114	72.61%	2011.04	\$10,950,000	34	21.85%	2011.04	\$4,300,000	123	78.34%
2012	1	\$5,233,961	131	2012.01	\$22,100,000	40	30.53%	2012.01	\$3,275,000	91	69.46%	2012.01	\$13,837,500	28	21.37%	2012.01	\$4,200,000	103	78.62%
2012	2	\$4,000,000	209	2012.02	\$17,000,000	61	29.18%	2012.02	\$2,779,500	148	70.81%	2012.02	\$15,900,000	22	10.52%	2012.02	\$3,700,000	187	89.47%
2012	3	\$7,000,000	169	2012.03	\$19,100,000	67	39.64%	2012.03	\$2,720,250	102	60.35%	2012.03	\$16,050,000	32	18.93%	2012.03	\$5,250,000	137	81.06%
2012	4	\$6,622,500	207	2012.04	\$24,866,613	74	35.74%	2012.04	\$3,125,000	133	64.25%	2012.04	\$16,174,794	39	18.84%	2012.04	\$5,070,000	168	81.15%
2013	1	\$5,999,992	239	2013.01	\$21,154,582	85	35.56%	2013.01	\$2,962,500	154	64.43%	2013.01	\$7,750,000	52	21.75%	2013.01	\$5,575,000	187	78.24%
2013	2	\$4,700,000	217	2013.02	\$22,000,000	71	32.71%	2013.02	\$2,500,000	146	67.28%	2013.02	\$16,000,000	38	17.51%	2013.02	\$4,200,000	179	82.48%
2013	3	\$5,260,855	246	2013.03	\$25,000,000	75	30.48%	2013.03	\$3,300,000	171	69.51%	2013.03	\$9,949,500	35	14.22%	2013.03	\$4,750,000	211	85.77%
2013	4	\$4,537,500	314	2013.04	\$24,000,000	98	31.21%	2013.04	\$2,790,000	216	68.78%	2013.04	\$13,500,000	55	17.51%	2013.04	\$4,000,000	259	82.48%
2014	1	\$5,625,000	228	2014.01	\$20,750,000	70	30.70%	2014.01	\$3,300,000	158	69.29%	2014.01	\$8,825,900	59	25.87%	2014.01	\$5,000,000	169	74.12%
2014	2	\$4,300,000	320	2014.02	\$26,125,000	88	27.50%	2014.02	\$2,818,750	232	72.50%	2014.02	\$11,200,000	59	18.43%	2014.02	\$3,700,000	261	81.56%
2014	3	\$5,500,000	351	2014.03	\$20,000,000	97	27.63%	2014.03	\$3,425,000	254	72.36%	2014.03	\$10,567,078	66	18.80%	2014.03	\$5,000,000	285	81.19%
2014	4	\$4,500,000	311	2014.04	\$29,625,000	78	25.08%	2014.04	\$3,040,000	233	74.91%	2014.04	\$8,200,000	73	23.47%	2014.04	\$3,950,000	238	76.52%

Transaction volume (observed) and median sale price (concluded)

Year	Qtr	Full Sample		Big			Small			Gateway			Non-Gateway						
		Median Sale Price	Obs	Median Sale Price (High Priced Hotels)	Obs	% Total Sales	Median Sale Price (Low Priced Hotels)	Obs	% Total Sales	Median Sale Price (Gateway Hotels)	Obs	% Total Sales	Median Sale Price (Non-Gateway Hotels)	Obs	% Total Sales				
2005	1	\$4,330,000	231	2005.01	\$18,100,000	52	22.51%	2005.01	\$3,300,000	179	77.48%	2005.01	\$6,687,500	40	17.31%	2005.01	\$3,800,000	191	82.68%
2005	2	\$4,568,250	316	2005.02	\$18,956,812	78	24.88%	2005.02	\$3,255,150	238	75.31%	2005.02	\$8,475,000	68	21.51%	2005.02	\$4,385,000	248	78.48%
2005	3	\$4,150,000	273	2005.03	\$21,475,000	72	26.37%	2005.03	\$3,100,000	201	73.62%	2005.03	\$8,100,000	61	22.34%	2005.03	\$3,750,000	212	77.65%
2005	4	\$4,425,000	300	2005.04	\$25,000,000	93	31.00%	2005.04	\$3,150,000	207	68.99%	2005.04	\$11,200,000	65	21.66%	2005.04	\$4,000,000	235	78.33%
2006	1	\$5,300,000	301	2006.01	\$25,750,000	92	30.56%	2006.01	\$3,800,000	209	69.43%	2006.01	\$18,000,000	64	21.26%	2006.01	\$4,943,744	237	78.73%
2006	2	\$4,750,000	313	2006.02	\$22,750,000	82	26.19%	2006.02	\$3,500,000	231	73.80%	2006.02	\$8,175,000	56	17.89%	2006.02	\$4,500,000	257	82.10%
2006	3	\$5,000,000	285	2006.03	\$22,500,000	88	30.17%	2006.03	\$3,650,000	199	69.82%	2006.03	\$7,000,000	59	20.70%	2006.03	\$4,705,399	228	79.29%
2006	4	\$4,587,500	248	2006.04	\$21,200,000	65	26.20%	2006.04	\$3,550,000	183	73.79%	2006.04	\$8,093,750	56	22.58%	2006.04	\$4,270,000	192	77.41%
2007	1	\$6,155,805	286	2007.01	\$21,225,000	104	36.36%	2007.01	\$3,700,000	182	63.63%	2007.01	\$9,500,000	63	22.02%	2007.01	\$5,700,000	223	77.97%
2007	2	\$5,650,000	385	2007.02	\$25,125,000	120	31.16%	2007.02	\$3,750,000	265	68.83%	2007.02	\$9,000,000	67	17.40%	2007.02	\$5,450,000	318	82.59%
2007	3	\$5,450,000	330	2007.03	\$20,100,161	105	31.81%	2007.03	\$3,900,000	225	68.18%	2007.03	\$8,325,000	53	16.06%	2007.03	\$5,011,554	277	83.93%
2007	4	\$4,680,000	249	2007.04	\$23,250,000	86	34.53%	2007.04	\$3,150,000	163	65.46%	2007.04	\$9,375,000	36	14.45%	2007.04	\$4,500,000	213	85.54%
2008	1	\$5,000,000	255	2008.01	\$16,000,000	61	23.92%	2008.01	\$3,985,000	194	76.07%	2008.01	\$5,990,000	46	18.03%	2008.01	\$4,650,000	209	81.96%
2008	2	\$5,062,900	228	2008.02	\$22,150,000	50	21.92%	2008.02	\$3,890,000	178	78.07%	2008.02	\$8,725,000	38	16.66%	2008.02	\$4,800,000	190	83.33%
2008	3	\$4,190,500	172	2008.03	\$17,133,333	37	21.51%	2008.03	\$3,350,000	135	78.48%	2008.03	\$5,500,000	27	15.69%	2008.03	\$3,900,000	145	84.30%
2008	4	\$4,050,000	159	2008.04	\$18,850,000	32	20.12%	2008.04	\$3,500,000	127	79.87%	2008.04	\$4,972,500	27	16.98%	2008.04	\$3,920,000	132	83.01%
2009	1	\$4,150,000	81	2009.01	\$15,800,000	15	18.51%	2009.01	\$3,600,000	66	81.48%	2009.01	\$7,375,000	16	19.75%	2009.01	\$3,700,000	65	80.24%
2009	2	\$3,090,231	86	2009.02	\$14,722,500	11	12.79%	2009.02	\$2,864,310	75	87.20%	2009.02	\$5,410,250	16	18.60%	2009.02	\$3,000,000	70	81.39%
2015	1	\$5,752,500	254	2015.01	\$29,750,000	82	32.28%	2015.01	\$3,125,000	172	67.71%	2015.01	\$8,280,000	47	18.50%	2015.01	\$5,500,000	207	81.49%
2015	2	\$6,350,000	268	2015.02	\$24,575,000	92	34.32%	2015.02	\$3,250,000	176	65.67%	2015.02	\$18,765,000	46	17.16%	2015.02	\$5,612,500	222	82.83%
2015	3	\$5,050,000	299	2015.03	\$24,800,000	87	29.09%	2015.03	\$3,012,500	212	70.90%	2015.03	\$12,100,000	53	17.72%	2015.03	\$4,275,000	246	82.27%
2015	4	\$6,850,000	292	2015.04	\$18,080,000	106	36.30%	2015.04	\$3,125,000	188	63.69%	2015.04	\$14,415,000	51	17.46%	2015.04	\$5,400,000	241	82.53%
2016	1	\$5,800,000	293	2016.01	\$20,375,000	87	29.69%	2016.01	\$3,350,000	206	70.30%	2016.01	\$13,600,000	45	15.35%	2016.01	\$5,275,000	248	84.64%
2016	2	\$4,100,000	322	2016.02	\$16,000,000	61	18.94%	2016.02	\$3,300,000	261	81.05%	2016.02	\$11,600,000	48	14.90%	2016.02	\$3,725,000	274	85.09%
2016	3	\$4,862,500	284	2016.03	\$25,000,000	75	26.40%	2016.03	\$3,200,000	209	73.59%	2016.03	\$24,500,000	34	11.97%	2016.03	\$4,362,500	250	88.02%
2016	4	\$4,000,000	283	2016.04	\$19,480,000	73	27.75%	2016.04	\$2,800,000	190	72.24%	2016.04	\$13,352,800	28	10.64%	2016.04	\$3,684,706	235	89.35%
2017	1	\$5,275,000	254	2017.01	\$22,880,750	70	27.55%	2017.01	\$3,600,000	184	72.44%	2017.01	\$14,726,254	28	11.02%	2017.01	\$4,950,000	226	88.97%
2017	2	\$5,100,000	331	2017.02	\$22,660,000	91	27.49%	2017.02	\$3,325,000	240	72.50%	2017.02	\$16,450,000	37	11.17%	2017.02	\$4,462,500	294	88.82%
2017	3	\$5,000,000	324	2017.03	\$22,250,000	86	26.54%	2017.03	\$3,403,000	238	73.45%	2017.03	\$22,250,000	38	11.72%	2017.03	\$4,500,000	286	88.27%
2017	4	\$4,500,000	265	2017.04	\$28,000,000	66	24.90%	2017.04	\$2,875,000	199	75.09%	2017.04	\$12,208,000	26	9.81%	2017.04	\$4,250,000	239	90.18%
2018	1	\$5,800,000	311	2018.01	\$21,691,200	98	31.51%	2018.01	\$3,500,000	213	68.48%	2018.01	\$14,750,000	40	12.86%	2018.01	\$5,000,000	271	87.13%
2018	2	\$4,805,200	366	2018.02	\$19,750,000	82	22.40%	2018.02	\$3,300,000	284	77.59%	2018.02	\$17,625,000	40	10.92%	2018.02	\$4,300,000	326	89.07%
2018	3	\$5,125,000	334	2018.03	\$21,265,000	83	24.85%	2018.03	\$3,710,000	251	75.14%	2018.03	\$13,342,500	22	6.58%	2018.03	\$5,000,000	312	93.41%
2018	4	\$6,490,000	279	2018.04	\$20,500,000	105	37.63%	2018.04	\$3,300,000	174	62.36%	2018.04	\$14,440,000	33	11.82%	2018.04	\$5,580,556	246	88.17%
2019	1	\$5,340,000	290	2019.01	\$17,802,698	76	26.20%	2019.01	\$3,525,000	214	73.79%	2019.01	\$15,750,000	34	11.72%	2019.01	\$4,750,000	256	88.27%
2019	2	\$4,015,500	334	2019.02	\$19,848,485	62	18.56%	2019.02	\$3,335,000	272	81.43%	2019.02	\$6,300,000	35	10.47%	2019.02	\$3,900,000	299	89.52%
2019	3	\$4,707,500	402	2019.03	\$21,000,000	96	23.88%	2019.03	\$3,500,000	306	76.11%	2019.03	\$15,850,000	42	10.44%	2019.03	\$4,362,500	360	89.55%
2019	4	\$4,950,000	383	2019.04	\$21,855,650	94	24.54%	2019.04	\$3,300,000	289	75.45%	2019.04	\$11,000,000	35	9.13%	2019.04	\$4,600,000	340	88.77%
2020	1	\$4,100,000	307	2020.01	\$16,900,000	48	15.83%	2020.01	\$3,500,000	259	84.36%	2020.01	\$5,500,000	23	7.49%	2020.01	\$4,095,000	284	92.50%
2020	2	\$3,400,000	81	2020.02	\$16,787,500	10	12.34%	2020.02	\$2,610,000	71	87.65%	2020.02	\$6,700,000	7	8.64%	2020.02	\$3,380,000	74	91.35%

Source: Cornell Center for Real Estate and Finance

Median sale price and number of sales (hotels with sale prices of \$10 million or more)

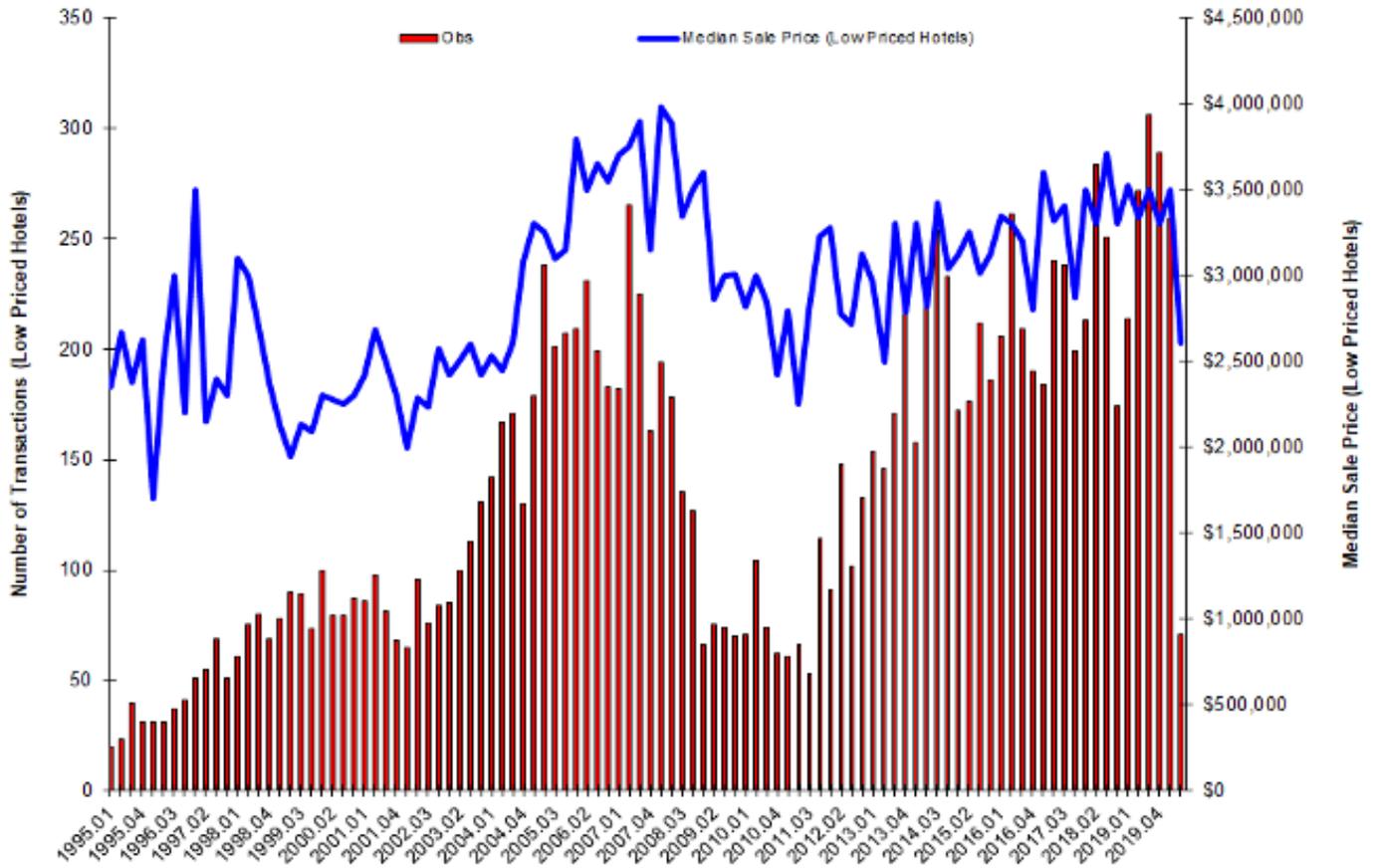


Sources: CoStar, Real Capital Analytics

The median price of hotels declined on both a quarter-over-quarter and a year-over-year basis, continuing the negative momentum from the prior period. The median price based on all hotel transactions (both large hotels and small hotels combined) fell 17 percent from the previous quarter (\$3.4M versus \$4.1M) on weaker volume (81 transactions for 2020Q2 versus 307 transactions for 2020Q1), as reported in Exhibit 12a, 12b, and 12c. Year over year (2020Q1 versus 2020Q2), the median price of hotels fell 15.3 percent compared to a reduction of 23.2 percent in the prior year-over-year period on weaker volume (-75.7% compared to +5.9% in the prior period). A comparison of

large hotels relative to small hotels on a year-over-year basis reveals that the median price of large hotels declined 15.4 percent compared to a drop of 5.1 percent in the prior period on weaker volume (-84%), while the median price of smaller hotels experienced a steeper decline (-21.7%) on weaker volume (-74%). Quarter over quarter, large hotels declined less than 1 percent on weaker transaction volume (-79%). The median sale price of small hotels fell more sharply (-25%), also on weaker volume (-73%). Exhibit 13 and Exhibit 14 show these year-over-year trends in the number of transactions for large hotels and small hotels.

Median sale price and number of sales (hotels with sale prices less than \$10 million)



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trendlines and our standardized unexpected price (SUP) performance metrics both indicate a hemorrhaging in the price of both large hotels and small hotels. Exhibit 16, which graphs the prices reported

in Exhibit 15, shows that the price of large hotels fell 3 percent this quarter compared to remaining relatively flat at .13 percent last quarter. Small hotels fell 2.4 percent this quarter, compared to a gentler decline of .83 percent last

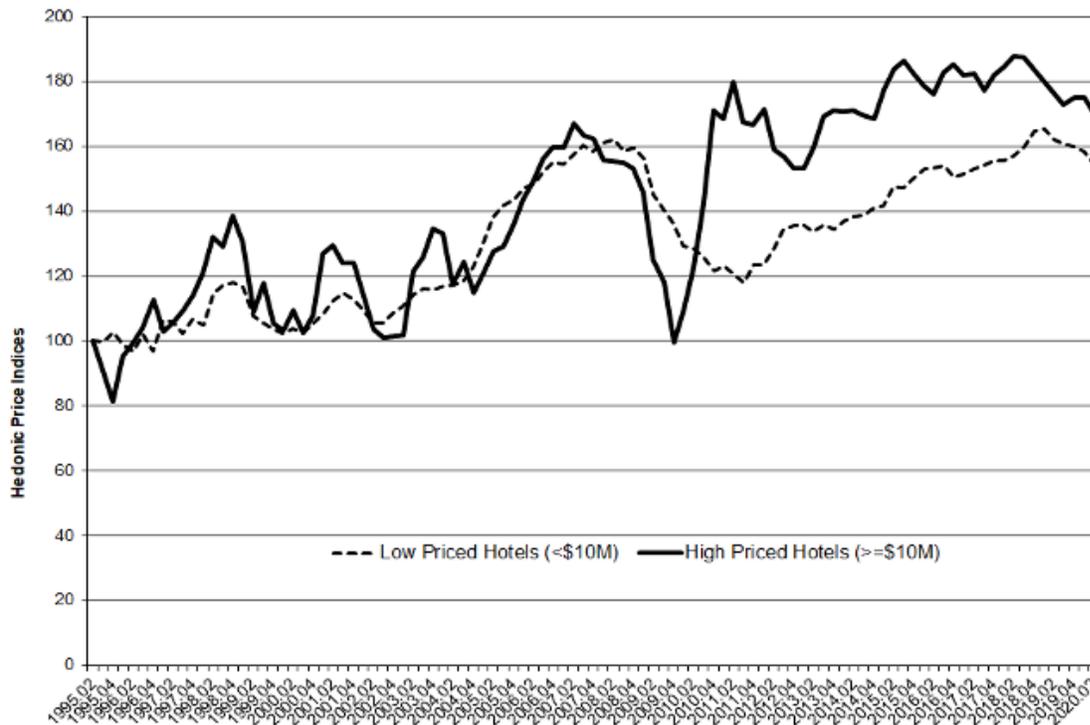
Hotel indices through 2020, quarter 2

YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales	YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales
1995	97.89	93.33	82.50	102.02	62.96	NA	2008.01	157.69	145.51	174.73	232.87	157.70	165.18
1995	97.80	84.92	81.45	97.88	66.32	NA	2008.02	158.83	145.03	171.29	237.60	158.00	166.71
1995	100.44	75.81	85.42	91.00	68.23	NA	2008.03	155.22	144.53	165.45	230.69	156.81	163.14
1996	96.72	88.80	89.99	93.55	69.96	NA	2008.04	156.13	142.89	159.98	224.08	158.99	166.82
1996	94.97	92.68	94.40	88.23	73.66	NA	2009.01	152.98	136.25	151.84	197.98	155.18	163.12
1996	99.97	97.07	105.05	96.29	72.49	NA	2009.02	142.02	116.78	135.75	172.67	150.62	156.16
1996	94.73	105.32	105.25	103.37	73.81	NA	2009.03	137.73	110.34	128.20	158.91	137.18	143.13
1997	104.14	96.07	112.69	109.44	86.89	NA	2009.04	133.46	93.12	114.84	158.16	122.73	128.43
1997	103.70	98.68	110.83	110.25	89.43	NA	2010.01	126.73	102.58	115.74	158.31	115.49	122.45
1997	100.27	102.17	105.76	111.43	95.70	NA	2010.02	126.07	114.62	119.12	162.29	108.14	115.76
1997	104.31	106.55	112.70	118.81	102.01	NA	2010.03	123.43	133.18	120.38	216.34	108.65	116.25
1998	102.73	112.93	115.04	123.24	98.52	NA	2010.04	119.00	159.49	129.67	245.53	110.53	116.21
1998	112.24	123.22	127.65	133.71	103.99	NA	2011.01	120.59	157.34	128.26	259.59	110.70	111.75
1998	114.95	120.70	131.70	125.06	105.99	NA	2011.02	118.02	167.98	130.70	266.18	111.35	111.37
1998	115.71	129.50	126.32	125.25	103.17	NA	2011.03	115.37	156.23	128.26	223.36	110.56	110.45
1999	114.17	121.97	114.84	117.49	96.63	NA	2011.04	120.73	155.47	126.83	208.57	112.41	112.56
1999	105.72	101.71	99.01	99.27	91.09	NA	2012.01	121.01	160.00	130.17	221.56	112.79	112.24
1999	103.36	110.05	94.83	105.06	89.09	NA	2012.02	125.49	148.55	132.87	226.66	116.75	118.35
1999	101.72	98.55	93.53	100.02	90.32	NA	2012.03	131.76	146.33	141.03	239.16	121.17	122.43
2000	100.15	96.39	94.86	96.35	95.02	98.05	2012.04	132.69	143.09	146.87	249.48	122.72	123.92
2000	101.64	102.23	99.21	100.54	98.38	98.05	2013.01	133.18	143.01	153.54	238.21	124.31	127.17
2000	100.62	95.86	100.71	95.98	97.95	93.57	2013.02	130.78	149.15	154.30	242.13	126.12	129.56
2000	103.36	100.81	102.41	101.78	96.05	94.80	2013.03	133.13	158.01	155.84	245.73	126.84	131.84
2001	106.13	118.32	109.75	105.51	97.06	93.25	2013.04	131.63	159.69	153.58	248.74	129.10	135.12
2001	110.10	120.75	110.35	117.37	97.10	92.05	2014.01	133.95	159.26	152.45	252.52	134.76	140.22
2001	112.27	115.71	109.37	116.03	98.00	95.59	2014.02	135.41	159.57	149.14	257.40	132.63	136.53
2001	110.45	115.70	106.13	111.58	97.27	91.38	2014.03	136.05	158.13	149.31	256.38	135.10	138.09
2002	107.51	106.10	99.54	107.50	97.40	93.56	2014.04	138.03	157.41	149.25	230.91	135.07	137.04
2002	103.58	96.67	95.81	97.32	95.39	92.06	2015.01	138.85	165.69	152.27	239.62	137.72	139.04
2002	103.48	94.50	95.10	99.93	95.90	90.26	2015.02	144.50	171.64	164.51	247.38	142.67	143.96
2002	106.19	94.69	100.17	100.89	96.86	95.32	2015.03	143.96	173.83	163.40	274.65	150.93	153.31
2003	108.33	95.03	101.04	112.18	96.48	95.36	2015.04	146.87	170.20	170.94	311.89	160.43	162.65
2003	111.81	113.25	105.41	120.13	100.71	99.03	2016.01	149.92	166.94	172.77	328.09	163.31	165.92
2003	113.84	117.60	108.35	128.11	101.93	102.49	2016.02	150.06	164.25	165.44	331.61	162.82	166.23
2003	113.37	125.68	107.95	132.35	103.24	105.38	2016.03	151.03	170.50	167.19	346.28	162.30	164.04
2004	114.59	124.43	108.52	131.57	102.91	106.73	2016.04	147.43	172.92	161.82	337.56	158.48	161.89
2004	114.70	109.78	107.12	134.16	103.41	107.66	2017.01	148.49	169.75	161.34	318.15	163.23	166.87
2004	115.98	116.11	109.52	141.64	107.29	111.96	2017.02	149.64	170.27	167.54	321.78	171.07	175.53
2004	120.29	107.36	114.13	149.06	108.47	111.79	2017.03	151.03	165.45	168.92	309.32	172.24	177.83
2005	127.48	113.05	122.67	167.73	112.68	115.15	2017.04	152.43	169.91	169.77	306.37	175.76	180.18
2005	135.25	119.20	135.72	169.28	118.42	121.84	2018.01	152.24	172.39	171.16	346.52	175.07	180.04
2005	138.57	120.68	141.13	167.16	122.54	125.74	2018.02	153.84	175.41	170.80	355.09	176.83	180.34
2005	140.69	126.80	145.03	176.55	127.97	131.95	2018.03	156.55	174.81	173.28	357.33	181.35	184.58
2006	143.99	134.11	152.03	180.84	132.88	137.34	2018.04	161.27	171.42	184.05	383.85	183.51	186.27
2006	145.17	139.37	151.88	193.98	136.12	140.31	2019.01	161.93	168.26	182.36	363.25	187.17	189.38
2006	149.13	145.62	157.23	211.93	138.03	142.19	2019.02	158.87	164.69	177.62	339.27	187.37	188.79
2006	151.78	148.94	161.55	212.89	142.25	144.35	2019.03	157.12	161.24	174.33	338.81	188.16	189.82
2007	151.16	149.14	165.59	218.54	145.68	146.61	2019.04	156.62	163.32	165.54	350.36	188.98	191.19
2007	154.24	155.84	173.04	228.68	149.67	150.42	2020.01	155.32	163.54	161.55	333.18	185.69	188.21
2007	156.86	152.38	176.73	226.79	154.99	157.23	2020.02	151.66	158.51	156.08	324.50	185.27	188.32
2007	155.20	151.61	180.37	229.23	156.23	159.67							

Source: Cornell Center for Real Estate and Finance

EXHIBIT 16

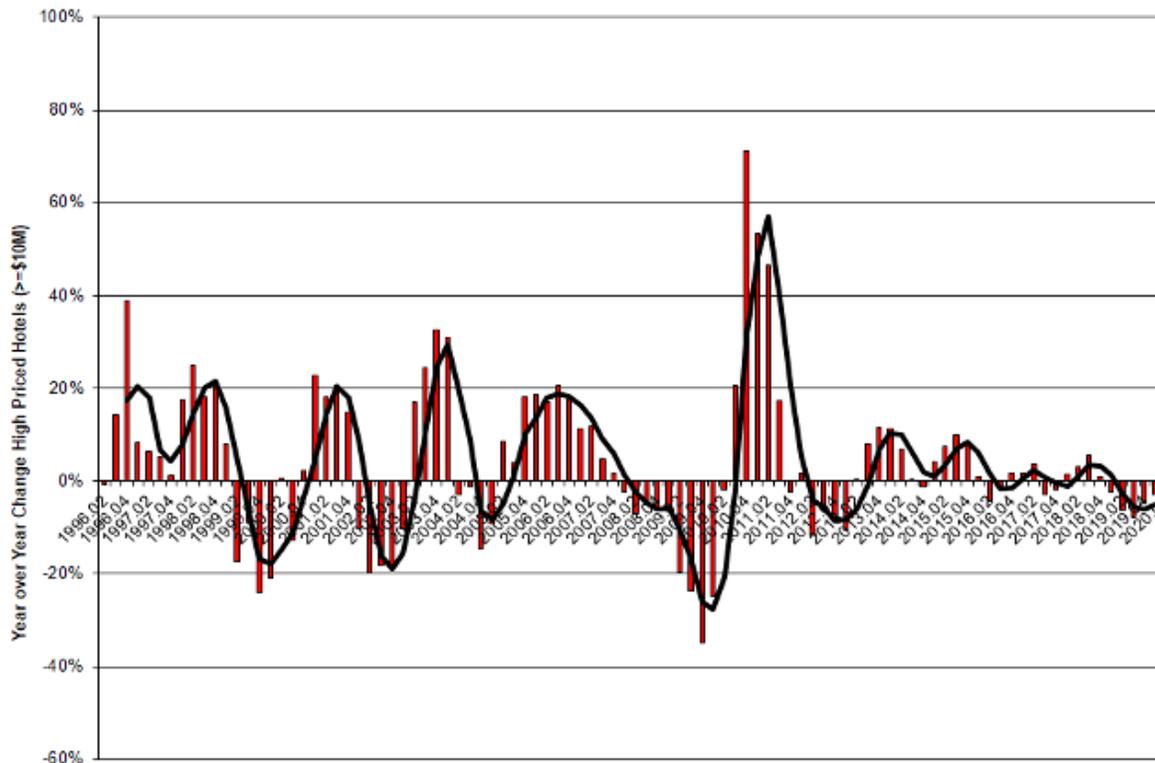
Hedonic hotel indices for large and small hotel transactions



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

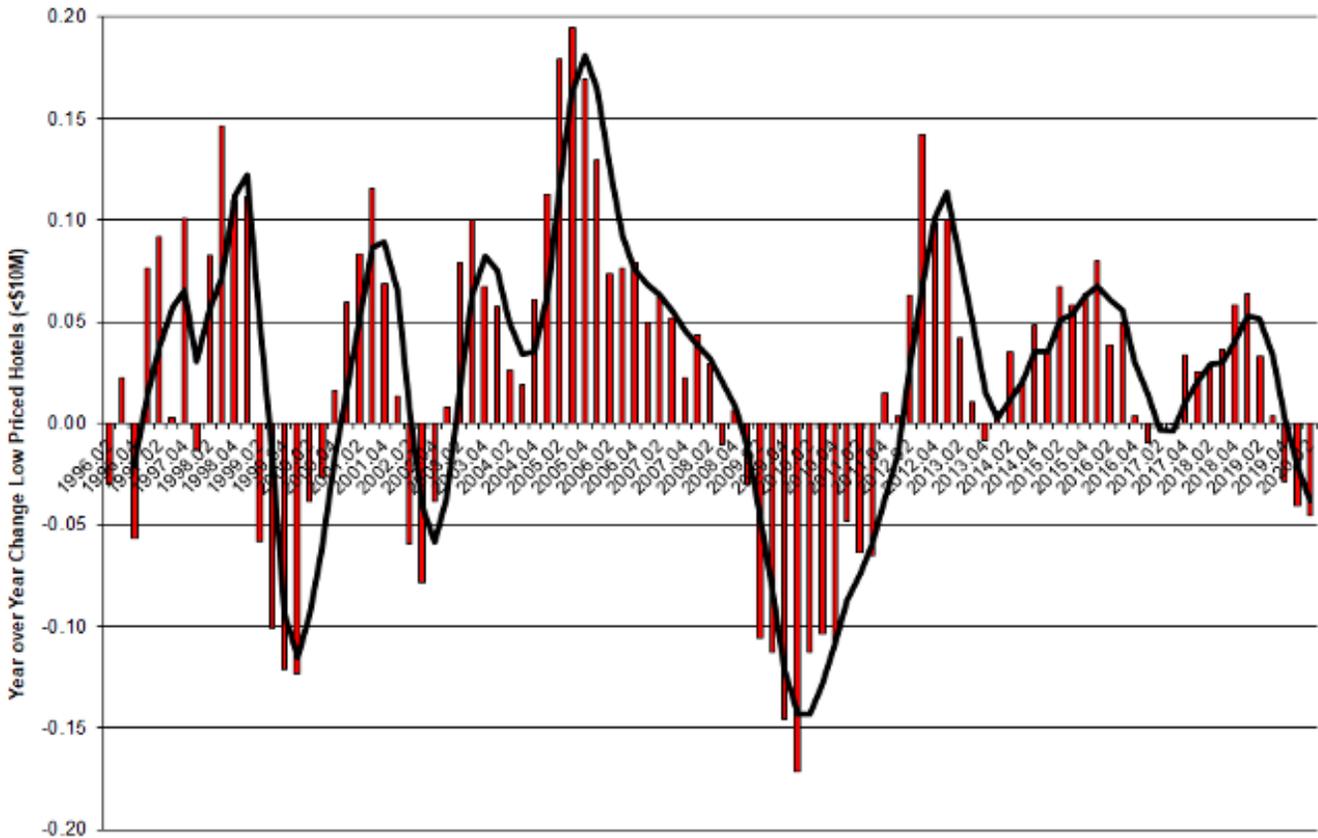
EXHIBIT 17

Year over year change in large-hotel index with a moving average trendline



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Year over year change in small-hotel index with a moving average trendline



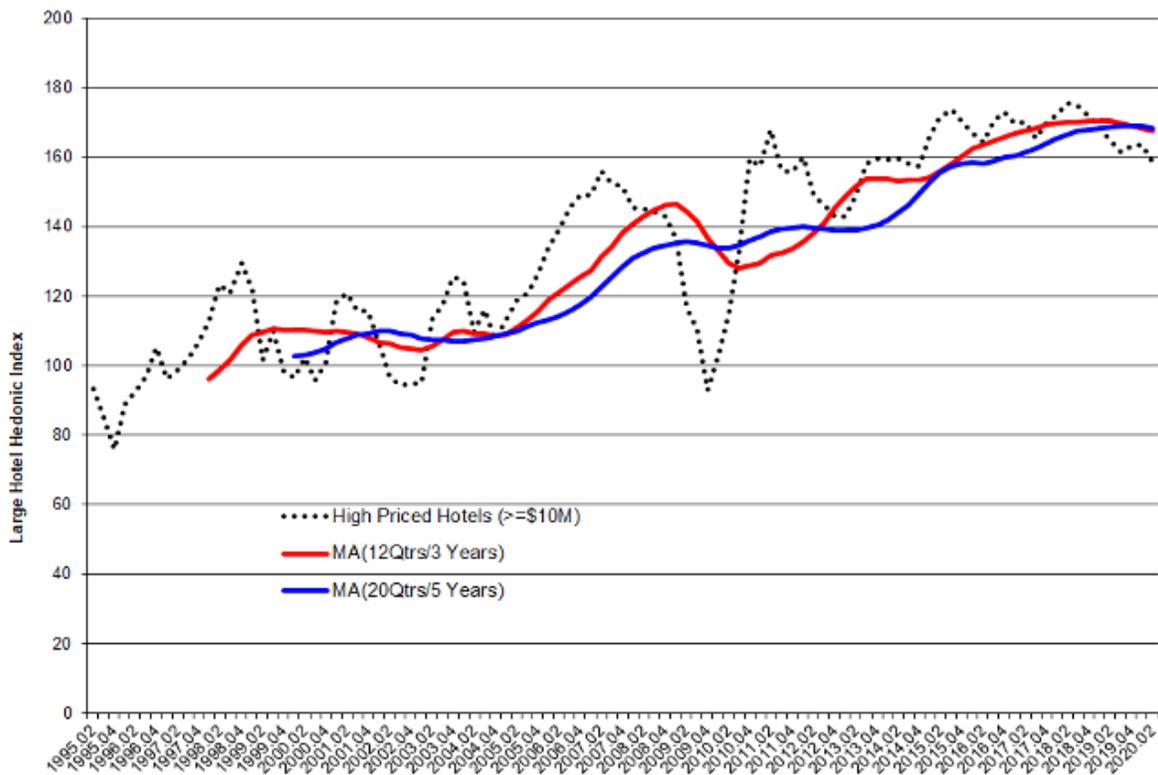
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

quarter. Year over year, Exhibit 17 shows that large hotels fell 3.75 percent (2019Q2-2020Q2) compared to a drop of 2.8 percent in the prior year-over-year period (2019Q1-2020Q1). Exhibit 18 shows that smaller hotels declined 4.5 percent year over year (2019Q2-2020Q2), compared to a 4.1-percent fall in the prior period (2019Q1-2020Q1).

Consistent with our analysis, our moving average trend lines for large hotels (in Exhibit 19) shows that the price for large hotels has dropped further below both its short-term and long-term moving average. Large hotels continue to exhibit negative price momentum, indicating a further softening in prices. The price for small hotels (in

EXHIBIT 19

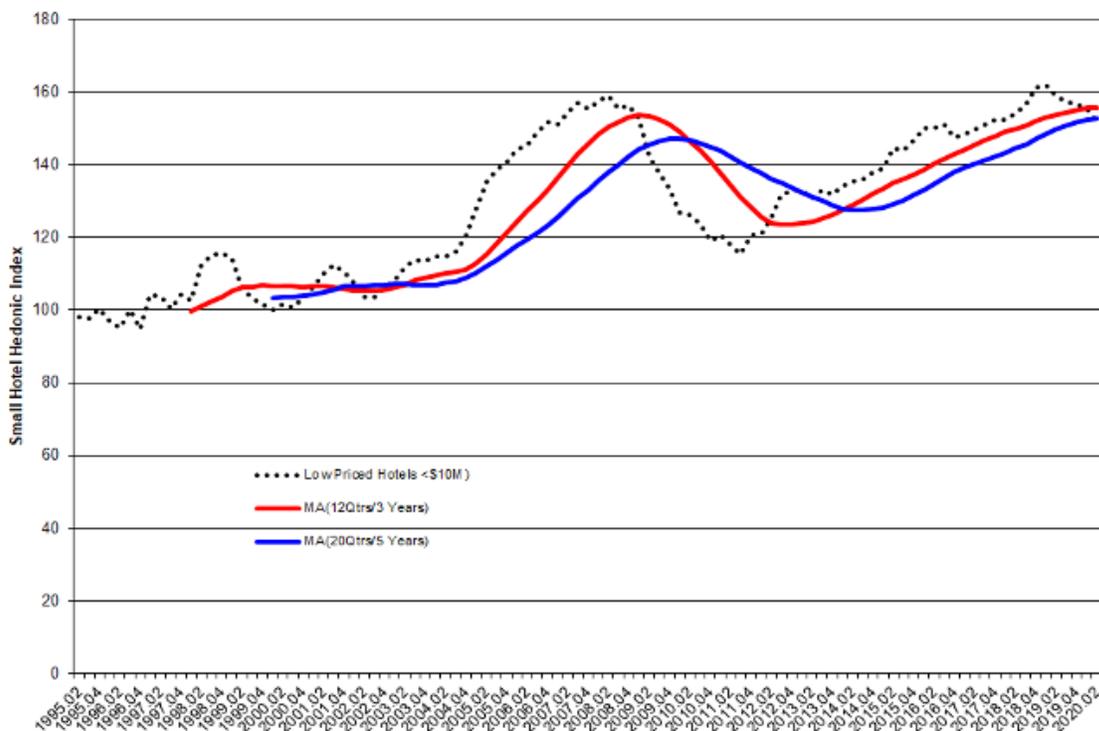
Moving average trendline for large hotel index



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

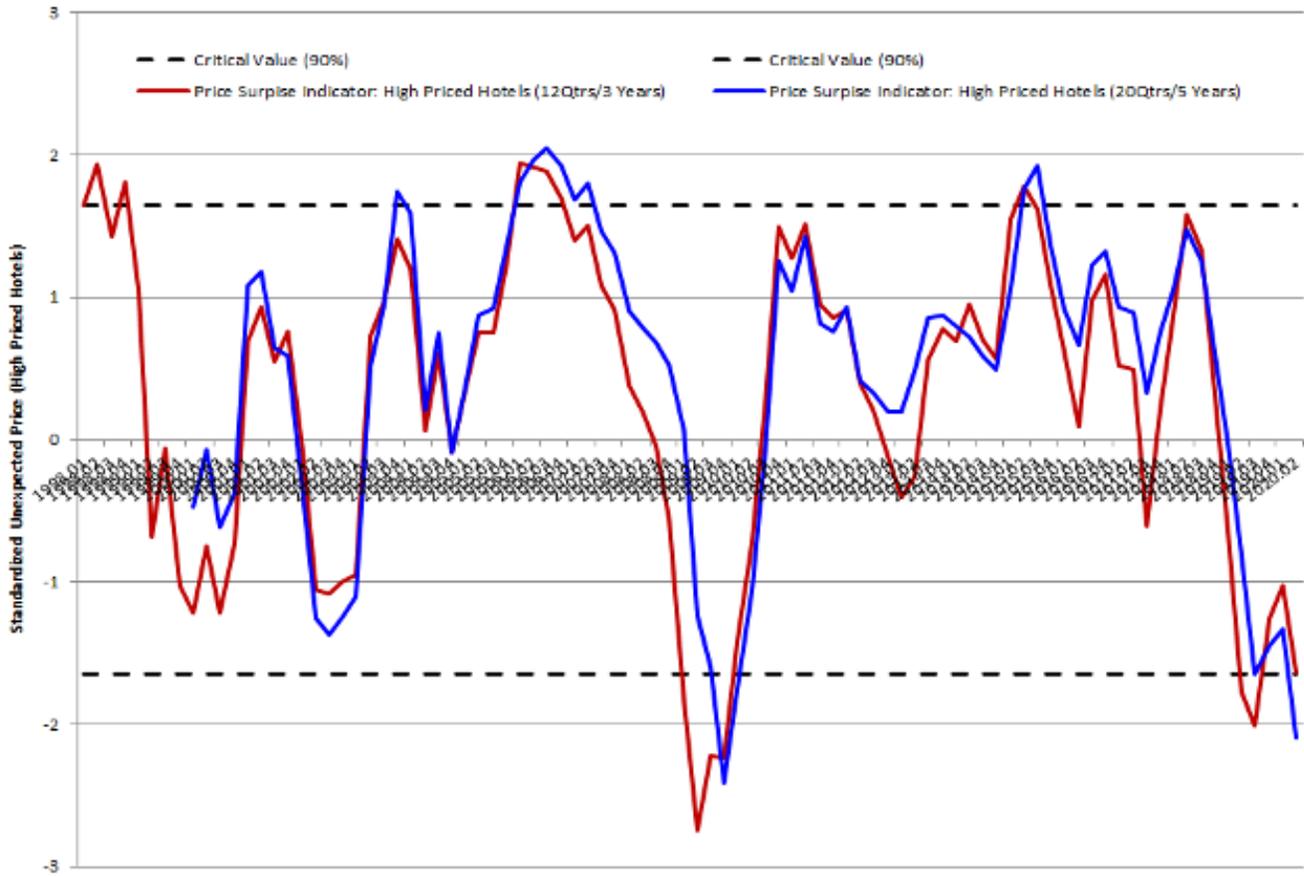
EXHIBIT 20

Moving average trend line for small hotel index



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Standardized Unexpected Price (SUP) for large hotel index



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

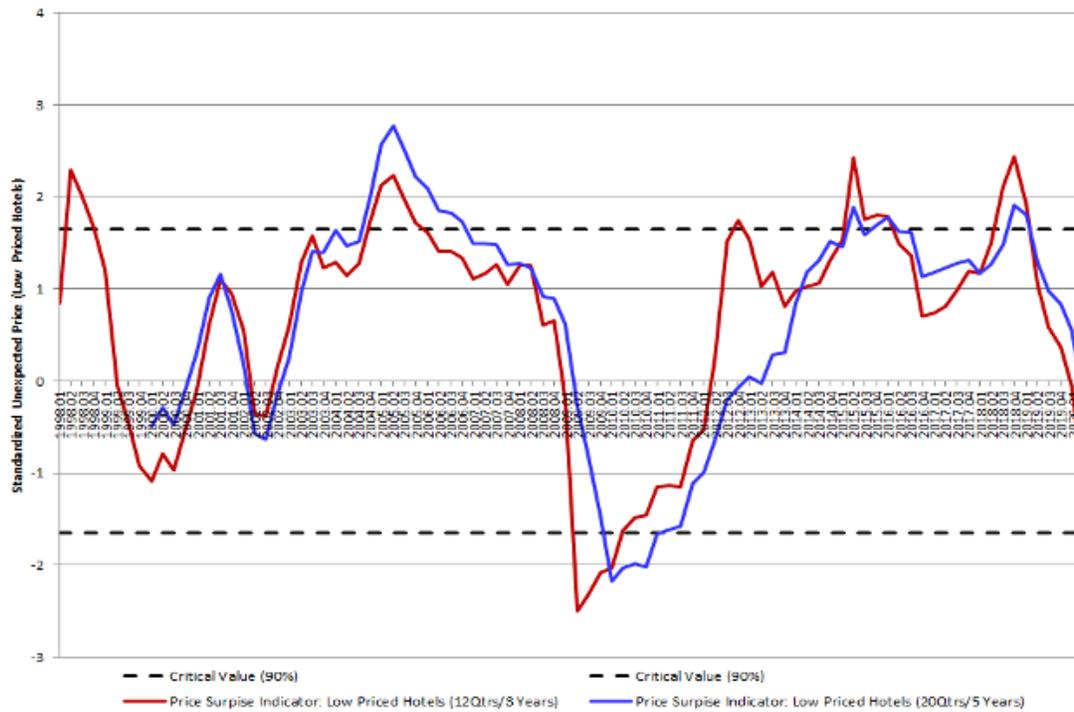
Exhibit 20) also falls below both its short-term and long-term moving average.

Our Standardized Unexpected Price (SUP) metric (in Exhibit 21) shows that the standardized price for large hotels has reached a statistically significant trough—a

new low. While this is not yet the case for small hotels, Exhibit 22 reveals that this scenario might occur in the next quarter if the price of small hotels continues its negative price trajectory.

EXHIBIT 22

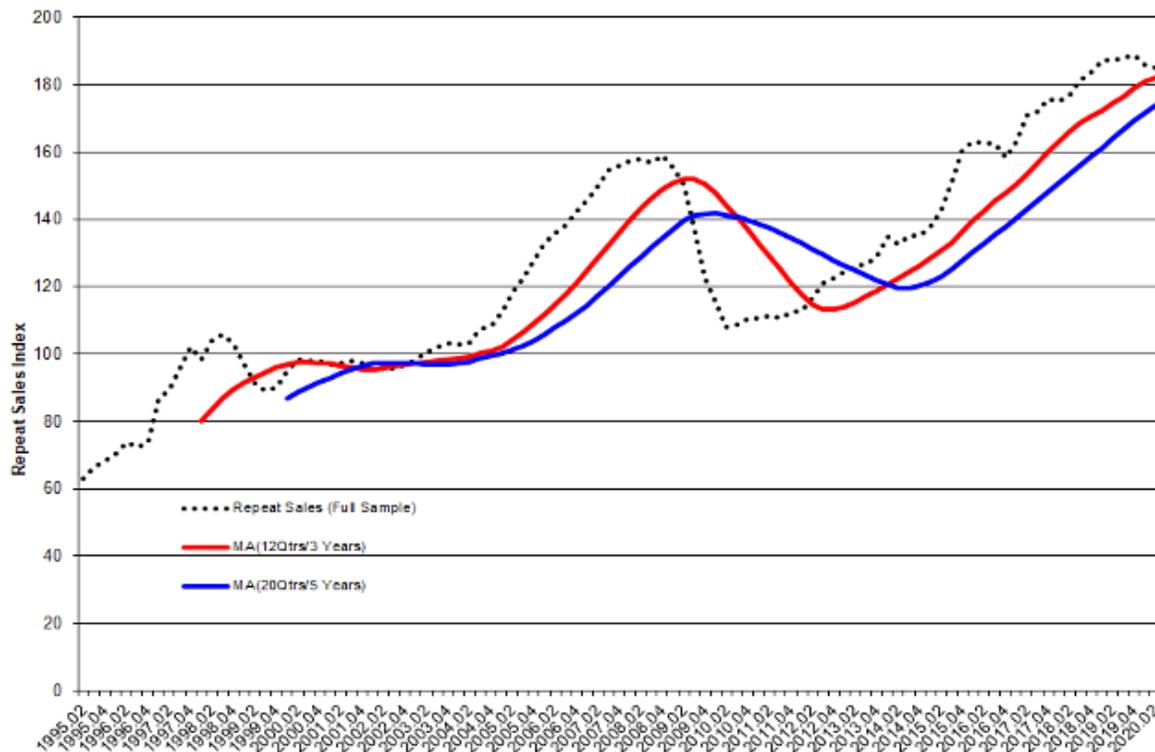
Standardized Unexpected Price (SUP) for small hotel index



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

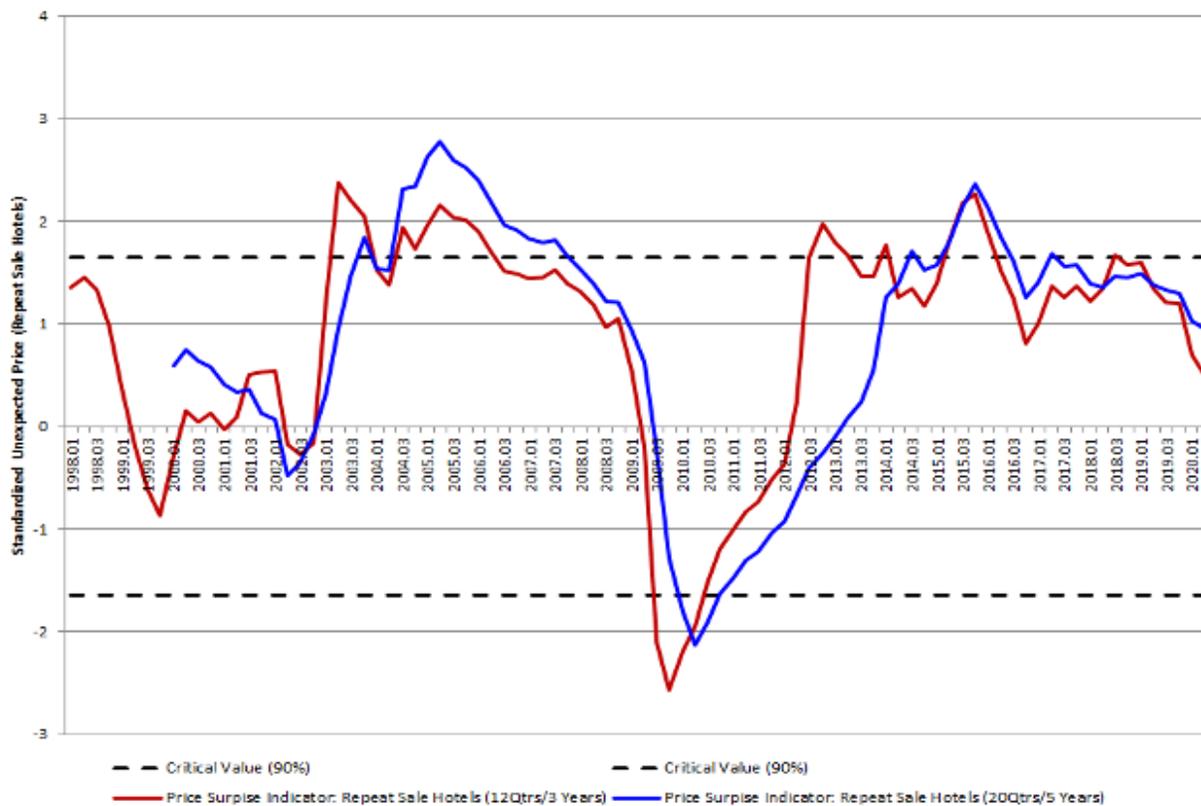
EXHIBIT 23

Moving average trend line for repeat-sale index



Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Standardized Unexpected Price (SUP) for hotel repeat-sale index (full sample)

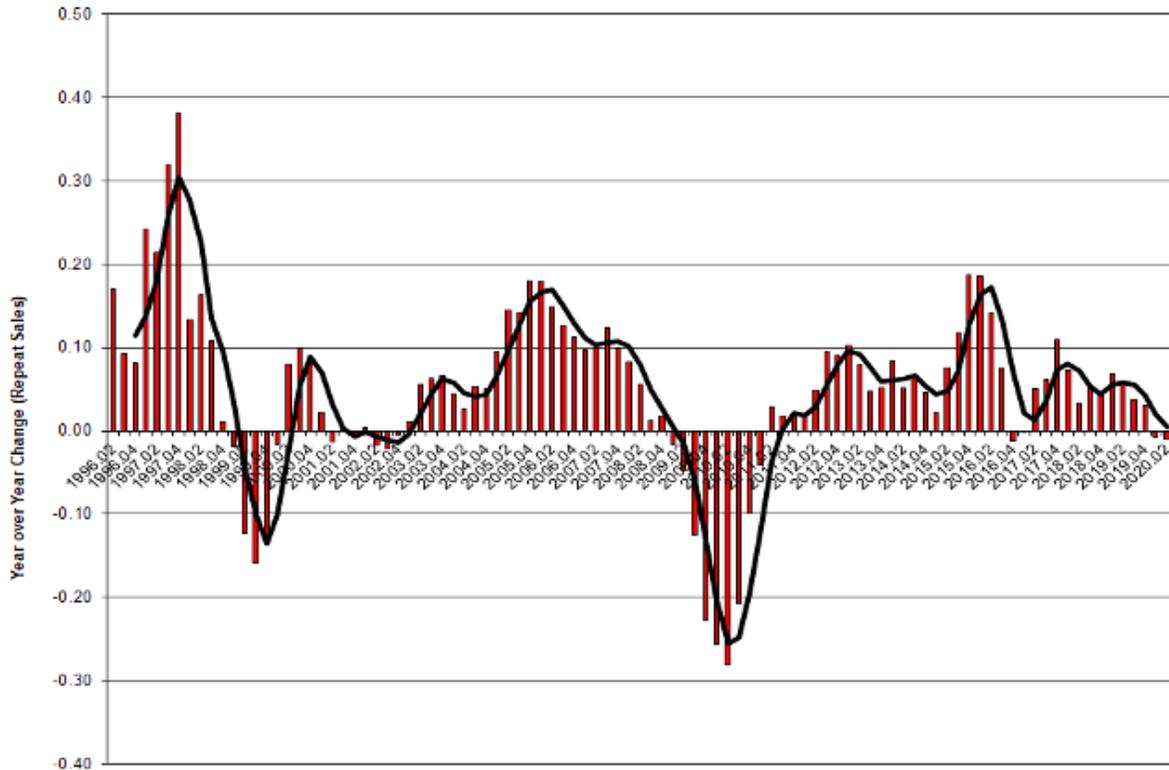


Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Repeat-sales metrics: prices continue to revert toward their mean. Our repeat-sale indicator, which reflects the price of hotels that have sold more than once, continues to revert towards its short-term and long-term moving average, although it is still higher than both averages, as displayed in Exhibit 23. Our SUP performance metric (in Exhibit 24) indicates that standardized prices continue to revert to the standardized mean of zero with the three-year SUP declining from .70 to .51 (and the 5-year SUP, from

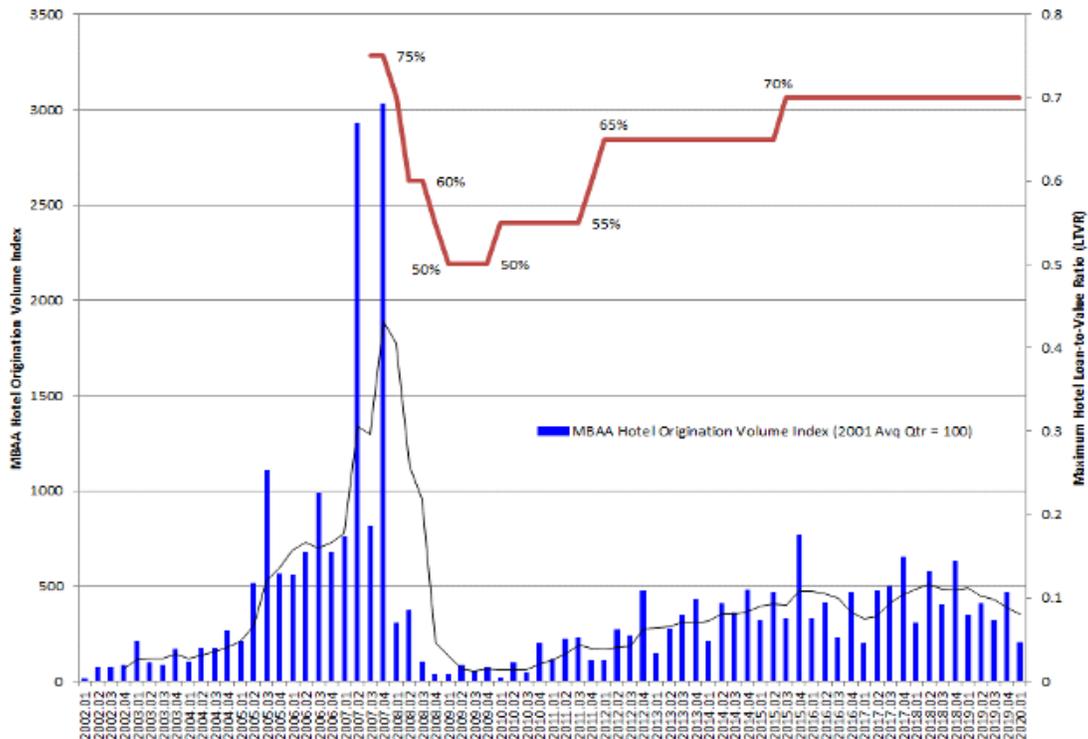
1.03 to .95) this quarter. Exhibit 25 shows that the repeat sale price index fell 1 percent year over year (2019Q2 to 2020Q2), dropping further from its .8-percent decline in the prior period (2019Q1 to 2020Q1). From a quarter-over-quarter perspective, the index experienced a slight decrease (a drop of .2%) in the current period (2020Q1-2020Q2), compared to a steeper decline of 1.7 percent in the prior quarter (2019Q4-2020Q1).

Year-over-year change in repeat-sale hotel index, with a moving average trendline



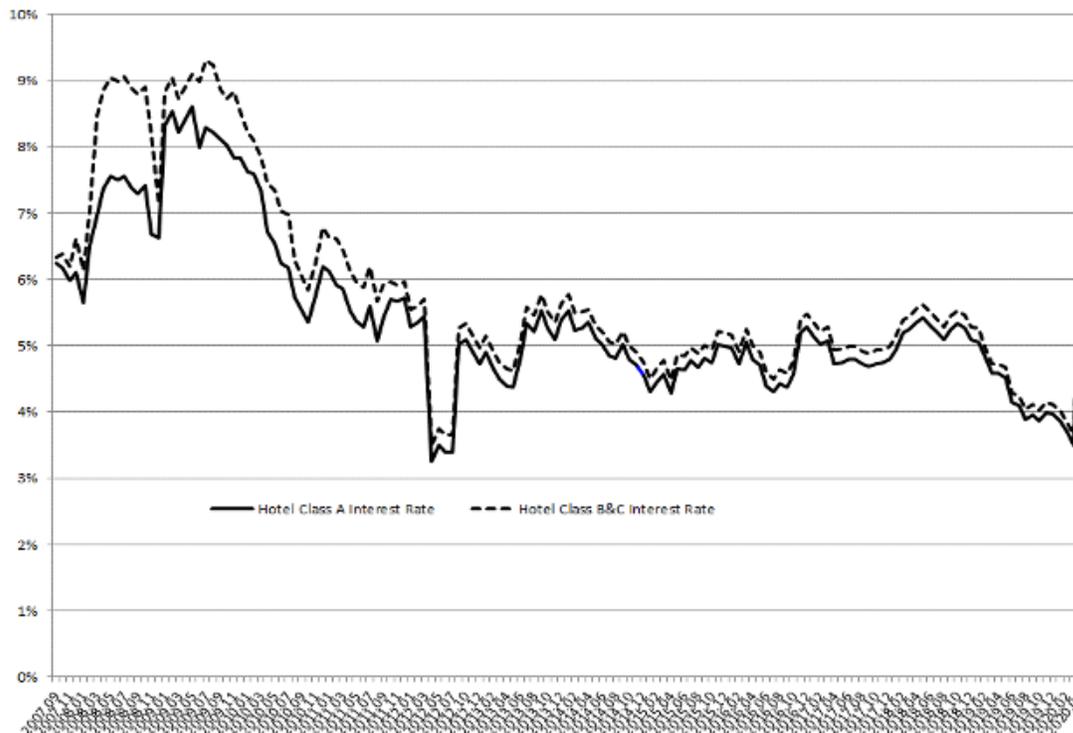
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Mortgage origination volume versus the loan-to-value ratio for hotels



Sources: Mortgage Bankers Association, Cornell Center for Real Estate and Finance, Cushman Wakefield Sonnenblick Goldman

Interest rates on Class A versus Class B and C Hotels



Source: Cushman Wakefield Sonnenblick Goldman

Mortgage financing volume for hotels fell year over year as well as quarter over quarter. Exhibit 26 shows that the mortgage origination volume for hotels, as reported for the first quarter of 2020, fell 42% year over year, continuing the declining trend from the prior period (-25%). Loan origination volume for hotels also declined 57 percent quarter over quarter. The maximum loan to value (LTV) ratio for hotels continues to remain at 70 percent.

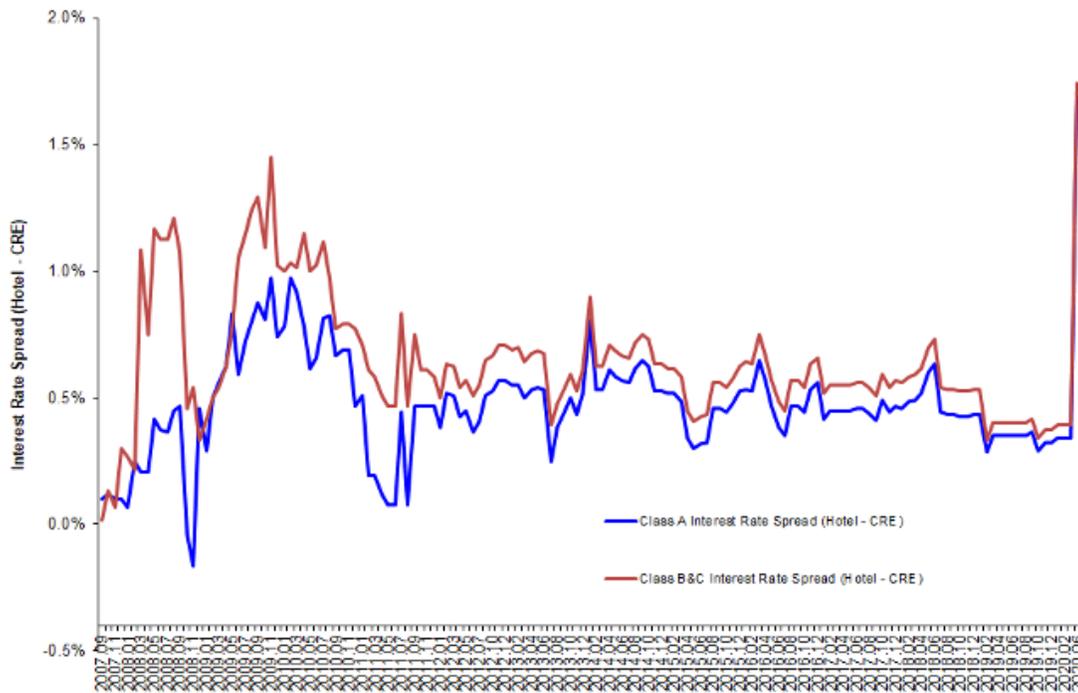
The cost of hotel debt financing spiked this quarter and has also risen sharply on a year-over-year basis. The cost of obtaining hotel debt financing, as reported by Cushman Wakefield Sonnenblick Goldman, rose this quarter for both Class A and Class B and C hotels. We should note

that the interest rate that CWSG reported for this quarter is based only on loan refinancings, not loan originations, so the interest rate this period isn't necessarily comparable to the interest rate in the prior quarter. Exhibit 27 shows that interest rates on Class A and Class B and C hotel deals increased 40 percent year over year. Quarter over quarter, interest rates rose 66 percent for Class A Hotels and 63 percent for Class B and C Hotels.

The relative risk premium that lenders require for hotels over other commercial real estate has widened. Exhibit 28 shows the spread between the interest rate on Class A full-service hotels (as well as B and C properties), compared to the (equally weighted) interest rate on other

EXHIBIT 28

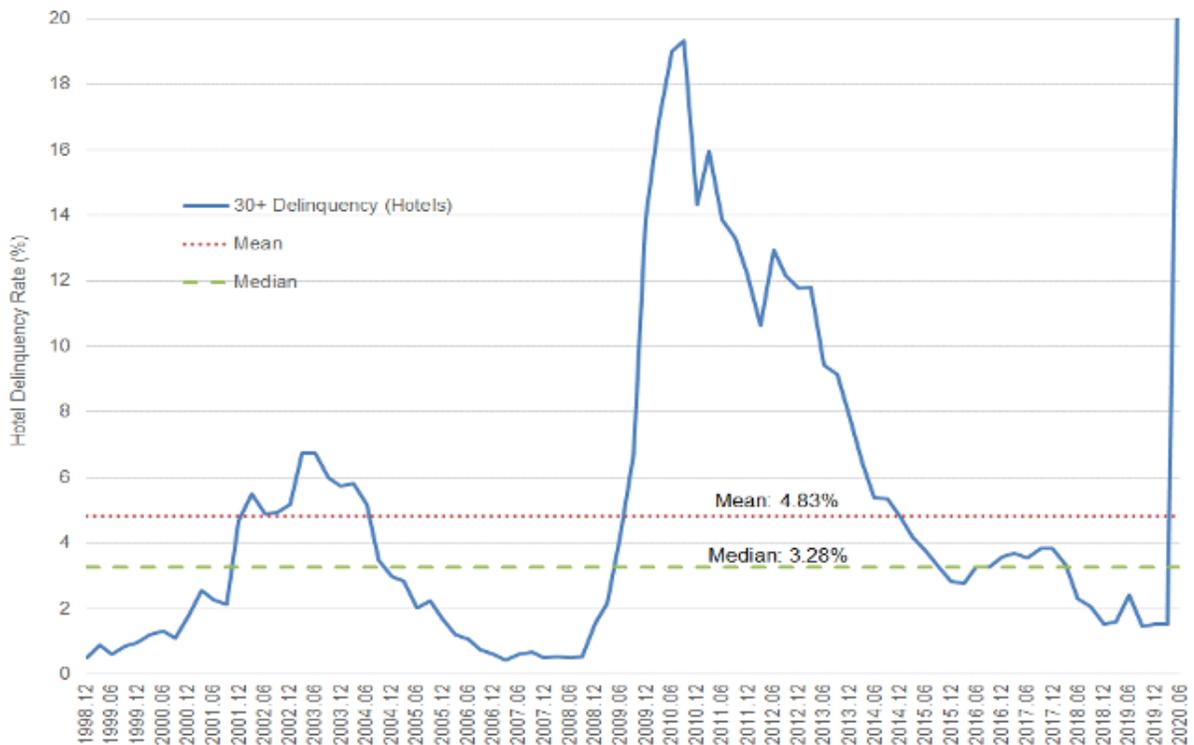
Interest rate spreads of hotels versus non-hotel commercial real estate



Source: Cushman Wakefield Sonnenblick Goldman

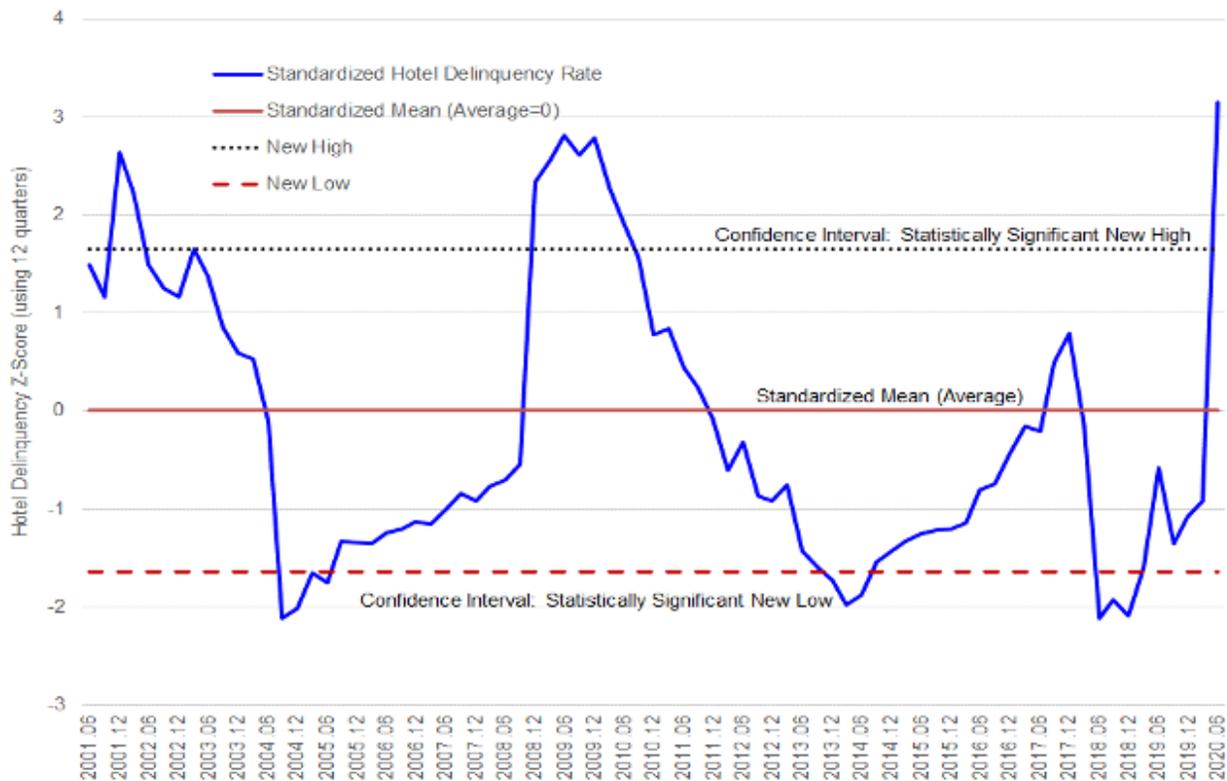
EXHIBIT 29

30-plus-day delinquency rate for hotels



Source: Trepp

Standardized 30-plus-day delinquency rate for hotels



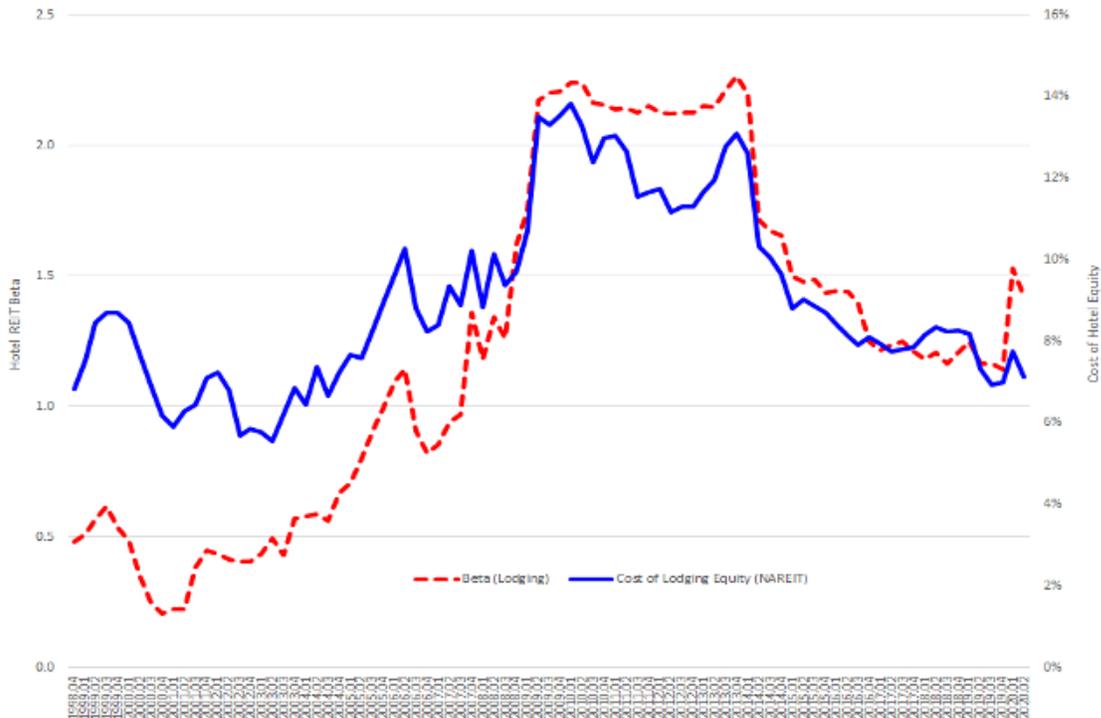
Source: Trepp

(non-hotel) commercial real estate. A positive spread associated with this hotel real-estate premium indicates that lenders demand more compensation to make hotel loans than on loans for other major property types, because hotels are perceived to be relatively riskier. The monthly hotel real estate premiums for both higher and lower quality properties. Class A premiums widened from .34 percent (34 bps) in the prior quarter to over 1.69 percent (169 bps). For Class B and C hotels, the spread widened from 39 basis points to 174 basis points. This signals that lenders perceive the default risk for hotel properties to be relatively high at the moment.

The delinquency rate on hotel loans has reached a new high. Along that line, the CMBS delinquency rate (30+ days) for lodging properties reached a new high of 24.3

percent in June, exceeding the previous high of 19.3 percent set in September 2010. This also exceeds the 19.1-percent hotel delinquency rate in May. For comparison purposes, the delinquency rate for retail real estate in June was 18.1 percent. The June delinquency rate for other property types reported by Trepp is as follows: Industrial, 1.57 percent; Multifamily, 3.29 percent; and Office, 2.66 percent. Exhibit 29 displays the historical 30-plus-day delinquency rate for hotels, while Exhibit 30 shows the standardized version of the 30-plus-day delinquency rate for hotels. Both exhibits reveal that the delinquency rate for hotels with loans securitized as part of CMBS deals are above their long-term average. If the indicator is above or below 1.645 (Z-score) then this indicates that the indicator has hit a statistically significant new high or low. In this case, we see a new low.

Cost of equity financing using the capital asset pricing model and hotel REITs



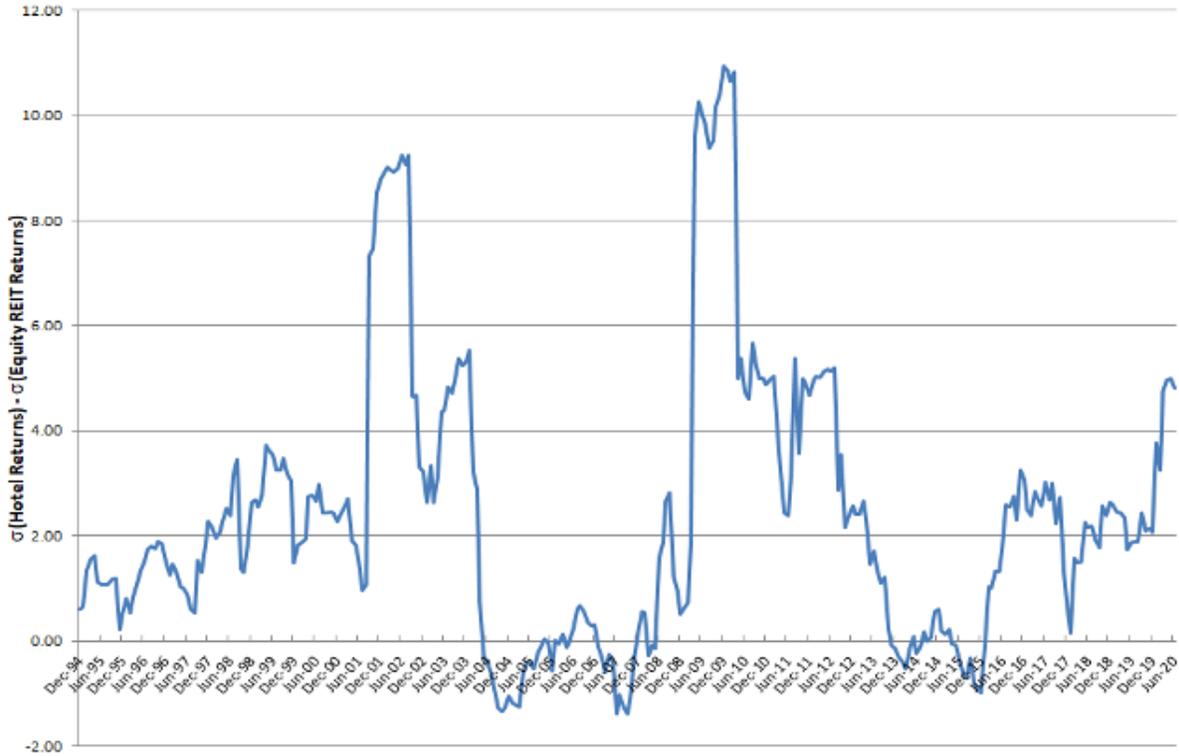
Sources: NAREIT, Cornell Center for Real Estate and Finance

Although the cost of equity financing is now lower, the riskiness of hotels has risen relative to other types of commercial real estate. The cost of using equity financing for hotels as measured using the capital asset pricing model (CAPM) on hotel REIT returns declined in June, as shown in Exhibit 31, making it theoretically cheaper to borrow from equity markets. The cost of using equity is currently 7.1 percent for 2020Q2 compared to 7.75 percent in the prior quarter, a drop of 65 bps. In terms of total risk (systematic risk + risk that is unique to hotel REITs), Exhibit 32 shows that the total risk of hotel REITs relative to the total risk of equity REITs dipped slightly this quarter (-3.6%), al-

though it increased 258.5 percent on a year-over-year basis. This indicates that the perceived default risk for hotels has widened relative to other types of commercial real estate consistent with our other hotel risk premium indicators.

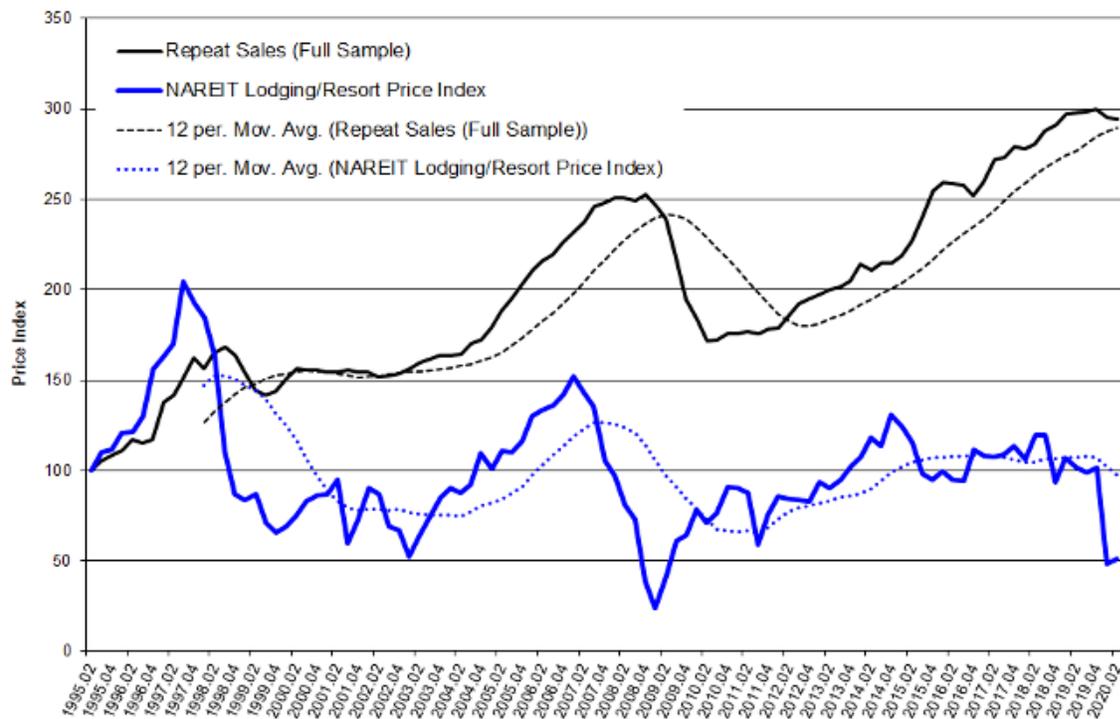
Our reading of the tea leaves suggests that the price of large hotels and small hotels should to continue to fall year over year. Exhibit 33 compares the performance of the repeat sales index relative to the NAREIT Lodging/Resort Price Index. Looking ahead, although the NAREIT lodging index rose 5.5 percent this quarter, it declined 50 percent year-over-year.

Risk differential between hotel REITs and equity REITs



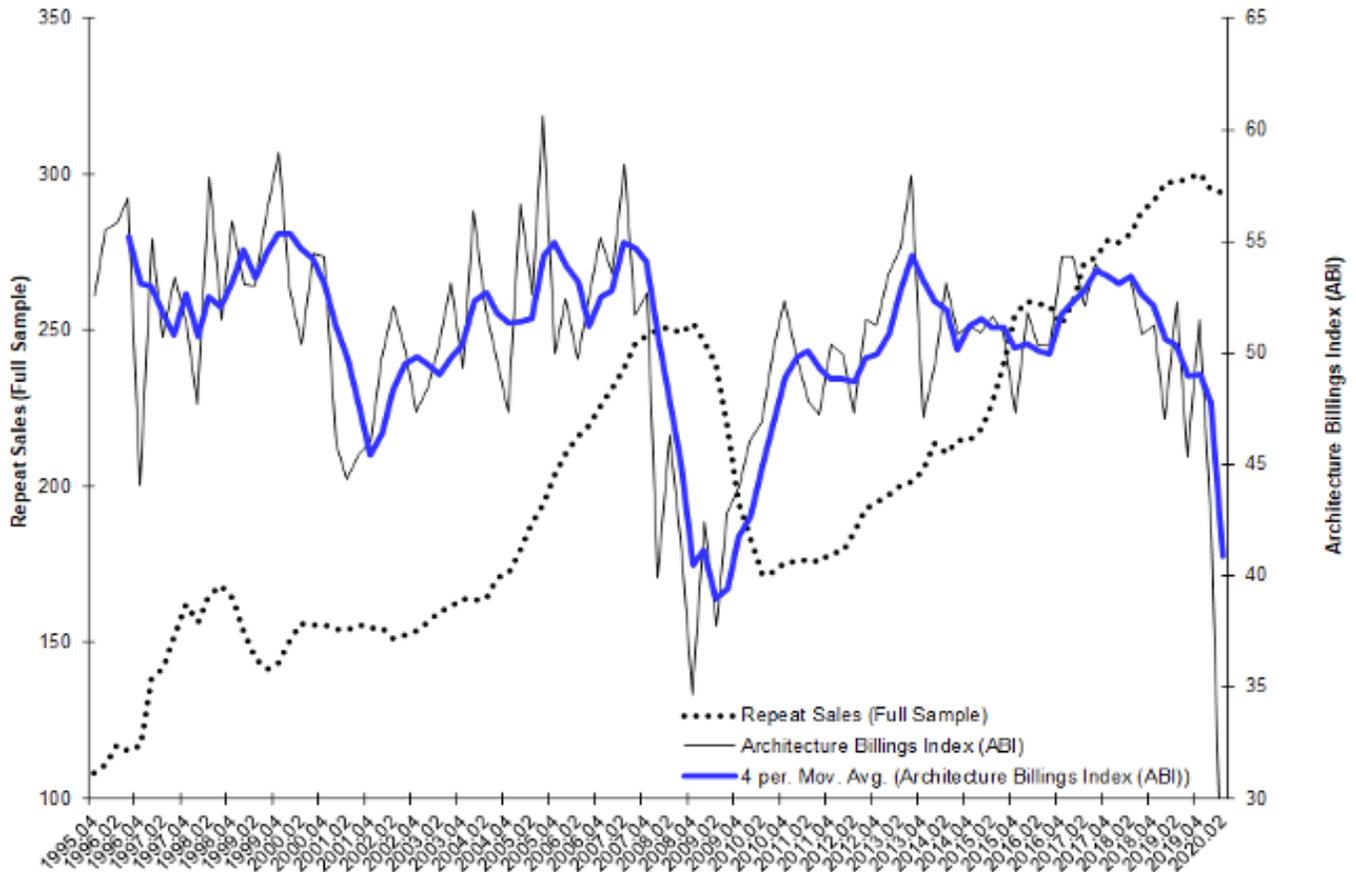
Sources: Cornell Center for Real Estate and Finance, NAREIT

Repeat sales index versus NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

Repeat sales index versus architectural billings index



Sources: American Institute of Architects, Cornell Center for Real Estate and Finance

The architecture billings index (ABI) for commercial and industrial property, shown in Exhibit 34, fell 41 percent this quarter (24.8 versus 41.9). Year over year, the ABI declined 53 percent.

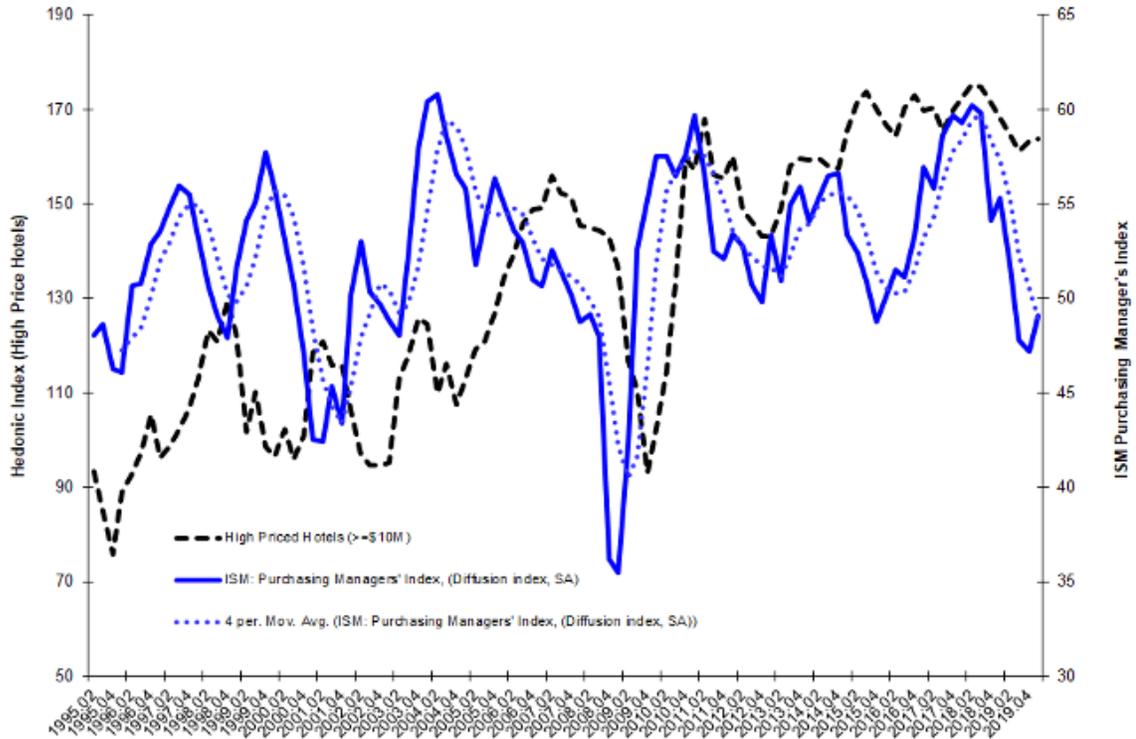
The National Association of Purchasing Managers (NAPM) index shown in Exhibit 35, which is an indicator of anticipated business confidence, rose 7.1 percent this quarter and increased 1.7 percent year over year. This

metric is one of the few that offers some hope for a quicker recovery, although it is still too early to call it a trend.

The Conference Board’s Consumer Confidence Index, graphed in Exhibit 36, which we use as a proxy for anticipated consumer demand for leisure travel and a leading indicator of the hedonic index for low-price hotels, fell 18 percent this quarter and also fell 19 percent year over year.

EXHIBIT 35

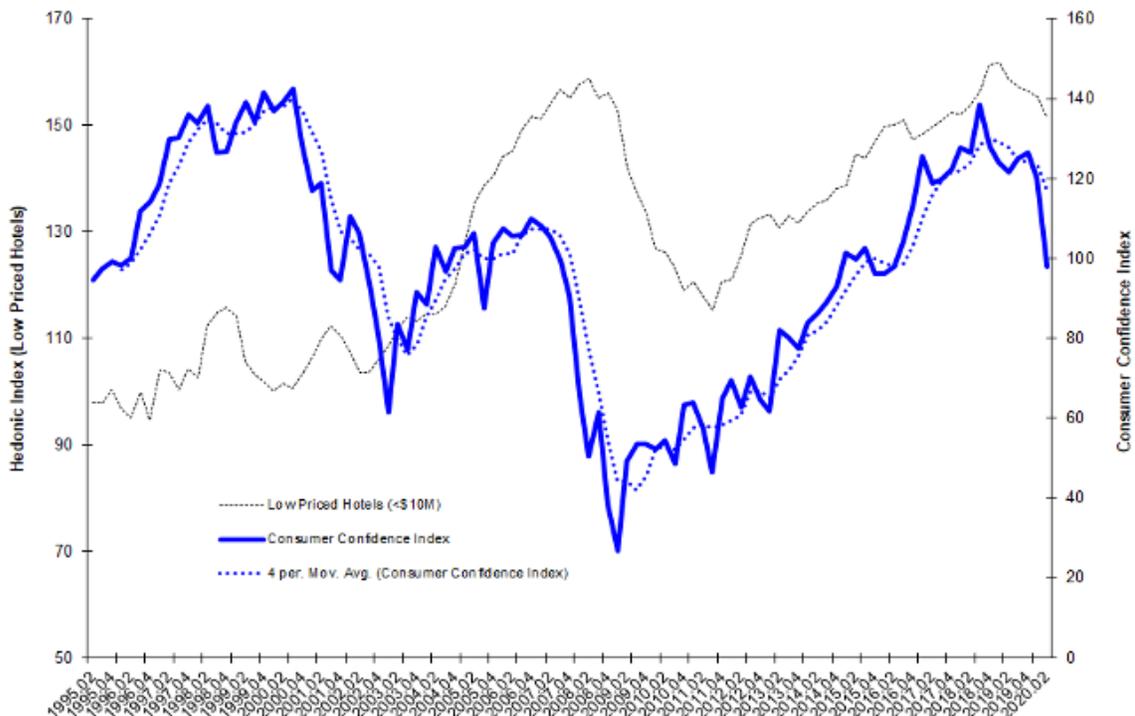
Business confidence and high-price hotels



: Cornell Center for Real Estate and Finance, Institute for Supply Management (ISM)

EXHIBIT 36

Consumer confidence and low-price hotels



Sources: Cornell Center for Real Estate and Finance, Conference Board

Analysts forecast of hotel REIT earnings

	AHT	CDOR	DRH	HT	HST	RHP	SOHO	SHO
Earnings								
E(QEPS)	-206.4%	-110.7%	-153.1%	-170.1%	-149.1%	-160.2%	-183.0%	-169.0%
E(EPS)	-22.8%	-129.2%	-110.0%	21.6%	-103.2%	-155.2%	108.9%	-155.6%
Revenue								
E(QRev)	-59.7%	-62.3%	-88.8%	-55.5%	-76.8%	-92.7%	-46.1%	-89.6%
E(ARev)	-36.7%	-35.2%	-40.1%	-28.2%	-49.0%	-56.5%	-66.1%	-51.3%

	Newer REITs								
	APLE	BHR	CLDT	CPLG	INN	PEB	PK	RLJ	XHR
Earnings									
E(QEPS)	-116.3%	-226.2%	-141.4%	-204.0%	-145.9%	-161.2%	-158.0%	-149.3%	-144.4%
E(EPS)	-72.7%	175.0%	-140.0%	-46.4%	-112.3%	-222.2%	-112.5%	-162.7%	-126.5%
Revenue									
E(QRev)	-71.9%	-56.5%	-50.3%	-45.2%	-78.7%	-92.0%	-81.2%	-73.4%	-67.6%
E(ARev)	-43.6%	-30.2%	-43.7%	-29.8%	-43.8%	-56.4%	-39.9%	-51.9%	-39.5%

	Median	Mean	StDev	Min	Max
Earnings					
E(QEPS)	-158.0%	-161.7%	0.3016	-226.2%	-110.7%
E(EPS)	-112.3%	-80.3%	1.0175	-222.2%	175.0%
Revenue					
E(QRev)	-71.9%	-69.9%	0.1608	-92.7%	-45.2%
E(ARev)	-43.6%	-43.6%	0.1049	-66.1%	-28.2%

Source: Cornell Center for Real Estate and Finance

Wall Street's view. Starting with this issue, we also look at Wall Street analysts' earnings estimates for hotel REITs, both in terms on next-quarter earnings per share (EPS) and also annual EPS. Exhibit 37 indicates that analysts are expecting quarterly EPS to decline between 158 percent (median) and 162 percent (mean) on average, with annual EPS falling 80 percent to 112 percent on average. Since analysts' estimates reflect the earnings guidance from management, this suggests that we should expect further price declines for the rest of 2020. ■

HOTEL VALUATION MODEL (HOTVAL) HAS BEEN UPDATED

We have updated our hotel valuation regression model to include the transaction data used to generate this report. We provide this user friendly hotel valuation model in an Excel spreadsheet entitled HOTVAL Toolkit as a complement to this report which is available for download from our [CREF website](#).

Appendix

SUP: The Standardized Unexpected Price Metric

The standardized unexpected price metric (SUP) is similar to the standardized unexpected earnings (SUE) indicator used to determine whether earnings surprises are statistically significant. An earnings surprise occurs when the firm's reported earnings per share deviates from the street estimate or the analysts' consensus forecast. To determine whether an earnings surprise is statistically significant, analysts use the following formula:

$$SUE_Q = (A_Q - m_Q)/s_Q$$

where SUE_Q = quarter Q standardized unexpected earnings,

A_Q = quarter Q actual earnings per share reported by the firm,

m_Q = quarter Q consensus earnings per share forecasted by analysts in quarter Q-1, and

s_Q = quarter Q standard deviation of earnings estimates.

From statistics, the SUE_Q is normally distributed with a mean of zero and a standard deviation of one ($\sim N(0,1)$). This calculation shows an earnings surprise when earnings are statistically significant, when SUE_Q exceeds either ± 1.645 (90% significant) or ± 1.96 (95% significant). The earnings surprise is positive when $SUE_Q > 1.645$, which is statistically significant at the 90% level assuming a two-tailed distribution. Similarly, if $SUE_Q < -1.645$ then earnings are negative, which is statistically significant at the 90% level. Intuitively, SUE measures the earnings surprise in terms of the number of standard deviations above or below the consensus earnings estimate.

From our perspective, using this measure complements our visual analysis of the movement of hotel prices relative to their three-year and five-year moving average (μ). What is missing in the visual analysis is whether prices diverge significantly from the moving average in statistical terms. In other words, we wish to determine whether the current price diverges at least one standard deviation from μ , the historical average price. The question we wish to answer is whether price is reverting to (or diverging from) the historical mean. More specifically, the question is whether this is price mean reverting.

To implement this model in our current context, we use the three- or five-year moving average as our measure of μ and the rolling three- or five-year standard deviation as our measure of σ . Following is an example of how to calculate the SUP metric using high price hotels with regard to their three-year moving average. To calculate the three-year moving average from quarterly data we sum 12 quarters of data then divide by 12:

$$\text{Average } (\mu) = \frac{(70.6+63.11+58.11+90.54+95.24+99.70 +108.38+99.66+101.62+105.34+109.53+115.78)}{12} = 93.13$$

$$\text{Standard Deviation } (\sigma) = 18.99$$

$$\text{Standardized Unexp Price (SUP)} = \frac{(115.78-93.13)}{18.99} = 1.19$$

SUP data and σ calculation for high-price hotels (12 quarters/3 years)				
Quarter	High-price hotels μ	Moving average	σ	Price surprise indicator (SUP)
1995.02	70.60			
1995.03	63.11			
1995.04	58.11			
1996.01	90.54			
1996.02	95.24			
1996.03	99.70			
1996.04	108.38			
1997.01	99.66			
1997.02	101.62			
1997.03	105.34			
1997.04	109.53			
1998.01	115.78	93.13	18.99	1.19
1998.02	126.74	97.81	19.83	1.46

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Steven Carvell, Arthur Adler '78 and Karen Newman Adler '78 Academic Director

Glenn Withiam, Contributing Editor

Kate Walsh, Dean, E.M. Statler Professor, School of Hotel Administration

Center for Real Estate and Finance

Cornell University

[Cornell SC Johnson College of Business](#)

School of Hotel Administration

Statler Hall

Ithaca, NY 14853

607-255-6025

www.cref.cornell.edu

Robert Springer '99

Executive Vice President,
Chief Investment Officer
Sunstone Hotel Investors

Alan Tantleff '87

Senior Managing Director—Corporate
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Hospitality Gaming and Leisure
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Linda Canina, Academic Director

Nicole McQuiddy-Davis, Assistant Program Manager
Glenn Withiam, Contributing Editor

Kate Walsh, Dean, E.M. Statler Professor,
School of Hotel Administration

The Center for Hospitality Research
School of Hotel Administration
Cornell SC Johnson College of Business
Cornell University
Statler Hall
Ithaca, NY 14853

607-254-4505
chr.cornell.edu

Jess Pettitt '05

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