

Cornell Hotel Indices: Fourth Quarter 2021

Converging Towards Normalcy

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

Executive Summary

Hotel prices continue to converge toward pre-pandemic levels. Gains posted were smaller relative to the previous quarter but higher year over year. Hotels in both gateway and non-gateway cities continue to exhibit positive performance, with hotels in non-gateway cities posting greater gains. Transaction volume continued strong for large and small hotels quarter over quarter and year over year, although the increase in volume was smaller in this instance than was the increase in the prior period. Our moving average trendlines indicate that large hotels are priced to buy, while small hotels are priced at market (priced fairly). Large hotels declined from their statistical high set last quarter, based on our standardized unexpected price (SUP) performance metric. In terms of financing hotels, mortgage financing volume continued to rise, as the cost of financing hotels slightly diminished this quarter. Among factors that have contributed to this situation are the relative risk premium, which has remained stationary this quarter, and a continued decline in the hotel delinquency rate. Hotel deals continue to look profitable, based on our economic value added (EVA) and shareholder value added (SVA) metrics. Looking toward the next quarter, our leading indicators of hotel price performance indicate that we should expect slower or declining price momentum for larger hotels but positive price gains for smaller hotels.

ABOUT THE AUTHORS



Crocker H. Liu, Ph.D., 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 *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 *Journal of Real Estate Finance and Economics*, *Journal of Property Research*, and *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.

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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



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Disclaimer

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Analysis of Indices through Q4, 2021

Hotels in all regions continue their positive price momentum. For the most recent quarter (2021Q4), Exhibits 1A through 1D show that all regions continued to regain ground lost prior to the initial onset of the pandemic. This is especially prominent in Exhibit 1D, which shows that all regions are either converging to their respective standardized mean of zero or have surpassed it. Quarter over quarter, Exhibit 1B shows that only the South Atlantic region continued to experience a double-digit price gain (10.7%). All other regions posted single-digit gains, except for the Mid-Atlantic region which posted a quarterly loss of 1.7 percent. However, the quarterly positive gains for all regions except the West South Central region were lower than the gains recorded in the prior quarter-over-quarter period. Year over year, the price paid for hotels increased in all regions except for the Mountain region (-3.7%). All regions except for the Midwest region experienced double-digit price gains. Compared to the prior year-over-year period, all regions fared better this period, consistent with our positive-price-momentum story.

EXHIBIT 1A

Time series hotel performance for seven regions

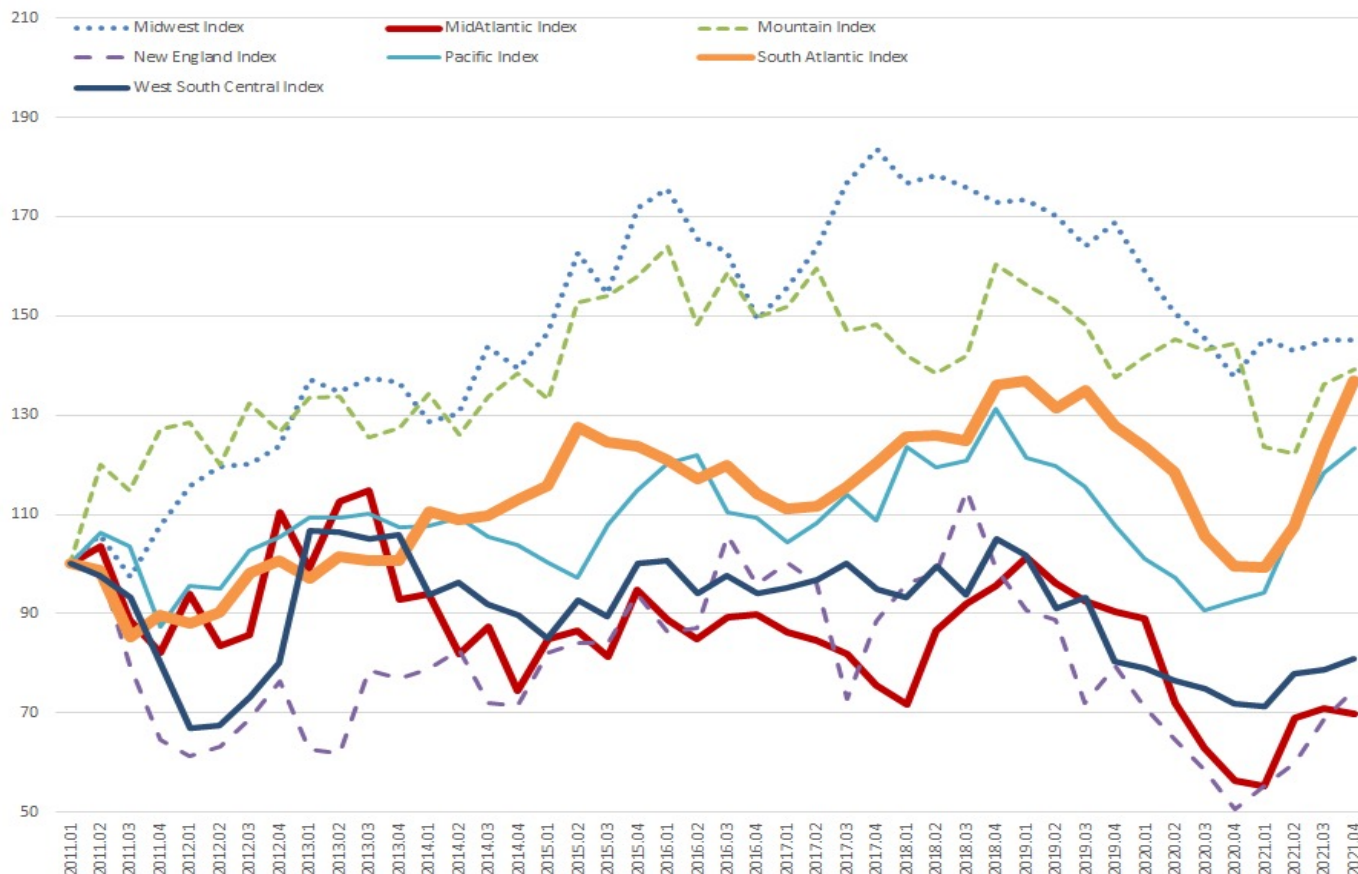
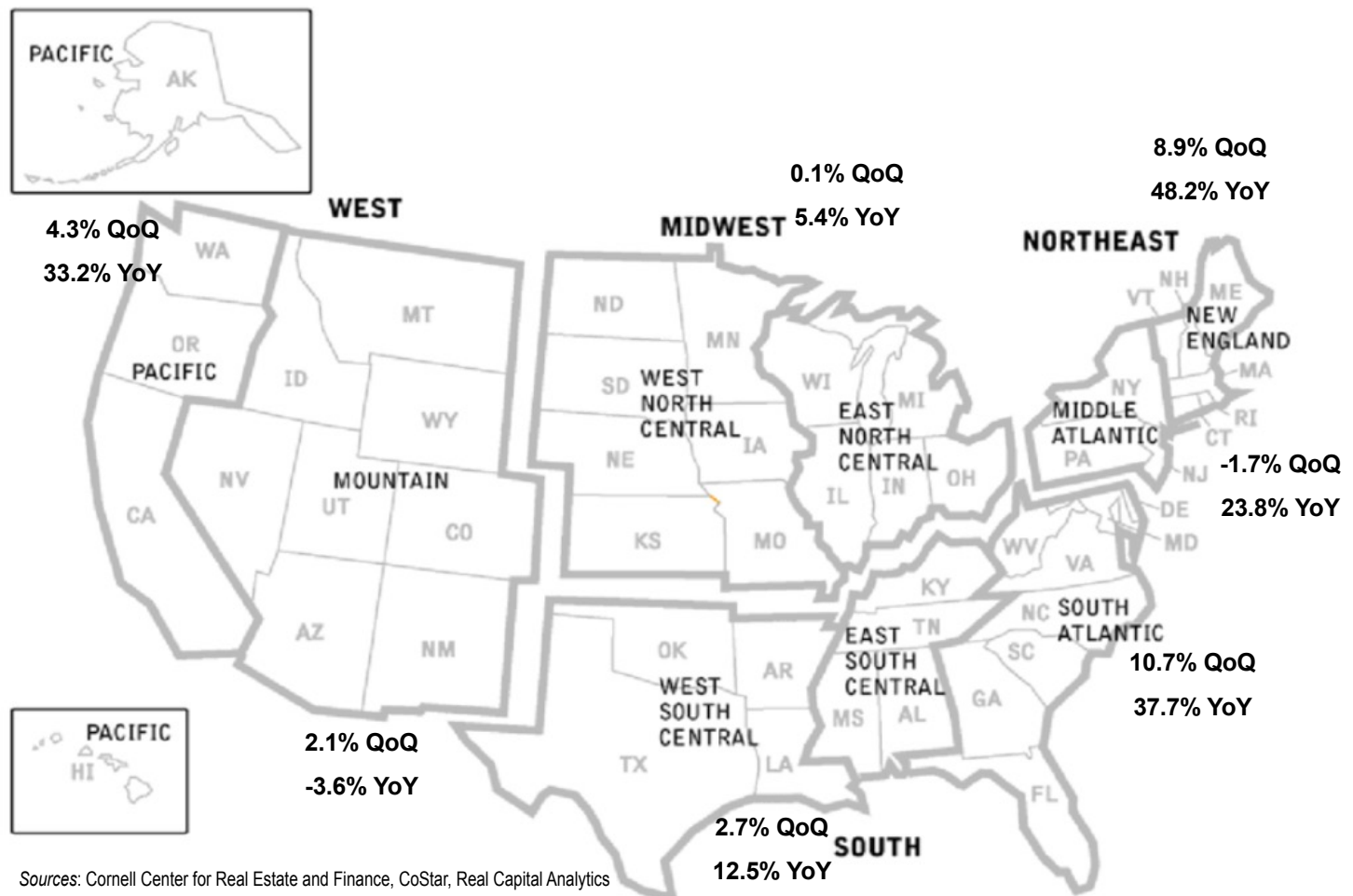


EXHIBIT 1b
Cross-section hotel performance for seven regions

EXHIBIT 1c
Changes in regional price indices, year over year and quarter over quarter

	Midwest	Mid-Atlantic	Mountain	New England	Pacific	South Atlantic	West South Central
YoY							
Current	5.45%	23.83%	-3.65%	48.21%	33.17%	37.73%	12.53%
Prior	-0.24%	12.75%	-4.79%	17.36%	30.71%	17.36%	5.26%
QoQ							
Current	0.06%	-1.66%	2.08%	8.89%	4.33%	10.66%	2.74%
Prior	1.49%	2.80%	11.65%	14.93%	9.26%	15.12%	1.16%

Note: Regions are as follows: **Middle Atlantic** region: New Jersey, New York, and Pennsylvania; **New England** region: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; **South Atlantic** region: Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia; **East South Central** region: Alabama, Kentucky, Mississippi, Tennessee; **East North Central** region: Illinois, Indiana, Michigan, Ohio, and Wisconsin; **Mountain** region: Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming; **West North Central** region: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; **Pacific**: Alaska, California, Hawaii, Oregon, and Washington.

Regional comparison of standardized unexpected prices (SUP), with confidence boundaries

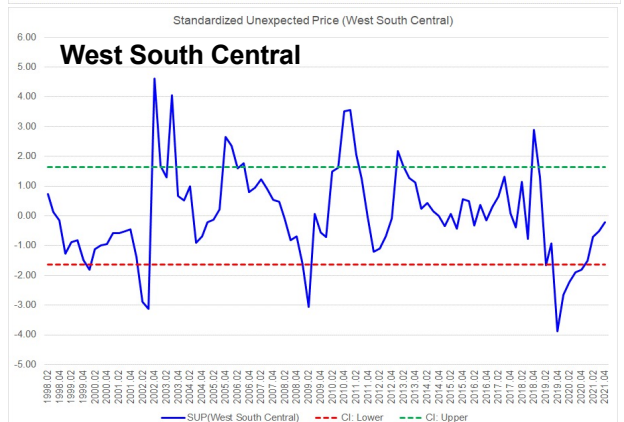
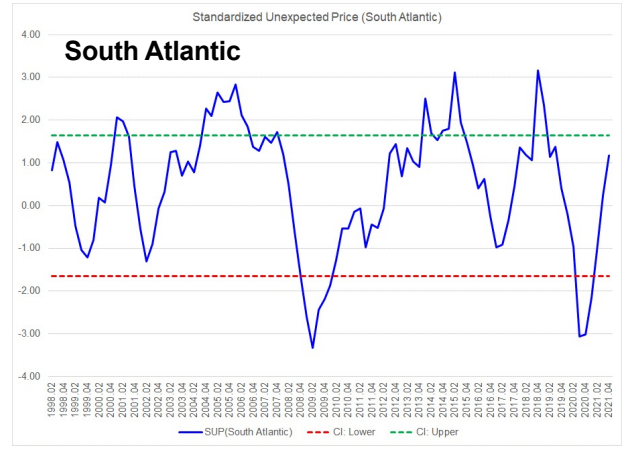
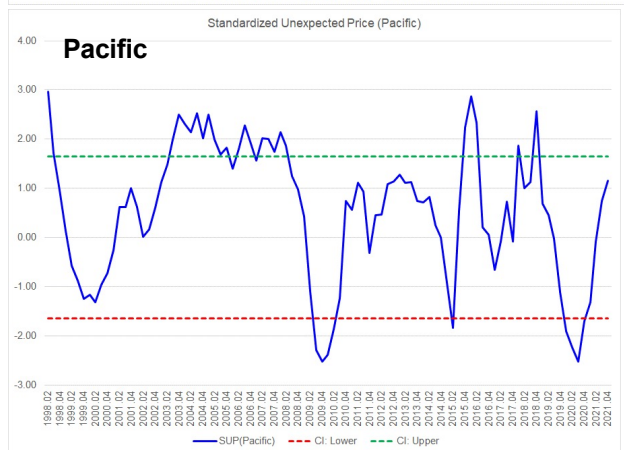
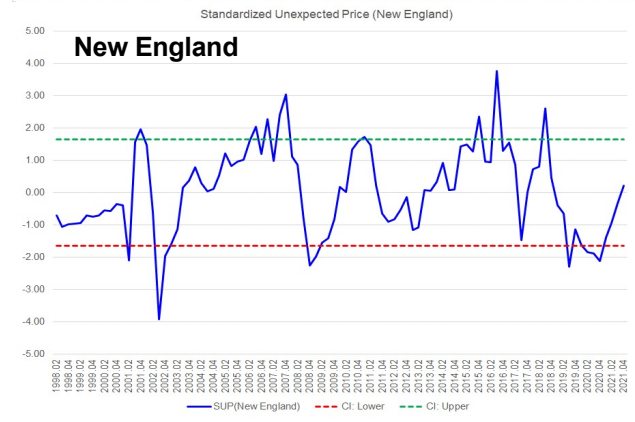
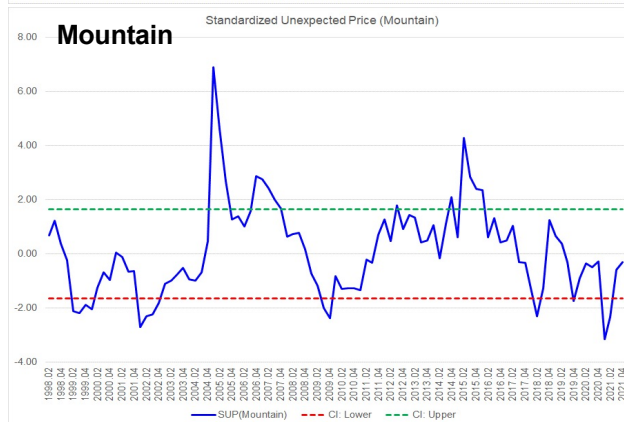
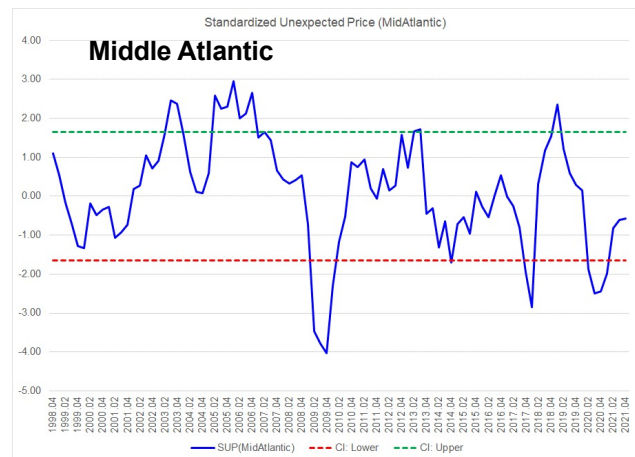
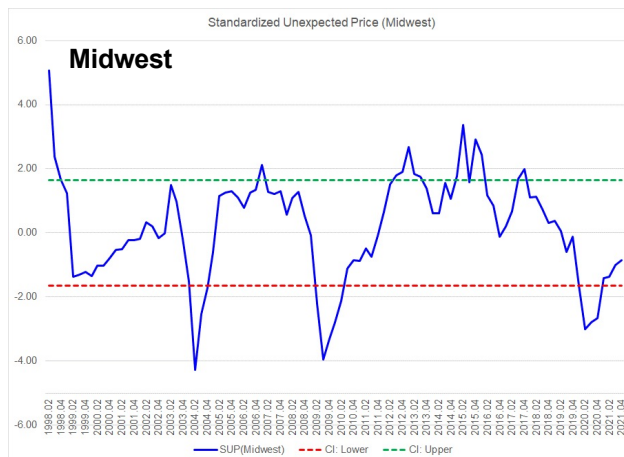
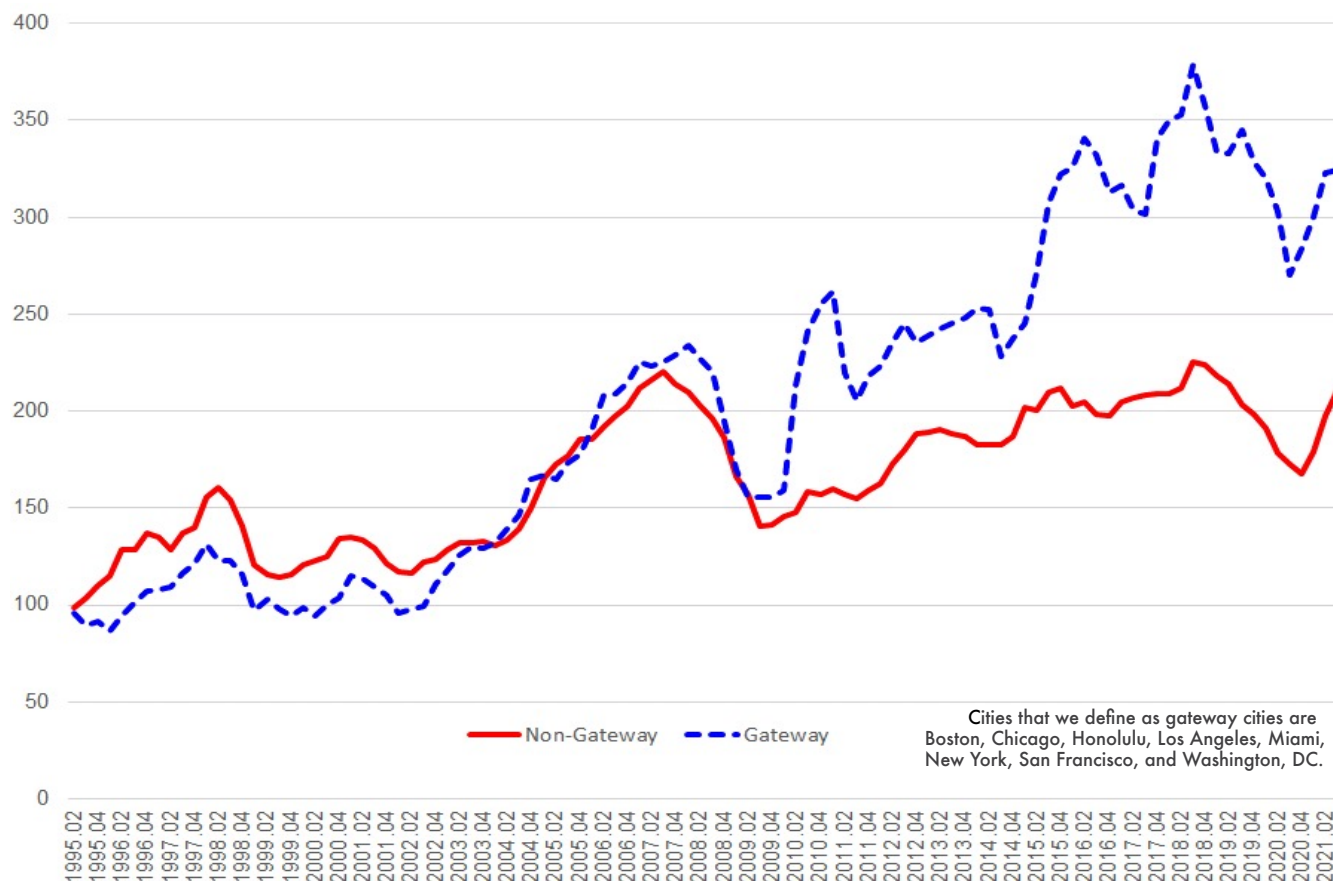


EXHIBIT 2

Hotel performance for gateway cities versus non-gateway cities



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

Hotels in both gateway and non-gateway cities exhibit positive performance, with hotels in non-gateway cities posting higher gains. Exhibit 2 shows that there was little price movement for hotels in gateway cities this quarter (.5%) compared to last quarter (7.4%). That finding stands in contrast to the experience of non-gateway city hotels, where prices rose 6.5 percent this quarter (albeit this increase was lower than the gain of 10.1 percent in the prior quarter). Year over year, the price of hotels in both gateway and non-gateway cities increased over 20 percent, with gateway cities experiencing a price appreciation of 20.1 percent compared to a 21.5-percent gain in non-gateway cities. These increases exceeded the change in hotel prices in the prior period for both gateway cities (6.5%) and non-gateway cities (10.6%).

Transaction volume continues to be strong for both large and small hotels year over year and quarter over quarter. The transaction volume on all hotel transactions

(that is, large hotels and small hotels combined) rose 10 percent this quarter, compared to 29 percent in the prior quarter, as shown in Exhibits 3A, 3B, and 3C.¹ Year over year, while transaction volume continued strong, increasing 100 percent, this increase was smaller than the volume growth in the prior period, which was 159 percent. Separating transactions by hotel size, transaction volume rose 182 percent year over year and 10 percent quarter over quarter for large hotels, while the transaction volume for smaller hotels increased 82 percent year over year and 10 percent quarter over quarter. These increases were smaller than the year-over-year and quarter-over-quarter gains posted in the prior period. Exhibit 4 and Exhibit 5 show the year-over-year trends in the number of transactions for large hotels and small hotels.

¹ Note that the number of transactions is limited to the sales that are included in the hedonic index. As such, it should not be construed necessarily as being representative of the total market activity.

Transaction volume (observed) and median sale price (1995–2003)

Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
1995	1	\$2,357,500	20	NA	0	0.00%	\$2,357,500	20	100.00%	\$3,400,000	7	35.00%	\$2,100,000	13	65.00%
1995	2	\$3,150,000	29	\$15,712,500	6	20.68%	\$2,670,000	23	79.31%	\$3,800,000	12	41.37%	\$2,906,150	17	58.62%
1995	3	\$2,562,500	44	\$12,400,000	4	9.09%	\$2,378,000	40	90.90%	\$3,500,000	20	45.45%	\$2,000,000	24	54.54%
1995	4	\$3,400,000	41	\$27,750,000	10	24.39%	\$2,625,000	31	75.60%	\$5,075,000	14	34.14%	\$3,100,000	27	65.85%
1996	1	\$2,500,000	39	\$14,475,000	8	20.51%	\$1,700,000	31	79.48%	\$2,500,000	13	33.33%	\$2,687,500	26	66.66%
1996	2	\$2,925,000	43	\$29,150,000	12	27.90%	\$2,500,000	31	72.09%	\$3,200,000	15	34.88%	\$2,730,000	28	65.11%
1996	3	\$6,500,000	57	\$17,740,000	20	35.08%	\$3,000,000	37	64.91%	\$5,500,000	25	43.85%	\$6,890,500	32	56.14%
1996	4	\$2,735,000	58	\$19,000,000	17	29.31%	\$2,200,000	41	70.68%	\$4,650,000	27	46.55%	\$2,400,000	31	53.44%
1997	1	\$5,053,250	74	\$16,635,500	23	31.08%	\$3,500,000	51	68.91%	\$6,300,000	29	39.18%	\$4,075,000	45	60.81%
1997	2	\$2,862,500	72	\$17,750,000	17	23.61%	\$2,150,000	55	76.38%	\$2,445,000	24	33.33%	\$3,047,350	48	66.66%
1997	3	\$3,437,500	90	\$19,000,000	21	23.33%	\$2,400,000	69	76.66%	\$5,140,000	38	42.22%	\$2,550,000	52	57.77%
1997	4	\$4,330,950	78	\$17,000,000	27	34.61%	\$2,300,000	51	65.38%	\$10,435,445	27	34.61%	\$3,600,000	51	65.38%
1998	1	\$4,698,800	92	\$20,000,000	31	33.69%	\$3,100,000	61	66.30%	\$6,353,000	33	35.86%	\$4,600,000	59	64.13%
1998	2	\$3,630,000	96	\$23,765,000	21	21.87%	\$3,000,000	75	78.12%	\$3,998,240	28	29.16%	\$3,575,000	68	70.83%
1998	3	\$2,961,059	92	\$16,740,000	12	13.04%	\$2,690,550	80	86.95%	\$2,255,000	30	32.60%	\$3,365,000	62	67.39%
1998	4	\$2,550,000	84	\$35,000,000	15	17.85%	\$2,375,000	69	82.14%	\$4,225,000	30	35.71%	\$2,500,000	54	64.28%
1999	1	\$2,425,000	88	\$24,638,095	10	11.36%	\$2,125,000	78	88.63%	\$3,500,000	32	36.36%	\$2,300,000	56	63.63%
1999	2	\$2,100,000	95	\$67,000,000	5	5.26%	\$1,950,000	90	94.73%	\$2,067,500	28	29.47%	\$2,100,000	67	70.52%
1999	3	\$2,500,000	99	\$20,711,100	10	10.10%	\$2,130,000	89	89.89%	\$1,800,000	19	19.19%	\$2,522,500	80	80.80%
1999	4	\$2,440,000	87	\$18,190,000	14	16.09%	\$2,090,000	73	83.90%	\$2,210,000	23	26.43%	\$2,575,000	64	73.56%
2000	1	\$2,400,000	110	\$23,253,895	10	9.09%	\$2,300,000	100	90.90%	\$2,325,000	44	40.00%	\$2,428,500	66	60.00%
2000	2	\$2,450,000	88	\$14,500,000	9	10.22%	\$2,275,000	79	89.77%	\$2,325,000	24	27.27%	\$2,450,000	64	72.72%
2000	3	\$2,600,000	95	\$20,346,875	16	16.84%	\$2,250,000	79	83.15%	\$2,925,000	24	25.26%	\$2,525,000	71	74.73%
2000	4	\$2,475,000	101	\$18,050,000	14	13.86%	\$2,300,000	87	86.13%	\$4,500,000	26	25.74%	\$2,350,000	75	74.25%
2001	1	\$2,970,650	104	\$28,437,500	18	17.30%	\$2,422,500	86	82.69%	\$2,650,000	29	27.88%	\$3,000,000	75	72.11%
2001	2	\$2,800,000	110	\$23,795,000	12	10.90%	\$2,687,150	98	89.09%	\$5,825,000	25	22.72%	\$2,684,300	85	77.27%
2001	3	\$2,700,000	87	\$16,000,000	6	6.89%	\$2,500,000	81	93.10%	\$3,150,000	21	24.13%	\$2,600,000	66	75.86%
2001	4	\$2,400,000	73	\$20,500,000	5	6.84%	\$2,300,000	68	93.15%	\$2,800,000	17	23.28%	\$2,300,000	56	76.71%
2002	1	\$2,125,000	70	\$11,518,052	5	7.14%	\$2,000,000	65	92.85%	\$1,700,000	17	24.28%	\$2,200,000	53	75.71%
2002	2	\$2,400,000	106	\$18,125,000	10	9.43%	\$2,287,500	96	90.56%	\$3,125,000	33	31.13%	\$2,300,000	73	68.86%
2002	3	\$2,355,400	81	\$12,750,000	5	6.17%	\$2,237,500	76	93.82%	\$2,197,500	24	29.62%	\$2,470,000	57	70.37%
2002	4	\$2,907,500	100	\$23,500,000	16	16.00%	\$2,575,000	84	84.00%	\$2,907,500	34	34.00%	\$2,862,500	66	66.00%
2003	1	\$2,530,000	94	\$13,000,000	9	9.57%	\$2,425,000	85	90.42%	\$3,850,000	21	22.34%	\$2,425,000	73	77.65%
2003	2	\$2,750,000	110	\$18,500,000	10	9.09%	\$2,509,500	100	90.90%	\$3,160,000	31	28.18%	\$2,600,000	79	71.81%
2003	3	\$3,333,000	141	\$14,359,286	28	19.85%	\$2,600,000	113	80.14%	\$3,660,000	45	31.91%	\$3,032,500	96	68.08%
2003	4	\$2,600,000	149	\$16,375,000	18	12.08%	\$2,425,000	131	87.91%	\$2,950,000	35	23.48%	\$2,500,000	114	76.51%

Transaction volume (observed) and median sale price (continued, 2004–2012)

Year	Qtr	Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2004	1	\$2,925,000	166	\$22,875,250	24	14.45%	\$2,536,756	142	85.54%	\$3,450,000	41	24.69%	\$2,894,000	125	75.30%
2004	2	\$2,700,000	195	\$16,280,000	28	14.35%	\$2,450,000	167	85.64%	\$4,500,000	39	20.00%	\$2,540,000	156	80.00%
2004	3	\$3,491,122	216	\$19,350,000	45	20.83%	\$2,610,000	171	79.16%	\$4,600,000	51	23.61%	\$3,306,500	165	76.38%
2004	4	\$4,000,000	177	\$20,475,000	47	26.55%	\$3,085,500	130	73.44%	\$8,850,000	36	20.33%	\$3,600,000	141	79.66%
2005	1	\$4,330,000	231	\$18,100,000	52	22.51%	\$3,300,000	179	77.48%	\$6,687,500	40	17.31%	\$3,800,000	191	82.68%
2005	2	\$4,566,250	316	\$18,956,812	78	24.68%	\$3,255,150	238	75.31%	\$6,475,000	68	21.51%	\$4,385,000	248	78.48%
2005	3	\$4,150,000	273	\$21,475,000	72	26.37%	\$3,100,000	201	73.62%	\$6,100,000	61	22.34%	\$3,750,000	212	77.65%
2005	4	\$4,425,000	300	\$25,000,000	93	31.00%	\$3,150,000	207	68.99%	\$11,200,000	65	21.66%	\$4,000,000	235	78.33%
2006	1	\$5,300,000	301	\$25,750,000	92	30.56%	\$3,800,000	209	69.43%	\$18,000,000	64	21.26%	\$4,943,744	237	78.73%
2006	2	\$4,750,000	313	\$22,750,000	82	26.19%	\$3,500,000	231	73.80%	\$6,175,000	56	17.89%	\$4,500,000	257	82.10%
2006	3	\$5,000,000	285	\$22,500,000	86	30.17%	\$3,650,000	199	69.82%	\$7,000,000	59	20.70%	\$4,705,399	226	79.29%
2006	4	\$4,587,500	248	\$21,200,000	65	26.20%	\$3,550,000	183	73.79%	\$8,093,750	56	22.58%	\$4,270,000	192	77.41%
2007	1	\$6,155,805	286	\$21,225,000	104	36.36%	\$3,700,000	182	63.63%	\$9,500,000	63	22.02%	\$5,700,000	223	77.97%
2007	2	\$5,650,000	385	\$25,125,000	120	31.16%	\$3,750,000	265	68.83%	\$9,000,000	67	17.40%	\$5,450,000	318	82.59%
2007	3	\$5,450,000	330	\$20,100,161	105	31.81%	\$3,900,000	225	68.18%	\$8,325,000	53	16.06%	\$5,011,554	277	83.93%
2007	4	\$4,680,000	249	\$23,250,000	86	34.53%	\$3,150,000	163	65.46%	\$9,375,000	36	14.45%	\$4,500,000	213	85.54%
2008	1	\$5,000,000	255	\$16,000,000	61	23.92%	\$3,985,000	194	76.07%	\$5,990,000	46	18.03%	\$4,650,000	209	81.96%
2008	2	\$5,062,900	228	\$22,150,000	50	21.92%	\$3,890,000	178	78.07%	\$8,725,000	38	16.66%	\$4,800,000	190	83.33%
2008	3	\$4,190,500	172	\$17,133,333	37	21.51%	\$3,350,000	135	78.48%	\$5,500,000	27	15.69%	\$3,900,000	145	84.30%
2008	4	\$4,050,000	159	\$18,850,000	32	20.12%	\$3,500,000	127	79.87%	\$4,972,500	27	16.98%	\$3,920,000	132	83.01%
2009	1	\$4,150,000	81	\$15,800,000	15	18.51%	\$3,600,000	66	81.48%	\$7,375,000	16	19.75%	\$3,700,000	65	80.24%
2009	2	\$3,090,231	86	\$14,722,500	11	12.79%	\$2,864,310	75	87.20%	\$5,410,250	16	18.60%	\$3,000,000	70	81.39%
2009	3	\$3,400,000	90	\$22,000,000	16	17.77%	\$3,000,000	74	82.22%	\$4,608,750	14	15.55%	\$3,195,271	76	84.44%
2009	4	\$3,562,500	84	\$14,100,000	14	16.66%	\$3,010,250	70	83.33%	\$4,520,000	12	14.28%	\$3,400,000	72	85.71%
2010	1	\$3,900,000	89	\$20,162,500	18	20.22%	\$2,825,000	71	79.77%	\$8,450,000	15	16.85%	\$3,825,000	74	83.14%
2010	2	\$3,700,000	138	\$30,833,449	34	24.63%	\$3,000,000	104	75.36%	\$15,400,000	34	24.63%	\$3,100,000	104	75.36%
2010	3	\$4,912,500	120	\$35,500,000	46	38.33%	\$2,850,000	74	61.66%	\$25,000,000	37	30.83%	\$3,117,000	83	69.16%
2010	4	\$3,988,800	100	\$30,353,182	38	38.00%	\$2,420,000	62	62.00%	\$38,500,000	23	23.00%	\$3,265,000	77	77.00%
2011	1	\$4,200,000	85	\$34,050,000	24	28.23%	\$2,795,500	61	71.76%	\$12,275,000	15	17.64%	\$3,775,000	70	82.35%
2011	2	\$4,200,000	97	\$51,200,000	31	31.95%	\$2,250,000	66	68.04%	\$15,600,000	23	23.71%	\$3,175,000	74	76.28%
2011	3	\$3,350,000	73	\$23,772,500	20	27.39%	\$2,800,000	53	72.60%	\$3,700,000	17	23.28%	\$3,275,000	56	76.71%
2011	4	\$5,000,000	157	\$32,400,000	43	27.38%	\$3,229,250	114	72.61%	\$10,950,000	34	21.65%	\$4,300,000	123	78.34%
2012	1	\$5,233,961	131	\$22,100,000	40	30.53%	\$3,275,000	91	69.46%	\$13,837,500	28	21.37%	\$4,200,000	103	78.62%
2012	2	\$4,000,000	209	\$17,000,000	61	29.18%	\$2,779,500	148	70.81%	\$15,900,000	22	10.52%	\$3,700,000	187	89.47%
2012	3	\$7,000,000	169	\$19,100,000	67	39.64%	\$2,720,250	102	60.35%	\$16,050,000	32	18.93%	\$5,250,000	137	81.06%
2012	4	\$5,622,500	207	\$24,866,613	74	35.74%	\$3,125,000	133	64.25%	\$16,174,794	39	18.84%	\$5,070,000	168	81.15%

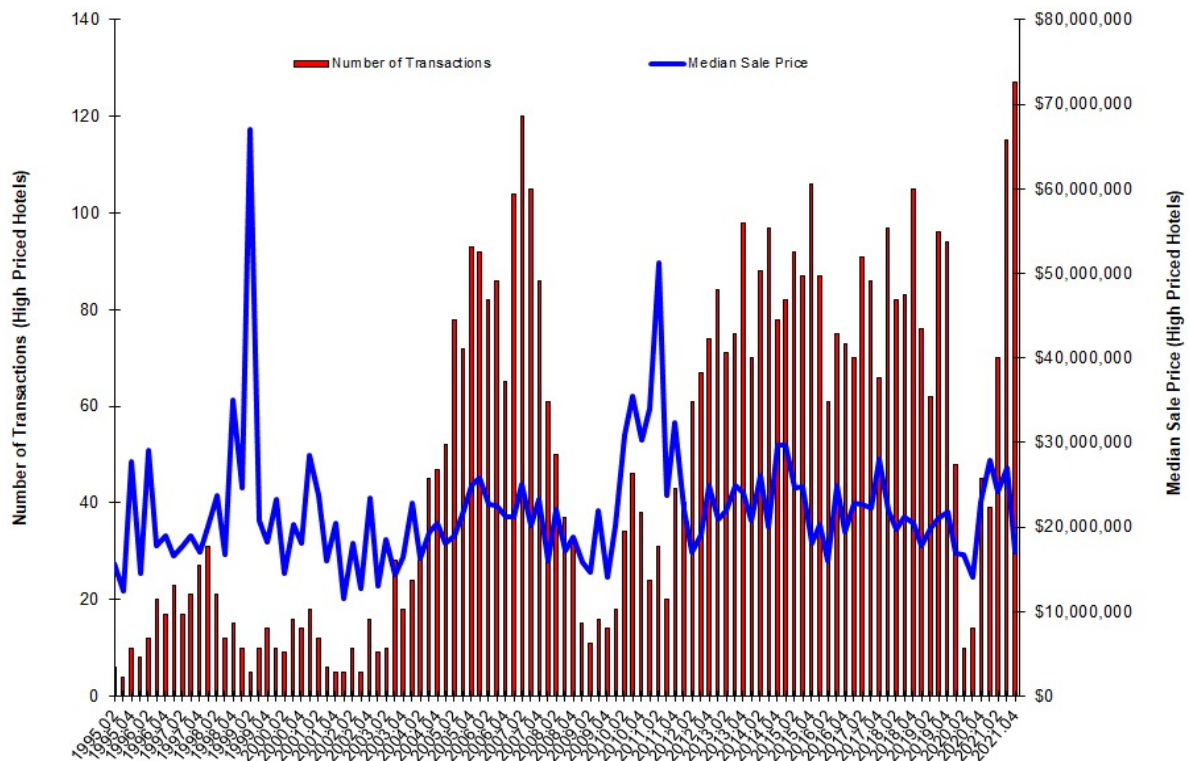
Transaction volume (observed) and median sale price (concluded, 2013–2021)

Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2013	1	\$5,997,496	238	\$20,927,291	84	35.29%	\$2,962,500	154	64.70%	\$6,500,000	51	21.42%	\$5,575,000	187	78.57%
2013	2	\$4,700,000	217	\$22,000,000	71	32.71%	\$2,500,000	146	67.28%	\$16,000,000	38	17.51%	\$4,200,000	179	82.48%
2013	3	\$5,260,855	246	\$25,000,000	75	30.48%	\$3,300,000	171	69.51%	\$9,949,500	35	14.22%	\$4,750,000	211	85.77%
2013	4	\$4,537,500	314	\$24,000,000	98	31.21%	\$2,790,000	216	68.78%	\$13,500,000	55	17.51%	\$4,000,000	259	82.48%
2014	1	\$5,625,000	228	\$20,750,000	70	30.70%	\$3,300,000	158	69.29%	\$8,825,900	59	25.87%	\$5,000,000	169	74.12%
2014	2	\$4,300,000	320	\$26,125,000	88	27.50%	\$2,818,750	232	72.50%	\$11,200,000	59	18.43%	\$3,700,000	261	81.56%
2014	3	\$5,500,000	351	\$20,000,000	97	27.63%	\$3,425,000	254	72.36%	\$10,567,078	66	18.80%	\$5,000,000	285	81.19%
2014	4	\$4,550,000	310	\$29,625,000	78	25.16%	\$3,107,500	232	74.83%	\$8,225,000	72	23.22%	\$3,950,000	238	76.77%
2015	1	\$5,900,000	253	\$29,750,000	82	32.41%	\$3,150,000	171	67.58%	\$8,280,000	47	18.57%	\$5,500,000	206	81.42%
2015	2	\$6,350,000	268	\$24,575,000	92	34.32%	\$3,250,000	176	65.67%	\$18,765,000	46	17.16%	\$5,612,500	222	82.83%
2015	3	\$5,050,000	299	\$24,800,000	87	29.09%	\$3,012,500	212	70.90%	\$12,100,000	53	17.72%	\$4,275,000	246	82.27%
2015	4	\$6,650,000	292	\$18,080,000	106	36.30%	\$3,125,000	186	63.69%	\$14,415,000	51	17.46%	\$5,400,000	241	82.53%
2016	1	\$5,600,000	293	\$20,375,000	87	29.69%	\$3,350,000	206	70.30%	\$13,600,000	45	15.35%	\$5,275,000	248	84.64%
2016	2	\$4,100,000	322	\$16,000,000	61	18.94%	\$3,300,000	261	81.05%	\$11,600,000	48	14.90%	\$3,725,000	274	85.09%
2016	3	\$4,862,500	284	\$25,000,000	75	26.40%	\$3,200,000	209	73.59%	\$24,500,000	34	11.97%	\$4,362,500	250	88.02%
2016	4	\$4,000,000	263	\$19,480,000	73	27.75%	\$2,800,000	190	72.24%	\$13,352,600	28	10.64%	\$3,664,706	235	89.35%
2017	1	\$5,275,000	254	\$22,880,750	70	27.55%	\$3,600,000	184	72.44%	\$14,726,254	28	11.02%	\$4,950,000	226	88.97%
2017	2	\$5,100,000	331	\$22,660,000	91	27.49%	\$3,325,000	240	72.50%	\$16,450,000	37	11.17%	\$4,462,500	294	88.82%
2017	3	\$5,000,000	323	\$22,250,000	86	26.62%	\$3,375,000	237	73.37%	\$22,250,000	38	11.76%	\$4,500,000	285	88.23%
2017	4	\$4,500,000	265	\$28,000,000	66	24.90%	\$2,875,000	199	75.09%	\$12,208,000	26	9.81%	\$4,250,000	239	90.18%
2018	1	\$5,500,000	310	\$21,882,400	97	31.29%	\$3,500,000	213	68.70%	\$14,750,000	40	12.90%	\$5,000,000	270	87.09%
2018	2	\$4,805,200	366	\$19,750,000	82	22.40%	\$3,300,000	284	77.59%	\$17,625,000	40	10.92%	\$4,300,000	326	89.07%
2018	3	\$5,125,000	334	\$21,265,000	83	24.85%	\$3,710,000	251	75.14%	\$13,342,500	22	6.58%	\$5,000,000	312	93.41%
2018	4	\$6,490,000	279	\$20,500,000	105	37.63%	\$3,300,000	174	62.36%	\$14,440,000	33	11.82%	\$5,580,556	246	88.17%
2019	1	\$5,350,000	289	\$17,802,698	76	26.29%	\$3,550,000	213	73.70%	\$15,750,000	34	11.76%	\$4,800,000	255	88.23%
2019	2	\$4,045,000	332	\$19,848,485	62	18.67%	\$3,372,500	270	81.32%	\$6,300,000	35	10.54%	\$3,900,000	297	89.45%
2019	3	\$4,707,500	402	\$21,000,000	96	23.88%	\$3,500,000	306	76.11%	\$15,850,000	42	10.44%	\$4,362,500	360	89.55%
2019	4	\$4,950,000	383	\$21,855,650	94	24.54%	\$3,300,000	289	75.45%	\$11,000,000	35	9.13%	\$4,600,000	340	88.77%
2020	1	\$4,100,000	306	\$16,900,000	48	15.68%	\$3,470,000	258	84.31%	\$6,313,000	22	7.18%	\$4,095,000	284	92.81%
2020	2	\$3,380,000	80	\$16,787,500	10	12.50%	\$2,515,000	70	87.50%	\$6,700,000	7	8.75%	\$3,360,000	73	91.25%
2020	3	\$2,800,000	173	\$14,062,500	14	8.09%	\$2,600,000	159	91.90%	\$7,219,750	12	6.93%	\$2,667,500	161	93.06%
2020	4	\$3,600,000	246	\$23,053,000	45	18.29%	\$2,750,000	201	81.70%	\$10,725,000	36	14.63%	\$3,000,000	210	85.36%
2021	1	\$3,975,750	216	\$27,900,000	39	18.05%	\$3,200,000	177	81.94%	\$11,431,000	20	9.25%	\$3,754,500	196	90.74%
2021	2	\$3,500,000	347	\$24,226,000	70	20.17%	\$2,900,000	277	79.82%	\$9,675,000	34	9.79%	\$3,375,000	313	90.20%
2021	3	\$4,350,000	448	\$27,000,000	115	25.66%	\$3,125,000	333	74.33%	\$33,820,000	38	8.48%	\$4,000,000	410	91.51%
2021	4	\$4,750,000	493	\$17,100,000	127	25.76%	\$3,300,000	366	74.23%	\$9,687,500	36	7.30%	\$4,400,000	457	92.69%

Source: Cornell Center for Real Estate and Finance

EXHIBIT 4

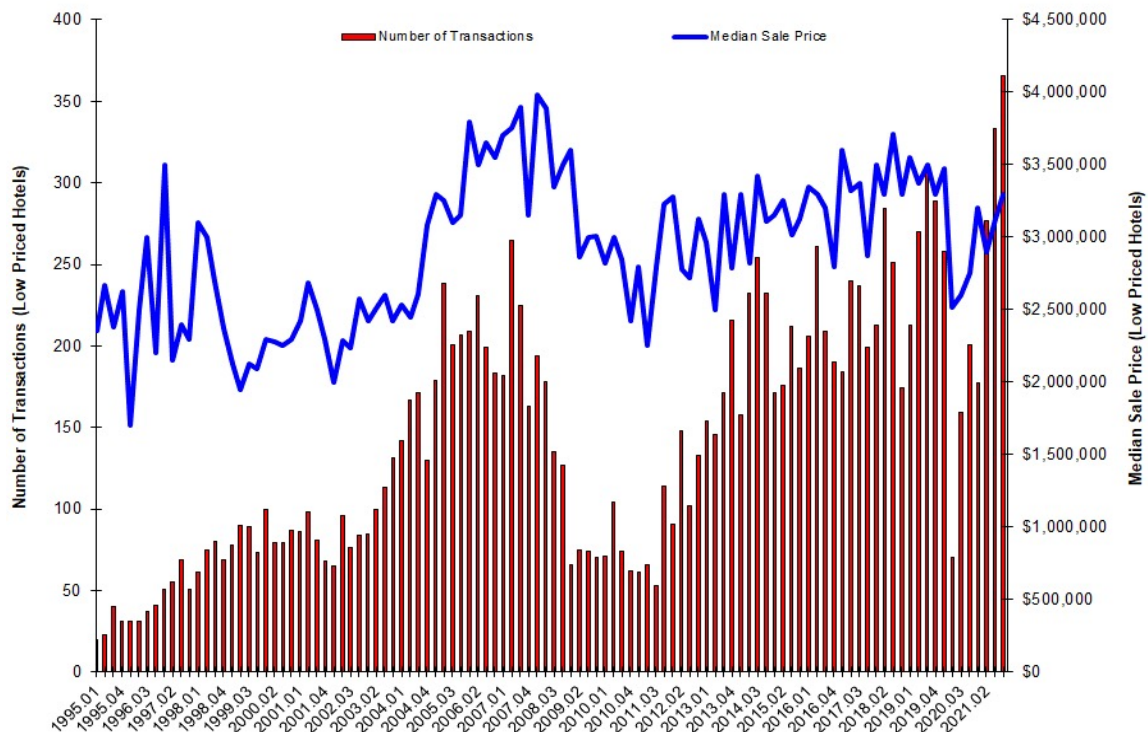
Median sale price and number of sales (hotels with sale prices of \$10 million or more)



Sources: CoStar, Real Capital Analytics

EXHIBIT 5

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



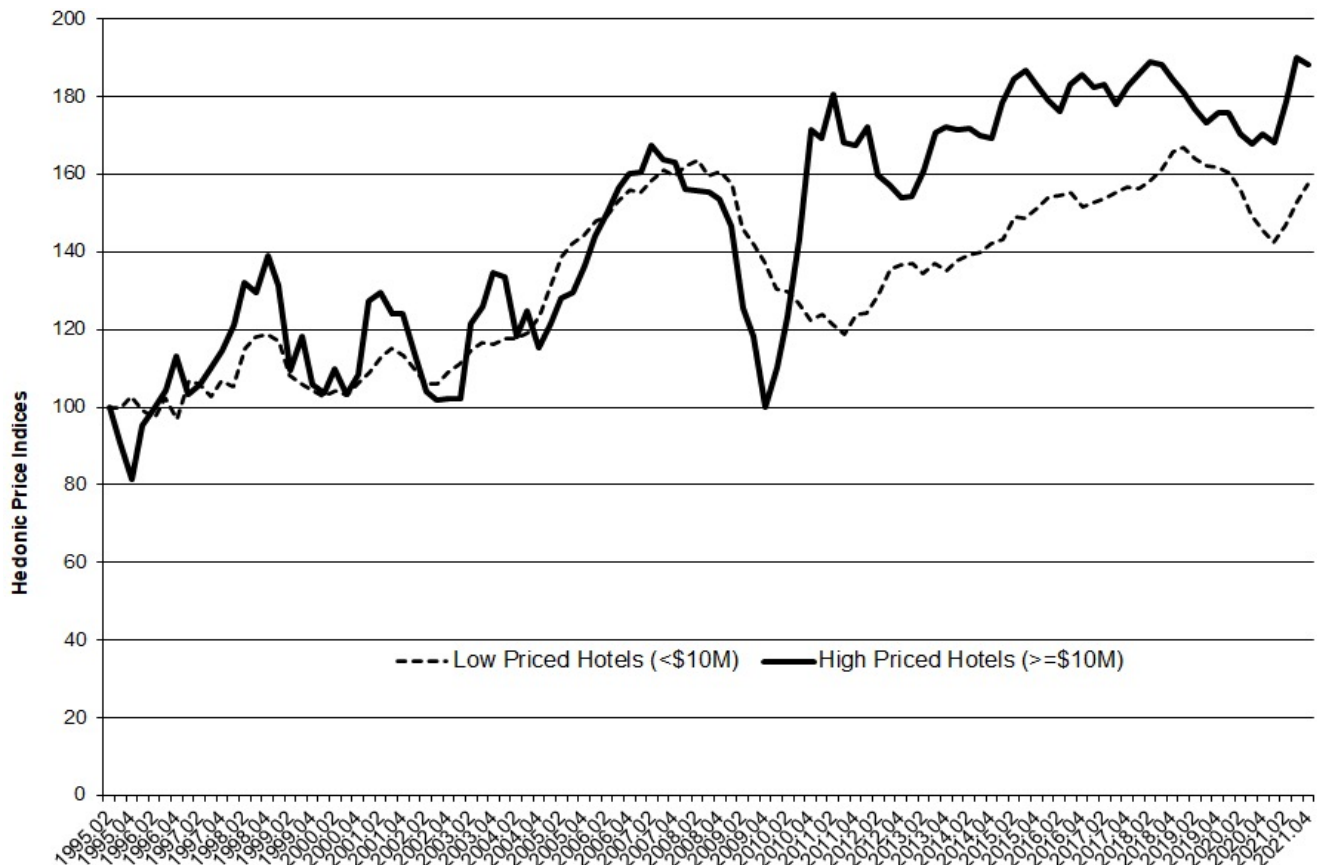
Sources: CoStar, Real Capital Analytics

Hotel indices through 2021, quarter 4

YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Repeat Sales	YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Repeat Sales
1995.02	97.55	92.87	81.94	101.79	63.75	NA	2008.01	158.25	145.16	175.20	233.19	157.80	164.35
1995.03	97.49	84.46	80.93	97.62	66.66	NA	2008.02	159.45	144.65	171.83	237.87	157.87	165.55
1995.04	100.24	75.55	85.11	90.77	68.48	NA	2008.03	155.82	144.17	165.99	231.01	156.75	161.97
1996.01	96.67	88.48	89.89	93.46	70.20	NA	2008.04	156.73	142.53	160.57	224.30	158.06	164.84
1996.02	94.96	92.43	94.36	88.15	72.52	NA	2009.01	153.50	136.06	152.38	198.04	153.33	160.09
1996.03	100.01	96.87	105.12	96.22	71.50	NA	2009.02	142.49	116.43	136.18	172.61	149.64	154.30
1996.04	94.70	104.97	105.19	103.27	72.71	NA	2009.03	138.16	109.96	128.56	158.66	136.42	141.49
1997.01	104.07	95.83	112.57	109.30	86.46	NA	2009.04	133.87	93.02	115.16	158.12	122.50	127.50
1997.02	103.60	98.45	110.65	110.13	88.97	NA	2010.01	127.10	102.29	116.03	158.13	115.57	121.50
1997.03	100.14	101.91	105.51	111.36	94.99	NA	2010.02	126.38	114.46	119.35	162.26	107.67	114.00
1997.04	104.19	106.28	112.46	118.78	101.21	NA	2010.03	123.79	133.16	120.78	216.68	108.20	114.61
1998.01	102.62	112.58	114.77	123.22	97.61	NA	2010.04	119.37	159.19	130.09	245.57	109.93	114.33
1998.02	112.31	122.78	127.71	133.70	102.97	NA	2011.01	120.97	157.11	128.63	259.74	110.30	110.77
1998.03	115.02	120.32	131.79	125.02	105.07	NA	2011.02	118.41	167.84	131.10	266.44	110.77	110.32
1998.04	115.79	129.19	126.44	125.27	102.87	NA	2011.03	115.70	156.08	128.56	223.42	109.73	109.25
1999.01	114.22	121.84	115.00	117.46	96.30	NA	2011.04	120.99	155.36	126.98	208.83	111.98	111.89
1999.02	105.64	101.73	98.91	99.19	90.47	NA	2012.01	121.29	159.90	130.37	222.17	113.18	112.54
1999.03	103.31	109.90	94.69	105.04	87.86	NA	2012.02	125.84	148.45	133.17	226.93	117.29	118.87
1999.04	101.70	98.40	93.41	100.00	88.55	NA	2012.03	132.16	146.13	141.32	239.33	121.17	122.22
2000.01	100.14	96.23	94.80	96.33	93.51	100.08	2012.04	133.15	143.00	147.28	249.93	122.18	123.10
2000.02	101.60	102.11	99.15	100.51	97.61	100.08	2013.01	133.65	143.40	154.04	239.23	123.79	126.21
2000.03	100.62	95.77	100.74	95.79	97.43	94.09	2013.02	131.16	149.47	154.67	243.25	124.63	127.56
2000.04	103.37	100.77	102.49	101.63	96.92	94.22	2013.03	133.54	158.46	156.32	246.81	125.46	129.78
2001.01	106.15	118.12	109.78	105.29	95.22	91.33	2013.04	132.04	160.04	154.05	249.58	127.64	133.40
2001.02	110.15	120.23	110.38	116.96	94.53	88.76	2014.01	134.37	159.13	152.96	252.51	133.02	138.27
2001.03	112.29	115.27	109.37	115.65	95.72	92.66	2014.02	135.89	159.50	149.74	257.55	131.83	135.36
2001.04	110.46	115.13	106.10	111.07	95.60	89.44	2014.03	136.54	157.92	149.86	256.69	134.26	136.97
2002.01	107.52	105.77	99.54	107.07	96.11	92.02	2014.04	138.69	157.24	149.82	232.46	134.87	136.24
2002.02	103.61	96.62	95.83	97.24	94.56	91.27	2015.01	139.74	165.61	153.05	241.67	137.55	138.35
2002.03	103.52	94.50	95.12	99.97	94.63	89.48	2015.02	145.41	171.47	165.29	249.35	142.82	143.49
2002.04	106.20	94.83	100.11	101.11	95.57	94.33	2015.03	144.85	173.57	164.16	276.45	151.15	152.70
2003.01	108.34	94.91	100.94	112.42	97.11	94.25	2015.04	147.58	169.88	171.70	312.39	160.03	161.35
2003.02	111.82	112.73	105.35	120.05	99.36	97.90	2016.01	150.46	166.41	173.28	328.23	161.95	163.79
2003.03	113.84	117.04	108.28	128.03	101.34	101.69	2016.02	150.62	163.66	165.99	331.58	161.86	164.63
2003.04	113.41	125.03	107.97	132.19	102.60	104.39	2016.03	151.60	170.04	167.75	346.47	161.21	162.56
2004.01	114.67	123.94	108.64	131.42	102.33	105.82	2016.04	147.99	172.49	162.32	337.98	156.65	159.31
2004.02	114.79	109.65	107.21	134.15	102.60	106.52	2017.01	148.99	169.38	161.74	318.46	161.09	163.65
2004.03	116.11	115.96	109.66	141.65	107.09	111.59	2017.02	150.12	169.99	167.91	322.17	168.53	171.74
2004.04	120.43	107.26	114.24	149.09	108.35	111.60	2017.03	151.53	165.17	169.42	309.42	169.70	173.87
2005.01	127.62	112.81	122.69	167.88	112.98	115.53	2017.04	152.99	169.70	170.38	306.57	174.08	177.31
2005.02	135.43	118.96	135.76	169.60	119.00	122.42	2018.01	152.53	172.41	171.49	347.07	174.52	178.32
2005.03	138.78	120.42	141.20	167.43	121.87	124.80	2018.02	154.18	175.47	171.18	356.26	176.07	178.58
2005.04	140.89	126.55	145.12	176.80	127.26	130.93	2018.03	156.95	174.94	173.63	358.82	180.69	182.99
2006.01	144.21	133.87	152.18	180.86	131.65	135.59	2018.04	161.64	171.45	184.37	384.88	182.39	184.29
2006.02	145.38	139.19	152.06	193.76	134.67	138.22	2019.01	162.80	168.02	183.27	363.87	185.01	186.12
2006.03	149.34	145.46	157.41	211.80	136.67	140.08	2019.02	159.98	164.42	178.83	339.17	184.65	184.92
2006.04	151.97	148.72	161.68	212.78	141.28	142.85	2019.03	158.23	160.93	175.53	339.07	184.88	185.46
2007.01	151.38	148.97	165.81	218.67	145.36	146.29	2019.04	157.77	163.10	166.76	351.11	186.01	187.02
2007.02	154.54	155.60	173.33	229.05	149.37	150.25	2020.01	156.37	163.27	162.68	334.60	183.17	184.75
2007.03	157.24	152.11	177.06	227.17	155.23	157.77	2020.02	151.87	158.27	156.41	326.02	183.19	185.43
2007.04	155.69	151.32	180.83	229.61	156.61	159.92	2020.03	145.64	155.85	146.12	308.34	181.30	183.59
							2020.04	141.85	158.30	141.73	274.72	182.64	185.45
							2021.01	138.82	156.30	137.52	288.70	181.98	184.49
							2021.02	143.34	166.12	146.82	305.78	183.95	185.95
							2021.03	149.15	176.60	161.64	328.35	191.71	192.66
							2021.04	153.42	174.64	172.17	329.96	201.48	199.96

Source: Cornell Center for Real Estate and Finance

Hedonic hotel indices for large and small hotel transactions



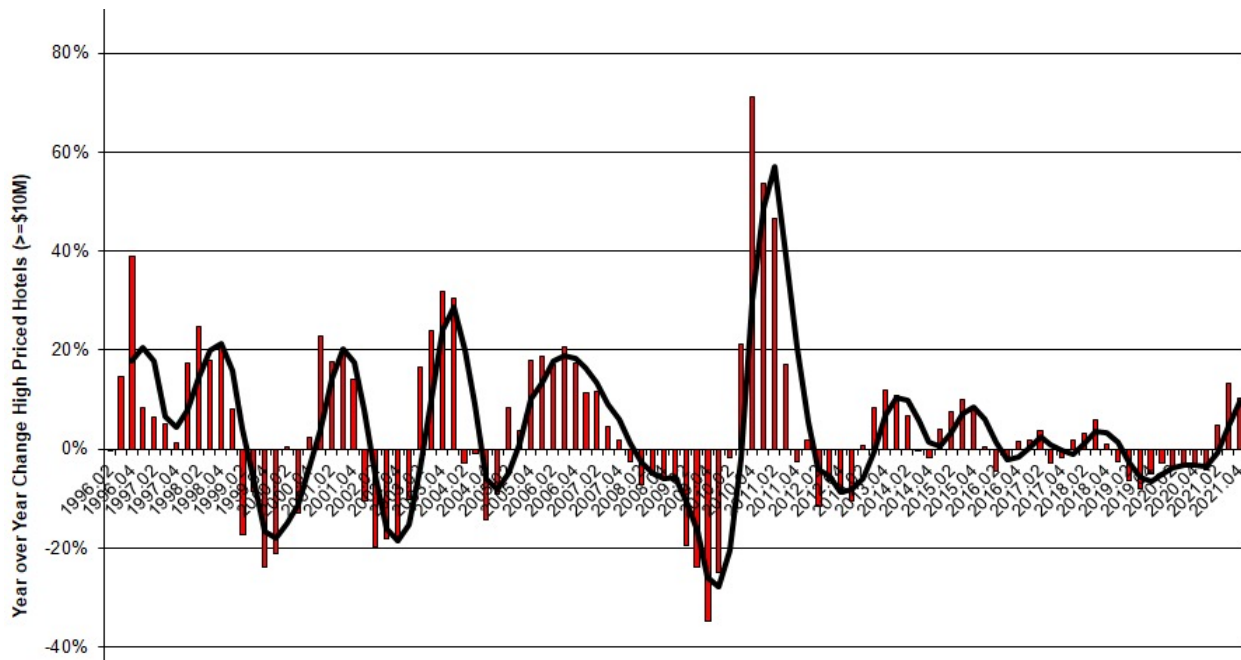
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trendlines indicate that large hotels are priced to buy, while small hotels are fairly priced. Large hotels declined from their statistical high set in the prior quarter, based on our standardized unexpected price (SUP) performance metric. Exhibit 7, which graphs the prices reported in Exhibit 6, shows that the

price of large hotels fell 1 percent, while small hotel prices increased 3 percent this quarter. Year over year, Exhibit 8 shows that large hotels increased 10 percent compared to 13 percent in the prior year-over-year period. Exhibit 9 shows that small hotels rose 8 percent year over year compared to 2 percent in the prior period.

EXHIBIT 8

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

EXHIBIT 9

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

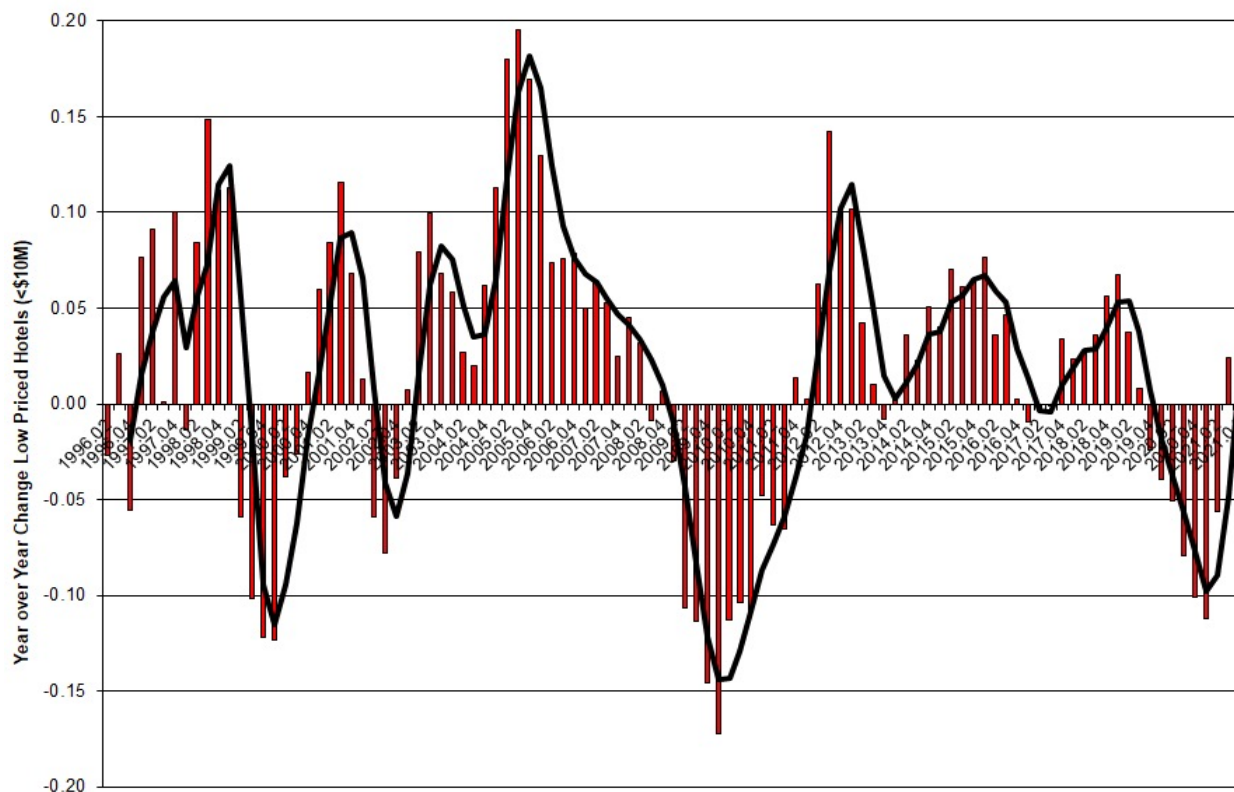
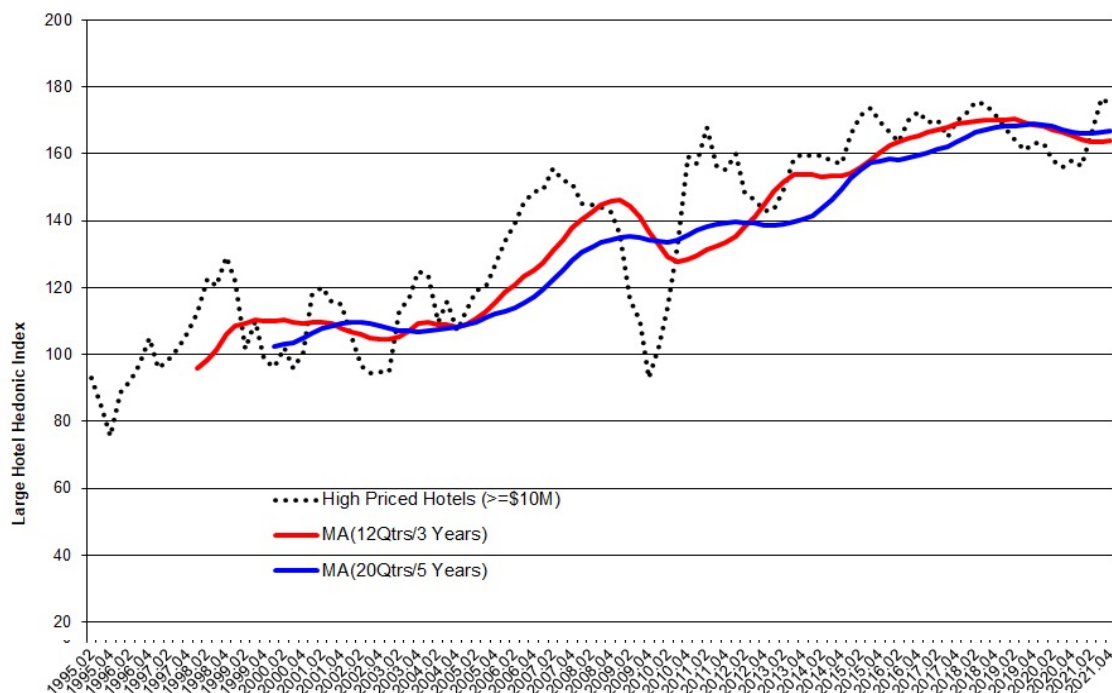
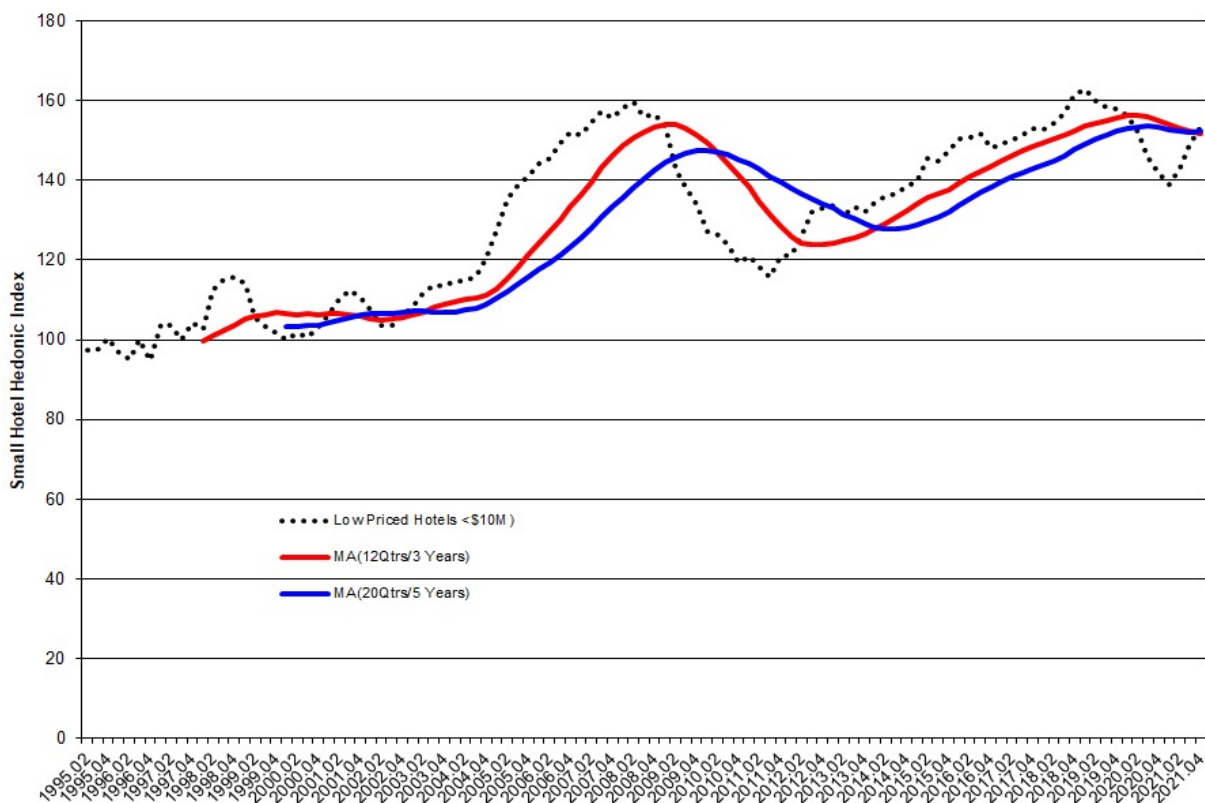


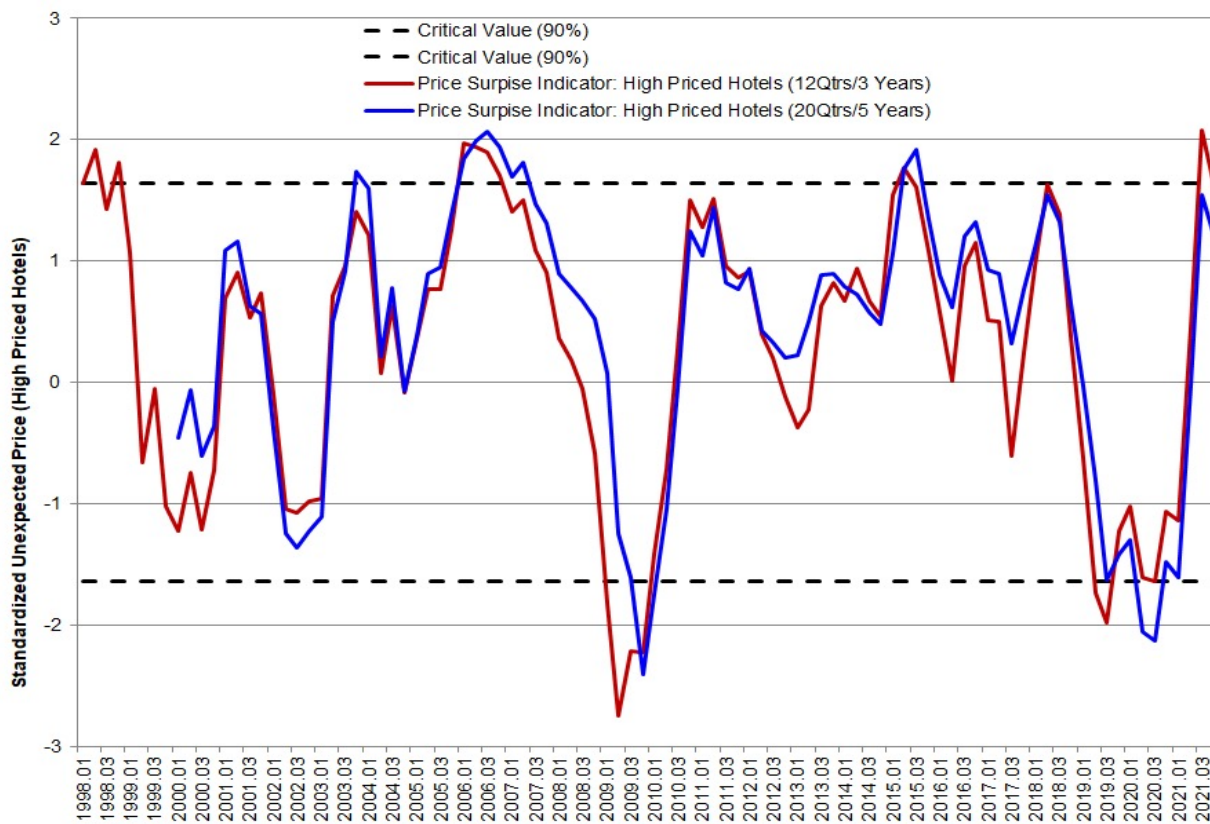
EXHIBIT 10**Moving average trendline for large hotel index**

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

EXHIBIT 11**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



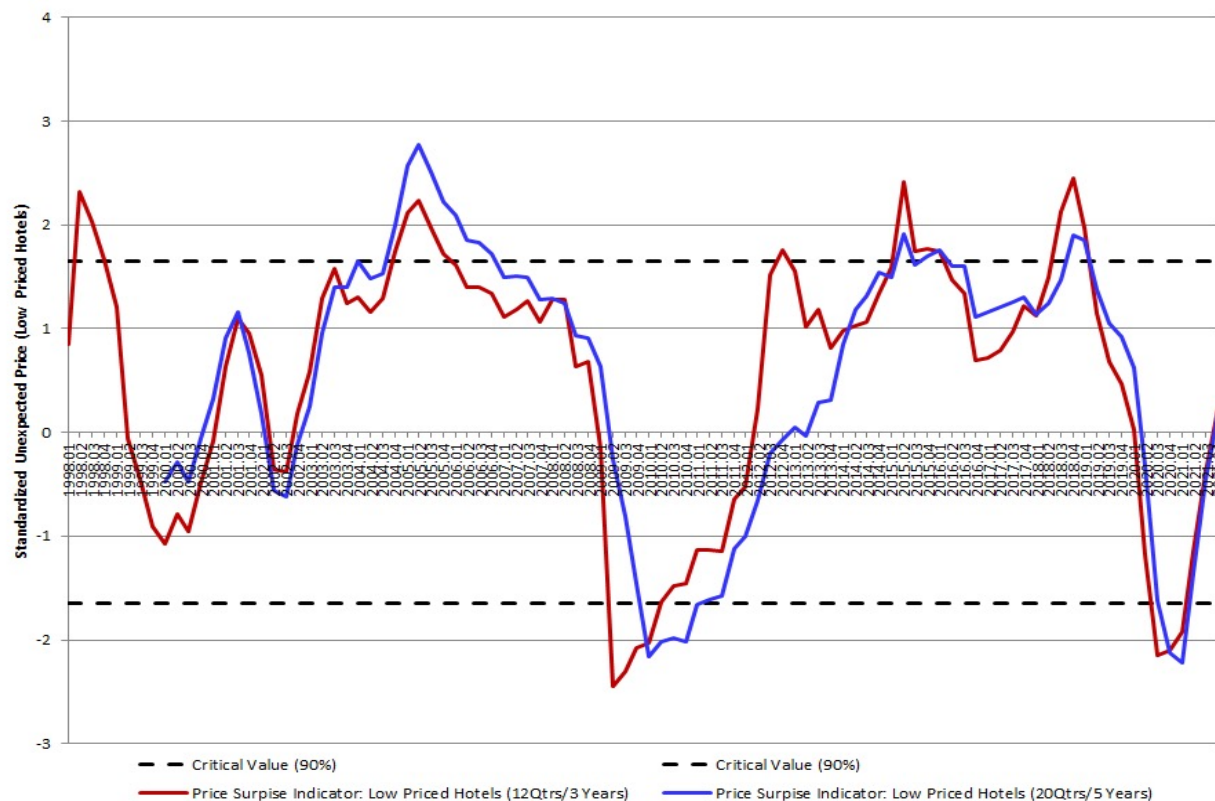
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trend lines for large hotels (Exhibit 10) show that the price for large hotels remains above both its short-term and long-term moving averages, indicating that large hotels are still a buy. In contrast, small hotels (Exhibit 11) now appear to be fairly priced since the small-hotel price is equal to both its short-term and long-term moving averages.

Our standardized unexpected price (SUP) metric (Exhibit 12) shows that the standardized price for large hotels declined from its new statistical high recorded in the prior period. In contrast, the standardized price for small hotels has now risen slightly above its standardized average (zero), as shown in Exhibit 13.

EXHIBIT 13

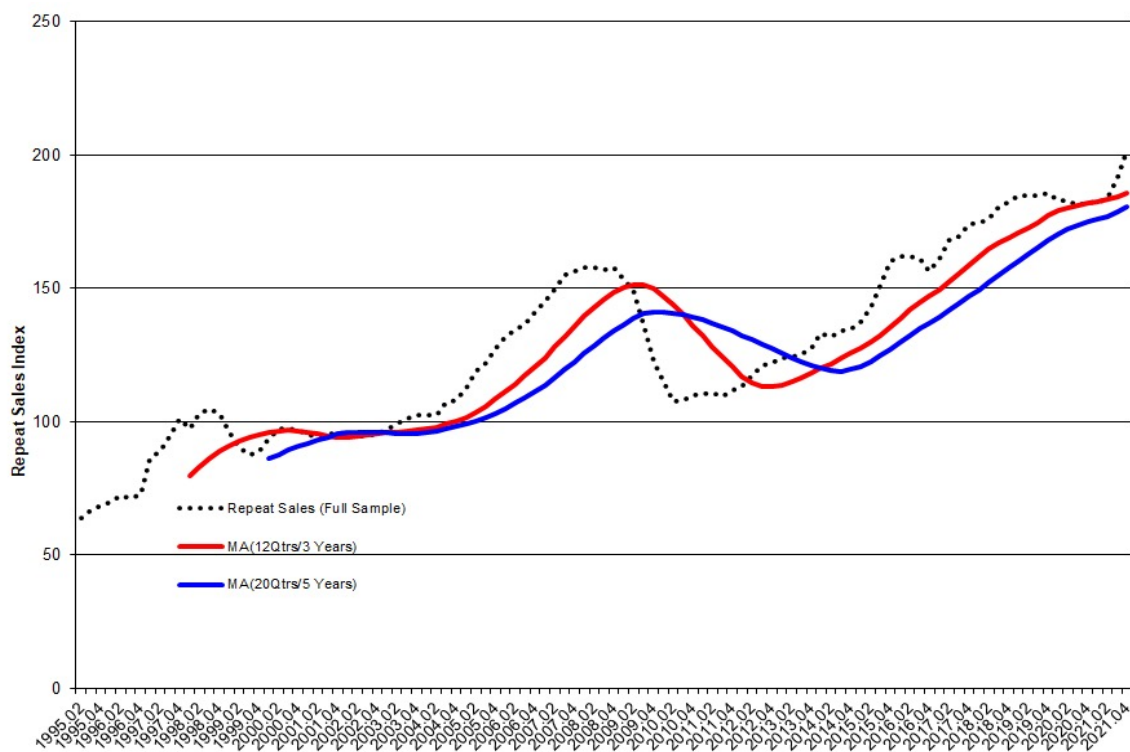
Standardized unexpected price (SUP) for small hotel index



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

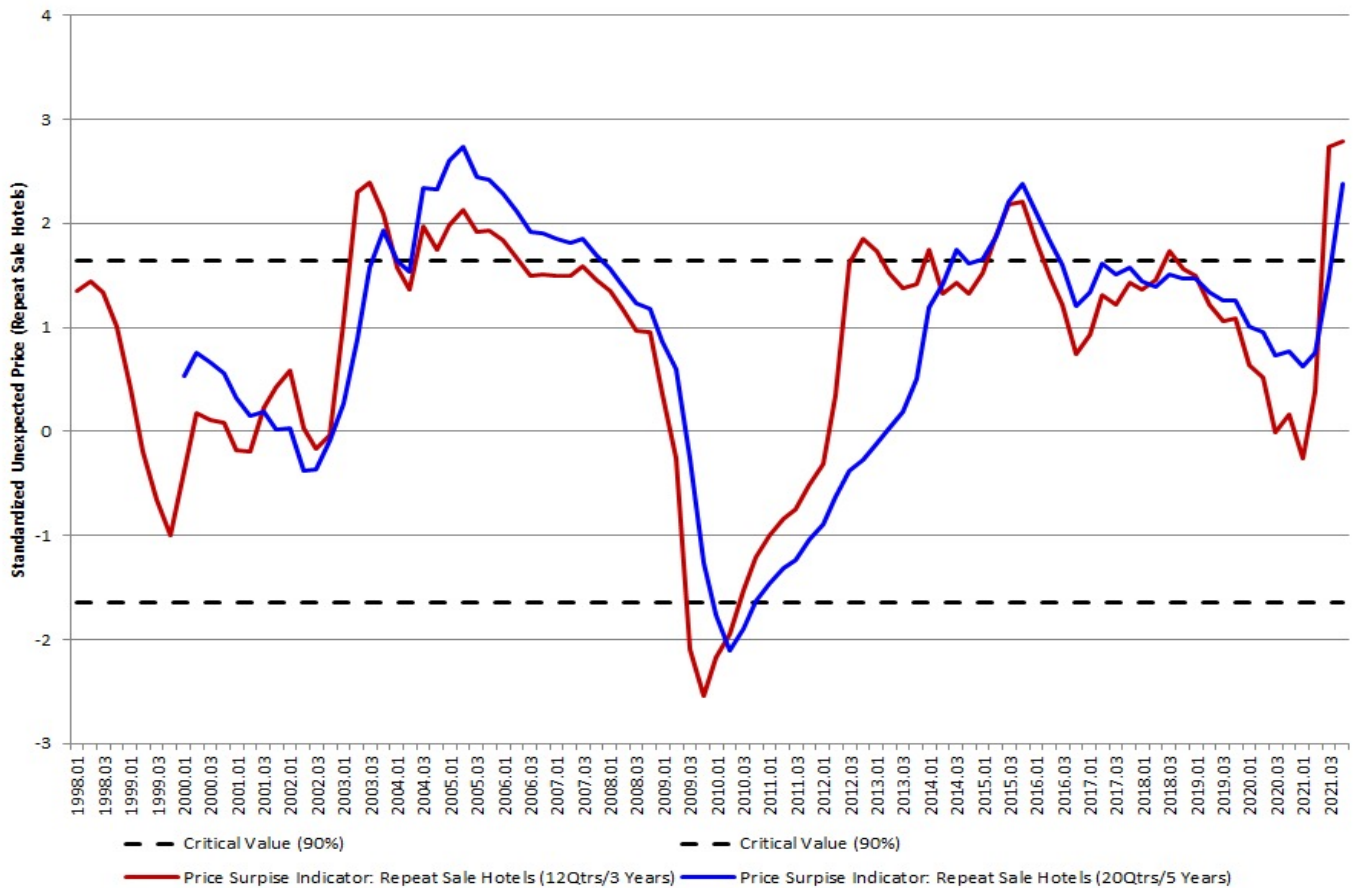
EXHIBIT 14

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

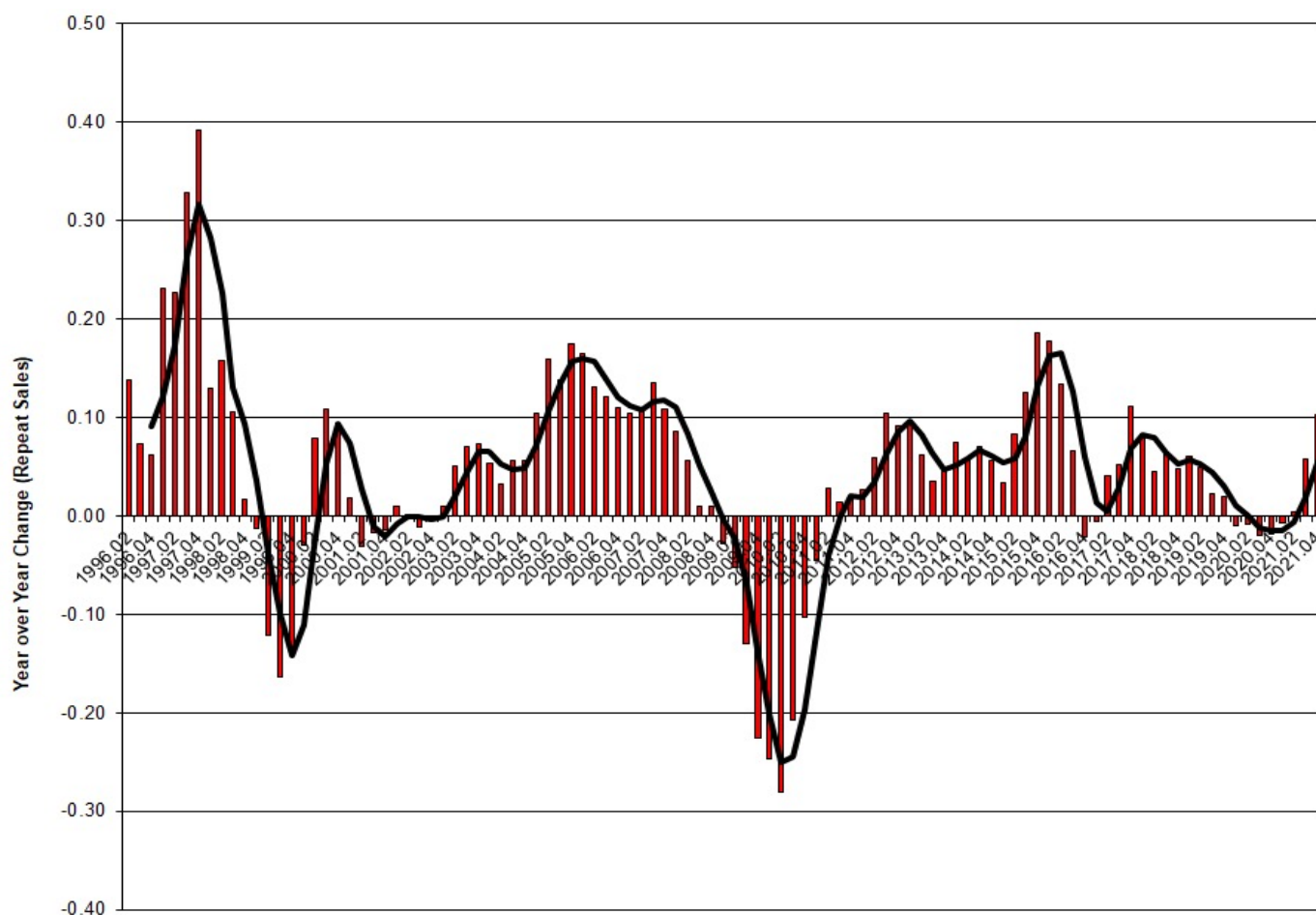
Repeat-sales metrics: Prices remain above their moving average; hotel prices continue to reach new highs. Exhibit 14 shows that our repeat sale indicator continues to remain above both its short-term and long-term moving averages, similar to that of large hotels.² This is another signal

² We report two repeat-sale indices. The repeat sale full sample index uses all repeat-sale pairs, whereas the repeat-sale index with a base of 100 at 2000Q1 uses only those sales that occurred on or after the first quarter of 2000. In other words, the latter repeat-sale index thus doesn't use information on sales prior to the first quarter of 2000. As such, if a hotel sold in 1995 and then sold again in 2012, it would be included in the first repeat sale index (i.e., repeat sale full sample index), but it would not be included in the latter repeat-sale index.

that good hotels continue to remain a buy opportunity. Our SUP performance metric (Exhibit 15) indicates that the standardized price, based both its 3-year moving average and its 5-year moving average, continues to remain above its statistical upper boundary. Exhibit 16 shows that the repeat sale price index is 10 percent year over year, compared to a rise of 5.7 percent in the prior period.³ Quarter over quarter, the index increased 5.1 percent, bettering a 4.2-percent rise in the prior quarter-over-quarter period.

³ This is the latest information reported by the Mortgage Bankers Association as of the writing of this report.

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-financing volume continues to rise both year over year and quarter over quarter. Exhibit 17 shows that the mortgage origination volume for hotels, as reported for the third quarter of 2021, rose 850 percent year over year, exceeding the 231-percent increase in the prior period. Quarter over quarter, the mortgage originations rose 60 percent, which is a smaller gain than the 231-percent increase posted in the previous quarter. The maximum loan-to-value (LTV) ratio for hotels remained at 65 percent.

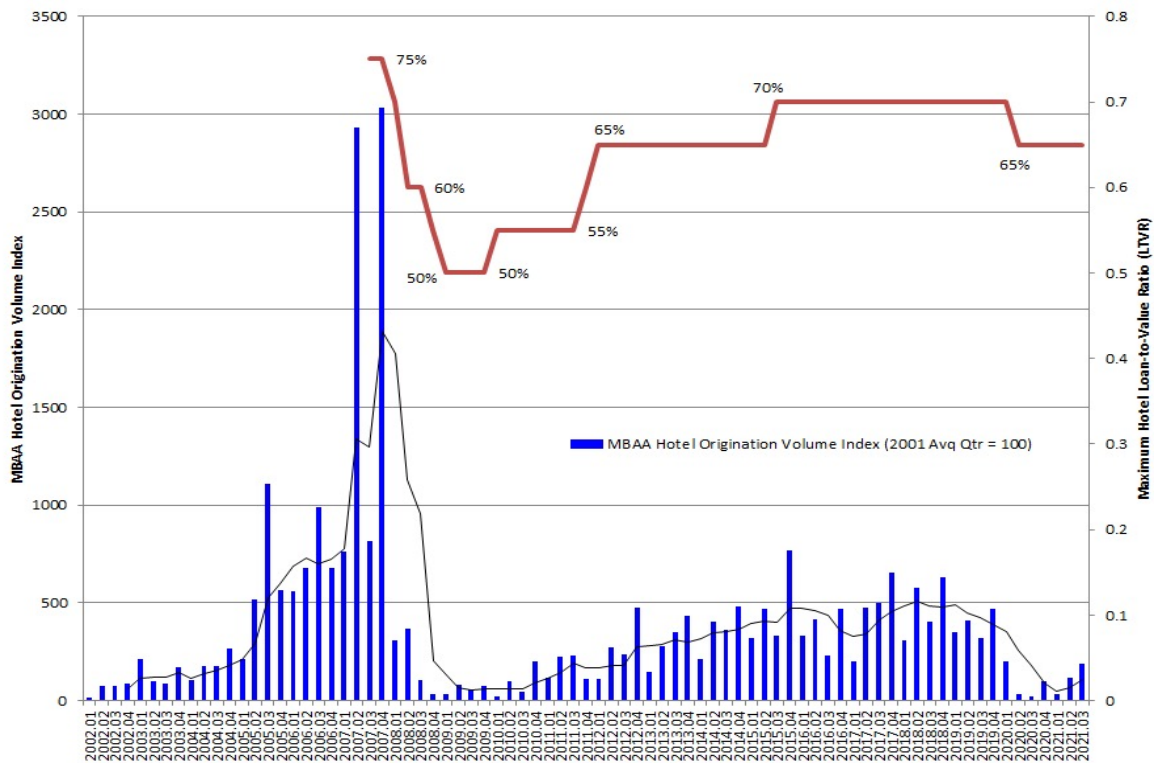
The cost of hotel debt financing fell slightly this quarter as well as year over year. The cost of obtaining hotel debt financing, as reported by Cushman Wakefield

Sonnenblick Goldman, declined this quarter for both Class A and Class B and C hotels.⁴ As of this writing (in December 2021), the interest rate on Class A hotels stood at 5.4 percent, compared to 5.44 percent in September 2021 and 5.5 percent in December 2020. The interest rates on Class B and C hotels are 4 basis points lower, at 5.6 percent, compared to 5.64 percent last quarter and 5.7 percent in December 2020 (Exhibit 18). Thus, we see that rates have moved imperceptibly lower year over year and quarter over quarter.

⁴ The interest rate reported by Cushman Wakefield Sonnenblick Goldman (CWSG) is based on deals that CWSG has brokered as well as their survey of rates on hotel deals.

EXHIBIT 17

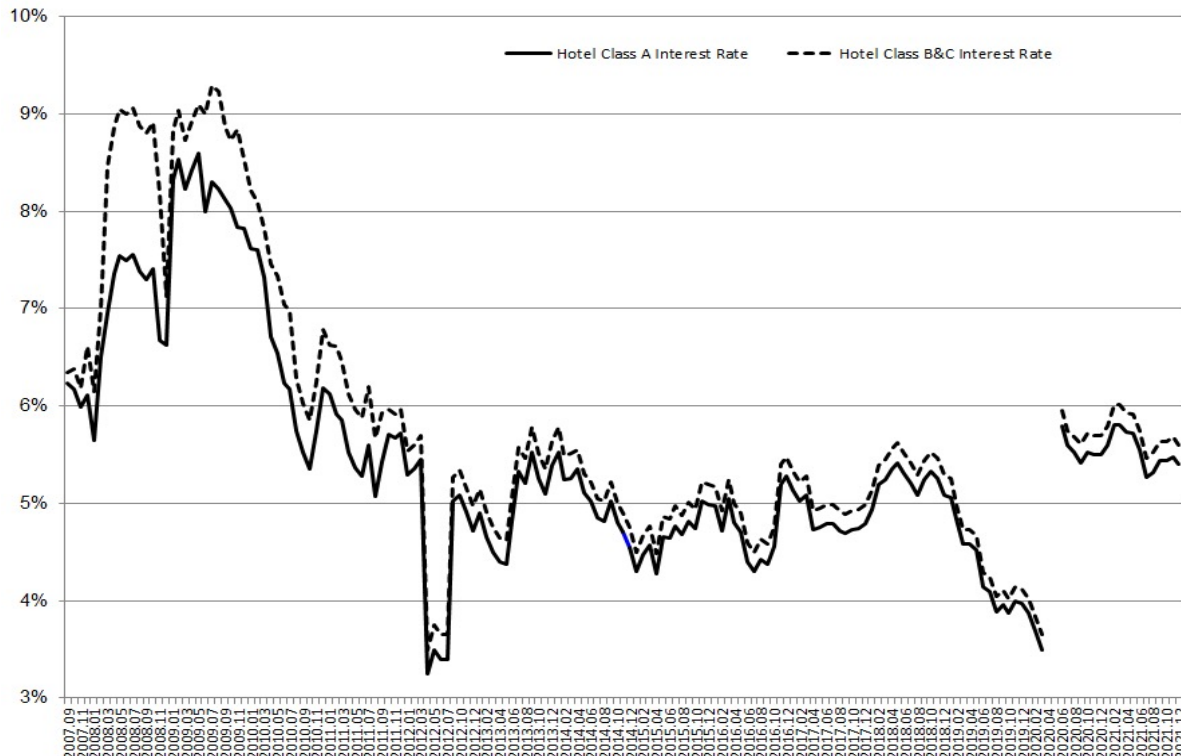
Mortgage origination volume versus the loan-to-value ratio for hotels



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

EXHIBIT 18

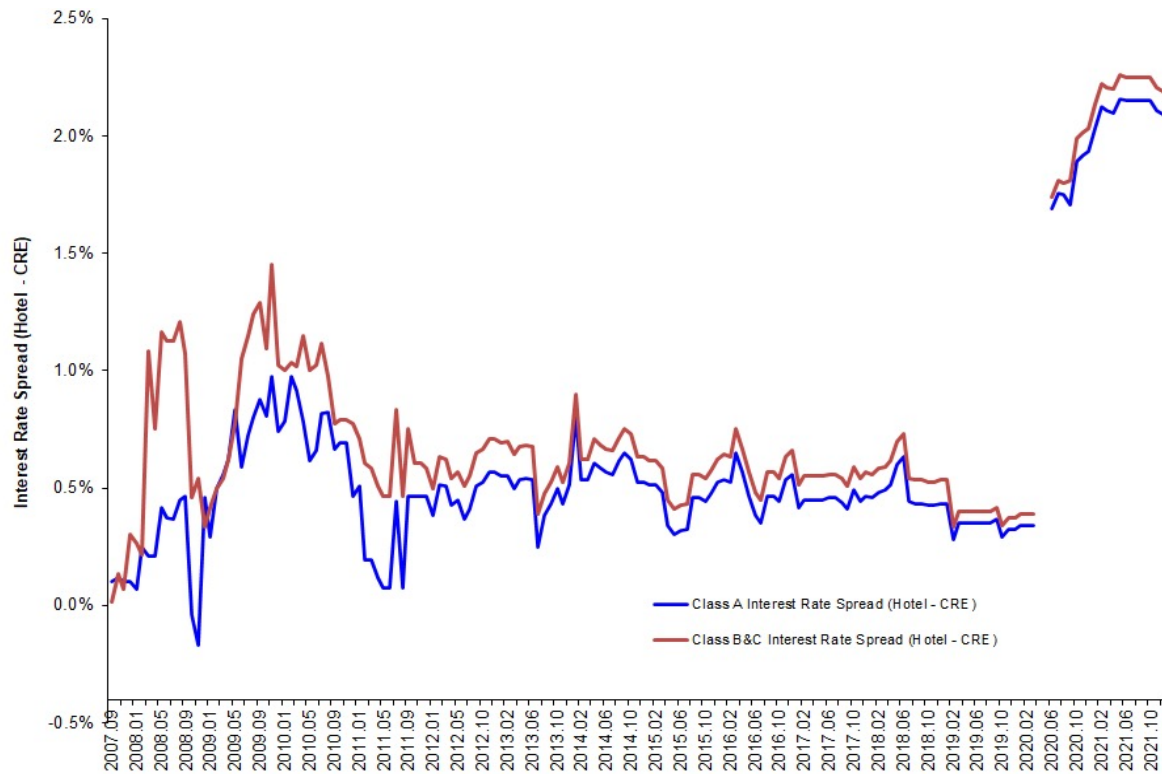
Interest rates on Class A versus Class B & C hotels



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

EXHIBIT 19

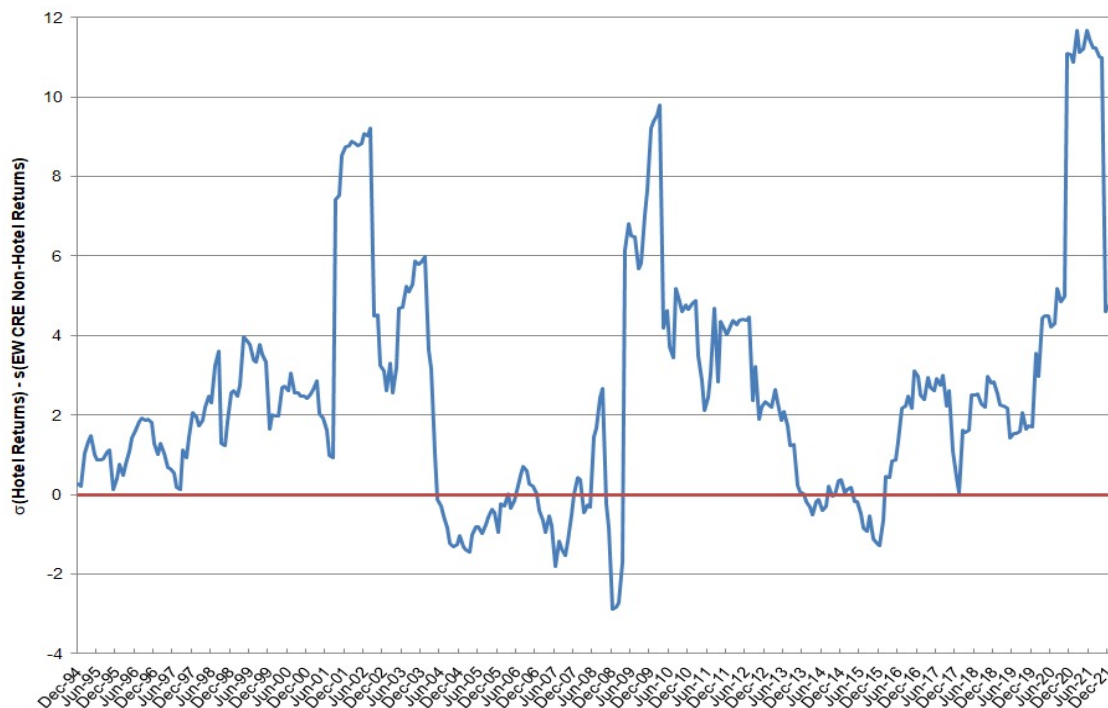
Interest rate spreads of hotels versus non-hotel commercial real estate



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

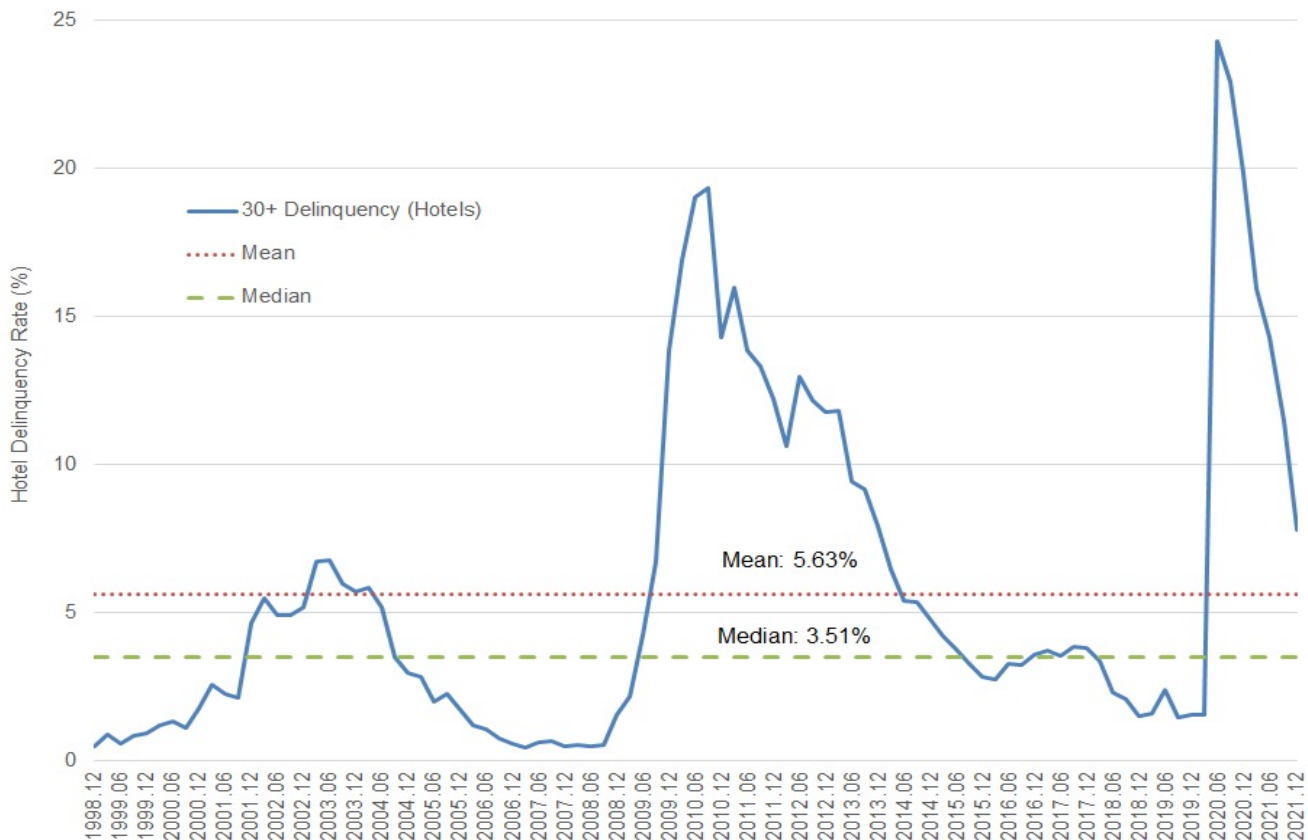
EXHIBIT 20

Risk differential between hotel REITs and equity REITs



Sources: NAREIT, Cornell Center for Real Estate and Finance

30-plus-day delinquency rate for hotels



Source: Trepp

The relative risk premium that lenders require for hotels over other commercial real estate has remained stable this quarter relative to the prior quarter. Exhibit 19 shows the spreads between the interest rates on Class A and of Class B and C full-service hotels compared to the (equally weighted) interest rate on other (non-hotel) commercial real estate. The positive spread (i.e., the hotel real estate premium) indicates that lenders demand more compensation to make hotel loans compared to loans on other major commercial property types, because hotels are perceived to represent a greater risk.⁵ The monthly hotel real estate premiums for both higher quality (Class A) and lower quality (Class B and C) hotels have declined imperceptibly, from 2.15 percent (Class A) and 2.25 (Class B and C) last quarter to 2.09 percent and 2.19 percent this quarter. Thus, although the relative premium for hotel properties fell slightly since last quarter, that premium has remained in the same range since January 2021.

Another way to view hotel default risk is to look at the equity market. Exhibit 20 shows the total risk of hotel

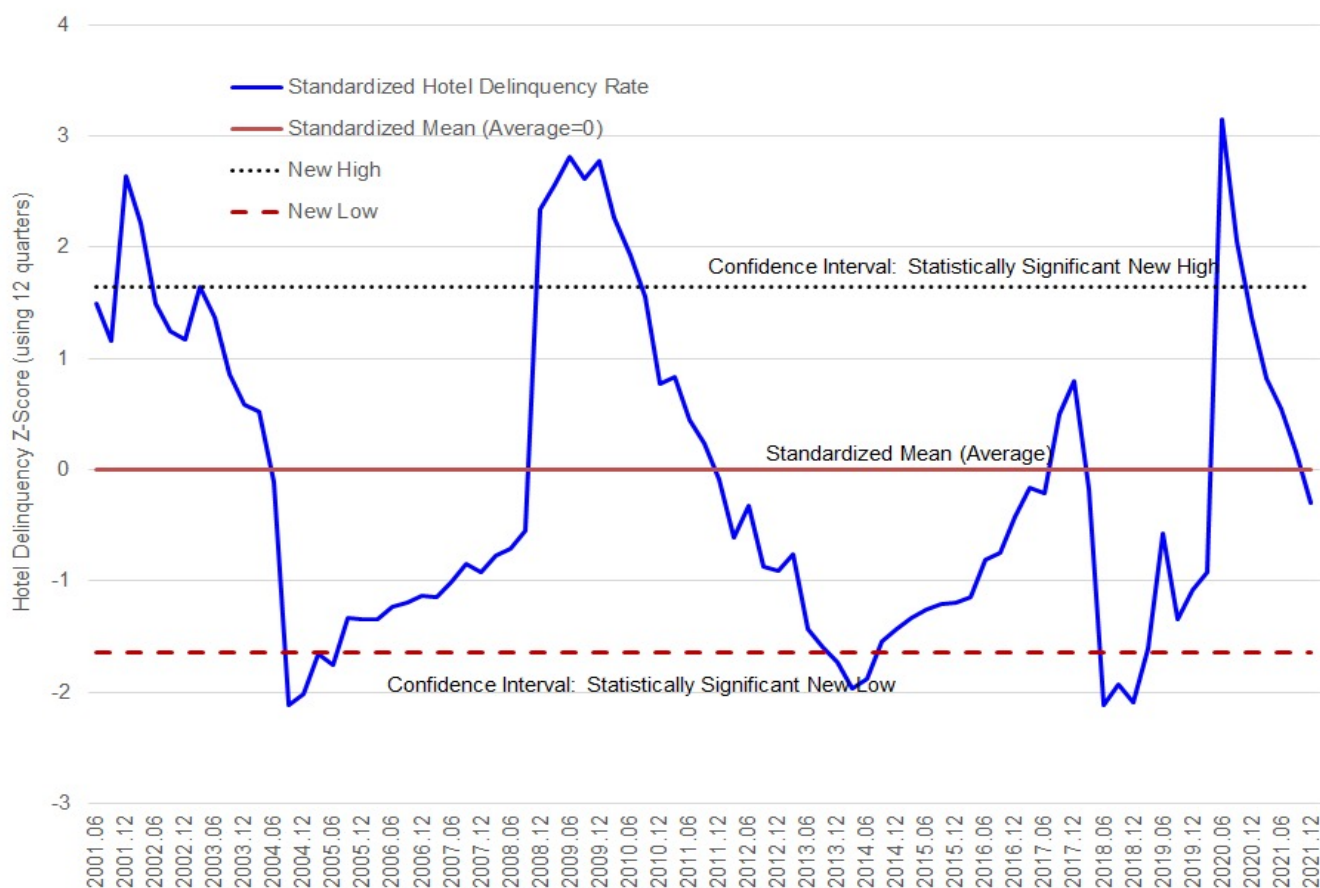
REITs relative to the total risk of an equally weighted portfolio of commercial real estate equity REITs (that is, office, industrial, retail, and multifamily). The risk differential, which should reflect the risk that is unique to hotel properties, is currently at 4.7 percent, compared to 11 percent in the prior quarter.⁶ This indicates that the perceived default risk for hotels has declined dramatically relative to other major types of commercial real estate. Thus, financing for hotels should be lower than it has been, relative to other major property types.

The delinquency rate on hotel loans continues to decline toward its pre-pandemic average. The CMBS delinquency rate (30-plus days) for lodging properties continued to decline in December from its high of 24.3 percent in June of last year. As of this writing, it is at 7.8 percent compared to 11.45 percent in September. The 7.8-percent delinquency rate for hotels is comparable to the retail delinquency rate (7.87%). The December 2021 delinquency rate for other property types, as reported by Trepp is as follows: 0.39 percent for industrial,

⁵ The interest rate on hotel properties is generally higher than that for apartment, industrial, office, and retail properties in part because hotels' cash flow is commonly more volatile than that of other commercial properties.

⁶ The risk differential calculation is as follows: ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 8.76\% - 4.02\%$).

Standardized 30-plus-day delinquency rate for hotels



Source: Trepp

0.28 percent for multifamily, and 2.36 percent for office. Exhibit 21 displays the historical 30-plus-day delinquency rate for hotels. Additionally, Exhibit 22, which shows the standardized version of the 30-plus-day delinquency rate for hotels, reveals that the delinquency rate for hotels whose loans are securitized as part of CMBS deals is now hovering around its long-term average.⁷ Using the standardized metric, the fact that the delinquency rate has reverted to zero suggests that the relative risk premium

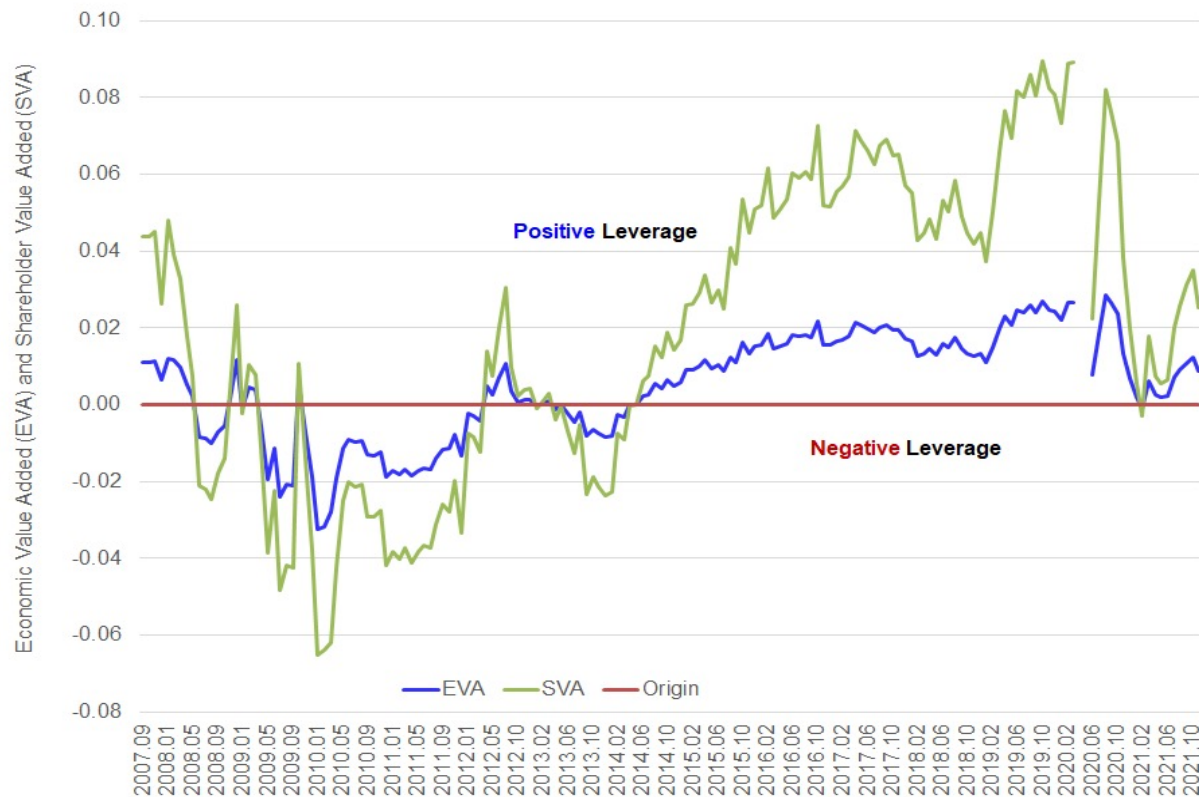
⁷ The advantage of standardizing an indicator is that the mean is set equal to zero and the standard deviation is set equal to 1. If the indicator is above or below 1.645 (Z-score), then this indicates that the indicator has hit a statistically significant new high or low.

for hotels should continue to narrow, which in turn should lead to a lower cost of debt financing for hotels.

Hotel investment based on operating performance is currently financially feasible. Our EVA indicator (Exhibit 23) is at about 1 percent, while our equity holder value added (SVA) metric is 2.5 percent (as of October 2021). These values signal that deals on existing hotels are above breakeven. The return that an investor receives from operations is therefore above the total weighted average borrowing cost (WACC) of 7.6 percent (cost of equity is 9.1%). Most of the juice is coming from anticipated future price gains.

EXHIBIT 23

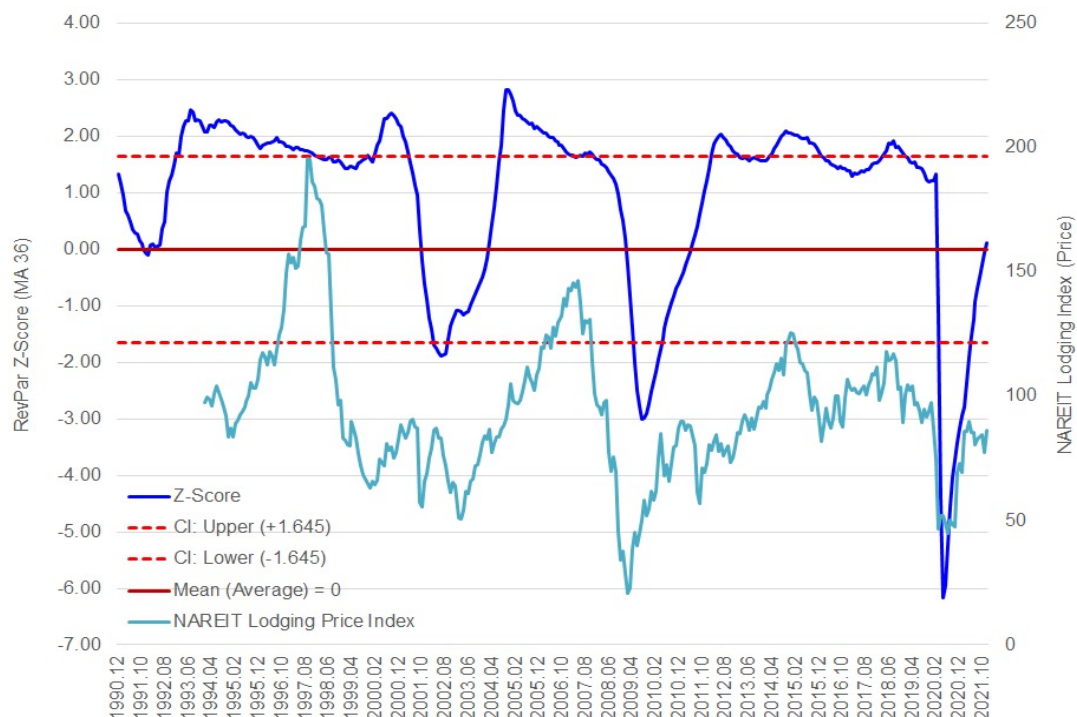
Economic value added (EVA) and equity (shareholder) value added (SVA) for hotels



Sources: Cornell Center for Real Estate and Finance, Cushman Wakefield, NAREIT, Real Capital Analytics, St Louis Fed

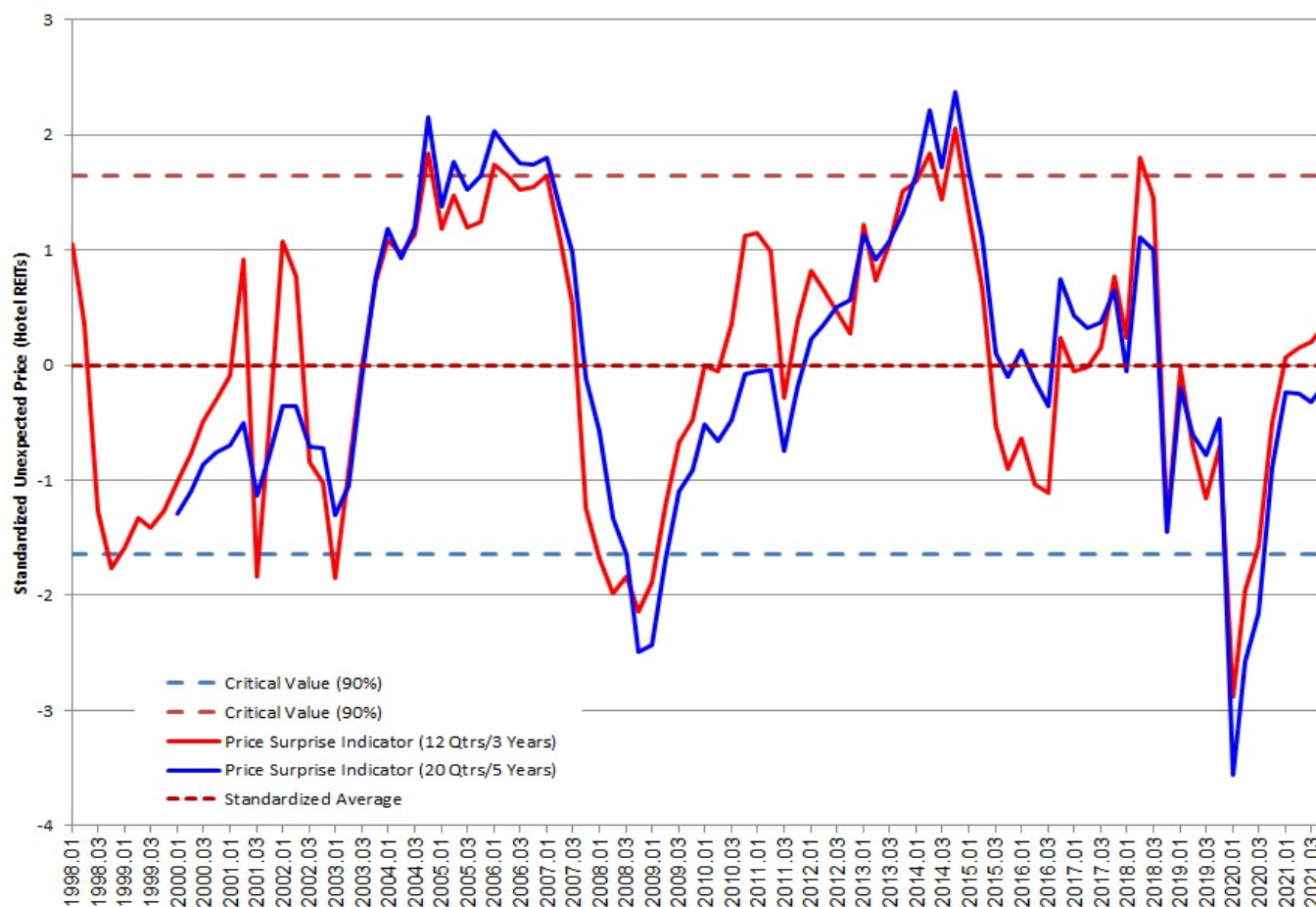
EXHIBIT 24

Standardized unexpected RevPAR (36-month moving average) vs. NAREIT lodging-price index



Sources: Cornell Center for Real Estate and Finance, CoStar (STR), NAREIT

Standardized unexpected NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

Our reading of the tea leaves suggests we should see slower to negative price momentum for large hotels, but positive price gains for small hotels near term. Our standardized unexpected RevPAR (Exhibit 24) has converged to its standardized mean of zero. We anticipate continued positive price momentum in the near term.

Exhibit 25 displays the standardized unexpected price of the NAREIT Lodging Index. Since the standardized unexpected lodging price index continues to rise this quarter, we expect our hotel price based on repeat sales to continue to rise near term.

The architecture billings index (ABI) for commercial and industrial property, shown in Exhibit 26, fell 12 percent this quarter, but rose 7 percent year over year, compared to a 6-percent decline in the previous quarter and a rise of 33 percent in the prior year-over-year period.⁸ Based on the

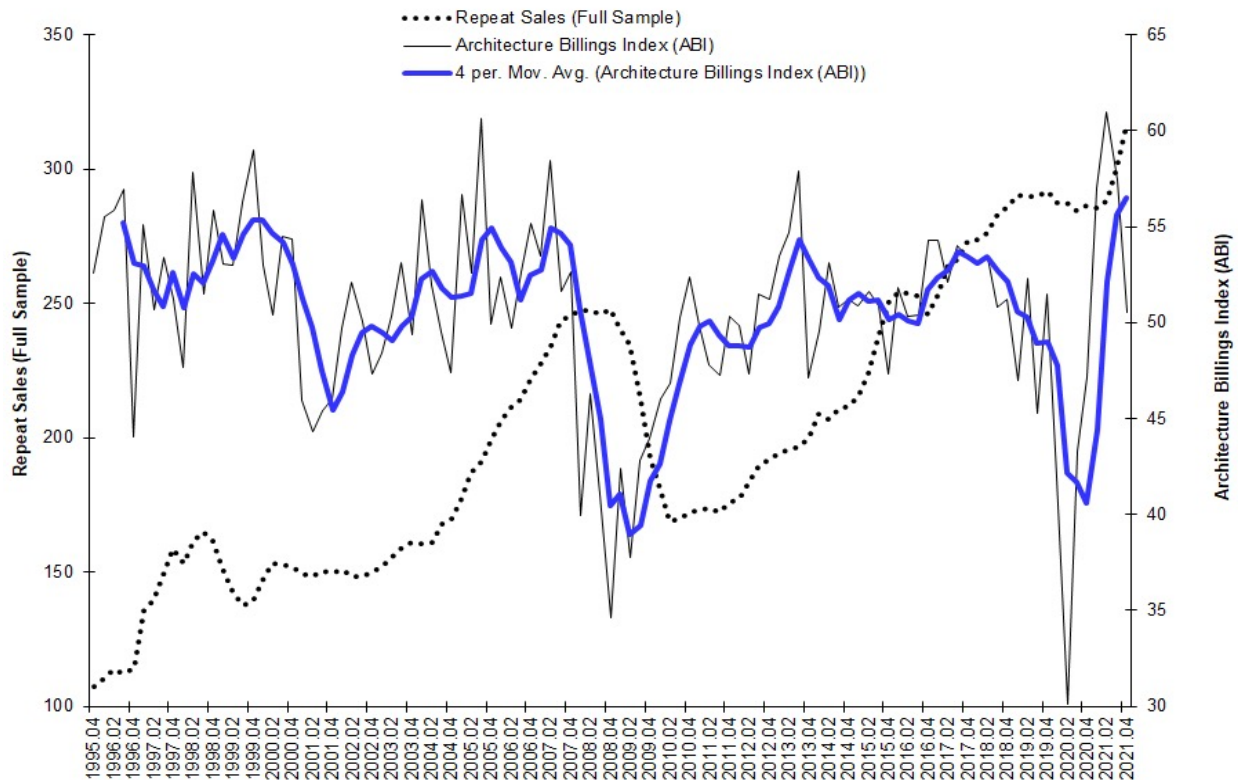
moving average of the ABI index, we should expect positive price momentum in the next period.

The National Association of Purchasing Managers (NAPM) index (shown in Exhibit 27), which is an indicator of anticipated business confidence, fell 4 percent this quarter, compared to a 0.8-percent rise last quarter.⁹ It also declined 3.3 percent year over year, down from its year-over-year gain of 10.3 percent in the prior period. Thus, we expect the prices of high-price hotels to decline near term.

⁹ The ISM: Purchasing Managers' Index, (Diffusion index, SA) also known as the National Association of Purchasing Managers (NAPM) index is based on a survey of over 250 companies within twenty-one industries covering all 50 states. It not only measures the health of the manufacturing sector but is a proxy for the overall economy. It is calculated by surveying purchasing managers for data about new orders, production, employment, deliveries, and inventory, in descending order of importance. A reading over 50% indicates that manufacturing is growing, while a reading below 50% means it is shrinking.

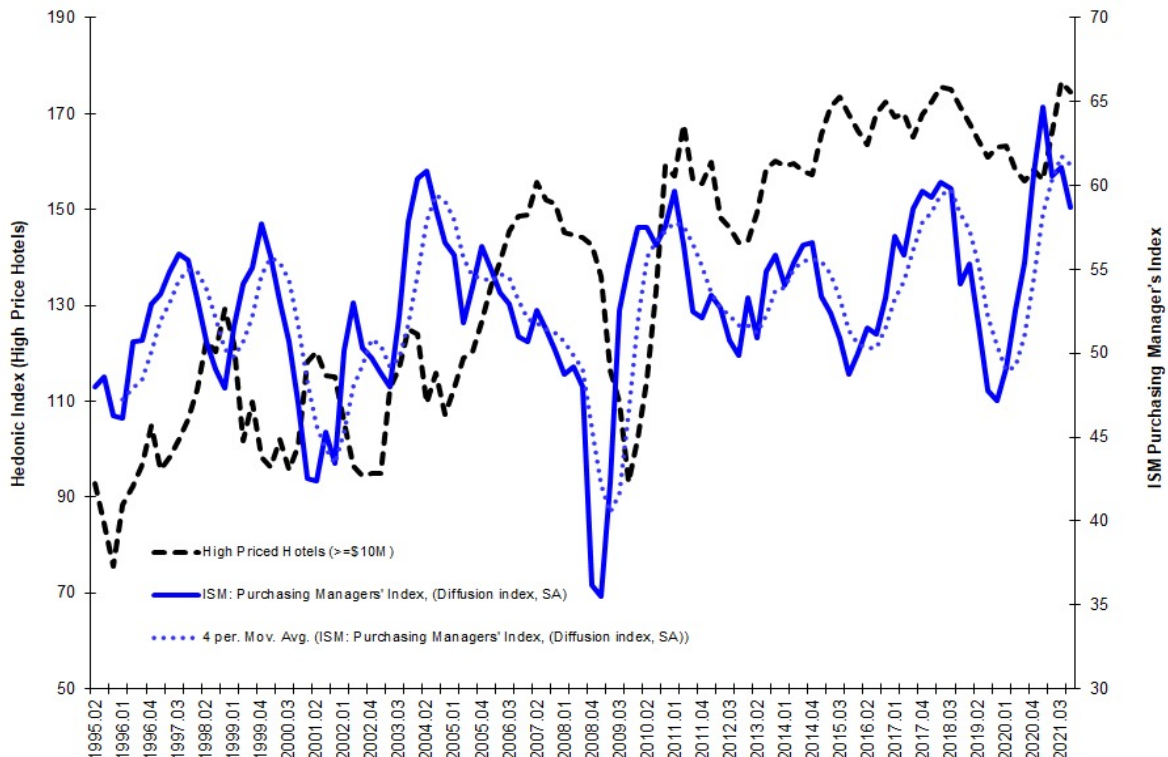
⁸ www.aiaa.org/practicing/economics/aiaas076265

Repeat sales index versus the architecture billings index



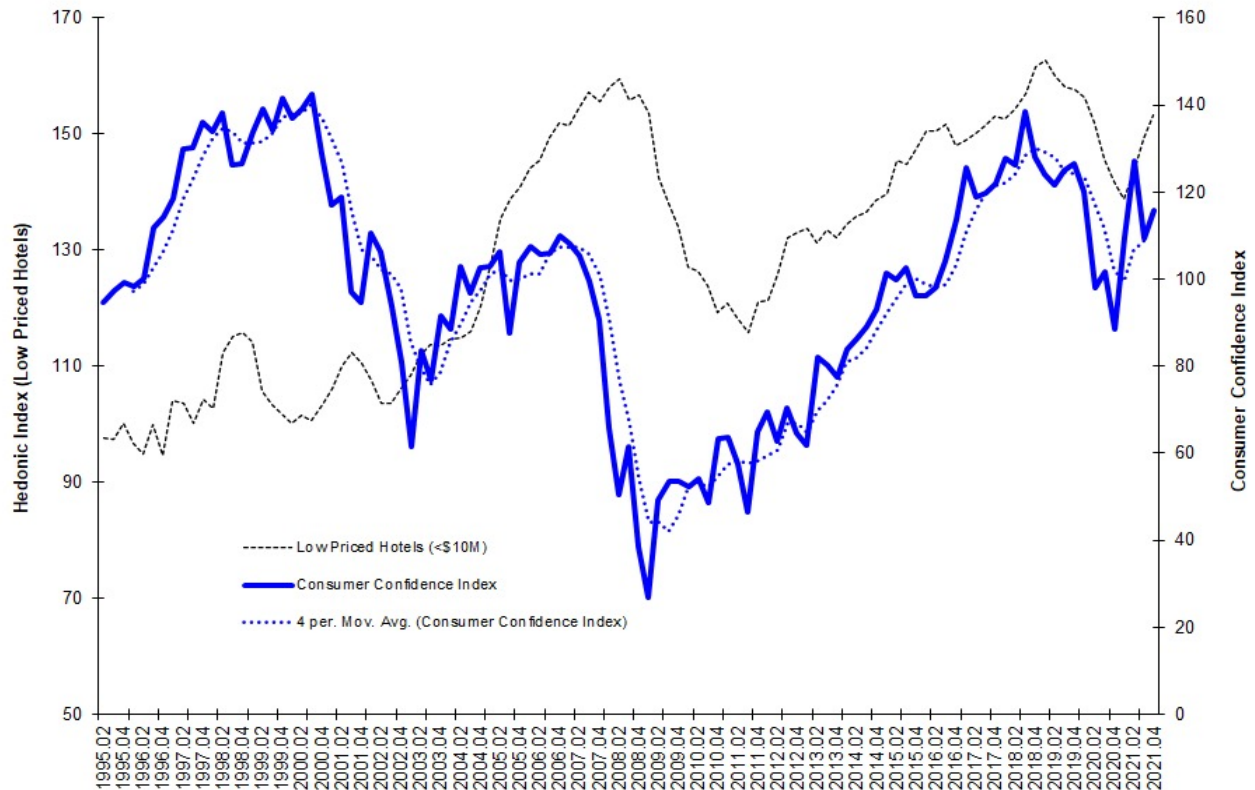
Sources: American Institute of Architects, Cornell Center for Real Estate and Finance Center for Real Estate and Finance

Business confidence and high-price hotels index



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

Consumer confidence and low-price hotels



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

In contrast, the Conference Board's Consumer Confidence Index (graphed in Exhibit 28), 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, rose 6 percent this quarter and increased almost 31 percent year over year. Thus, we expect low-price hotels to outperform high-price hotels near term.

We also look at the expected growth rate in Wall Street analysts' earnings (revenue) estimates for hotel REITs both in terms of next quarter earnings per share (EPS) and also annual EPS.¹⁰ As shown in Exhibit 29, analysts are expecting average quarterly EPS to rise between 66 percent (median) and 272 percent (mean) and average annual EPS to rise between 8 percent (median) and 15 percent (mean). Since analysts' estimates reflect the earnings guidance from management, this suggests that we should expect prices to rise, reflecting continued positive guidance regarding the EPS. ■

¹⁰ We obtain the growth rate in earnings and revenue estimates from <https://www.earningswhispers.com>.

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.

Analysts' forecasts of hotel REIT earnings

Earnings Growth					
E(QEPS)	Median	Mean	StDev	Min	Max
2020Q2	-159.1%	-164.9%	28.0%	-226.2%	-116.3%
2020Q3	-161.5%	-293.1%	514.3%	-2214.3%	-91.1%
2020Q4	-152.6%	-233.7%	223.4%	-866.7%	-90.6%
2021Q1	-237.3%	-376.8%	343.9%	-1400.0%	-76.5%
2021Q2	98.0%	104.3%	51.4%	59.7%	272.7%
2021Q3	136.4%	191.1%	137.4%	99.6%	625.0%
2021Q4	165.7%	371.9%	647.5%	97.1%	2700.0%
E(EPS)	Median	Mean	StDev	Min	Max
2020Q2	-111.2%	-77.3%	104.3%	-222.2%	175.0%
2020Q3	-141.4%	-91.3%	181.5%	-307.9%	290.6%
2020Q4	-161.6%	-104.1%	190.1%	-325.4%	366.7%
2021Q1	91.3%	97.0%	23.8%	70.9%	170.1%
2021Q2	98.0%	104.5%	24.7%	76.1%	184.4%
2021Q3	105.6%	113.7%	28.5%	87.7%	203.9%
2021Q4	107.7%	115.4%	32.0%	88.1%	220.8%
Revenue Growth					
E(QRev)	Median	Mean	StDev	Min	Max
2020Q2	-72.7%	-70.4%	16.5%	-92.7%	-45.2%
2020Q3	-73.1%	-70.3%	9.6%	-81.6%	-46.5%
2020Q4	-64.6%	-64.7%	12.1%	-79.6%	-45.1%
2021Q1	-58.2%	-53.7%	17.8%	-74.2%	0.0%
2021Q2	364.0%	420.1%	259.2%	60.6%	1047.7%
2021Q3	150.3%	167.5%	91.9%	28.2%	368.9%
2021Q4	151.3%	163.7%	80.0%	25.1%	361.1%
E(ARev)	Median	Mean	StDev	Min	Max
2020Q2	-43.7%	-44.2%	10.6%	-66.1%	-28.2%
2020Q3	-62.8%	-60.9%	6.3%	-69.2%	-47.7%
2020Q4	-64.7%	-61.9%	9.1%	-73.7%	-40.6%
2021Q1	44.1%	47.4%	10.4%	32.7%	66.0%
2021Q2	49.0%	45.5%	11.4%	13.0%	60.6%
2021Q3	55.0%	53.9%	14.0%	16.7%	73.5%
2021Q4	64.6%	61.8%	17.1%	16.6%	89.4%

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:

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

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

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

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

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 In our 2019Q2 issue, we introduced our new Regional Indices to add further granularity to hotel performance. More recently, we have included information on hotel delinquencies as well as short-term and long-term hotel earning expectations to aid hotel decisionmakers. We also present updates and revisions to our hotel indices along with commentary and supporting evidence from the real estate market. Starting in 2021Q2, we included standardized unexpected price for our regional price indices as well as standardized unexpected RevPar for the U.S. as a whole. We also introduced Shareholder Value Added as a complementary metric to EVA so that readers can now compare the profitability (EVA) of hotel real estate to investors' equity return (SVA).

¹ Cities that we define as gateway cities are 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.

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