

Cornell Hotel Indices: Third Quarter 2021

Pole Vaulting to a New High

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

Executive Summary

Hotels prices continued to gain ground during the recent quarter, regaining losses incurred during the pandemic. Prices in all regions are reverting to their long-term average, with hotels in the Pacific and South Atlantic regions rising above their standardized average. Hotels in both gateway and non-gateway cities continue to exhibit positive performance, although hotels in the gateway cities have posted greater gains. For both large and small hotels, transaction volume increased both quarter over quarter and year over year. Our moving average trendlines indicate that large hotels are priced to buy, while small hotels represent an opportunistic buy at best. Large hotels reached a new statistical high based on our standardized unexpected price (SUP) performance metric. Mortgage financing volume rose, given that financing costs were lower this quarter. Among factors that have contributed to this situation are the facts that the relative risk premium remained stationary this quarter and that the hotel delinquency rate has continued to decline. Our economic value added (EVA) and our shareholder value added (SVA) are positive, indicating that hotel investment based on operating performance is currently financially feasible. Looking toward the next quarter, our leading indicators of hotel price performance indicate that positive price momentum should continue to exist for both large and small hotels.

ABOUT THE AUTHORS



Crocker H. Liu is a professor of real estate at the Nolan 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*. Mr. White is a noted authority on the real estate capital markets with credits in *The Wall Street Journal*, *Barron's*, *The Economist*, *Forbes*, *The New York Times*, and the *Financial Times*, among others.

Acknowledgments

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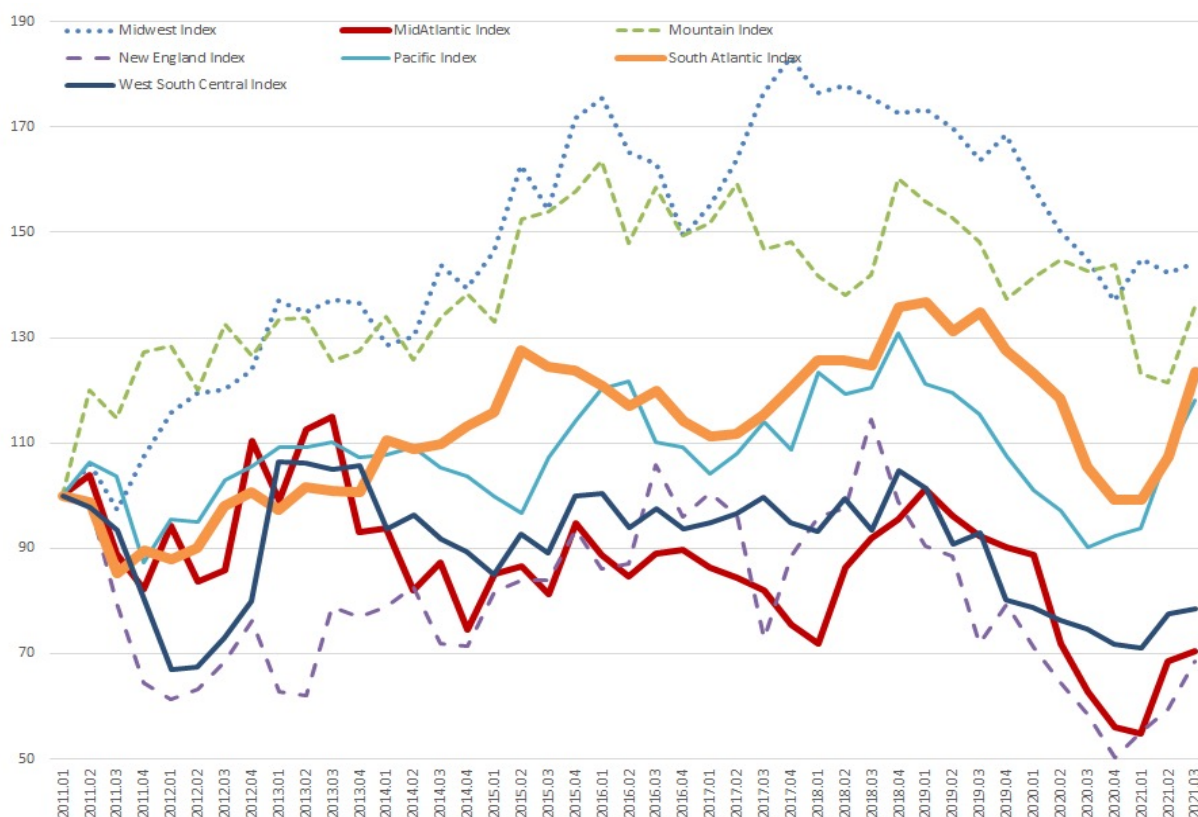
The Cornell hotel indices produced by The Center for Real Estate and Finance at the School of Hotel Administration at Cornell University are provided as a free service to academics and practitioners on an as-is, best-effort basis with no warranties or claims regarding its usefulness or implications. The indices are not audited, and they are not necessarily free of errors or omissions although every effort has been made to minimize these. The reported indices for any quarter of any year should be considered preliminary and subject to revision.

Analysis of Indices through Q3, 2021

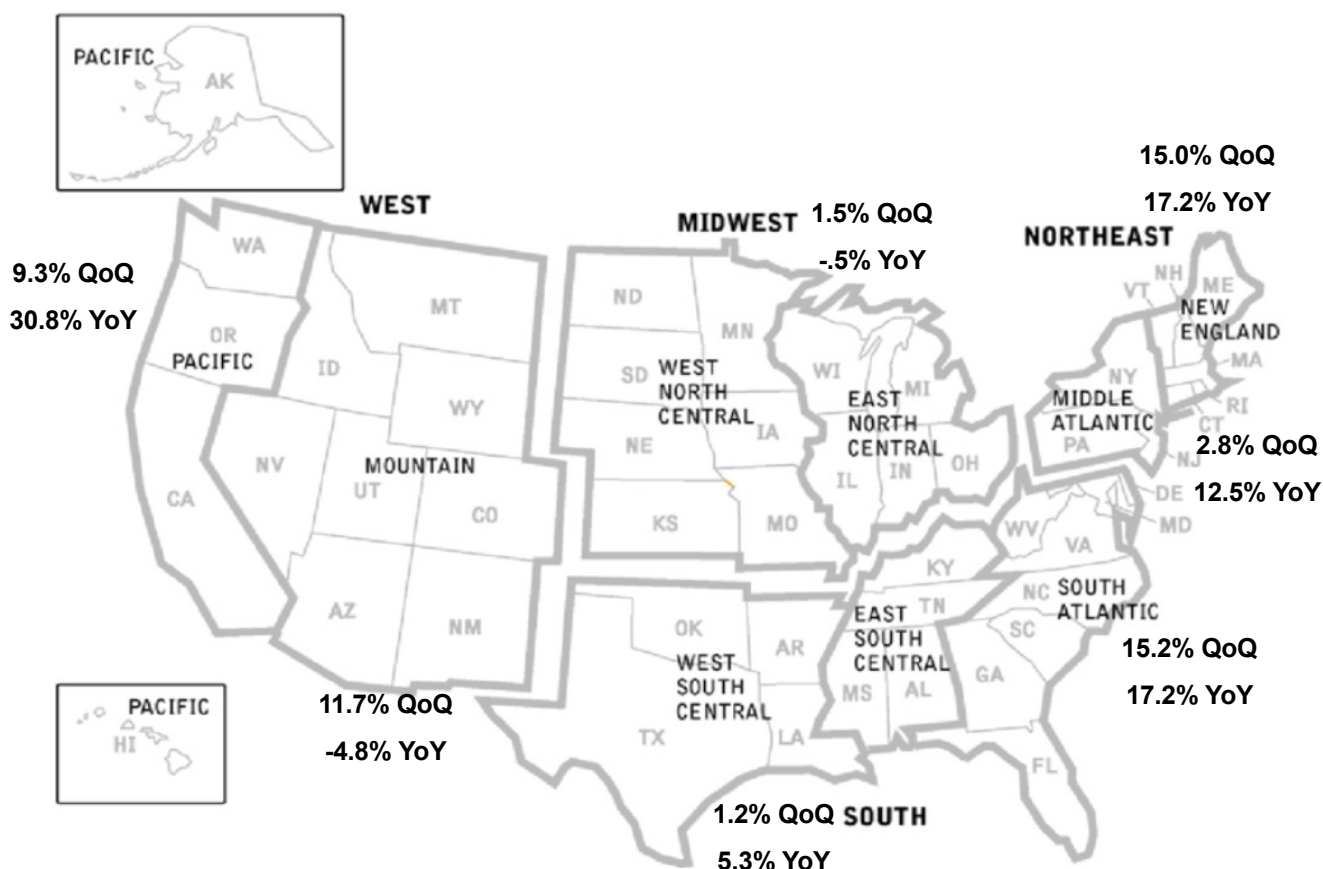
Prices for hotels in all regions continue to gain ground. For the most recent quarter (2021Q3), Exhibits 1a through 1d show that the Midwest and Mountain regions have now bounced back from the impact of the pandemic, while all other regions continue to exhibit positive price momentum. Quarter over quarter, Exhibit 1b shows that three regions experienced double-digit price gains: South Atlantic, 15.2percent; New England, 15 percent; and Mountain, 11.7 percent. All other regions also posted gains: the Pacific region experienced a quarterly price gain of 9.3 percent; the Mid-Atlantic, 2.8 percent; Midwest, 1.5 percent; and West South Central, 1.2 percent. From a year-over-year perspective, however, two regions remain in negative territory with regard to the change in hotel prices: Mountain at -4.8 percent and Midwest at -.5 percent. That said, all regions except for the West South Central region experienced double-digit price gains. In that regard, the Pacific region had the largest price appreciation, at 30.8 percent, the New England and the South Atlantic regions each gained 17.2 percent, and the Mid-Atlantic region recorded a 12.5-percent gain. Prices in the West South Central region did see an increase, but it was a comparatively small gain of 5.25 percent.

EXHIBIT 1A

Time series hotel performance for seven regions



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

EXHIBIT 1b
Cross-section hotel performance for seven regions


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

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

Year over year	Midwest	Mid Atlantic	Mountain	New England	Pacific	South Atlantic	West South Central
Current	-0.49%	12.45%	-4.83%	17.19%	30.79%	17.21%	5.25%
Prior	-5.38%	-4.52%	-16.04%	-7.56%	11.27%	-9.50%	1.53%
Quarter over quarter							
Current	1.47%	2.82%	11.70%	15.00%	9.29%	15.16%	1.17%
Prior	-1.82%	24.98%	-1.30%	8.05%	15.13%	8.20%	9.09%

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

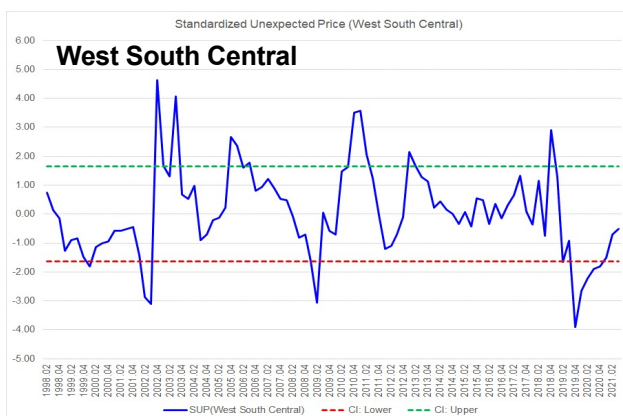
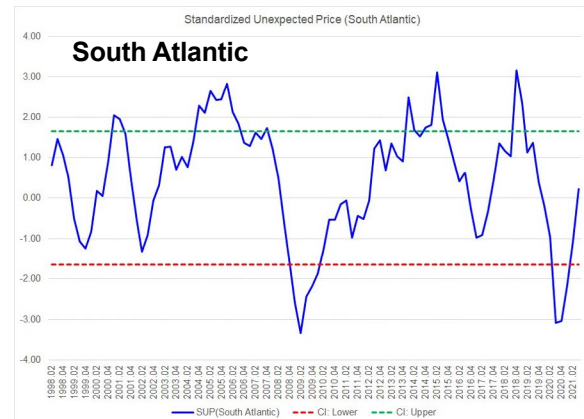
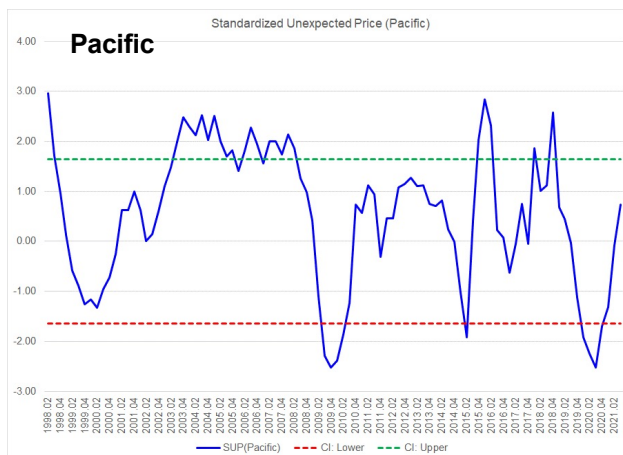
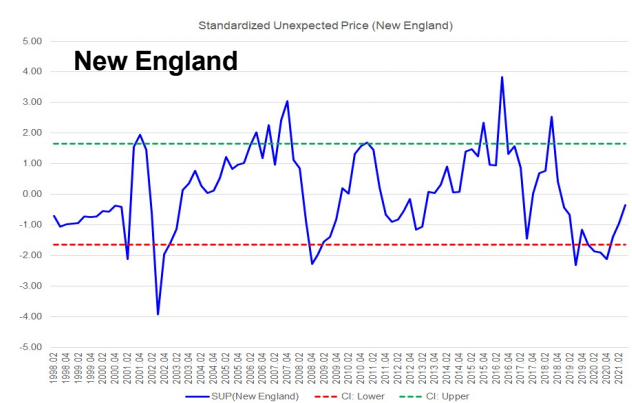
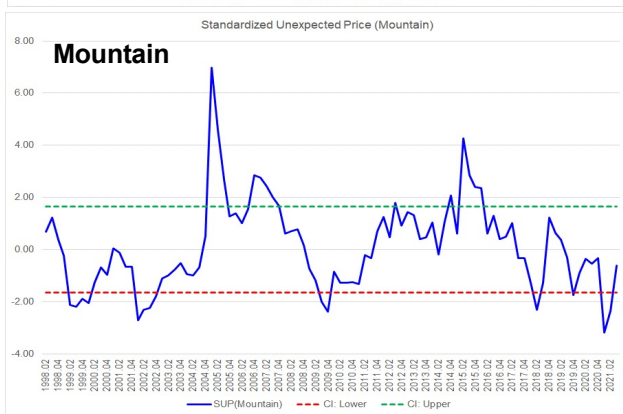
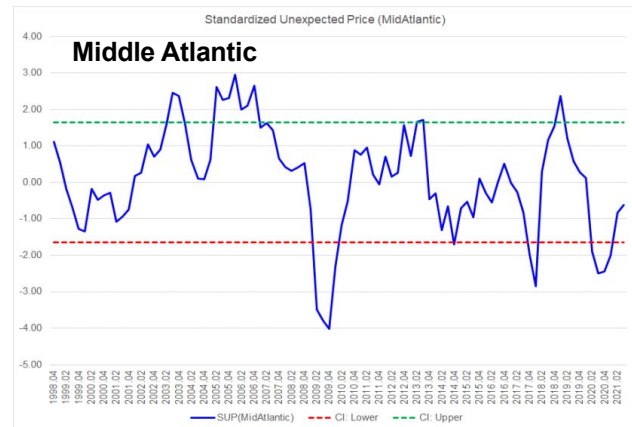
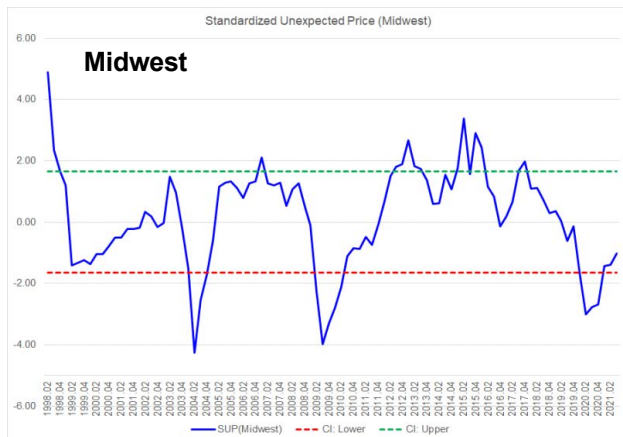
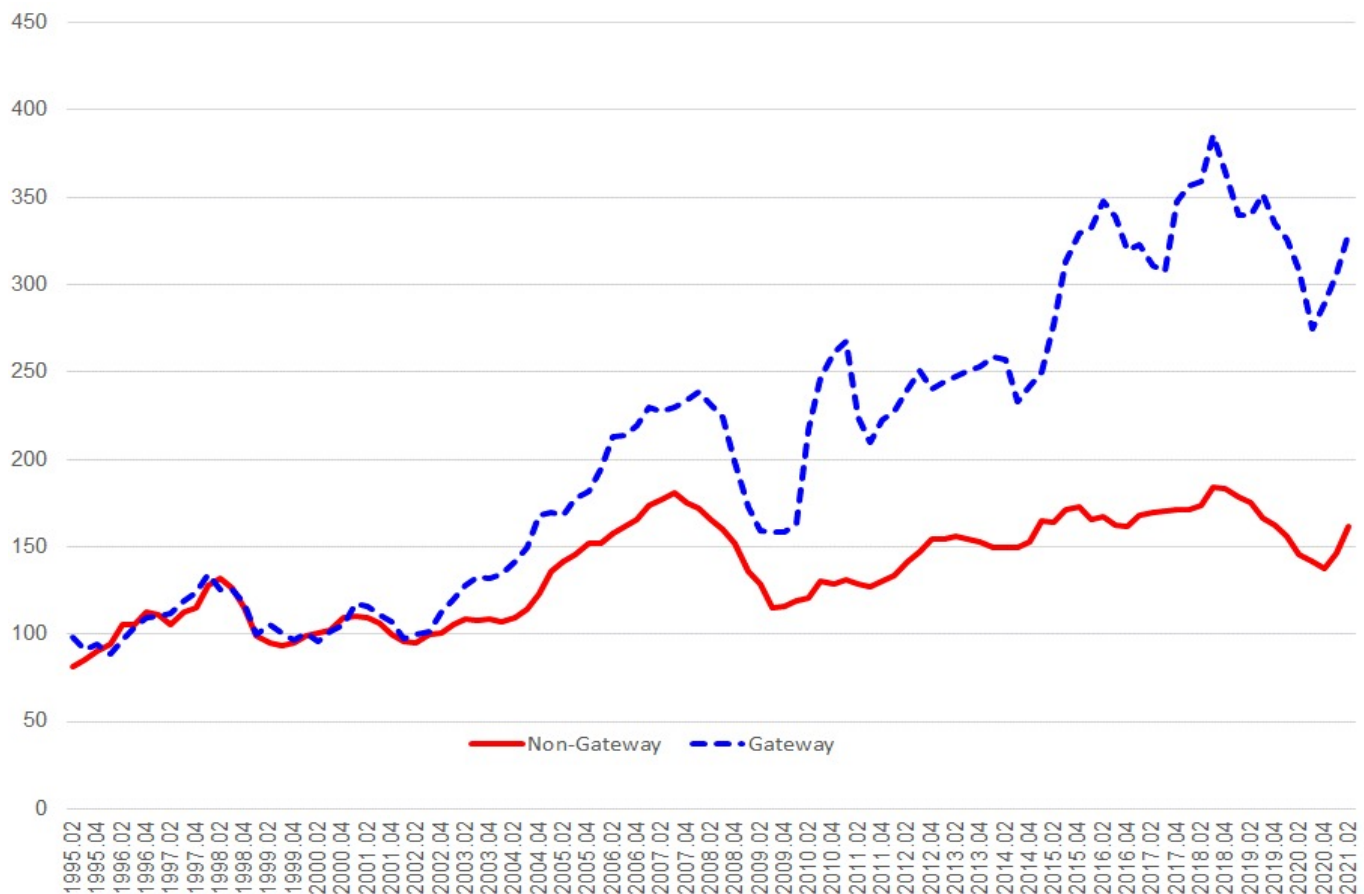


Exhibit 1d reveals that in terms of the standardized unexpected price (Z-score), hotel prices have risen above their statistical lower bound (confidence interval) in all regions and are currently reverting to their standardized average (zero) with the Pacific and South Atlantic rising above their average. In fact, the current price point for the Pacific states (273.58) in aggregate is similar to its price point in 2019Q2 (276.96). The current price point for the South Atlantic states of 168.88 is similar to its price point at 2020Q1, the start of the pandemic.

Hotel performance for gateway cities versus non-gateway cities



Hotels in both gateway and non-gateway cities exhibit positive performance; hotels in gateway cities posted greater gains. Exhibit 2 shows that the price performance of hotels in gateway cities continued its upward climb, rising another 6 percent this quarter on top of a 6 percent increase last quarter. (We define gateway cities as Boston, Chicago, Honolulu, Los Angeles, Miami, New York, San Francisco, and Washington, D.C.) Hotels in non-gateway cities rose 4 percent this quarter compared to a rise of 3 percent in the previous quarter. Year over year, the price of hotels increased 13 percent in gateway cities, compared to a 2-percent gain in non-gateway cities. These increases exceeded the change in hotel prices in the prior period for both gateway cities (+5 percent) and non-gateway cities (-5 percent).

Transaction volume and prices increased for both large and small hotels year over year and quarter over quarter. The transaction volume on all hotel transactions (both large hotels and small hotels combined) rose almost 29 percent this quarter compared to 61 percent in the prior

quarter as shown in Exhibit 3.¹ Year over year, volume increased 159 percent compared to a decrease in volume of 334 percent in the prior period. When transactions are separated into large hotels and small hotels, transaction volume rose 721 percent year over year and 64 percent quarter over quarter for large hotels. The transaction volume for small hotels increased 109 percent year over year and 20 percent quarter over quarter. Buoyed by stronger transaction volume, the median price (based on all hotel transactions) rose 55 percent with larger hotels rising 92 percent and smaller hotels increasing 20 percent year over year. Quarter over quarter, the median price rose 24 percent for the entire sample, as large hotels rose 11 percent and small hotels increased 8 percent. Exhibit 4 and Exhibit 5 show this year-over-year trend 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 as being 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%	2,357,500	20	100%	3,400,000	7	35%	2,100,000	13	65%
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%	2,428,500	66	60%
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%	2,575,000	84	84%	2,907,500	34	34%	2,862,500	66	66%
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)

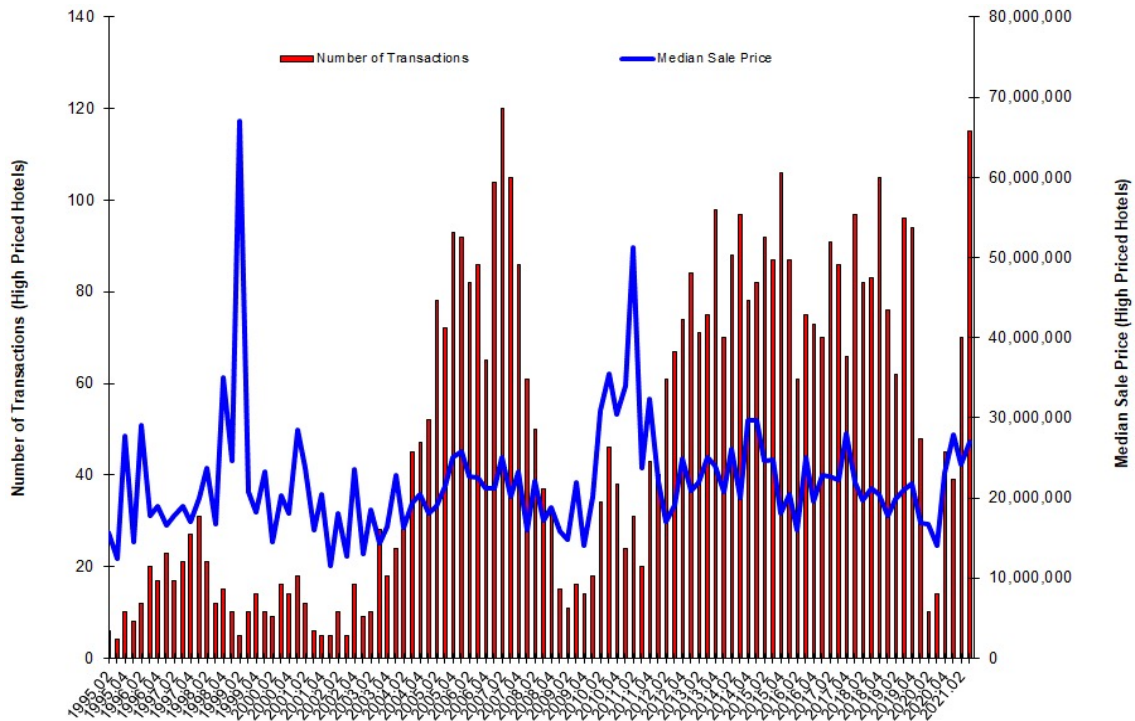
Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2004	1	2,925,000	166	22,875,250	24	14.45%	2,536,756	142	85.54%	3,450,000	41	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%	2,540,000	156	80%
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%	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%	2,420,000	62	62%	38,500,000	23	23%	3,265,000	77	77%
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	5,752,500	254	29,750,000	82	32.28%	3,125,000	172	67.71%	8,280,000	47	18.50%	5,500,000	207	81.49%
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	247	23,053,000	45	18.21%	2,700,500	202	81.78%	10,725,000	36	14.57%	3,000,000	211	85.42%
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%

EXHIBIT 4

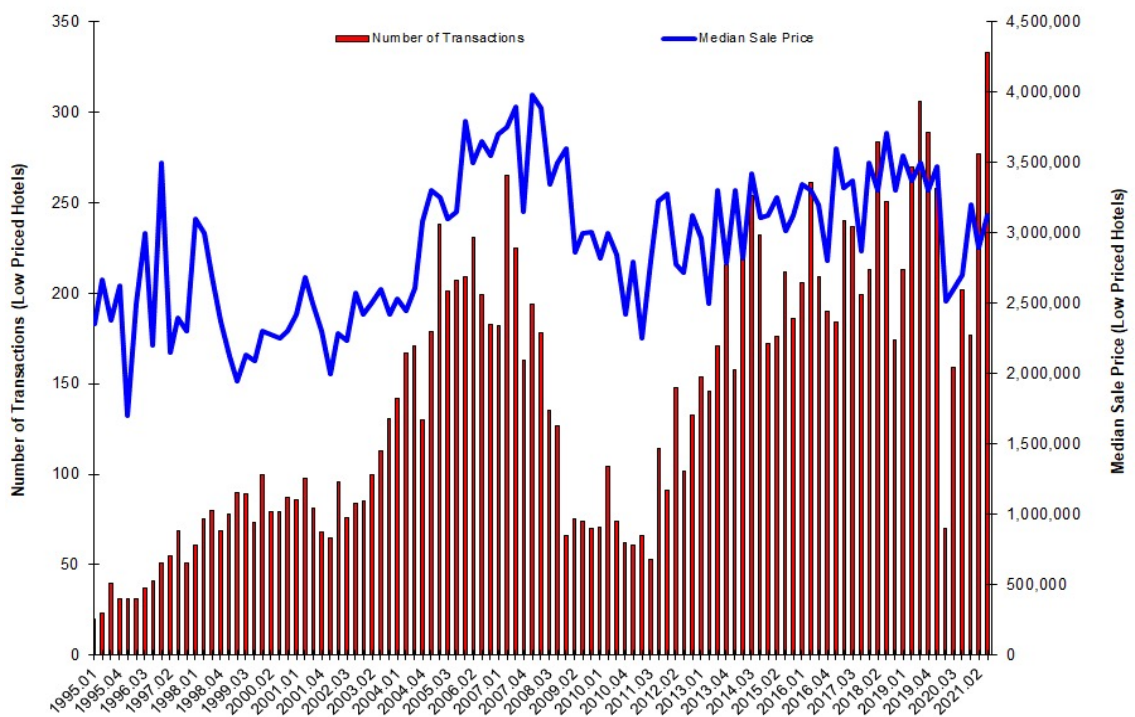
Median sale price and number of sales (hotels with sale prices of \$10 million or more)



Sources: CoStar, Real Capital Analytics

EXHIBIT 5

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



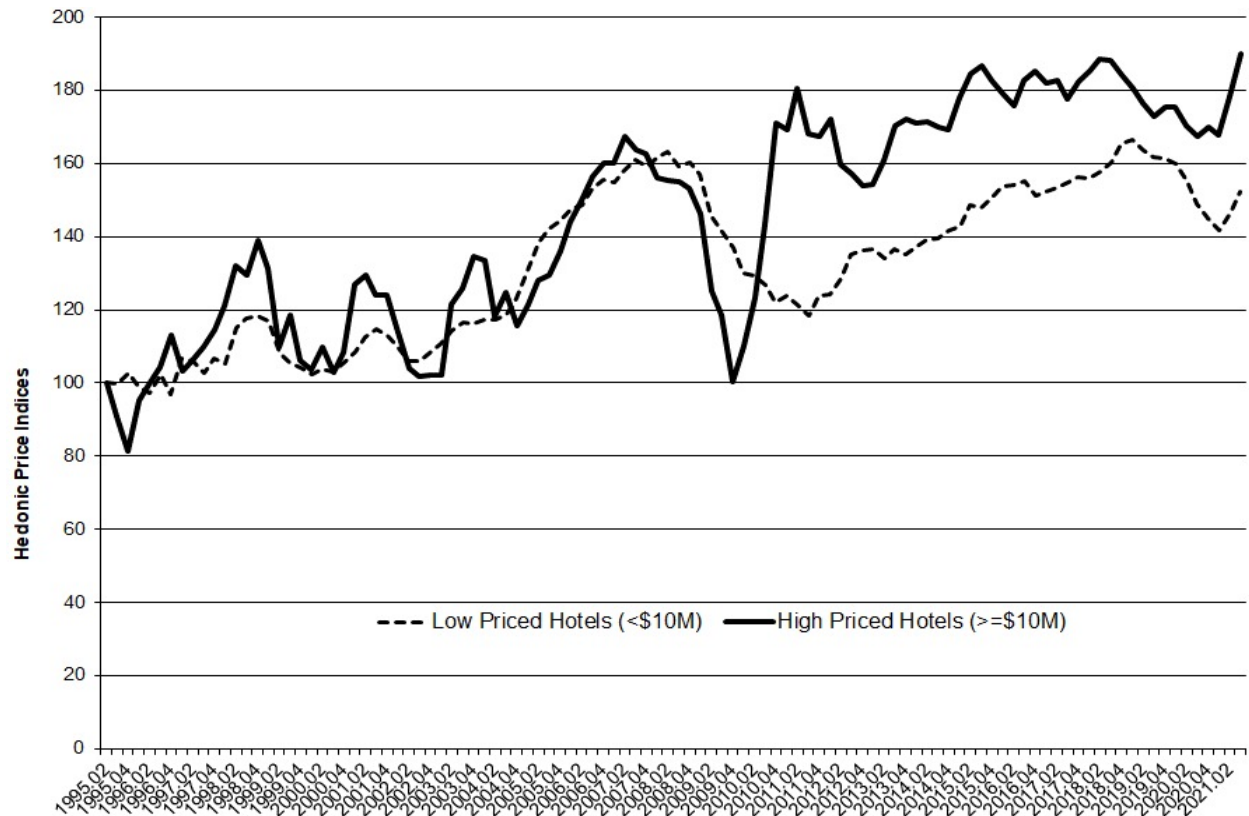
Sources: CoStar, Real Capital Analytics

Hotel indices through 2021, quarter 3

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
1995.02	97.7078	93.11666	82.2037	102.079	63.73	NA	2008.01	158.154	145.4033	175.116	233.488	157.54	164.2
1995.03	97.6413	84.69885	81.1738	97.9159	66.649	NA	2008.02	159.345	144.8524	171.661	238.261	157.79	165.63
1995.04	100.373	75.8435	85.3064	91.1301	68.457	NA	2008.03	155.718	144.3184	165.78	231.391	156.58	162.05
1996.01	96.7603	88.76005	90.0237	93.7894	70.276	NA	2008.04	156.628	142.6234	160.295	224.573	157.96	165.05
1996.02	95.0241	92.75444	94.448	88.5253	72.657	NA	2009.01	153.437	136.2493	152.156	198.523	153.24	160.31
1996.03	100.074	97.24764	105.239	96.658	71.559	NA	2009.02	142.408	116.6933	135.99	173.038	149.58	154.49
1996.04	94.763	105.326	105.333	103.688	72.769	NA	2009.03	138.096	110.2981	128.406	159.203	136.15	141.46
1997.01	104.162	96.1903	112.779	109.792	86.416	NA	2009.04	133.816	93.43216	115.094	158.642	122.12	127.28
1997.02	103.704	98.77515	110.913	110.516	88.885	NA	2010.01	127.027	102.6432	115.944	158.62	115.4	121.68
1997.03	100.237	102.2088	105.745	111.681	95.501	NA	2010.02	126.352	114.7731	119.313	162.811	107.43	114.17
1997.04	104.287	106.5742	112.712	119.128	101.74	NA	2010.03	123.749	133.4016	120.7	217.337	108.25	115.05
1998.01	102.708	112.8997	115.062	123.558	98.15	NA	2010.04	119.323	159.4558	129.975	246.735	109.98	114.78
1998.02	112.334	123.123	127.831	134.092	103.6	NA	2011.01	120.921	157.4628	128.587	260.998	110.24	110.91
1998.03	115.045	120.6069	131.891	125.363	105.17	NA	2011.02	118.353	168.2505	131.065	267.777	110.81	110.53
1998.04	115.789	129.5068	126.491	125.529	102.93	NA	2011.03	115.654	156.5042	128.56	224.536	109.52	109.18
1999.01	114.203	122.1898	114.964	117.713	96.357	NA	2011.04	120.981	155.7766	127.027	209.592	111.53	111.55
1999.02	105.665	102.1346	98.9606	99.4294	90.816	NA	2012.01	121.283	160.1898	130.377	222.774	112.44	111.88
1999.03	103.327	110.3771	94.7243	105.277	88.386	NA	2012.02	125.81	148.6709	133.121	227.605	116.22	118.01
1999.04	101.713	98.81814	93.4406	100.186	89.087	NA	2012.03	132.139	146.3874	141.296	240.369	120.44	121.73
2000.01	100.144	96.59654	94.8011	96.4555	94.038	100.09	2012.04	133.119	143.2078	147.253	250.921	121.7	122.89
2000.02	101.606	102.2713	99.1446	100.576	97.797	100.09	2013.01	133.601	143.6189	153.994	240.177	123.09	125.71
2000.03	100.6	95.92759	100.71	95.908	97.578	94.312	2013.02	131.142	149.7035	154.68	244.086	124.16	127.11
2000.04	103.35	100.9438	102.416	101.767	97.067	94.364	2013.03	133.496	158.6906	156.272	247.562	124.96	129.35
2001.01	106.133	118.3396	109.729	105.486	95.349	91.44	2013.04	131.986	160.2753	153.955	250.458	127.13	133.04
2001.02	110.131	120.5925	110.324	117.302	94.819	89.136	2014.01	134.311	159.3355	152.827	253.407	132.86	138.38
2001.03	112.29	115.6645	109.308	115.989	95.865	92.872	2014.02	135.82	159.7331	149.589	258.365	131.94	135.88
2001.04	110.46	115.5512	106.049	111.397	95.6	89.305	2014.03	136.455	158.1207	149.693	257.323	134.56	137.71
2002.01	107.52	106.046	99.477	107.287	96.259	92.18	2014.04	138.613	157.4693	149.666	233.024	135.15	136.9
2002.02	103.59	96.84985	95.7532	97.3067	94.523	91.151	2015.01	139.459	165.8767	152.663	242.19	137.59	138.71
2002.03	103.481	94.6786	95.0514	99.9262	95.018	89.353	2015.02	145.118	171.7347	164.899	249.975	142.38	143.44
2002.04	106.174	95.01217	100.099	101.06	96.104	94.552	2015.03	144.568	173.8564	163.781	277.096	150.59	152.57
2003.01	108.311	95.13652	100.917	112.409	97.515	94.209	2015.04	147.296	170.1087	171.309	313.121	159.33	161.08
2003.02	111.796	112.9801	105.313	120.107	99.781	97.889	2016.01	150.363	166.6347	173.118	328.979	161.33	163.65
2003.03	113.832	117.2889	108.281	128.15	101.31	101.69	2016.02	150.506	163.8298	165.758	332.333	161.17	164.28
2003.04	113.384	125.2687	107.916	132.313	102.57	104.37	2016.03	151.484	170.2064	167.515	347.401	160.41	162.07
2004.01	114.648	124.2566	108.595	131.548	102.3	105.78	2016.04	147.876	172.6681	162.103	338.777	156.33	159.42
2004.02	114.776	109.9581	107.21	134.321	102.65	106.6	2017.01	148.901	169.58	161.573	319.452	161.22	164.25
2004.03	116.081	116.3116	109.638	141.847	106.96	111.48	2017.02	150.033	170.2311	167.786	323.168	168.78	172.46
2004.04	120.442	107.6041	114.28	149.437	108.19	111.47	2017.03	151.434	165.3636	169.246	310.473	169.93	174.58
2005.01	127.641	113.1245	122.76	168.247	112.82	115.43	2017.04	152.874	169.9201	170.179	307.539	173.83	177.52
2005.02	135.437	119.2581	135.819	169.941	118.67	122.14	2018.01	152.386	172.6203	171.254	347.745	173.8	178.09
2005.03	138.786	120.7151	141.255	167.869	121.77	124.64	2018.02	154.003	175.6482	170.887	356.773	175.46	178.49
2005.04	140.881	126.8658	145.182	177.285	127.11	130.75	2018.03	156.75	175.131	173.339	358.984	180.09	182.89
2006.01	144.201	134.2128	152.226	181.609	131.49	135.41	2018.04	161.464	171.6044	184.083	385.215	182.4	184.8
2006.02	145.385	139.5499	152.135	194.577	134.35	137.85	2019.01	162.612	168.1537	182.915	364.583	185.45	187.19
2006.03	149.355	145.8141	157.498	212.566	136.3	139.8	2019.02	159.799	164.5532	178.464	339.91	185.06	185.92
2006.04	151.986	149.035	161.739	213.457	140.96	142.6	2019.03	158.048	161.0562	175.162	339.712	185.21	186.37
2007.01	151.371	149.2658	165.845	219.216	144.95	145.98	2019.04	157.572	163.2609	166.376	351.596	185.91	187.52
2007.02	154.511	155.8901	173.341	229.528	149.06	150.05	2020.01	156.143	163.4134	162.266	334.771	182.79	184.87
2007.03	157.182	152.3834	177.058	227.603	154.88	157.48	2020.02	151.666	158.4539	156.045	325.983	182.9	185.59
2007.04	155.595	151.6081	180.791	230.056	156.3	159.7	2020.03	145.447	155.9214	145.755	308.283	181.1	183.81
							2020.04	141.64	158.3565	141.315	274.807	182.48	185.69
							2021.01	138.621	156.3969	137.13	288.874	181.87	184.69
							2021.02	143.119	166.1949	146.373	306.138	183.76	186.15
							2021.03	148.913	176.8134	161.199	329.102	191.47	192.81

Source: Cornell Center for Real Estate and Finance

Hedonic hotel indices for large and small hotel transactions



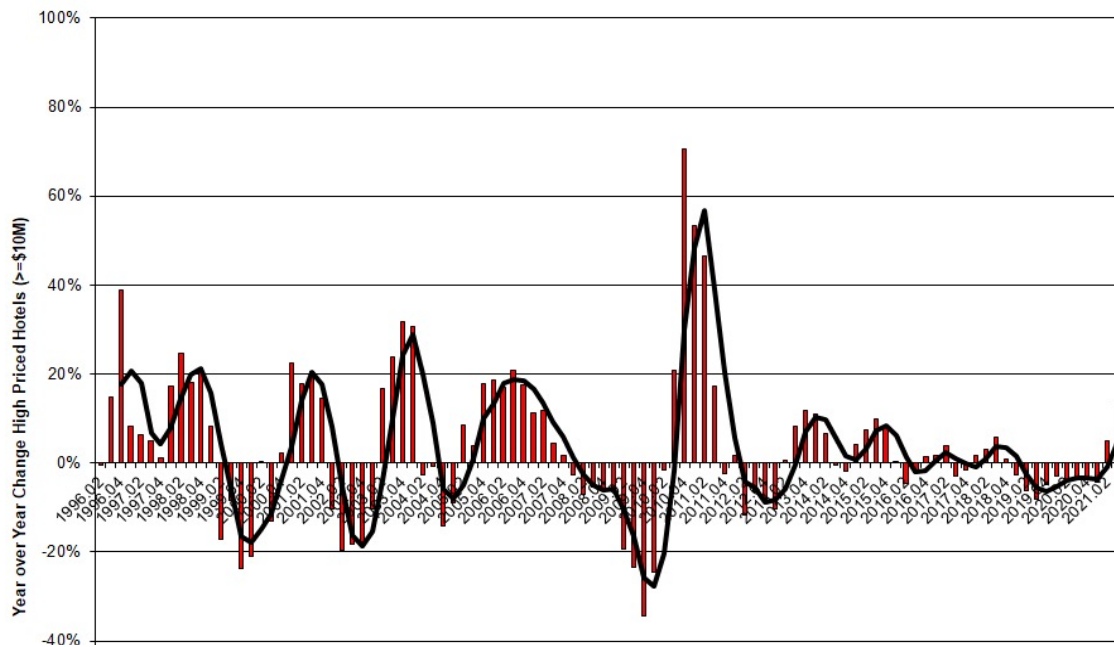
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trendlines indicate that large hotels are priced to buy, while small hotels constitute an opportunistic buy at best. Large hotels reached a new statistical high 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 rose 6.4 percent, while smaller hotels increased 4 percent in the third quarter. Year over year, Exhibit 8 shows that large hotels increased 13.4 percent compared to 4.9 percent in the prior year-over-year period. Exhibit 9 shows that smaller hotels rose 2.4 percent year over year, compared to a -5.6 percent decline in the prior period.

EXHIBIT 8

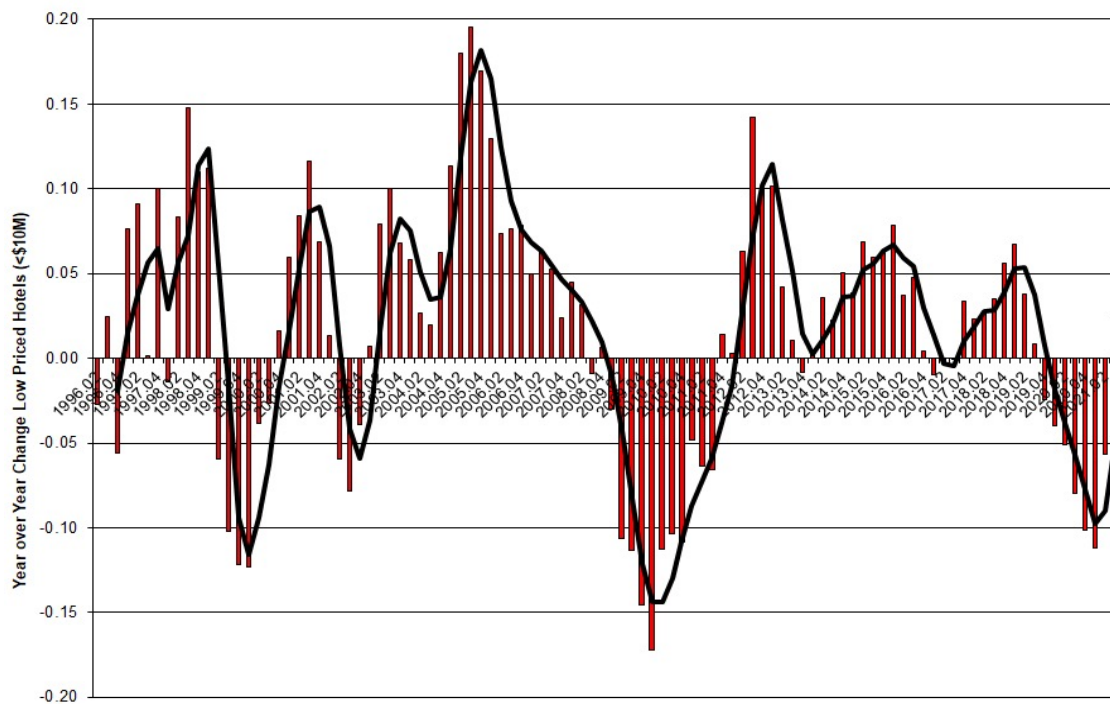
Year-over-year change in large-hotel index with a moving average trendline



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

EXHIBIT 9

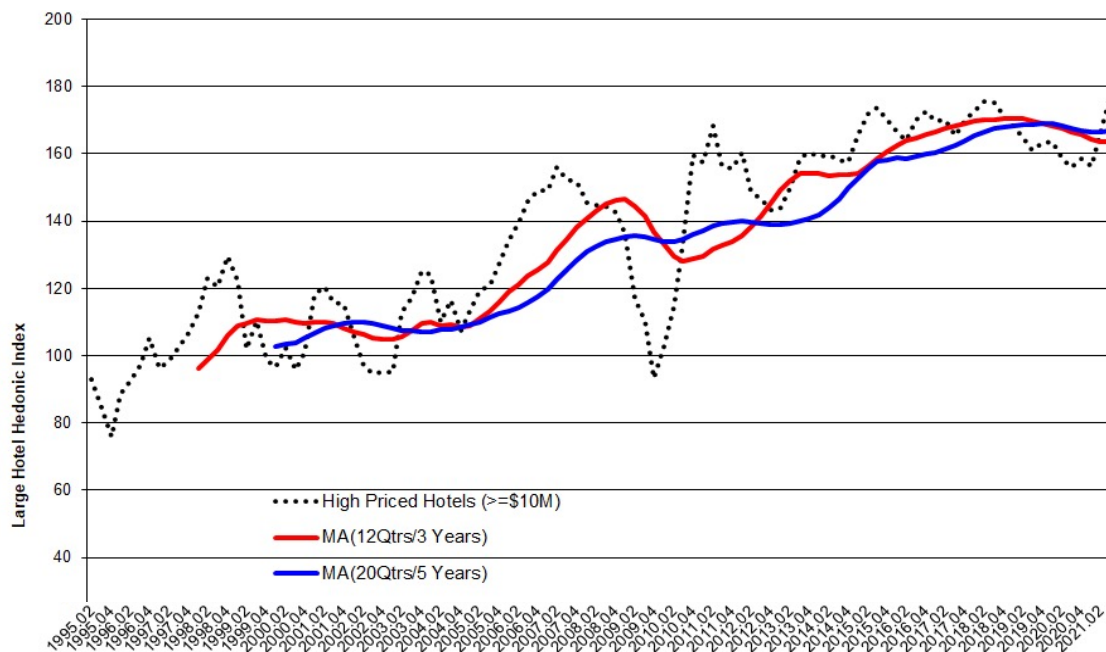
Year-over-year change in small-hotel index with a moving average trendline



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

EXHIBIT 10

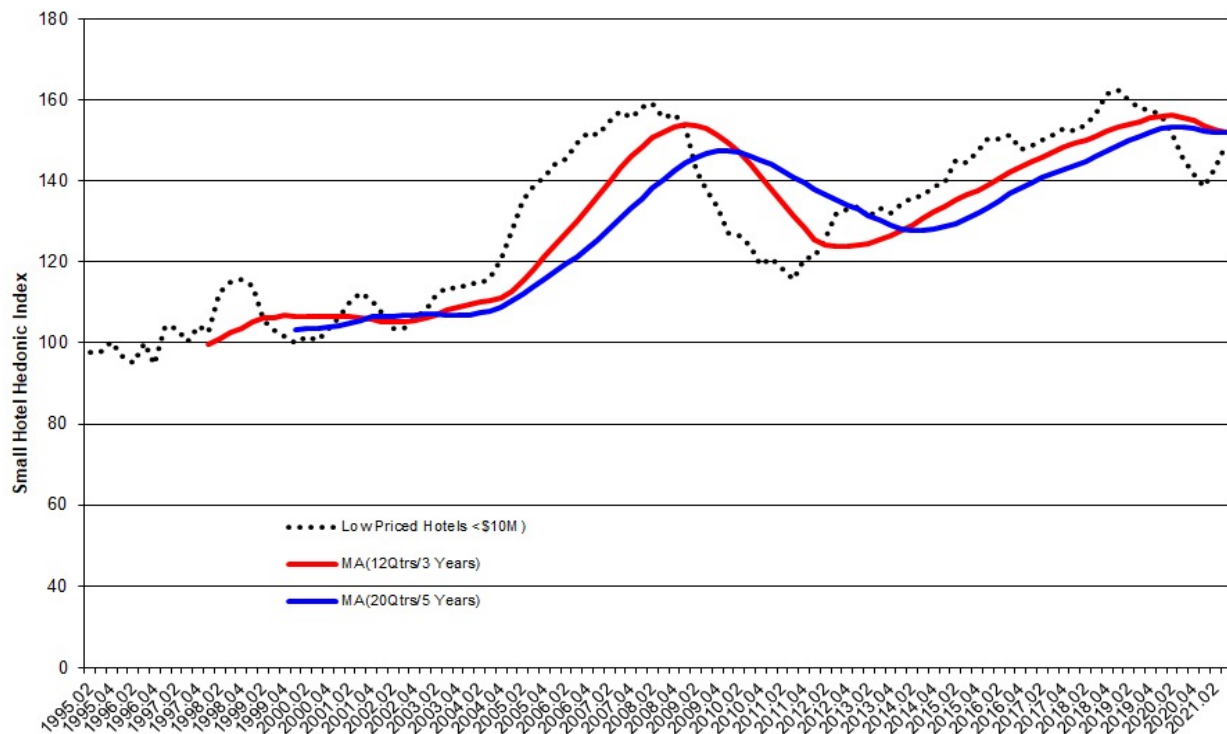
Moving average trendline for large hotel index



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

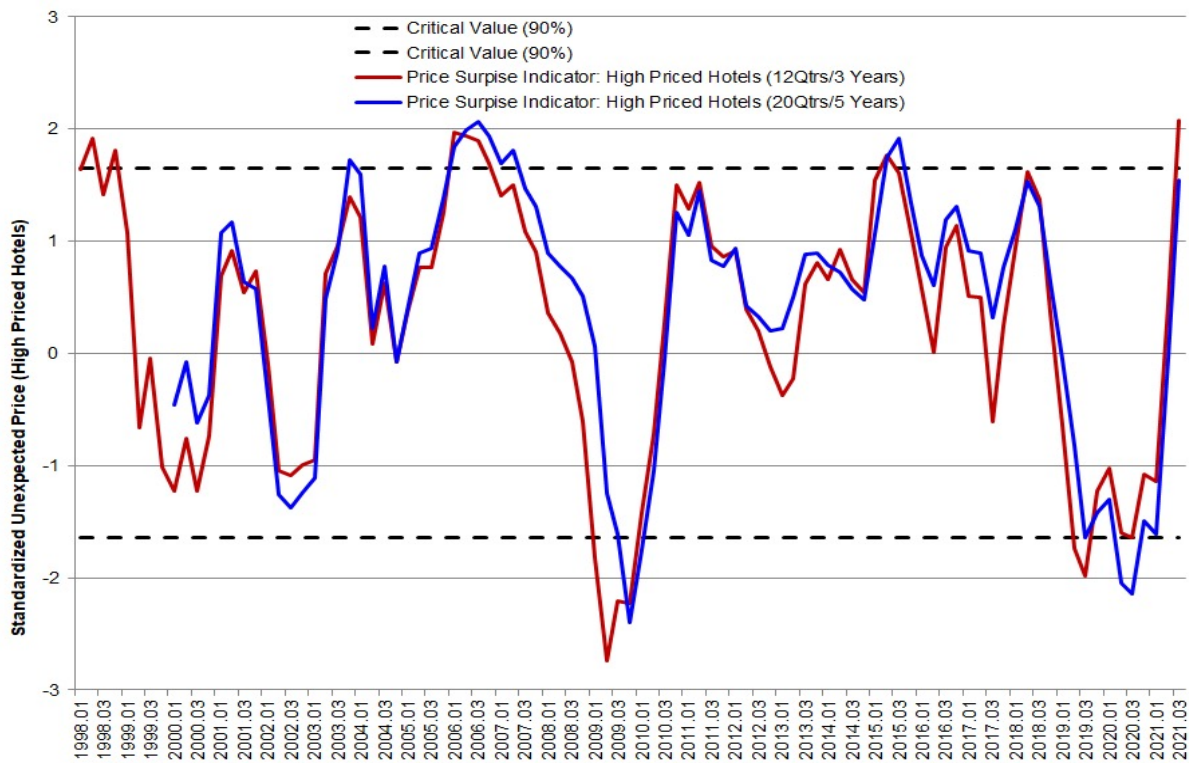
EXHIBIT 11

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



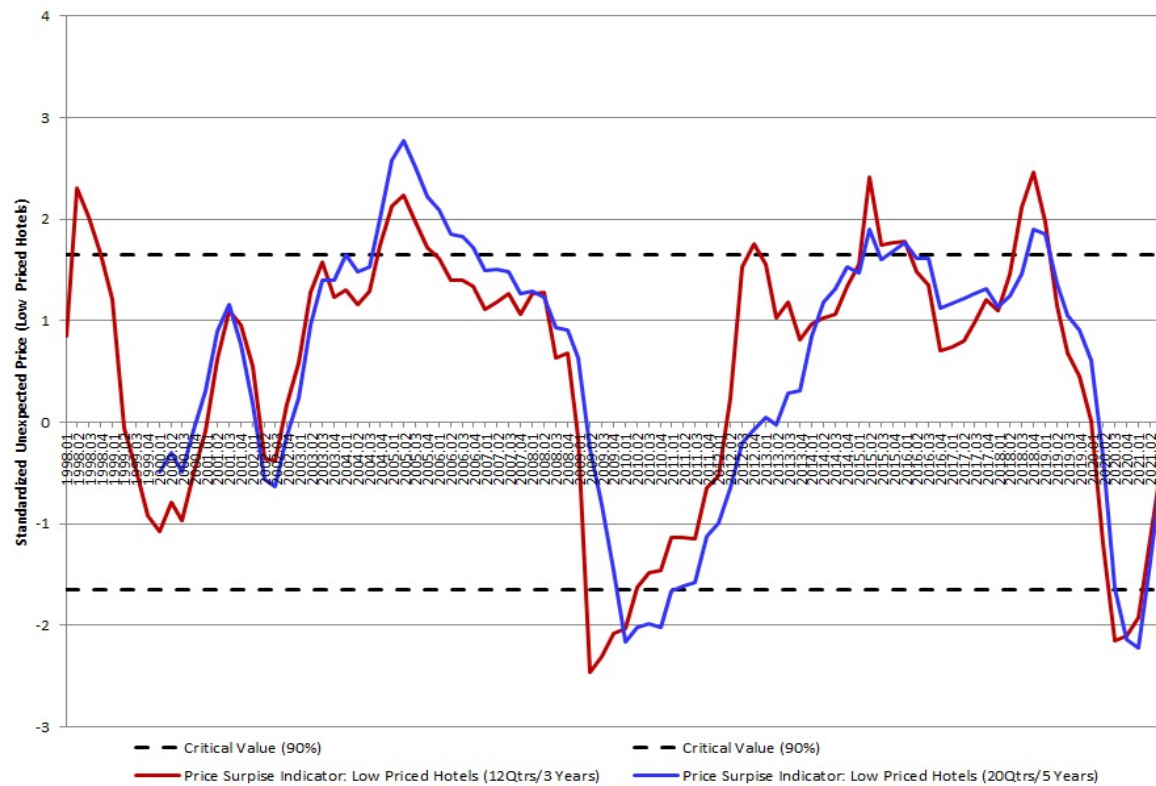
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trend lines for large hotels (in Exhibit 10) shows that the prices for large hotels has crossed above both their short term and long-term moving averages, indicating that large hotels are a buy. In contrast, the prices for small hotels (Exhibit 11) have remained below both their short-term and long-term moving averages, representing an opportunistic buy at best.

Our Standardized unexpected price (SUP) metric in Exhibit 12 shows that the standardized price for large hotels has reached a new statistical high. The standardized price for small hotels is continuing to revert towards its standardized average (zero) as shown in Exhibit 13.

EXHIBIT 13

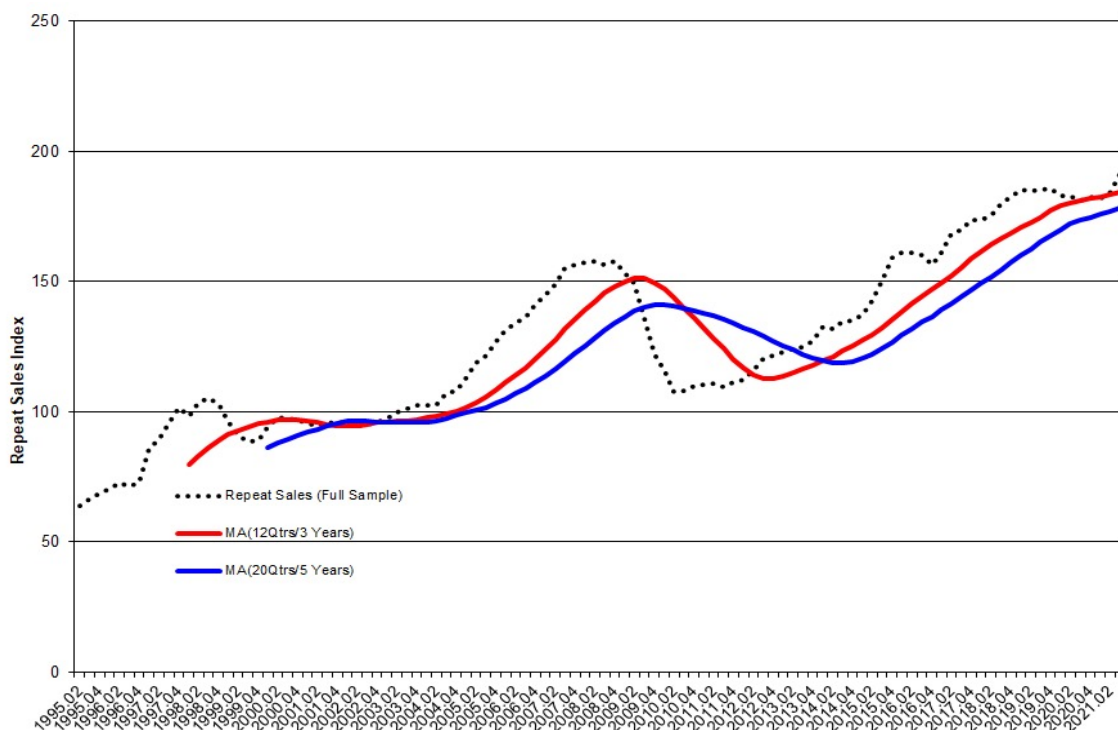
Standardized unexpected price (SUP) for small hotel index



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

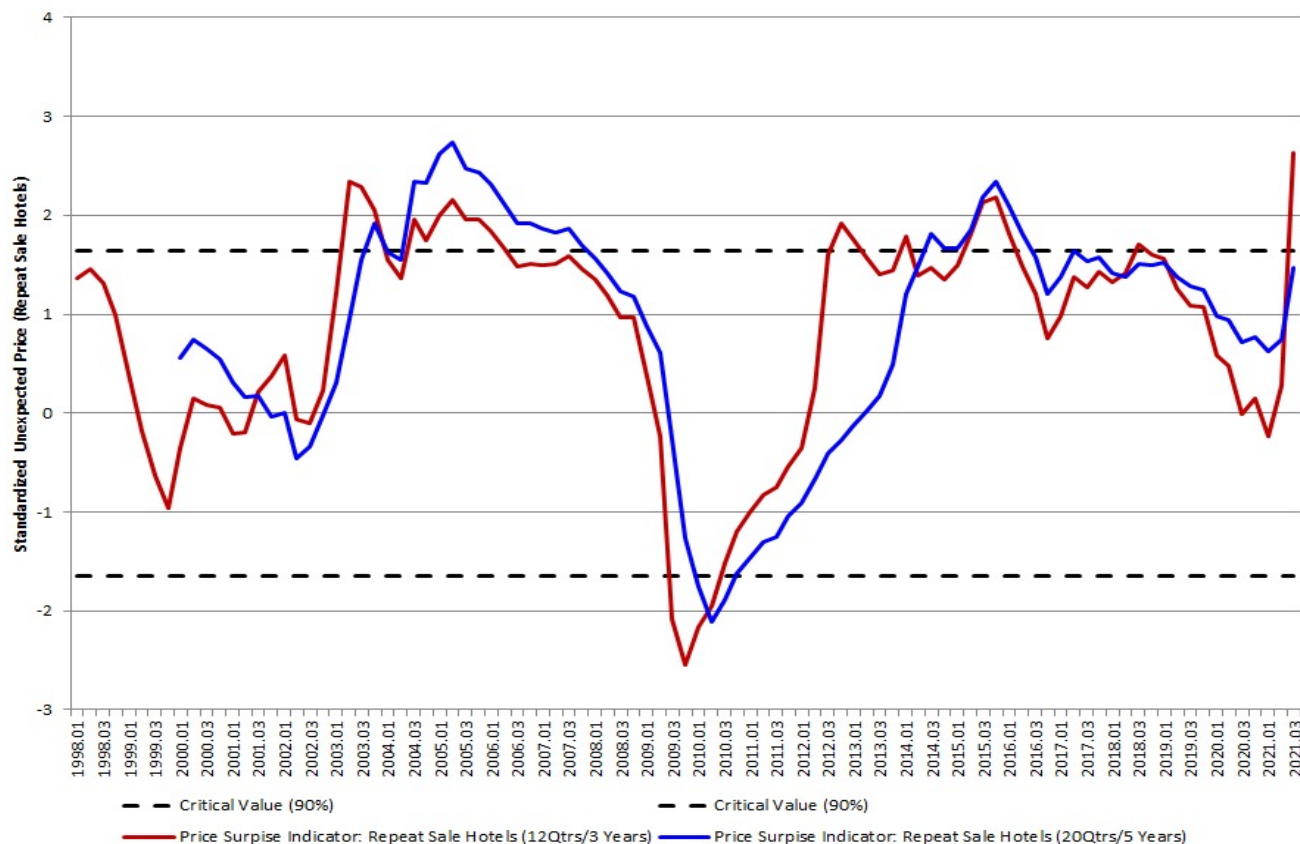
EXHIBIT 14

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)

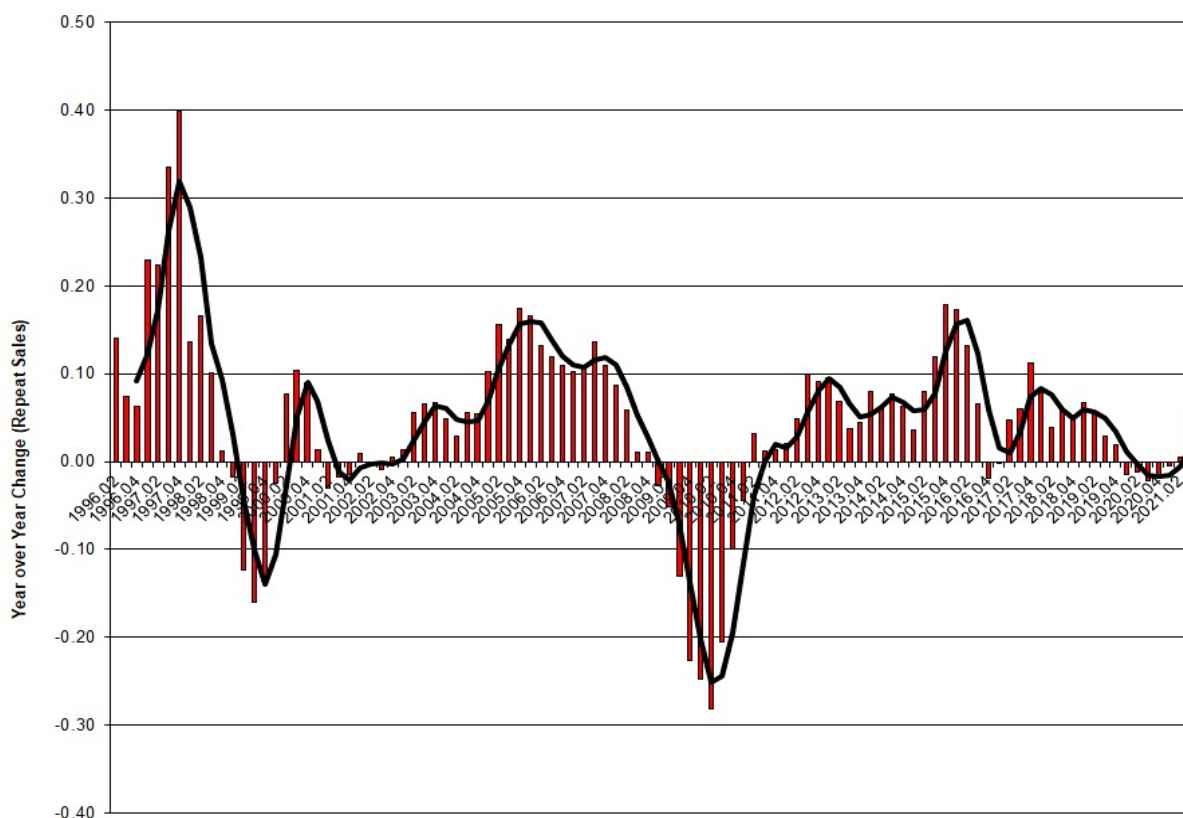


Repeat-sale metrics: prices rise above moving average; hotel prices have reached a new high. Exhibit 14 shows that our repeat-sale indicator has risen above both its short term and long-term moving averages, similar to those of large hotels.² This is another signal of a buy oppor-

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.

tunity. Our SUP performance metric in Exhibit 15 indicates that the standardized price based on a 3-year moving average has reached a new statistical high, while the standardized price based on a 5-year moving average is hovering near the new high statistical boundary. Both prices are trending upwards. Exhibit 16 shows that the repeat-sale price index is 5.7 percent year over year, compared to an imperceptible .5 percent increase in the prior period. Quarter over quarter, the index increased 4.2 percent, bettering a 1-percent rise in the prior quarter-over-quarter period.

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 rose both year over year and quarter over quarter. Exhibit 17 shows that the mortgage origination volume for hotels as reported for the second quarter of 2021 rose 231 percent year over year, reversing the declining trend from the prior period (which had been -82 percent).³ Quarter over quarter, the mortgage originations also rose 231 percent. The maximum loan-to-value (LTV) ratio for hotels remained at 65 percent.

The cost of hotel debt financing fell this quarter, but rose imperceptibly year over year. The cost of obtaining

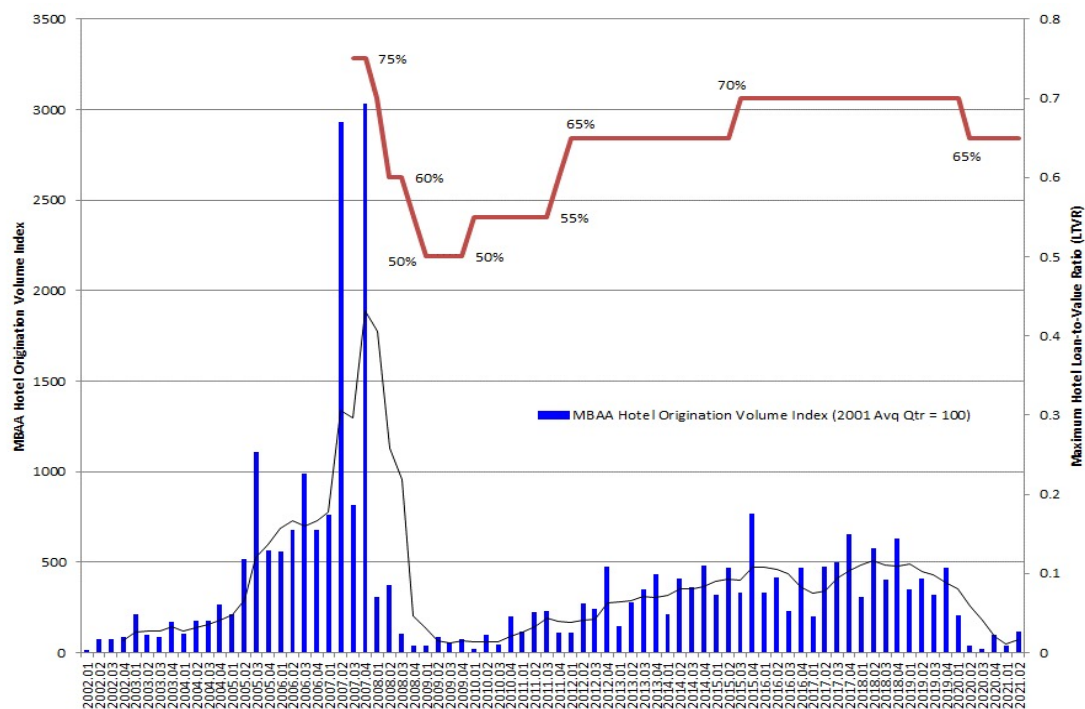
hotel debt financing, as reported by Cushman Wakefield Sonnenblick Goldman, declined this quarter for both Class A and Class B&C Hotels.⁴ Currently, the interest rate on Class A Hotels stands at 5.44 percent, compared to 5.55 percent in June 2021 and 5.41 percent in September 2020. The interest rate on Class B&C Hotels is 11 basis points lower in Q3, at 5.64 percent, compared to 5.75 percent in Q2 and 5.61 percent last September. As such rates moved imperceptibly higher year over year (about .5 percent), but declined quarter over quarter, as shown in Exhibit 18.

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

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

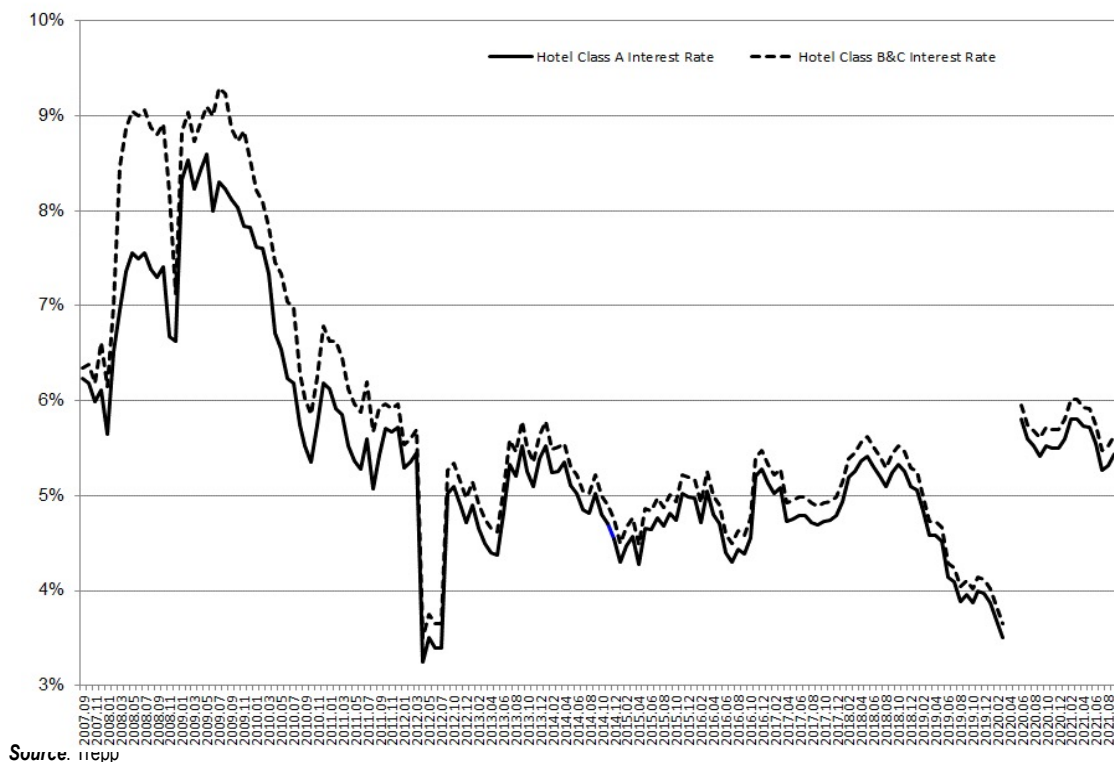
Mortgage origination volume versus the loan-to-value ratio for hotels



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

EXHIBIT 18

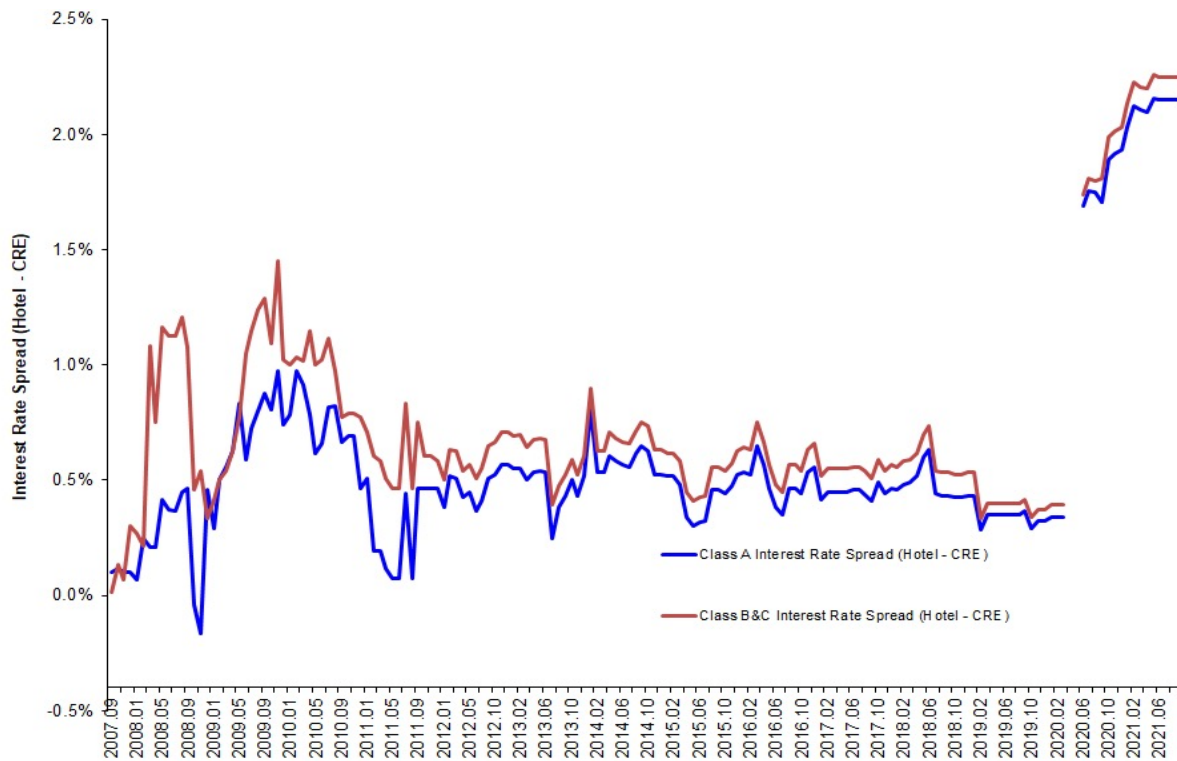
Interest rates on Class A versus Class B & C hotels



Source: NREPP

EXHIBIT 19

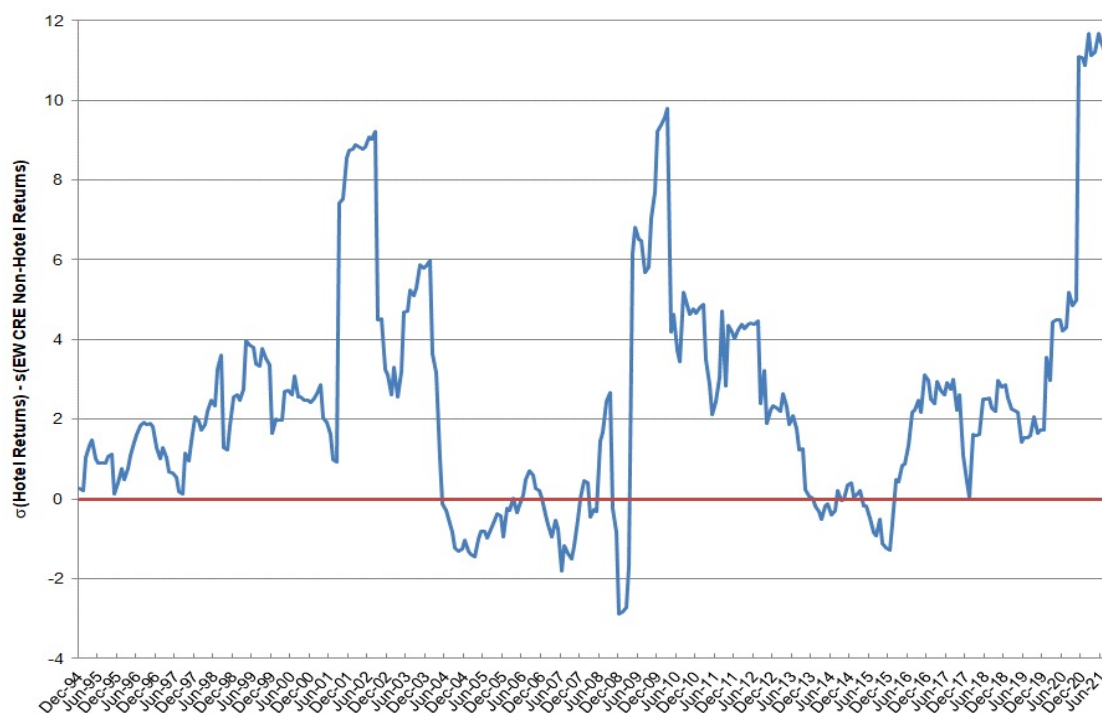
Interest rate spreads of hotels versus non-hotel commercial real estate



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

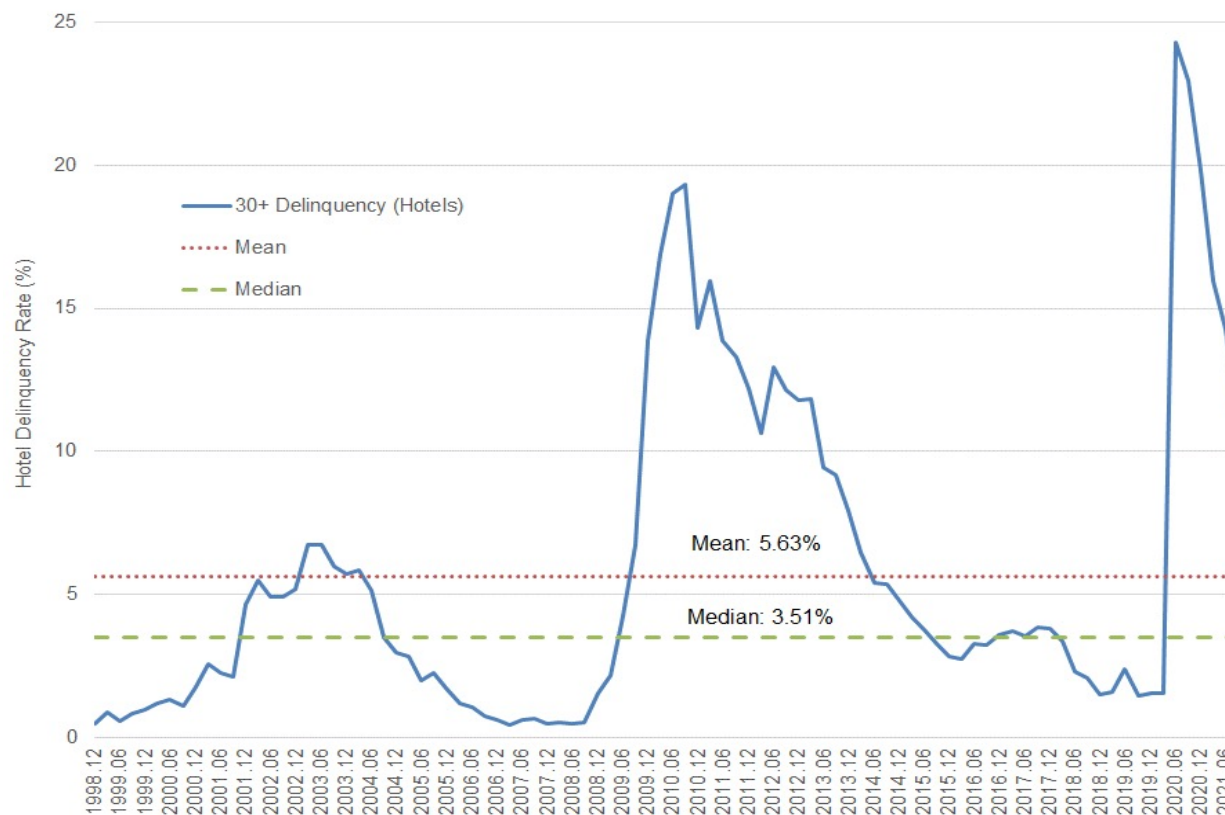
EXHIBIT 20

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 spread between the interest rate on Class A (B&C) full-service hotels compared to the (equally weighted) interest rate on other (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 compared to loans on other major property types, because hotels are perceived to be relatively riskier.⁵ The monthly hotel real estate premiums for higher quality (Class A) hotels have remained stationary at 2.15 percent, and those for lower quality (Class B&C) properties have held at 2.25 percent since May 2021. This

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.

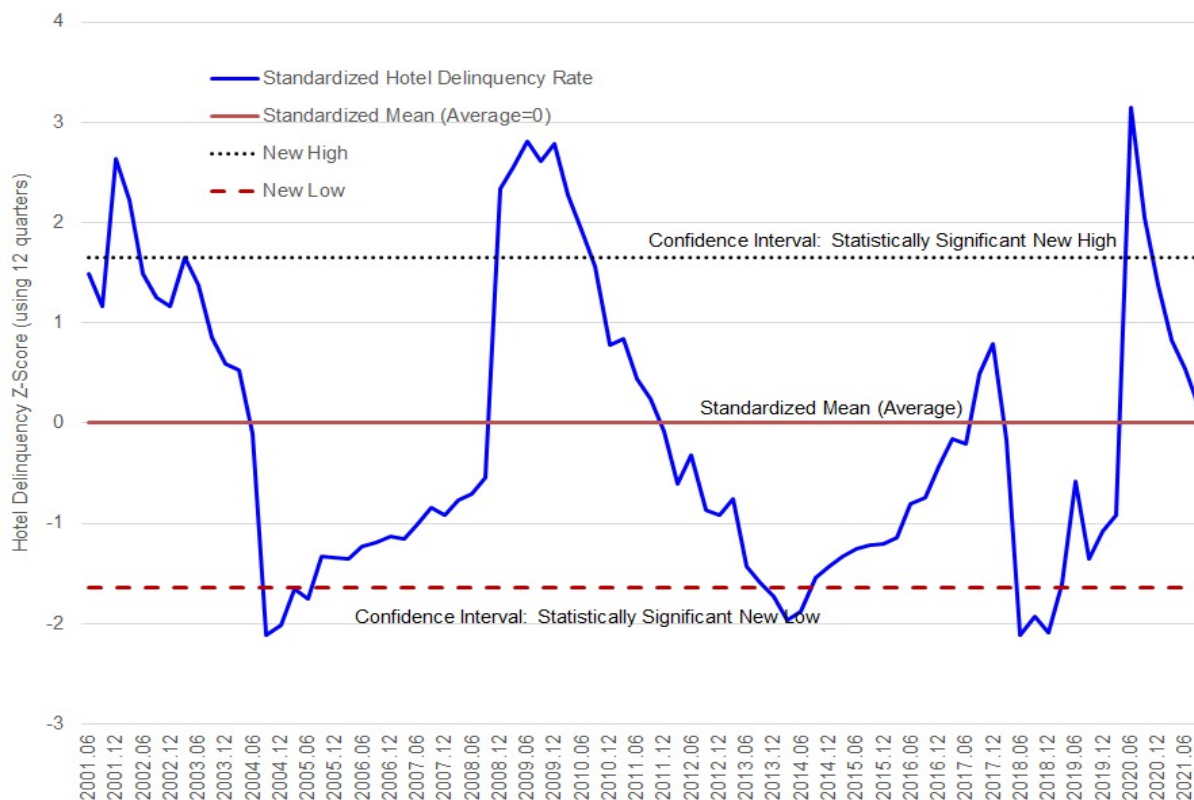
signals that the relative premium for hotel properties hasn't changed since last quarter.

Another way to view 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 (office, industrial, retail and multifamily).⁶ The risk differential, which should reflect the risk that is unique to hotel properties, is currently at 11 percent, where it has hovered since November 2020.⁷ This indicates that the perceived default risk for hotels continues to remain relatively stationary relative to other major types of commercial real estate, consistent with our other hotel risk premium indicators.

⁶ We calculate the total risk for hotel REITs using a 12-month rolling window of monthly returns on hotel REITs.

⁷ $\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 16.61\% - 5.59\%$.

Standardized 30-plus-day delinquency rate for hotels



Source: Trepp

The delinquency rate on hotel loans continues to decline toward its pre-pandemic average. The CMBS delinquency rate (30+ days) for lodging properties continued to decline in September from its new high of 24.3 percent in June of last year. Currently, it is at 11.45 percent, compared to 14.27 percent in June. The 11.45 percent delinquency rate for hotels remains higher than that for all other property types. The September delinquency rate for other property types reported by Trepp is as follows: .59 percent for industrial, 1.95 percent for multifamily, 2.02 percent for office and 9.75 percent for retail. The delinquency rates for each of these property types has declined from March. Exhibit 21 displays the historical 30+ day delinquency rate for hotels, while Exhibit 22 shows the standardized version of the 30+ day delinquency rate for hotels. Both exhibits reveal that the delinquency rate for hotels that have loans securitized as part of CMBS deals continues to converge towards the long-term average; indeed, it has almost reverted to this average. 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 sta-

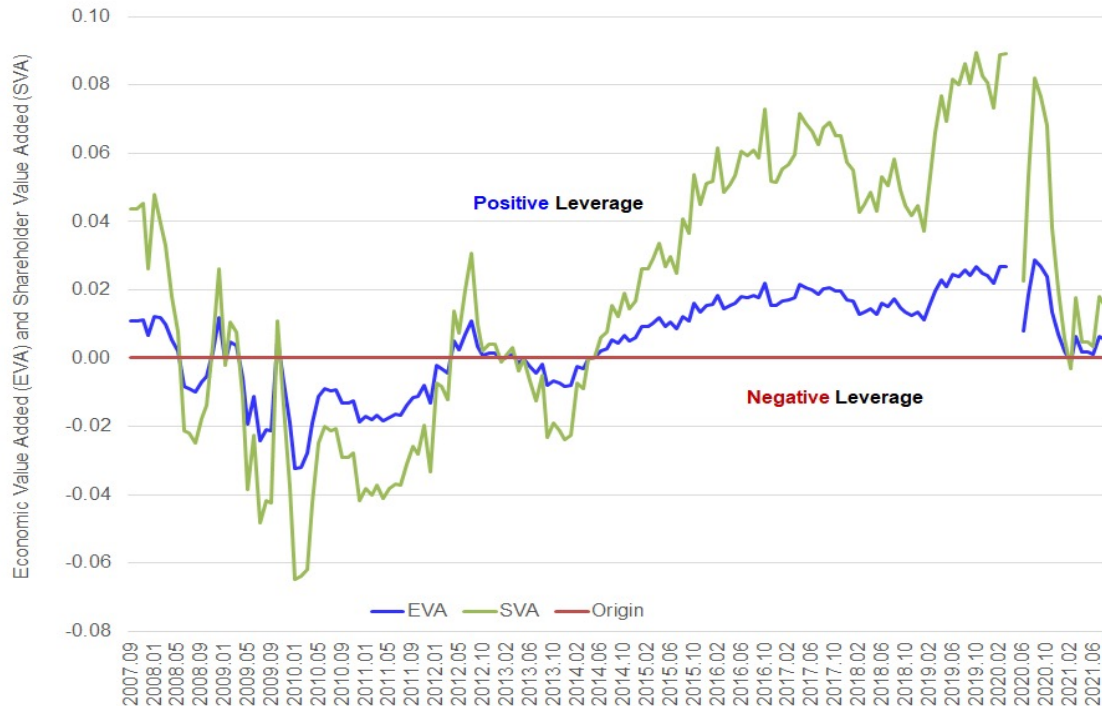
tistically significant new high or low. Using the standardized metric, the fact that the delinquency rate has almost reverted to zero suggests that the relative risk premium for hotels should continue to narrow, which in turn should lead to a relatively low cost of debt financing for hotels.

Hotel investment based on operating performance is currently financially feasible. Our EVA indicator in Exhibit 23 is at .5 percent, while our equity holder value add (SVA) metric is 1.5 percent (as of August 2021) which is a signal that deals on existing hotels are slightly above breakeven. This means that the return that an investor receives from operations is slightly above the total weighted average borrowing cost (WACC) of 7.6 percent (cost of equity is 9.2%). Most of the juice is coming from anticipated future price gains.

Our reading of the tea leaves suggests we should see a positive price momentum for both large hotels and small hotels near term. Our standardized unexpected RevPAR (in Exhibit 24) continues to rise upwards, reverting to its standardized mean of zero. We anticipate continued positive price momentum in the near term.

EXHIBIT 23

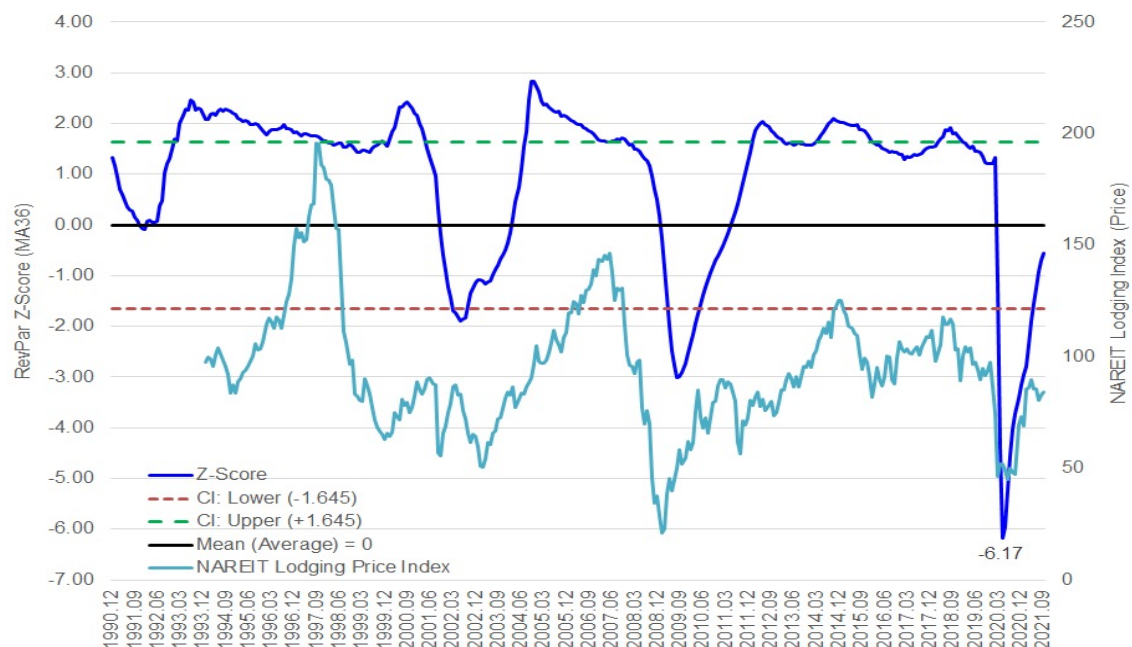
Economic value added (EVA) and equity (shareholder) value added (SVA) for hotels



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

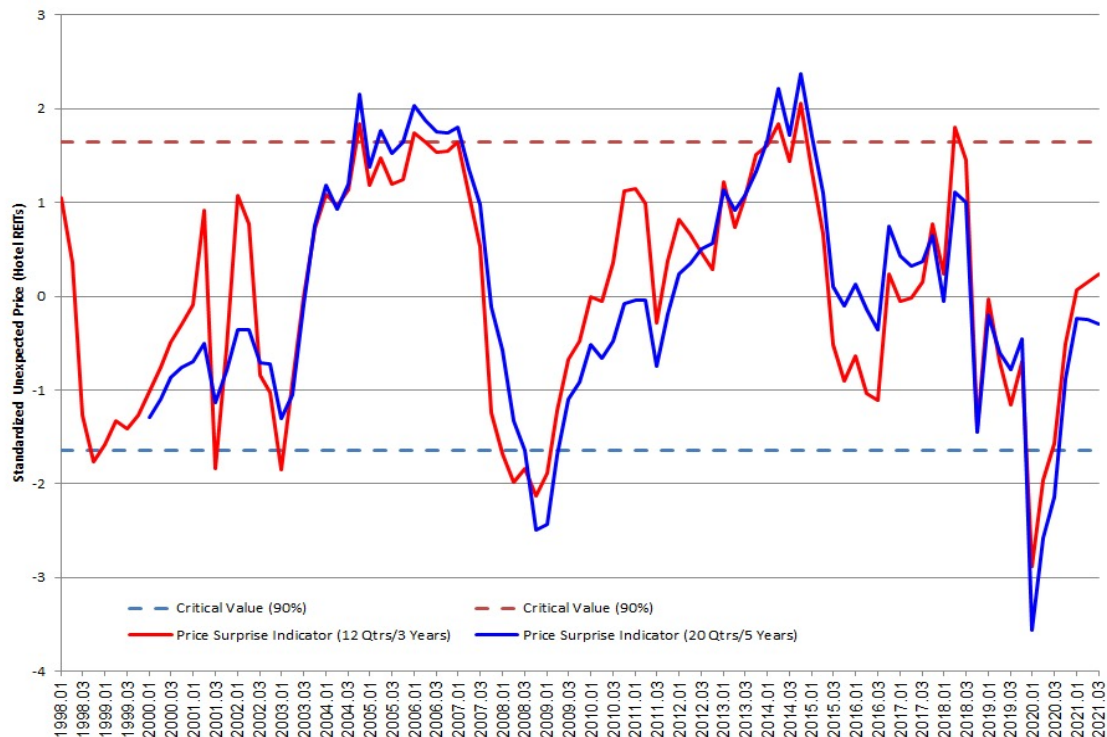
EXHIBIT 24

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

Exhibit 25 displays the standardized unexpected price of the NAREIT Lodging Index. Since the standardized unexpected lodging price index has risen above its standardized mean of zero in this quarter, we expect hotel prices 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 10.3 percent this quarter, but rose 26 percent year over year. Based on the moving average of the ABI index, we should expect positive price momentum in the next period.⁸

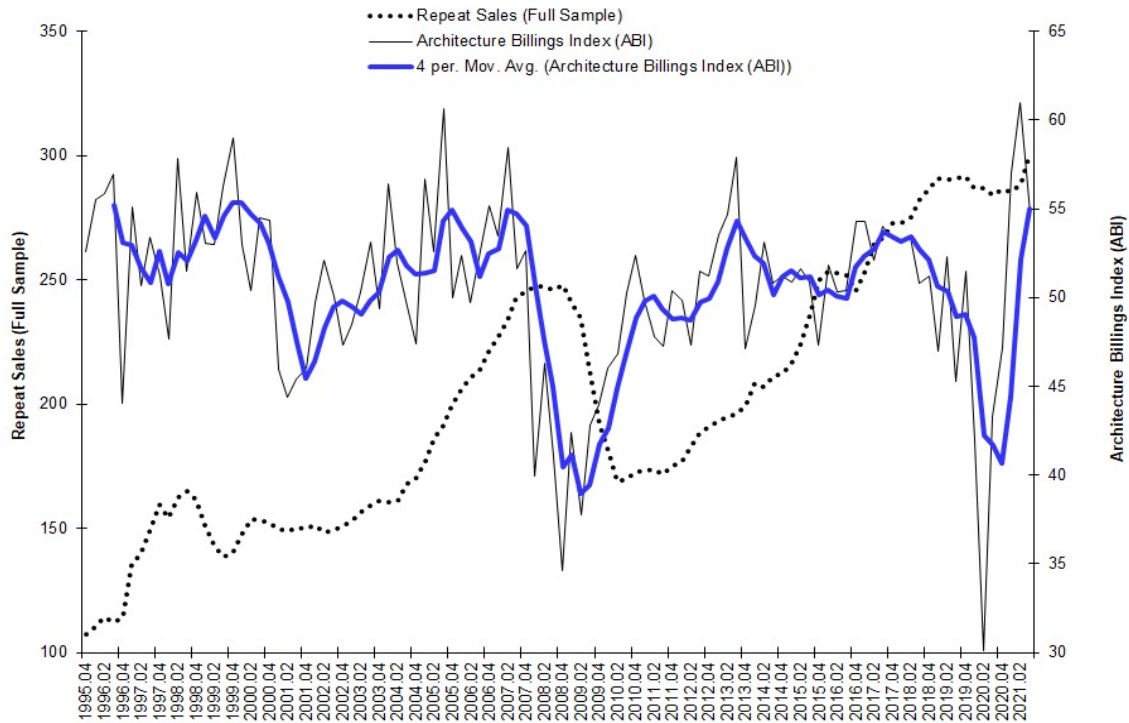
The National Association of Purchasing Managers (NAPM) index (shown in Exhibit 27), which is an indicator

of anticipated business confidence, rose slightly this quarter (.8%) compared to a 6.3-percent decrease last quarter.⁹ It increased 10.3 percent year over year, up from the 15.2 percent year-over-year gain in the prior period. Expect high-price hotels to continue to experience price gains 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 percent indicates that manufacturing is growing, while a reading below 50 percent means it is shrinking.

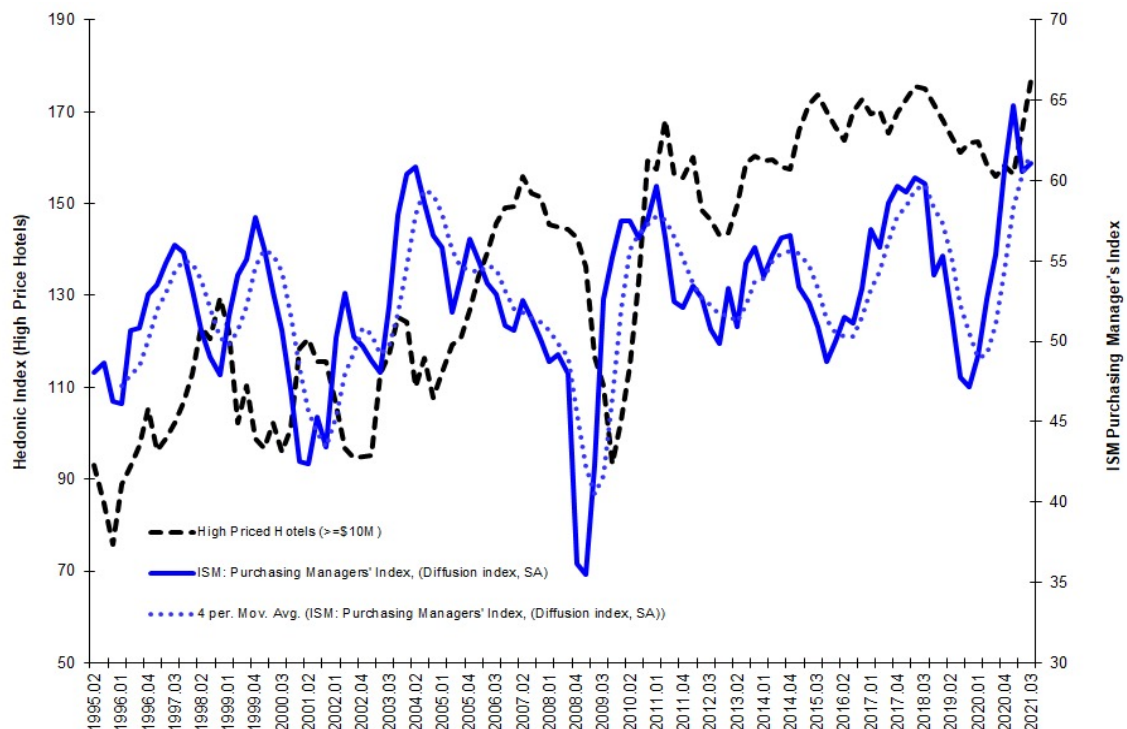
⁸ www.aiaa.org/practicing/economics/aiaas076265

Repeat sales index versus the architecture billings index



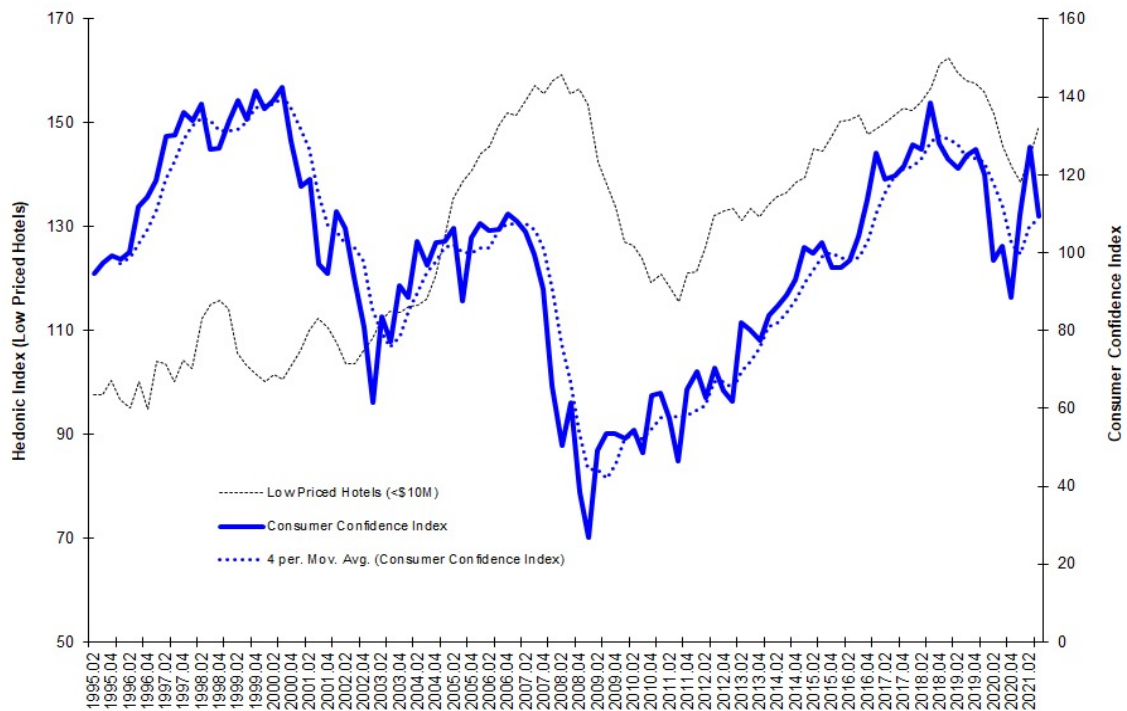
Sources: American Institute of Architects, Cornell Center for Real Estate and Finance Center for Real Estate and Finance Cornell Center for Real Estate and Finance, Institute for Supply Management

Business confidence and high-price hotels



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

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, fell 14

percent this quarter but increased 7.4 percent year over year. Expect low-price hotels to underperform large hotels near term.

Analysts' forecasts of hotel REIT earnings

Earnings					
E(QEPS)	Median	Mean	StDev	Min	Max
2020Q2	-158.0%	-161.7%	30.2%	-226.2%	-110.7%
2020Q3	-160.0%	-283.9%	499.4%	-2214.3%	-91.1%
2020Q4	-151.9%	-225.1%	219.3%	-866.7%	-86.7%
2021Q1	-233.3%	-364.4%	336.9%	-1400.0%	-76.5%
2021Q2	98.2%	104.5%	49.8%	59.7%	272.7%
2021Q3	140.1%	190.0%	132.8%	99.6%	625.0%
E(EPS)	Median	Mean	StDev	Min	Max
2020Q2	-112.3%	-80.3%	101.7%	-222.2%	175.0%
2020Q3	-135.0%	-89.1%	176.0%	-307.9%	290.6%
2020Q4	-160.0%	-100.1%	184.8%	-325.4%	366.7%
2021Q1	92.4%	97.6%	23.2%	70.9%	170.1%
2021Q2	98.2%	104.5%	23.9%	76.1%	184.4%
2021Q3	106.6%	113.9%	27.6%	87.7%	203.9%
Revenue					
E(QRev)	Median	Mean	StDev	Min	Max
2020Q2	-71.9%	-69.9%	16.1%	-92.7%	-45.2%
2020Q3	-72.4%	-69.4%	10.1%	-81.6%	-46.5%
2020Q4	-63.7%	-62.5%	14.9%	-79.6%	-26.8%
2021Q1	-57.6%	-52.6%	17.8%	-74.2%	0.0%
2021Q2	348.6%	402.4%	261.4%	60.6%	1047.7%
2021Q3	143.0%	160.2%	93.9%	28.2%	368.9%
E(ARev)	Median	Mean	StDev	Min	Max
2020Q2	-43.6%	-43.6%	10.5%	-66.1%	-28.2%
2020Q3	-62.4%	-60.2%	6.8%	-69.2%	-47.7%
2020Q4	-63.0%	-60.7%	10.2%	-73.7%	-40.5%
2021Q1	43.1%	45.7%	12.3%	18.6%	66.0%
2021Q2	48.1%	44.0%	12.6%	13.0%	60.6%
2021Q3	52.5%	52.5%	14.8%	16.7%	73.5%

Finally, we also look at Wall Street analysts' earnings estimates for hotel REITs, both in terms of next quarter's earnings per share (EPS) and also annual EPS.¹⁰ As shown in Exhibit 29, analysts are expecting quarterly EPS to rise

between 140 percent (median) and 190 percent (mean), and they foresee annual EPS to rise between +107 percent (median) to +114 percent (mean) on average. 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 earnings estimates from <https://www.earningswhispers.com>

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.

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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. All items are available for download from our [CREF website](#).

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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

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

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

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

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Pole Vaulting to a New High
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