

Cornell Hotel Indices: Second Quarter 2023

Hotel Prices Continue to Lose Momentum

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

Executive Summary

The price performance of hotels continues to lose momentum, with all regions posting lower year-over-year and quarter-over-quarter performance relative to the previous period. While performance was weaker for hotels in both gateway and non-gateway cities, hotels in the non-gateway cities fared better than those in the gateway cities. While transaction volume declined on a year-over-year basis, transaction volume was up quarterly for small hotels and hotels in non-gateway cities. Based on moving averages, a sell signal is indicated for large hotels, while a buy signal applies to small properties. That said, since the standardized prices of both large and small hotels have softened, this situation calls for keeping your powder dry. Although interest rates for both Class A and Class B&C hotels fell 74 basis points (bps) this quarter, hotel interest rates are higher by 45-50 bps relative to June 2022. Moreover, the delinquency rate on hotel loans rose this quarter. As in the prior period, borrowing costs still exceed returns on hotels. Based on our leading indicators of hotel price performance, we can expect to see hotel prices continue to falter next quarter. This is Volume 12, Issue 2 of the *CREF Hotel Indices*.

ABOUT THE AUTHORS

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



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



Robert M. White, Jr., CRE, is the founder and former president of Real Capital Analytics Inc., an international research firm that publishes the *Capital Trends Monthly*. On August 2, 2021, he sold Real Capital Analytics to MSCI. MSCI-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*, *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.



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Disclaimer

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Cornell Hotel Indices: Second Quarter 2023

Hotel Prices Continue to Lose Momentum

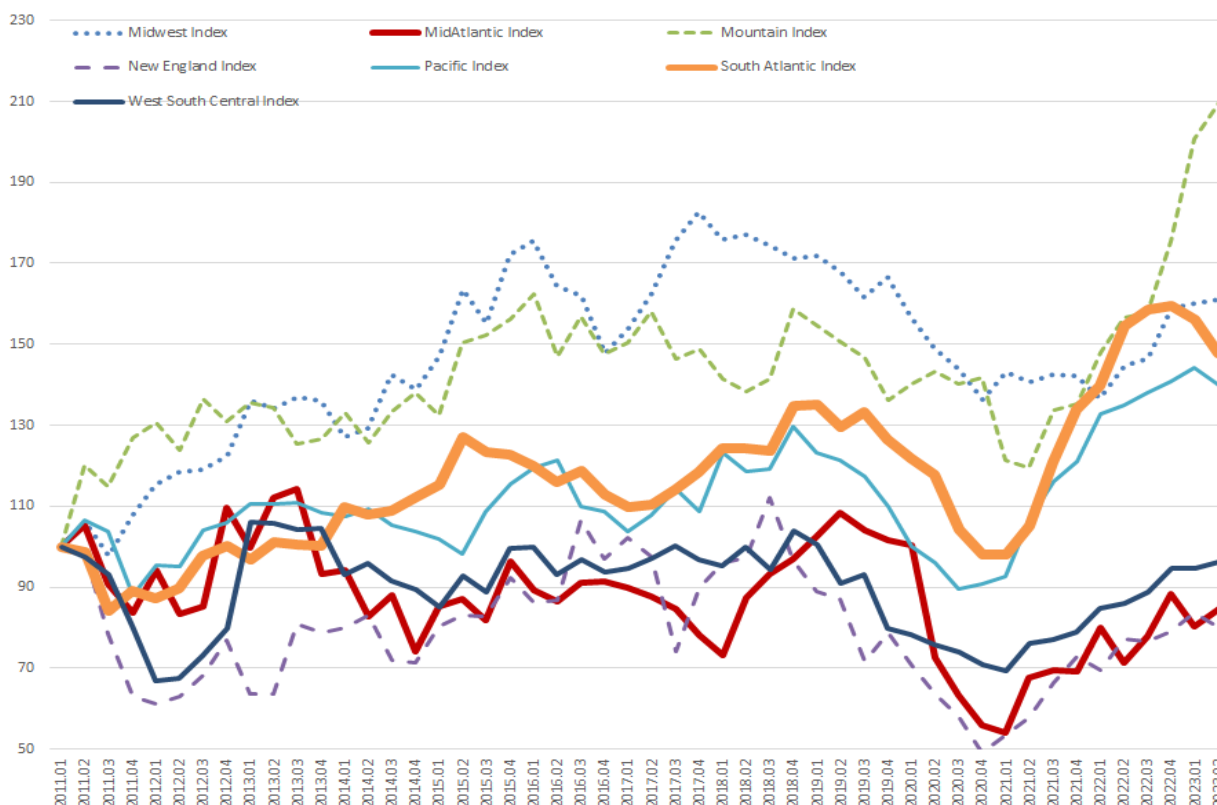
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Analysis of Indices through Q2, 2023

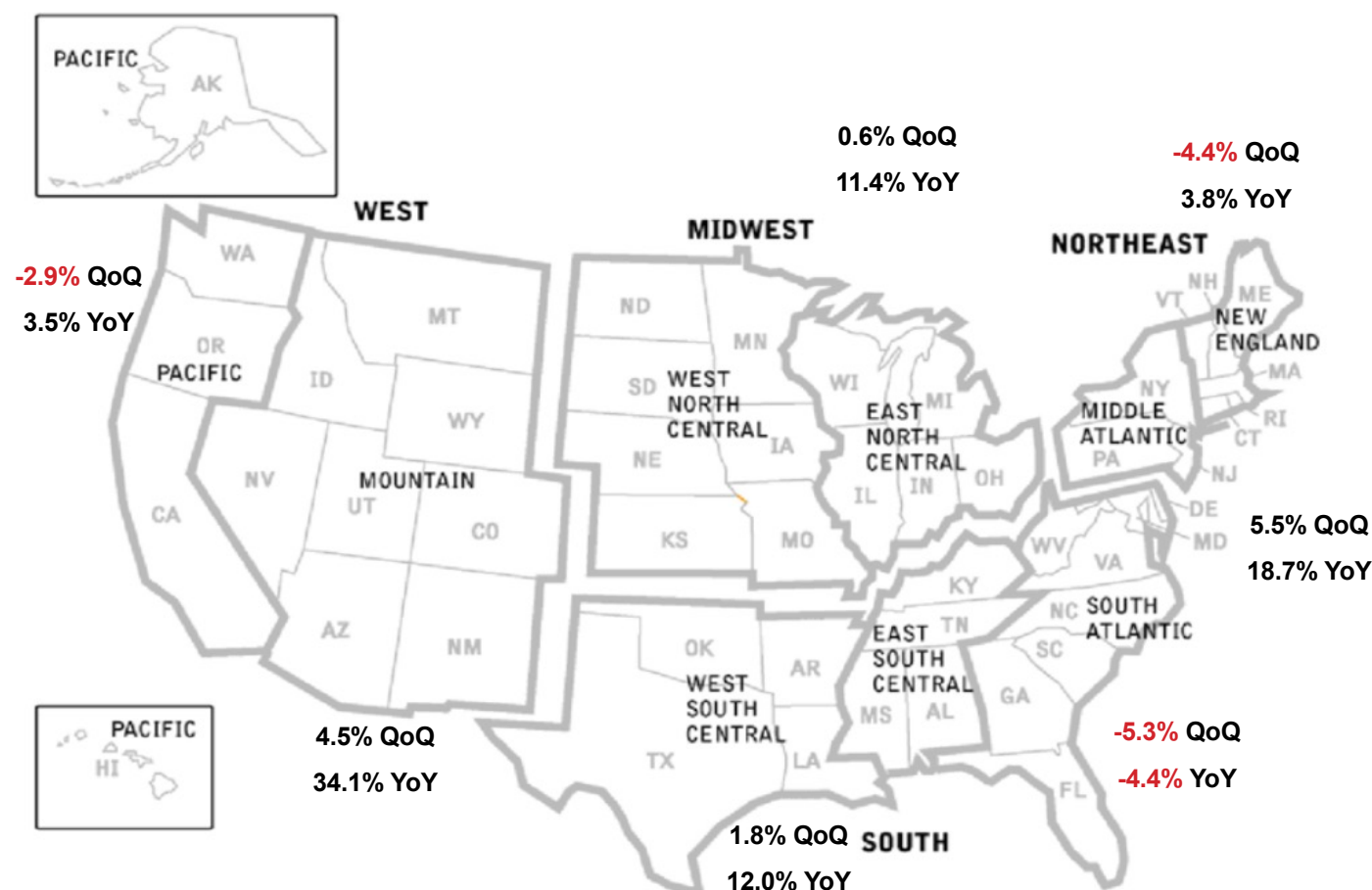
All regions posted lower year-over-year and quarter-over-quarter performance relative to the previous period. Exhibits 1a through 1c show that the Midwest, Mid-Atlantic, Mountain, and West South Central regions all experienced positive double-digit price gains. In contrast, the New England and the Pacific regions had similar low single-digit positive gains, while the South Atlantic region posted a price decline.

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

Y-o-Y	Midwest	MidAtlantic	Mountain	New England	Pacific	South Atlantic	West South Central
Current	11.4%	18.7%	34.1%	3.8%	3.5%	-4.4%	12.0%
Prior	17.1%	0.5%	35.7%	20.5%	8.4%	11.7%	11.4%
Q-to-Q							
Current	0.6%	5.5%	4.5%	-4.4%	-2.9%	-5.3%	1.8%
Prior	0.7%	-9.0%	14.4%	6.0%	2.3%	-2.1%	-0.2%

Standardized Unexpected Prices (Z-Scores)

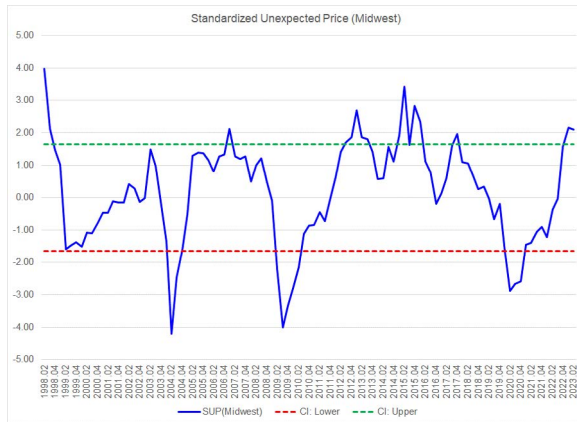
	Midwest	Mid-Atlantic	Mountain	New England	Pacific	South Atlantic	West South Central
2023.01	2.15	0.61	3.73	1.78	1.55	1.30	1.99
2023.02	2.08	1.39	2.72	1.15	1.08	0.77	1.76

Compared to the prior year-over-year period, all regions exhibited lower hotel-price performance. Quarter over quarter, however, a more somber situation emerges: hotel prices declined in the New England, Pacific, and South Atlantic regions, while the remaining regions posted modest price increases ranging from under 1 percent in the Midwest region to 5.5 percent in the Mid-Atlantic region.

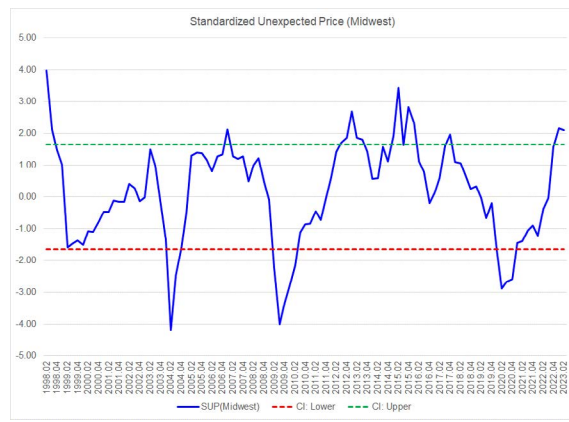
In terms of standardized unexpected prices (Z-Scores), hotel prices moved toward their historical averages, trending downwards in all regions except for the Mid-Atlantic region.

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

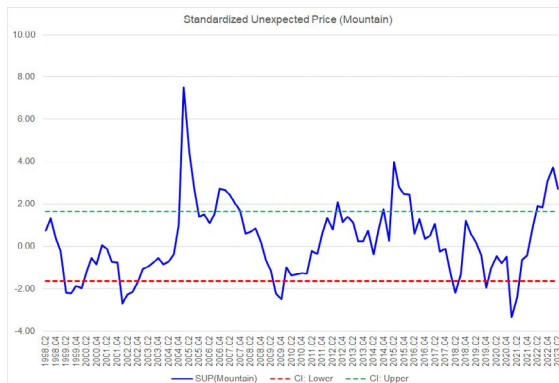
Midwest



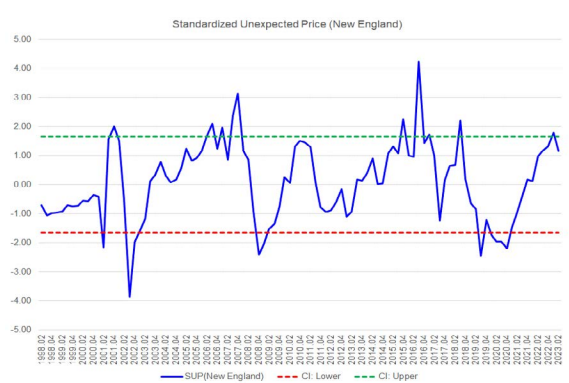
Middle Atlantic



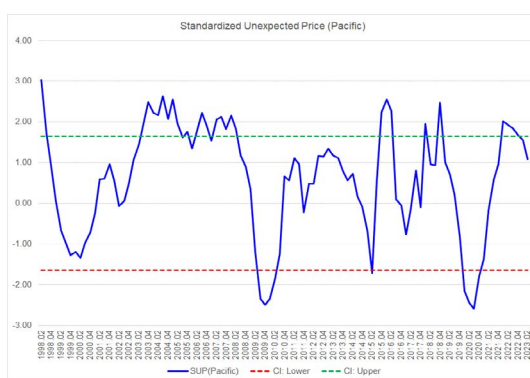
Mountain



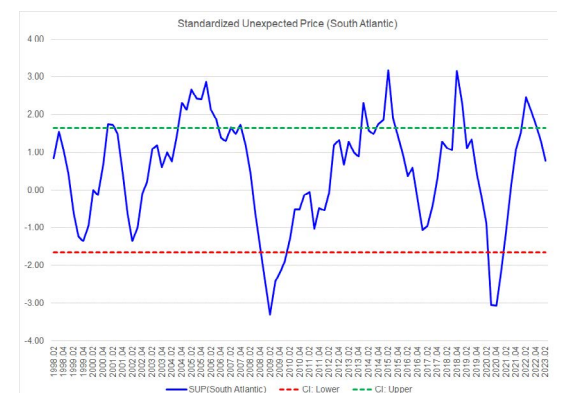
New England



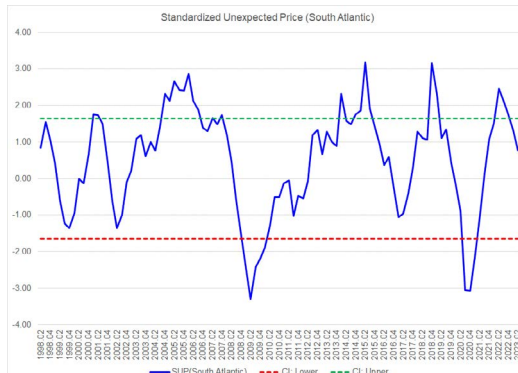
Pacific



South Atlantic



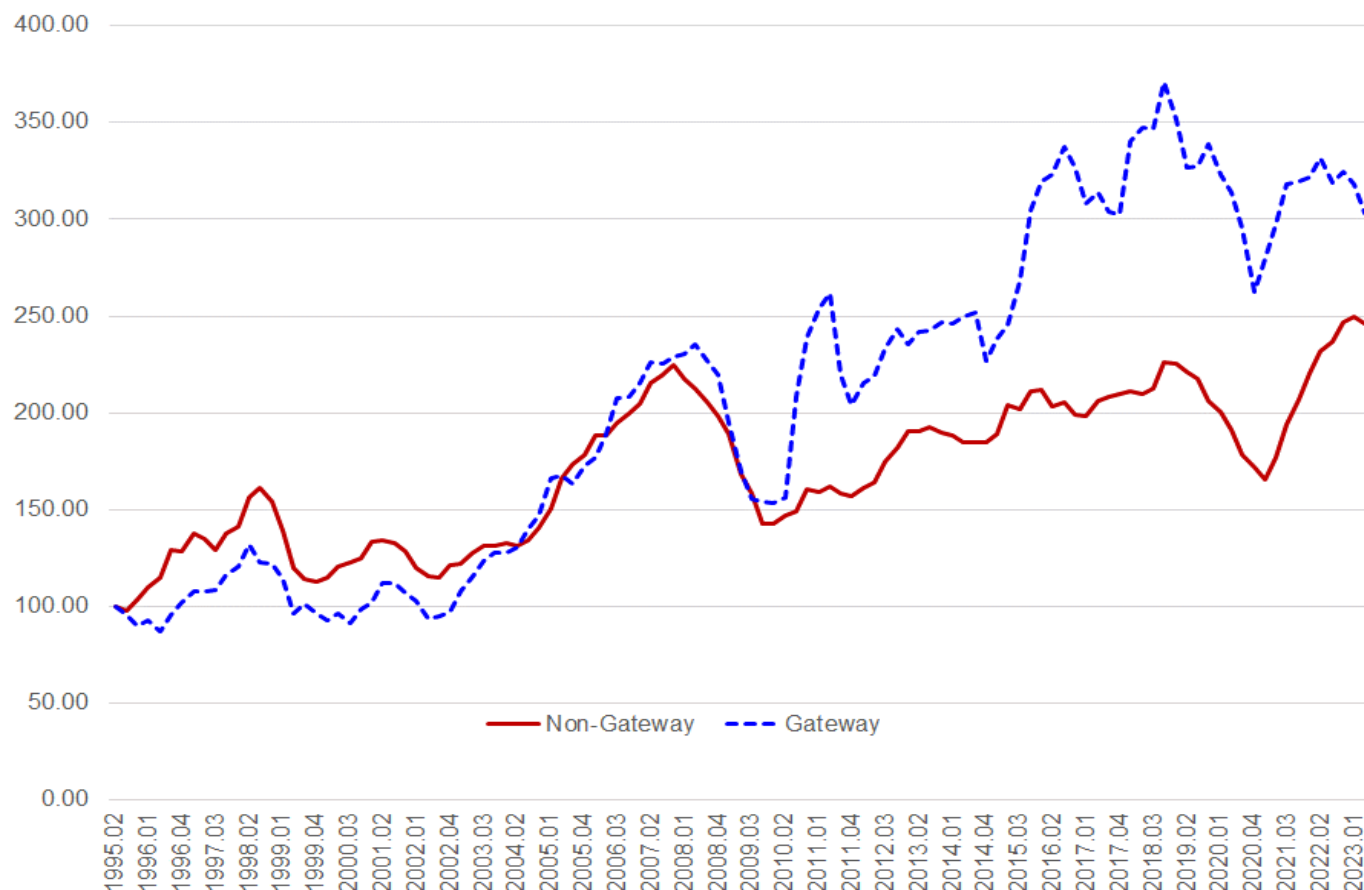
West South Central



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; **West South Central** region: Arkansas, Louisiana, Oklahoma, and Texas; **West North Central** region: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota; **Mountain** region: Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Utah, and Wyoming; **Pacific**: Alaska, California, Hawaii, Oregon, and Washington.

EXHIBIT 2

Hotel performance for gateway cities versus non-gateway cities



However, hotel prices remained above their statistical highs in the Midwest, Mountain, and West South Central regions.

Hotels in non-gateway cities continued to outperform those in gateway cities, although performance is weaker this time around. Continuing the trend in the prior four periods, the price paid for hotels in non-gateway cities outperformed those in gateway cities. Year over year, hotel prices in non-gateway cities rose 6.2 percent compared to an 8.6-percent decline in gateway cities. However, this performance is weaker than it was

in the prior year-over-year period for both gateway (6.2% vs 13.1%) and non-gateway (-8.6% vs -1.1%) hotels. The trend is similar on a quarter-over-quarter basis, although both gateway and non-gateway hotels suffered price declines. The price of hotels in non-gateway cities fell 1.3 percent this quarter, compared to a larger price decline of 4.6 percent in gateway cities, as shown in Exhibit 2. In comparison, non-gateway hotels rose 1.1 percent in the prior quarter, while gateway property prices fell 2 percent.

Quarter over Quarter	Gateway Cities	Non-Gateway Cities
Current Period (2023Q1)	-2%	1%
Prior Period (2022Q4)	2%	4%
Year over Year		
Current Period (2023Q1/2022Q1)	1%	13%
Prior Period (2022Q4/2021Q4)	3%	19%

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

Year	Quarter	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	N	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	2357500	20	NA	0	0.0%	2357500	20	100.0%	3400000	7	35.0%	2100000	13	65.0%
1995	2	3150000	29	15712500	6	20.7%	2670000	23	79.3%	3800000	12	41.4%	2906150	17	58.6%
1995	3	2562500	44	12400000	4	9.1%	2378000	40	90.9%	3500000	20	45.5%	2000000	24	54.5%
1995	4	3400000	41	27750000	10	24.4%	2625000	31	75.6%	5075000	14	34.1%	3100000	27	65.9%
1996	1	2500000	39	14475000	8	20.5%	1700000	31	79.5%	2500000	13	33.3%	2687500	26	66.7%
1996	2	2925000	43	29150000	12	27.9%	2500000	31	72.1%	3200000	15	34.9%	2730000	28	65.1%
1996	3	6500000	57	17740000	20	35.1%	3000000	37	64.9%	5500000	25	43.9%	6890500	32	56.1%
1996	4	2735000	58	19000000	17	29.3%	2200000	41	70.7%	4650000	27	46.6%	2400000	31	53.4%
1997	1	5053250	74	16635500	23	31.1%	3500000	51	68.9%	6300000	29	39.2%	4075000	45	60.8%
1997	2	2862500	72	17750000	17	23.6%	2150000	55	76.4%	2445000	24	33.3%	3047350	48	66.7%
1997	3	3437500	90	19000000	21	23.3%	2400000	69	76.7%	5140000	38	42.2%	2550000	52	57.8%
1997	4	4330950	78	17000000	27	34.6%	2300000	51	65.4%	10435445	27	34.6%	3600000	51	65.4%
1998	1	4698800	92	20000000	31	33.7%	3100000	61	66.3%	6353000	33	35.9%	4600000	59	64.1%
1998	2	3635000	95	23765000	21	22.1%	3000000	74	77.9%	3998240	28	29.5%	3625000	67	70.5%
1998	3	2961059	92	16740000	12	13.0%	2690550	80	87.0%	2255000	30	32.6%	3365000	62	67.4%
1998	4	2500000	83	35000000	15	18.1%	2337500	68	81.9%	4450000	29	34.9%	2500000	54	65.1%
1999	1	2425000	88	24638095	10	11.4%	2125000	78	88.6%	3500000	32	36.4%	2300000	56	63.6%
1999	2	2106250	94	67000000	5	5.3%	2000000	89	94.7%	2067500	28	29.8%	2106250	66	70.2%
1999	3	2500000	99	20711100	10	10.1%	2130000	89	89.9%	1800000	19	19.2%	2522500	80	80.8%
1999	4	2470000	86	18190000	14	16.3%	2095000	72	83.7%	2325000	22	25.6%	2575000	64	74.4%
2000	1	2400000	109	23253895	10	9.2%	2300000	99	90.8%	2350000	43	39.4%	2428500	66	60.6%
2000	2	2450000	88	14500000	9	10.2%	2275000	79	89.8%	2325000	24	27.3%	2450000	64	72.7%
2000	3	2650000	94	20346875	16	17.0%	2275000	78	83.0%	2925000	24	25.5%	2537500	70	74.5%
2000	4	2475000	101	18050000	14	13.9%	2300000	87	86.1%	4500000	26	25.7%	2350000	75	74.3%
2001	1	2970650	104	28437500	18	17.3%	2422500	86	82.7%	2650000	29	27.9%	3000000	75	72.1%
2001	2	2800000	109	23795000	12	11.0%	2690000	97	89.0%	5825000	25	22.9%	2687150	84	77.1%
2001	3	2650000	86	16000000	6	7.0%	2500000	80	93.0%	3150000	21	24.4%	2600000	65	75.6%
2001	4	2400000	73	20500000	5	6.8%	2300000	68	93.2%	2800000	17	23.3%	2300000	56	76.7%
2002	1	2125000	70	11518052	5	7.1%	2000000	65	92.9%	1700000	17	24.3%	2200000	53	75.7%
2002	2	2400000	105	18125000	10	9.5%	2295000	95	90.5%	3125000	33	31.4%	2322496	72	68.6%
2002	3	2390200	80	12750000	5	6.3%	2250000	75	93.8%	2197500	24	30.0%	2485000	56	70.0%
2002	4	2907500	100	23500000	16	16.0%	2575000	84	84.0%	2907500	34	34.0%	2862500	66	66.0%
2003	1	2530000	94	13000000	9	9.6%	2425000	85	90.4%	3850000	21	22.3%	2425000	73	77.7%
2003	2	2750000	110	18500000	10	9.1%	2509500	100	90.9%	3160000	31	28.2%	2600000	79	71.8%
2003	3	3333000	141	14359286	28	19.9%	2600000	113	80.1%	3660000	45	31.9%	3032500	96	68.1%
2003	4	2650000	147	16375000	18	12.2%	2430000	129	87.8%	2975000	34	23.1%	2500000	113	76.9%

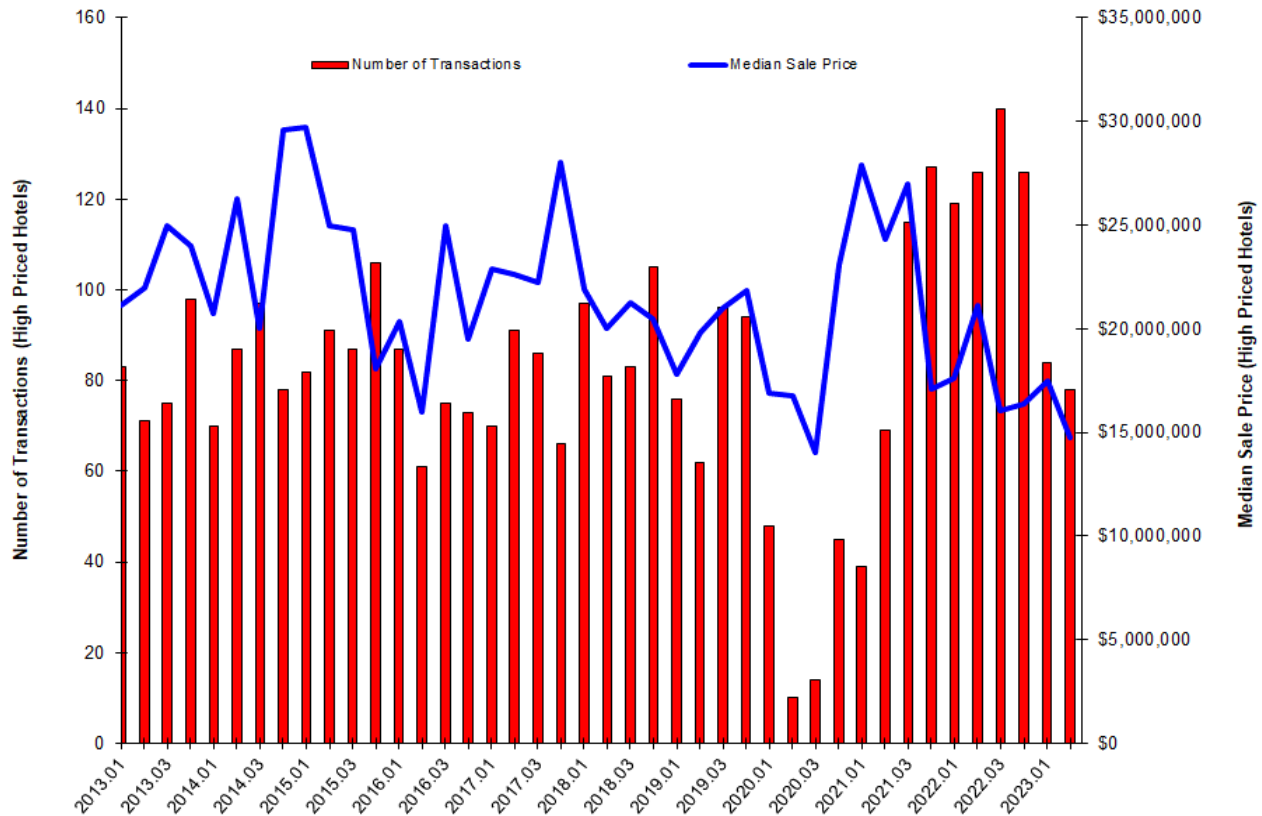
Transaction volume (observed) and median sale price (continued, 2004–2012)

Year	Quarter	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	N	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	2925000	166	22875250	24	14.5%	2536756	142	85.5%	3450000	41	24.7%	2894000	125	75.3%
2004	2	2750000	193	16280000	28	14.5%	2500000	165	85.5%	4500000	39	20.2%	2575000	154	79.8%
2004	3	3535000	212	19350000	45	21.2%	2700500	167	78.8%	5018750	48	22.6%	3328250	164	77.4%
2004	4	4000000	177	20475000	47	26.6%	3085500	130	73.4%	8850000	36	20.3%	3600000	141	79.7%
2005	1	4400000	229	18100000	52	22.7%	3400000	177	77.3%	6687500	40	17.5%	3800000	189	82.5%
2005	2	4588750	314	18956812	78	24.8%	3292650	236	75.2%	6500000	67	21.3%	4400000	247	78.7%
2005	3	4237500	270	21475000	72	26.7%	3150000	198	73.3%	6100000	61	22.6%	3850000	209	77.4%
2005	4	4425000	300	25000000	93	31.0%	3150000	207	69.0%	11200000	65	21.7%	4000000	235	78.3%
2006	1	5387500	298	25750000	92	30.9%	3825000	206	69.1%	19800000	63	21.1%	5000000	235	78.9%
2006	2	4750000	313	22750000	82	26.2%	3500000	231	73.8%	6175000	56	17.9%	4500000	257	82.1%
2006	3	5000000	285	22500000	86	30.2%	3650000	199	69.8%	7000000	59	20.7%	4705399	226	79.3%
2006	4	4587500	248	21200000	65	26.2%	3550000	183	73.8%	8093750	56	22.6%	4270000	192	77.4%
2007	1	6205000	284	21225000	104	36.6%	3744750	180	63.4%	9525000	62	21.8%	5706500	222	78.2%
2007	2	5668000	381	25125000	120	31.5%	3800000	261	68.5%	9125000	66	17.3%	5500000	315	82.7%
2007	3	5500000	327	20100161	105	32.1%	3949250	222	67.9%	8611500	51	15.6%	5018277	276	84.4%
2007	4	4680000	249	23250000	86	34.5%	3150000	163	65.5%	9375000	36	14.5%	4500000	213	85.5%
2008	1	5000000	255	16000000	61	23.9%	3985000	194	76.1%	5990000	46	18.0%	4650000	209	82.0%
2008	2	5062900	228	22150000	50	21.9%	3890000	178	78.1%	8725000	38	16.7%	4800000	190	83.3%
2008	3	4300000	170	17133333	37	21.8%	3350000	133	78.2%	5500000	27	15.9%	3950000	143	84.1%
2008	4	4050000	159	18850000	32	20.1%	3500000	127	79.9%	4972500	27	17.0%	3920000	132	83.0%
2009	1	4150000	81	15800000	15	18.5%	3600000	66	81.5%	7375000	16	19.8%	3700000	65	80.2%
2009	2	3090231	86	14722500	11	12.8%	2864310	75	87.2%	5410250	16	18.6%	3000000	70	81.4%
2009	3	3400000	89	22000000	16	18.0%	3000000	73	82.0%	4608750	14	15.7%	3237500	75	84.3%
2009	4	3562500	84	14100000	14	16.7%	3010250	70	83.3%	4520000	12	14.3%	3400000	72	85.7%
2010	1	3900000	89	20162500	18	20.2%	2825000	71	79.8%	8450000	15	16.9%	3825000	74	83.1%
2010	2	3700000	138	30833449	34	24.6%	3000000	104	75.4%	15400000	34	24.6%	3100000	104	75.4%
2010	3	4925000	119	35500000	46	38.7%	2850000	73	61.3%	25000000	37	31.1%	3133500	82	68.9%
2010	4	3988800	100	30353182	38	38.0%	2420000	62	62.0%	38500000	23	23.0%	3265000	77	77.0%
2011	1	4325000	84	34050000	24	28.6%	2797750	60	71.4%	12275000	15	17.9%	3800000	69	82.1%
2011	2	4200000	97	51200000	31	32.0%	2250000	66	68.0%	15600000	23	23.7%	3175000	74	76.3%
2011	3	3350000	73	23772500	20	27.4%	2800000	53	72.6%	3700000	17	23.3%	3275000	56	76.7%
2011	4	5100000	156	32400000	43	27.6%	3250000	113	72.4%	10950000	34	21.8%	4400000	122	78.2%
2012	1	5266981	130	22100000	40	30.8%	3337500	90	69.2%	13837500	28	21.5%	4225000	102	78.5%
2012	2	4000000	209	17000000	61	29.2%	2779500	148	70.8%	15900000	22	10.5%	3700000	187	89.5%
2012	3	7000000	169	19100000	67	39.6%	2720250	102	60.4%	16050000	32	18.9%	5250000	137	81.1%
2012	4	5661250	206	24866613	74	35.9%	3150000	132	64.1%	16174794	39	18.9%	5100000	167	81.1%

Transaction volume (observed) and median sale price (concluded, 2013–2023)

Year	Quarter	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	N	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	5997496	236	21154582	83	35.2%	2975000	153	64.8%	7750000	50	21.2%	5575000	186	78.8%
2013	2	4700000	217	22000000	71	32.7%	2500000	146	67.3%	16000000	38	17.5%	4200000	179	82.5%
2013	3	5385855	244	25000000	75	30.7%	3500000	169	69.3%	9949500	35	14.3%	5000000	209	85.7%
2013	4	4633750	312	24000000	98	31.4%	2800000	214	68.6%	13500000	55	17.6%	4000000	257	82.4%
2014	1	5625000	228	20750000	70	30.7%	3300000	158	69.3%	8825900	59	25.9%	5000000	169	74.1%
2014	2	4300000	317	26250000	87	27.4%	2837500	230	72.6%	11200000	59	18.6%	3725000	258	81.4%
2014	3	5625000	348	20000000	97	27.9%	3500000	251	72.1%	12633718	63	18.1%	5000000	285	81.9%
2014	4	4625000	308	29625000	78	25.3%	3185000	230	74.7%	8225000	72	23.4%	4040000	236	76.6%
2015	1	6000000	250	29750000	82	32.8%	3156050	168	67.2%	8280000	47	18.8%	5550000	203	81.2%
2015	2	6300000	267	25000000	91	34.1%	3250000	176	65.9%	18765000	46	17.2%	5525000	221	82.8%
2015	3	5050000	299	24800000	87	29.1%	3012500	212	70.9%	12100000	53	17.7%	4275000	246	82.3%
2015	4	6650000	292	18080000	106	36.3%	3125000	186	63.7%	14415000	51	17.5%	5400000	241	82.5%
2016	1	5608750	292	20375000	87	29.8%	3400000	205	70.2%	13600000	45	15.4%	5300000	247	84.6%
2016	2	4100000	319	16000000	61	19.1%	3375000	258	80.9%	11600000	48	15.0%	3750000	271	85.0%
2016	3	4862500	284	25000000	75	26.4%	3200000	209	73.6%	24500000	34	12.0%	4362500	250	88.0%
2016	4	4100000	261	19480000	73	28.0%	2800000	188	72.0%	13352600	28	10.7%	3720000	233	89.3%
2017	1	5275000	252	22880750	70	27.8%	3600000	182	72.2%	14726254	28	11.1%	4950000	224	88.9%
2017	2	5150000	329	22660000	91	27.7%	3356250	238	72.3%	16450000	37	11.2%	4525000	292	88.8%
2017	3	5000000	321	22250000	86	26.8%	3431000	235	73.2%	22250000	38	11.8%	4525000	283	88.2%
2017	4	4532000	263	28000000	66	25.1%	2950000	197	74.9%	12208000	26	9.9%	4300000	237	90.1%
2018	1	5500000	309	21882400	97	31.4%	3500000	212	68.6%	14750000	40	12.9%	5000000	269	87.1%
2018	2	4805200	364	20000000	81	22.3%	3300000	283	77.7%	17625000	40	11.0%	4300000	324	89.0%
2018	3	5150000	331	21265000	83	25.1%	3730000	248	74.9%	13342500	22	6.6%	5000000	309	93.4%
2018	4	6490000	279	20500000	105	37.6%	3300000	174	62.4%	14440000	33	11.8%	5580556	246	88.2%
2019	1	5350000	285	17802698	76	26.7%	3600000	209	73.3%	15750000	34	11.9%	4820000	251	88.1%
2019	2	4080000	330	19848485	62	18.8%	3384500	268	81.2%	6300000	35	10.6%	3942000	295	89.4%
2019	3	4700000	399	21000000	96	24.1%	3500000	303	75.9%	15850000	42	10.5%	4350000	357	89.5%
2019	4	5002498	380	21855650	94	24.7%	3350000	286	75.3%	11000000	35	9.2%	4697000	337	88.7%
2020	1	4100000	303	16900000	48	15.8%	3400000	255	84.2%	6313000	22	7.3%	4090000	281	92.7%
2020	2	3380000	80	16787500	10	12.5%	2515000	70	87.5%	6700000	7	8.8%	3360000	73	91.3%
2020	3	2850000	171	14062500	14	8.2%	2600000	157	91.8%	7219750	12	7.0%	2670000	159	93.0%
2020	4	3625000	242	23053000	45	18.6%	2800000	197	81.4%	10725000	36	14.9%	3000000	206	85.1%
2021	1	3925750	212	27900000	39	18.4%	3100000	173	81.6%	11500000	19	9.0%	3700000	193	91.0%
2021	2	3500000	346	24352000	69	19.9%	2900000	277	80.1%	9675000	34	9.8%	3337500	312	90.2%
2021	3	4350000	448	27000000	115	25.7%	3125000	333	74.3%	33820000	38	8.5%	4000000	410	91.5%
2021	4	4712500	492	17100000	127	25.8%	3300000	365	74.2%	9687500	36	7.3%	4380000	456	92.7%
2022	1	5062500	439	17600000	119	27.1%	3475000	320	72.9%	12025000	42	9.6%	4875000	397	90.4%
2022	2	5300000	556	21140000	126	22.7%	3750000	430	77.3%	9250000	50	9.0%	5074500	506	91.0%
2022	3	5277500	550	16050000	140	25.5%	3650000	410	74.5%	11000000	61	11.1%	5000000	489	88.9%
2022	4	5675000	468	16358750	126	26.9%	3995000	342	73.1%	9300000	35	7.5%	5500000	433	92.5%
2023	1	5000000	348	17456879	84	24.1%	3585000	264	75.9%	11750000	28	8.0%	4850000	320	92.0%
2023	2	5173300	402	14760099	78	19.4%	3800000	324	80.6%	5025000	24	6.0%	5173300	378	94.0%

Source: Cornell Center for Real Estate and Finance

EXHIBIT 4
Median sale price and number of sales, large hotels (sale prices of \$10 million or more)


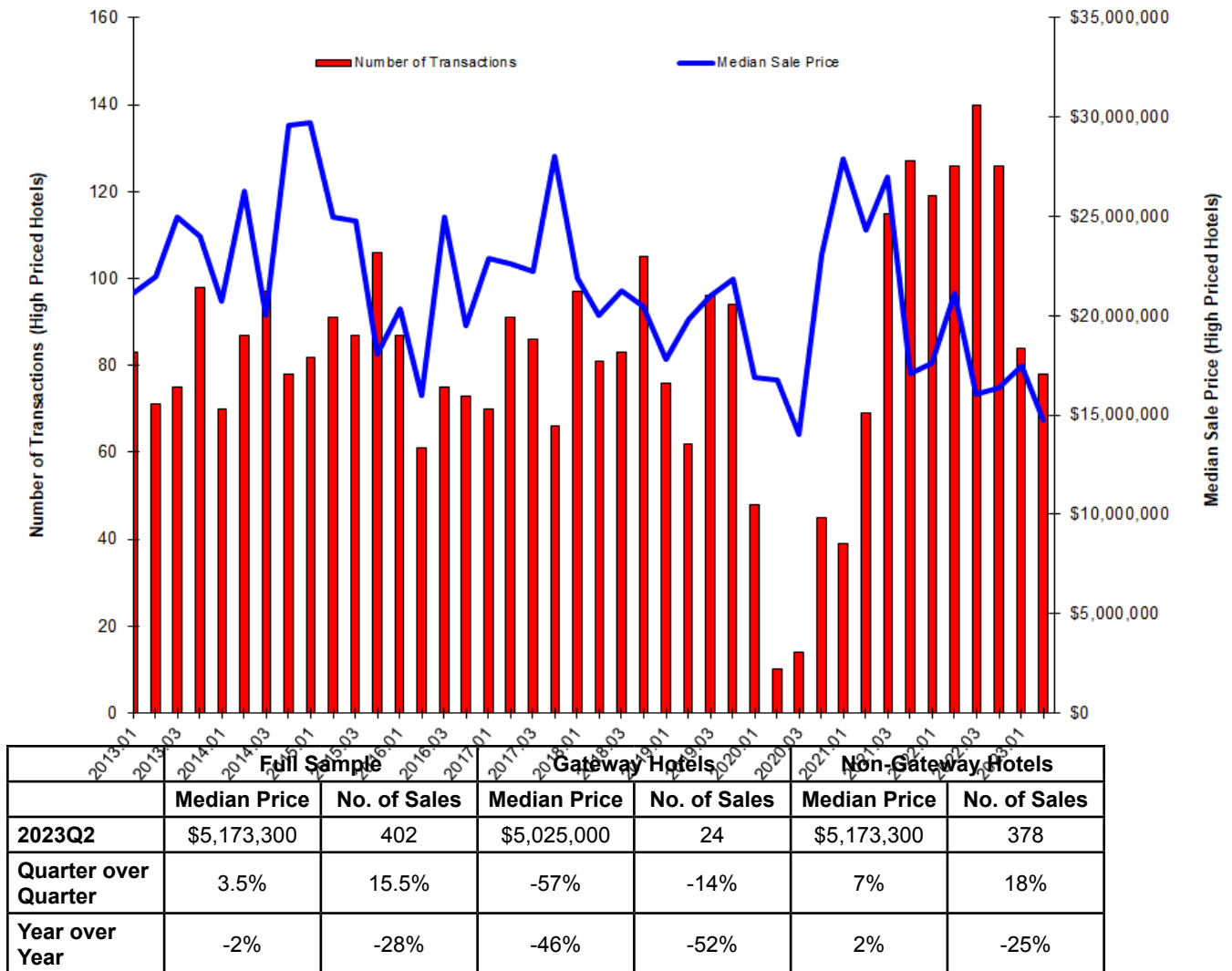
	Full Sample		Large Hotels		Small Hotels	
	Median Price	No. of Sales	Median Price	No. of Sales	Median Price	No. of Sales
2023Q2	\$5,173,300	402	\$14,760,099	78	\$3,800,000	324
Quarter over Quarter	3.5%	15.5%	-15.5%	-7%	6%	23%
Year over Year	-2%	-28%	-30%	-38%	1%	-25%

Transaction volume continues to fall year over year, but is up this quarter for small hotels and hotels in non-gateway cities. The transaction volume on all hotel transactions (both large hotels and small hotels combined) continued to be weaker year over year.

However, transaction volume was up quarter over quarter due to price changes for smaller hotels and those

in non-gateway markets. Exhibit 3 reports the transaction volume and median price of large and small hotels as well as hotels located in gateway and non-gateway cities. Exhibit 4 and Exhibit 5 show this year-over-year trend in the number of transactions for large hotels and small hotels.

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

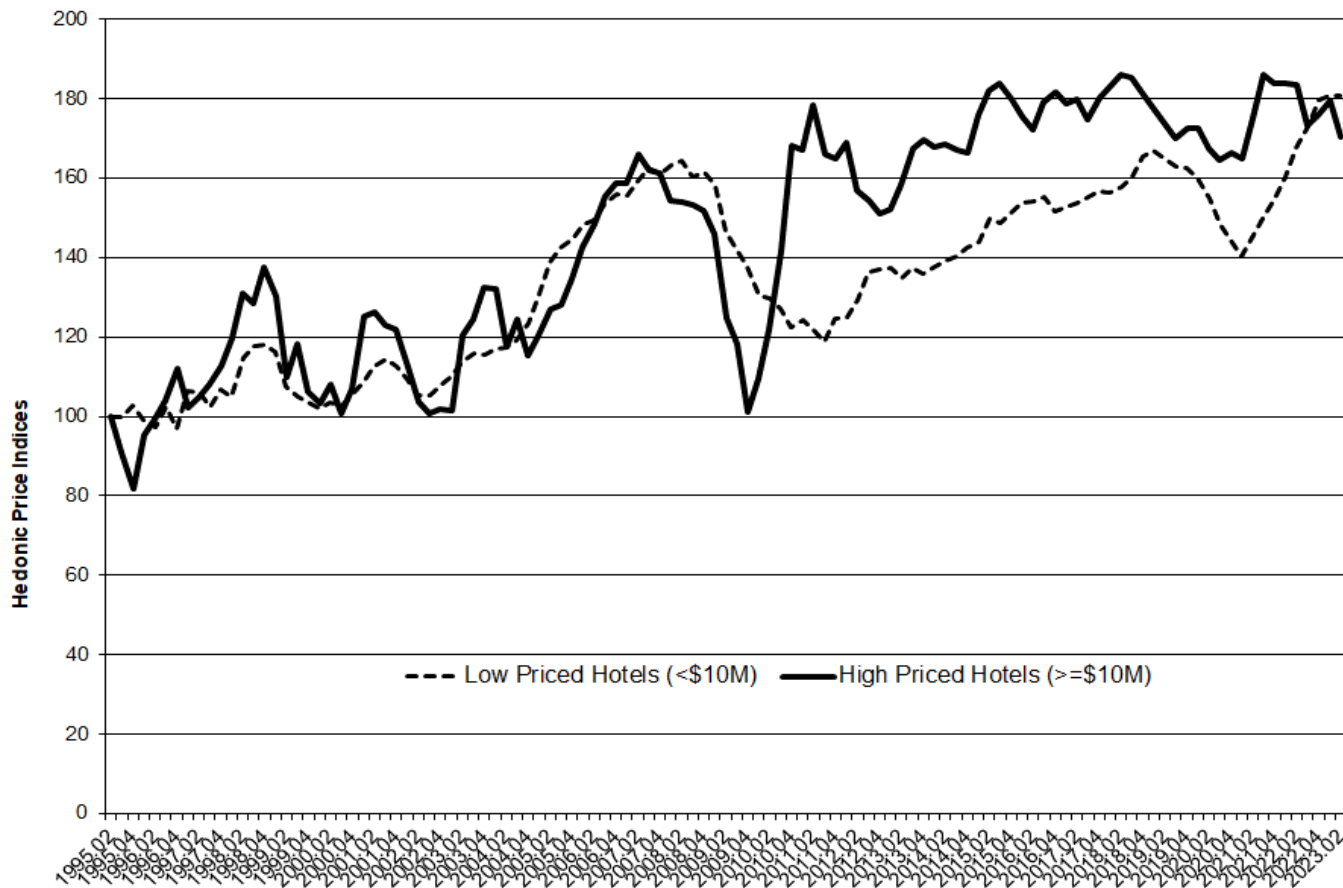


Hotel indices through 2022, quarter 3

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	98.13	94.65	82.25	104.02	64.62	NA	2009.01	155.30	137.96	155.56	202.48	156.88	163.74
1995.03	97.91	86.11	80.72	99.76	67.48	NA	2009.02	143.87	118.24	138.49	176.63	152.82	157.62
1995.04	100.84	77.54	85.45	93.48	69.23	NA	2009.03	139.43	111.76	130.50	161.92	137.62	142.42
1996.01	97.21	90.29	90.38	96.51	70.97	NA	2009.04	135.19	95.82	117.67	160.01	123.81	128.57
1996.02	95.47	94.00	94.82	90.90	74.86	NA	2010.01	128.00	103.60	117.65	159.54	117.78	122.19
1996.03	100.60	98.51	105.99	99.73	73.86	NA	2010.02	127.38	115.30	121.16	162.27	109.70	114.51
1996.04	95.12	106.14	105.90	106.04	75.13	NA	2010.03	124.62	133.89	122.88	217.05	111.02	116.12
1997.01	104.50	96.84	113.06	112.42	88.78	NA	2010.04	120.04	159.30	131.78	248.73	113.17	116.57
1997.02	104.02	99.12	111.23	112.45	89.40	NA	2011.01	121.86	158.09	130.66	264.37	113.10	114.31
1997.03	100.56	102.36	106.05	113.18	95.43	NA	2011.02	119.51	168.89	133.44	272.14	113.34	113.41
1997.04	104.68	106.72	113.10	121.09	101.73	NA	2011.03	116.53	157.17	130.45	228.68	112.02	111.98
1998.01	103.12	113.33	116.12	125.49	98.40	NA	2011.04	122.28	155.89	129.01	212.55	112.90	112.97
1998.02	112.61	123.90	128.35	137.18	104.35	NA	2012.01	122.64	159.68	132.37	224.50	113.64	112.75
1998.03	115.39	121.49	132.66	127.92	106.40	NA	2012.02	127.07	148.38	135.18	227.83	116.43	117.42
1998.04	115.73	130.12	126.66	127.06	104.08	NA	2012.03	133.60	146.14	143.52	242.90	120.42	120.83
1999.01	113.98	123.16	114.49	118.88	96.90	NA	2012.04	134.31	142.93	149.45	253.20	122.28	123.03
1999.02	105.55	103.85	98.64	100.18	90.97	NA	2013.01	134.92	143.89	156.44	245.21	124.70	127.06
1999.03	103.04	111.77	94.05	105.83	88.52	NA	2013.02	132.43	149.83	156.83	251.47	126.60	129.76
1999.04	101.53	100.44	92.92	100.64	90.06	NA	2013.03	134.77	158.63	158.49	252.43	127.99	132.51
2000.01	100.07	97.61	94.45	96.42	95.26	93.02	2013.04	133.22	160.41	155.96	256.94	130.84	136.54
2000.02	101.70	102.33	99.13	100.53	97.93	93.02	2014.01	135.18	158.85	154.73	255.91	135.91	141.01
2000.03	100.79	95.33	100.73	95.44	97.66	89.76	2014.02	136.75	159.67	151.72	259.63	135.54	139.18
2000.04	103.62	101.16	102.58	102.27	95.67	90.26	2014.03	137.66	158.10	151.75	262.28	137.90	140.82
2001.01	106.43	118.33	110.00	105.87	94.63	90.08	2014.04	139.87	157.42	151.87	236.36	137.50	139.03
2001.02	110.45	119.65	110.41	116.95	95.05	89.39	2015.01	141.21	166.52	155.64	247.73	138.97	139.84
2001.03	112.34	116.42	109.06	116.83	96.15	92.64	2015.02	146.87	172.13	167.79	254.98	143.27	144.03
2001.04	110.54	115.47	105.64	111.59	96.10	90.40	2015.03	145.82	174.11	166.36	278.86	152.27	153.95
2002.01	107.43	106.40	98.84	107.28	96.85	93.24	2015.04	148.39	170.15	173.60	316.96	162.51	164.34
2002.02	103.31	98.08	95.16	97.45	95.44	92.67	2016.01	151.03	166.14	174.50	332.42	165.24	167.64
2002.03	103.23	95.40	94.58	99.09	96.10	91.54	2016.02	151.26	162.99	167.20	336.20	166.26	169.46
2002.04	105.88	96.34	99.76	100.69	97.14	95.58	2016.03	152.40	169.49	169.22	350.65	165.65	167.40
2003.01	107.97	96.05	100.40	112.25	97.81	94.19	2016.04	148.85	171.75	163.86	339.80	160.21	162.78
2003.02	111.57	113.96	104.98	120.10	99.94	97.69	2017.01	149.76	169.11	163.38	320.62	163.94	166.39
2003.03	113.71	117.93	108.22	128.28	101.92	102.10	2017.02	150.88	170.07	169.65	326.63	170.46	173.41
2003.04	113.50	125.39	107.76	133.12	103.46	105.11	2017.03	152.37	165.39	171.21	316.00	171.12	174.88
2004.01	114.90	124.95	108.95	132.62	103.31	106.81	2017.04	153.81	170.57	172.23	314.81	174.57	177.59
2004.02	115.16	111.06	107.74	135.93	104.11	108.13	2018.01	153.43	173.14	173.52	354.00	175.18	178.61
2004.03	116.85	117.74	110.46	145.64	108.37	112.90	2018.02	154.86	176.09	172.70	361.67	175.90	178.20
2004.04	121.22	109.12	115.45	153.25	109.83	113.28	2018.03	157.42	175.36	175.01	360.58	179.30	181.31
2005.01	128.51	114.06	123.71	172.64	114.86	117.68	2018.04	162.18	171.31	185.82	385.76	181.85	183.56
2005.02	136.29	120.05	136.87	174.34	120.31	123.67	2019.01	163.85	167.84	185.34	365.79	183.83	185.05
2005.03	139.65	121.16	142.56	170.33	123.25	126.05	2019.02	161.74	164.33	182.18	339.87	184.04	184.42
2005.04	141.85	127.34	146.91	179.45	129.03	132.69	2019.03	159.78	160.80	178.72	340.60	184.29	185.05
2006.01	145.50	135.15	154.91	183.95	133.57	137.53	2019.04	159.31	163.19	169.85	352.32	186.31	187.55
2006.02	146.74	140.48	154.98	196.83	137.25	141.14	2020.01	157.15	163.23	164.68	336.23	184.28	185.91
2006.03	150.61	147.17	160.47	216.28	139.01	142.57	2020.02	151.79	158.34	157.13	326.40	185.44	187.83
2006.04	153.09	150.06	164.29	216.70	143.32	145.16	2020.03	145.69	155.60	146.45	307.00	183.69	186.14
2007.01	152.59	150.34	168.57	224.03	147.08	148.36	2020.04	141.44	157.56	141.28	272.92	184.71	187.54
2007.02	156.29	157.13	176.94	235.15	151.05	152.21	2021.01	137.75	155.99	136.31	290.77	183.98	186.70
2007.03	159.46	153.26	180.93	234.68	157.60	160.62	2021.02	142.15	165.76	145.27	309.44	185.27	187.60
2007.04	157.99	152.78	185.07	238.21	159.00	162.62	2021.03	147.60	176.09	159.82	330.86	192.81	194.14
2008.01	160.28	146.15	178.71	239.85	160.60	167.02	2021.04	151.88	174.11	170.44	332.05	202.25	201.16
2008.02	161.09	145.57	174.74	244.57	161.14	168.69	2022.01	157.37	173.98	181.49	334.58	210.08	208.34
2008.03	157.44	145.07	168.89	236.12	160.76	166.14	2022.02	164.52	173.60	190.83	345.14	224.05	222.60
2008.04	158.32	143.47	163.23	228.74	162.08	168.77	2022.03	169.96	164.08	194.79	331.55	228.25	227.39
							2022.04	176.33	166.34	203.04	337.68	229.13	231.18
							2023.01	177.36	169.92	205.33	330.83	236.07	240.40
							2023.02	177.29	161.16	202.64	315.46	232.52	239.05

Source: Cornell Center for Real Estate and Finance

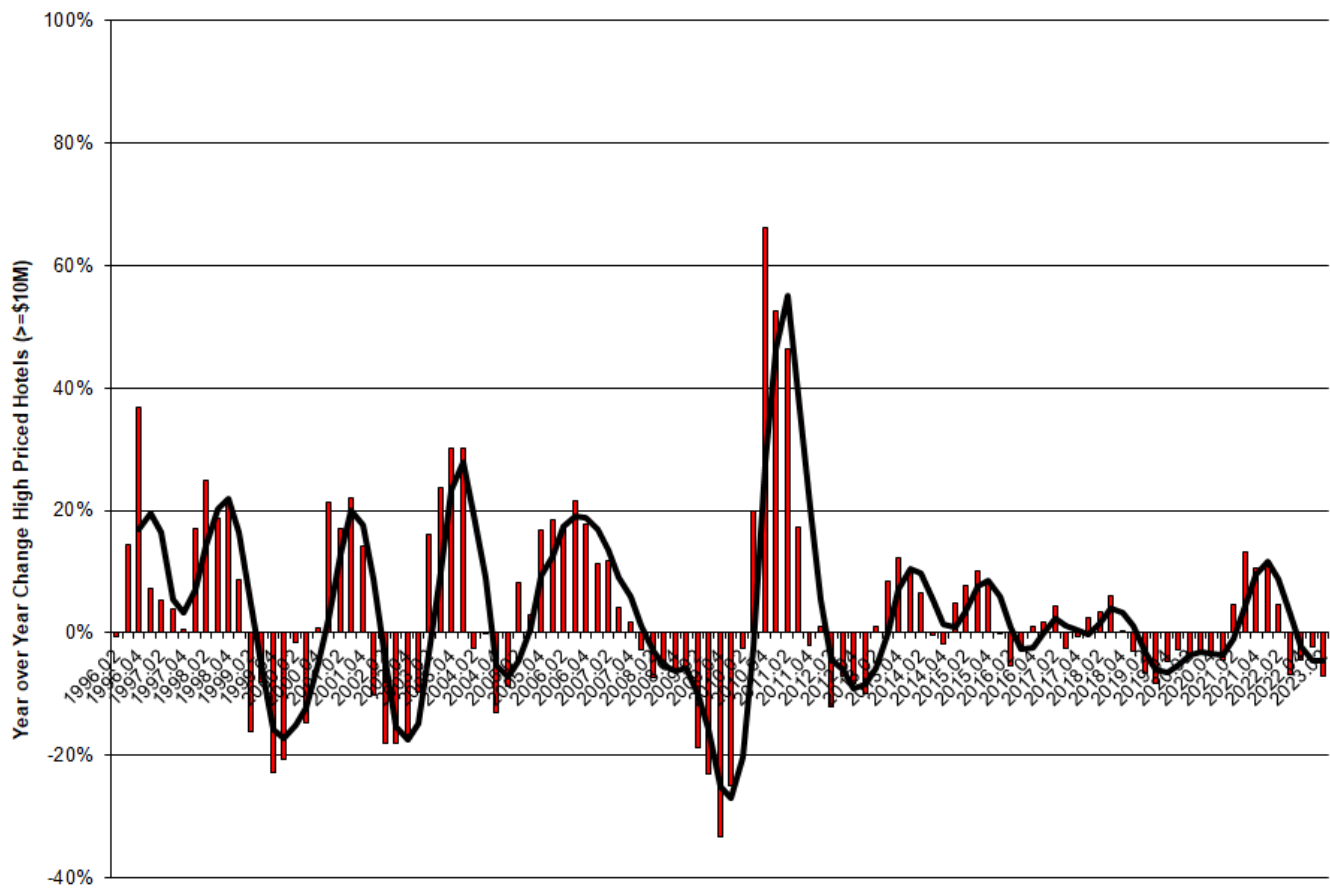
Hedonic hotel indices for large and small hotel transactions



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

Moving averages indicate a sell signal for large hotels, but a buy signal for small properties. nevertheless, standardized prices of large and smaller hotels have softened, an indication that investors should keep their powder dry. Exhibit 7 graphs the prices reported in Exhibit 6. The price of large hotels fell 5 percent, while the price of small hotels remained relatively flat this quarter.

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

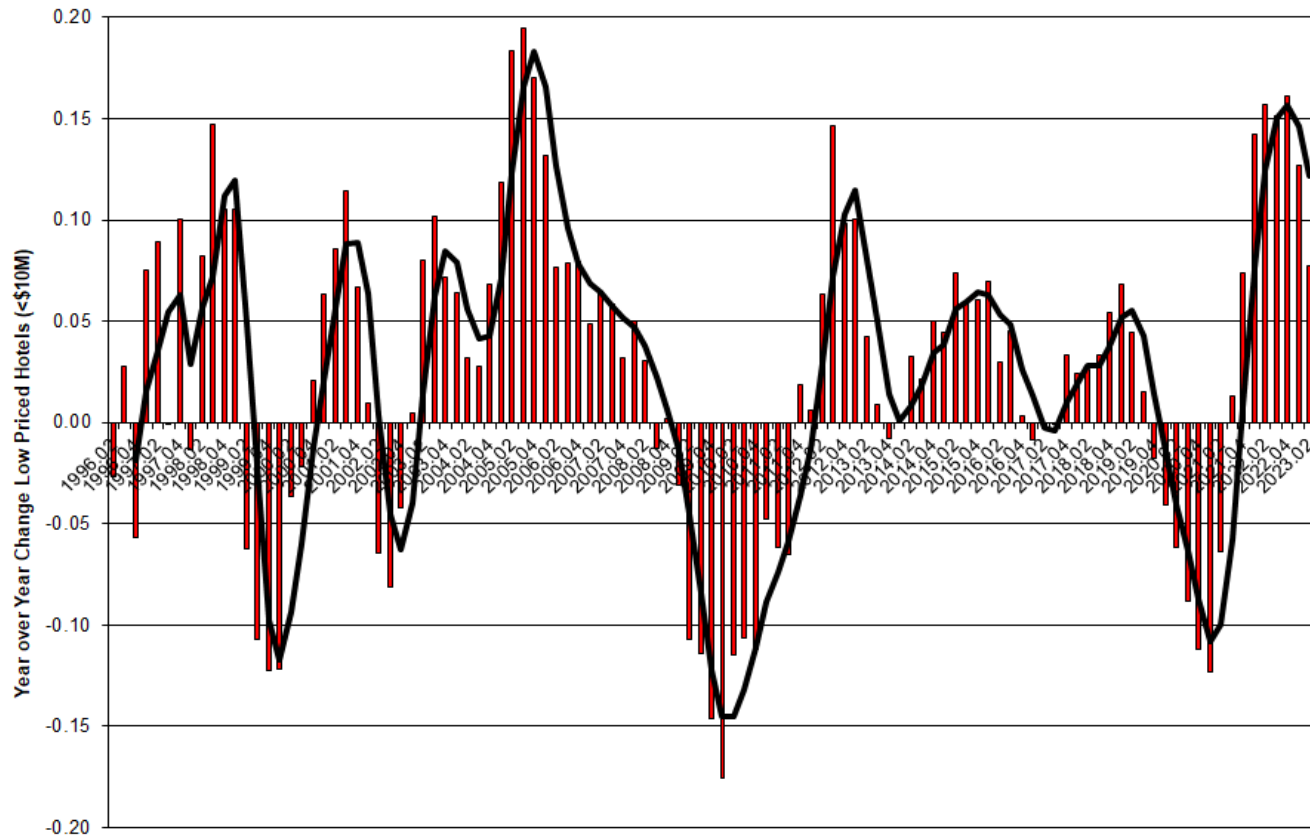


Sources: Cornell Center for Real Estate and Finance, CoStar, MSCI-Real Capital Analytics

Exhibits 8 and 9 show the historical year-over-year change in large and small hotel indices. Year over year, large hotels declined 7 percent, compared to an almost 8-percent increase in the price of smaller hotels.

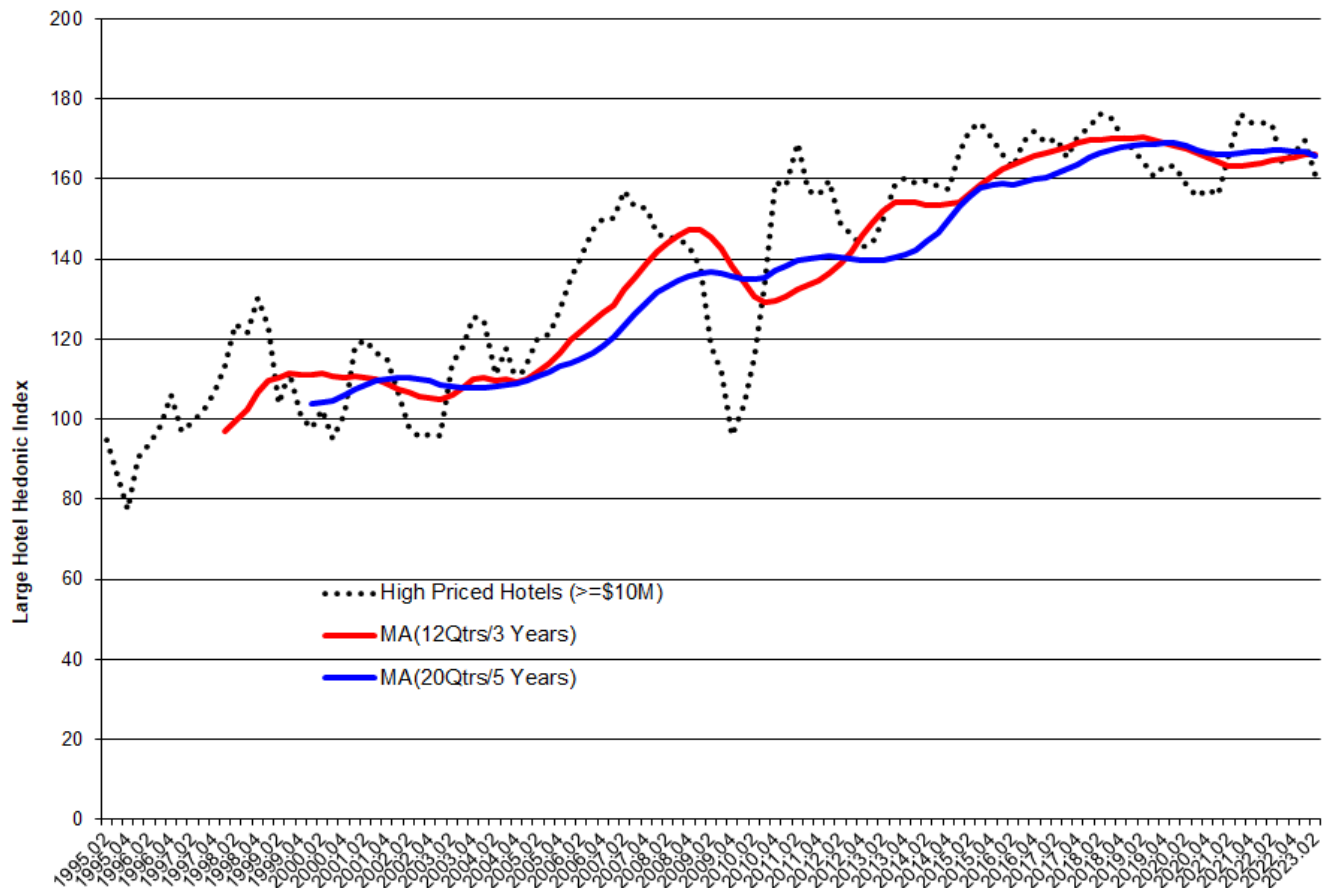
EXHIBIT 9

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



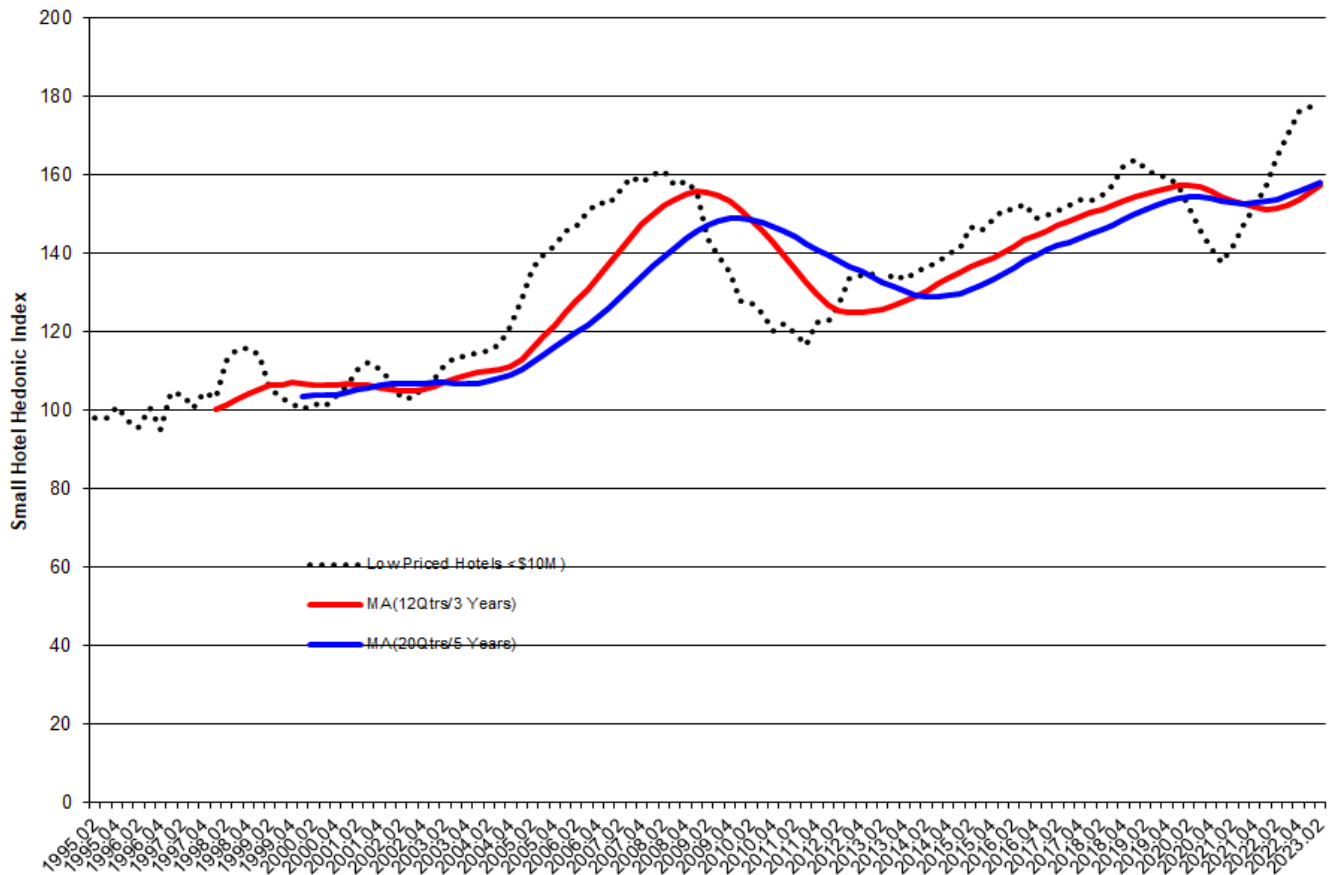
Sources: Cornell Center for Real Estate and Finance, CoStar, MSCI-Real Capital Analytics

Moving average trendlines for large hotel index



	Hedonic Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Large Hotels	Price	3 Year	5 Year	3 Year	5 Year
2022Q2	173.60				
2023Q1	169.92				
2023Q2	161.16	166.18	165.93	-0.67	-0.72
Quarter over Quarter	-5%				
Year over Year	-7%				
Small Hotels	Price	3 Year	5 Year	3 Year	5 Year
2022Q2	164.52				
2023Q1	177.36				
2023Q2	177.29	157.45	158.13	1.32	1.63
Quarter over Quarter	0.0%				
Year over Year	8.0%				

Moving average trendlines for small hotel index



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

To gauge whether the prices of large and small hotels signal a buy or sell, we compared the hedonic prices relative to the 3-year and 5-year moving averages, as shown in Exhibit 10 and Exhibit 11. If the price is above a moving average, the trend is up, while a price sitting below the moving average signals a downward trend. Since the hedonic prices for large hotels sit below both their associated 3-year and 5-year moving averages, this indicates a sell signal. The reverse is true for small hotels, as prices above the moving average signal a buy.

As shown in Exhibit 12 and Exhibit 13, the standardized price of large hotels continues fall below its mean of zero, while the standardized price of small hotels has now fallen below its statistical high. This indicates the standardized prices of large and small hotels have softened.

EXHIBIT 12

Standardized unexpected price (SUP) for large hotel index

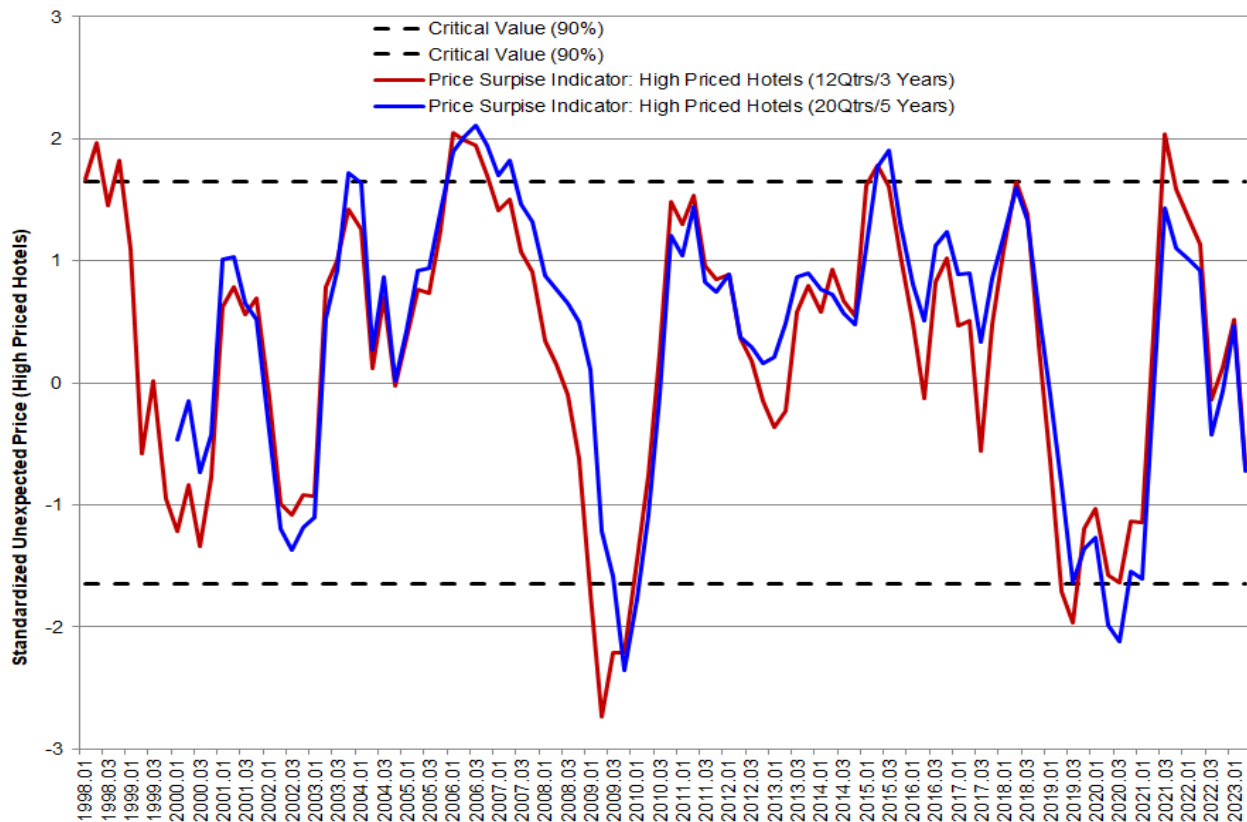
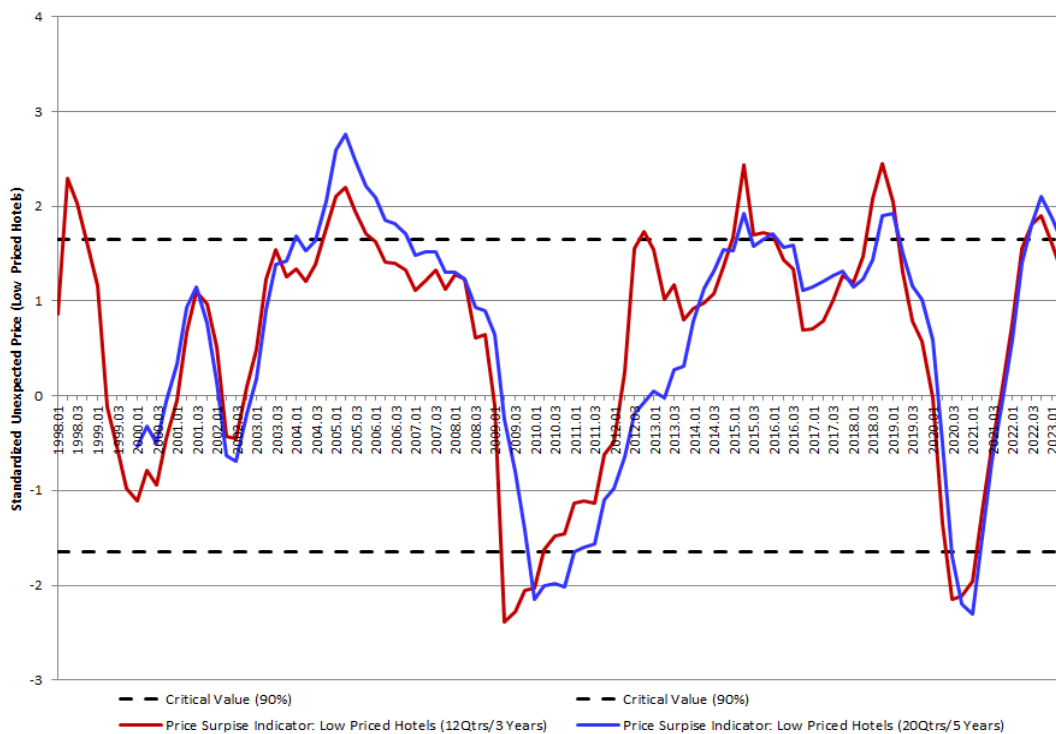


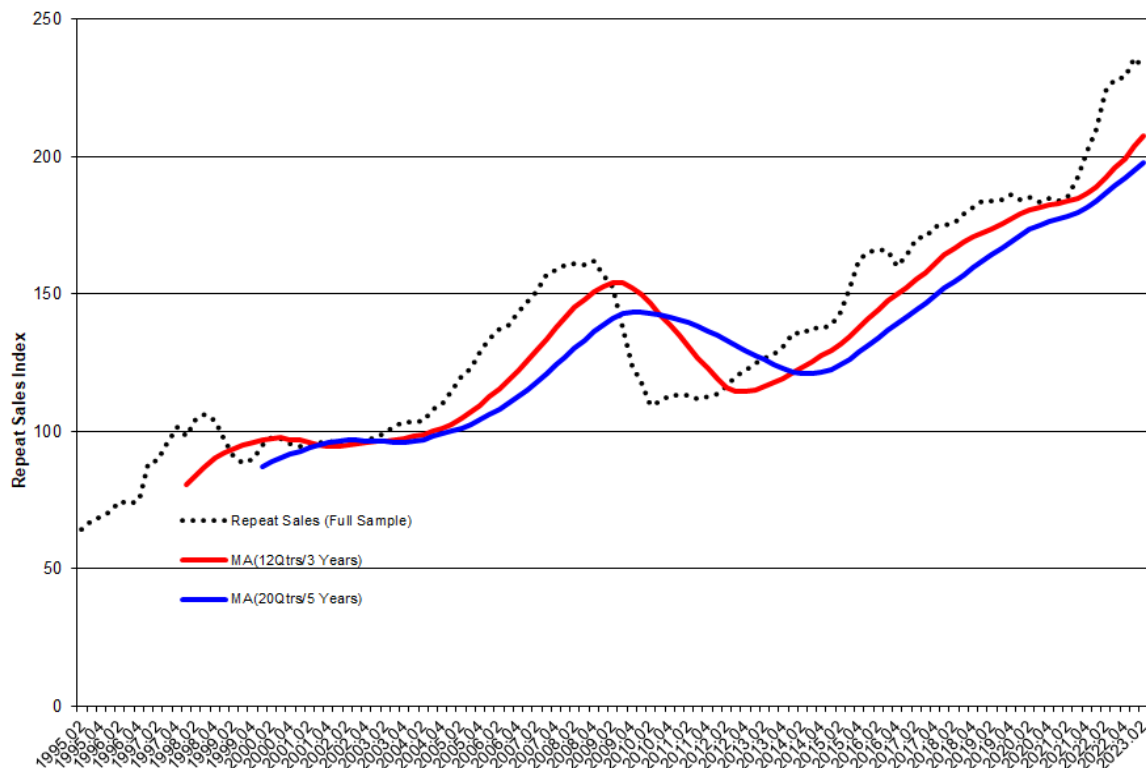
EXHIBIT 13

Standardized unexpected price (SUP) for small hotel index



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

Moving average trendline for repeat-sale hotel index



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

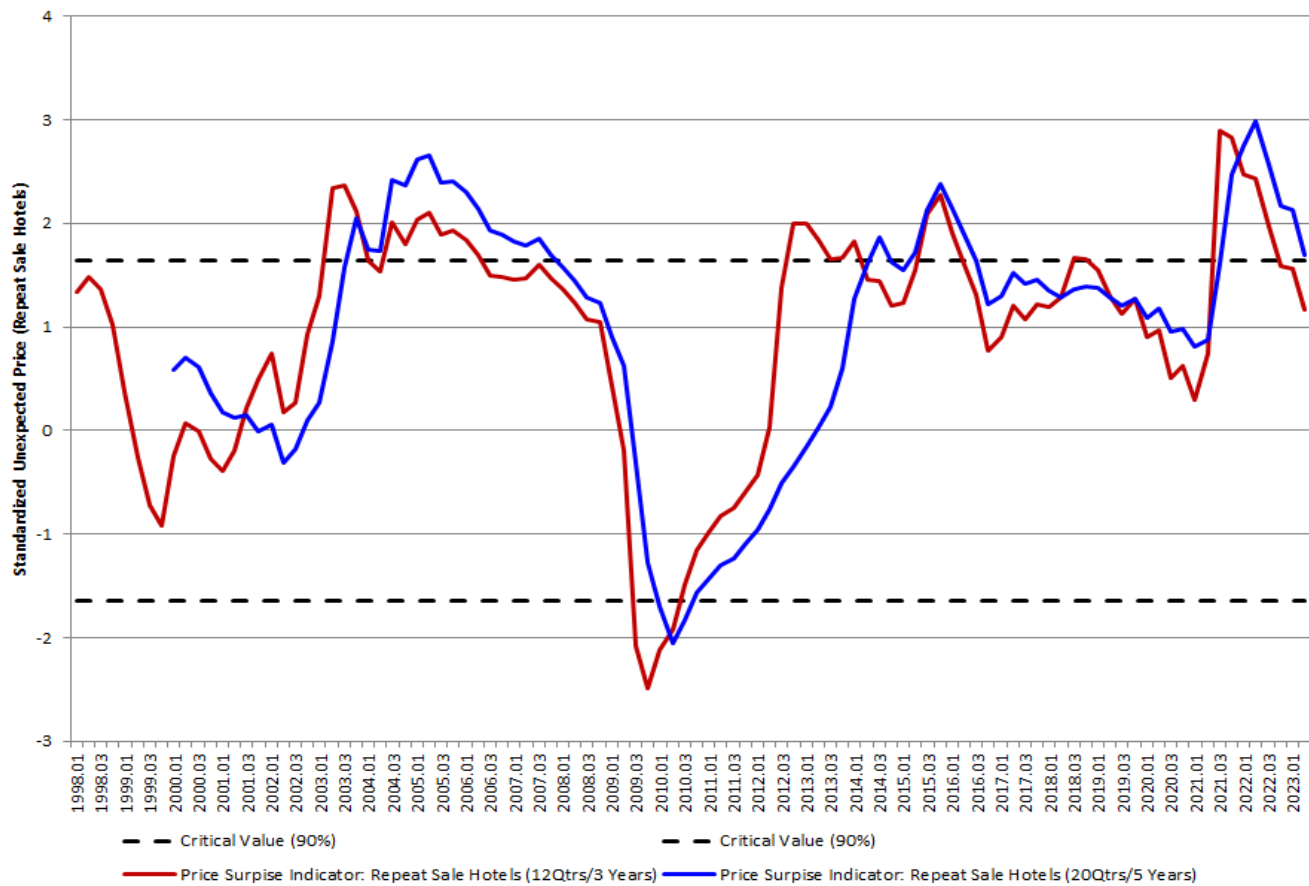
	Repeat Sale Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Repeat Sale Hotels	Price	3 Year	5 Year	3 Year	5 Year
2022Q2	224.05				
2023Q1	236.07				
2023Q2	232.52	207.73	198.11	1.16	1.70*
Quarter over Quarter	-1.5%				
Year over Year	4%				

Prices of frequently sold hotels remain above the moving averages, signaling a buy or hold. Prices of repeat sale hotels also remain above statistical highs, based on a 5-year window. Since most hotels that sell frequently tend to be small hotels, the repeat-sale price performance is unsurprisingly like that of small hotels. That is, hotels that tend to sell frequently (and therefore have repeat sales), fell 1.5 percent in price this quarter, but rose almost 4 percent year over year (see also

Exhibit 16). Again like small hotels, the repeat-sale indicator remains above both its short-term ($232.52 > 207.73$) and long-term ($232.52 > 198.11$) moving averages, indicating that these hotels remain a buying opportunity (see Exhibit 14). Our standardized unexpected price (SUP)

EXHIBIT 15

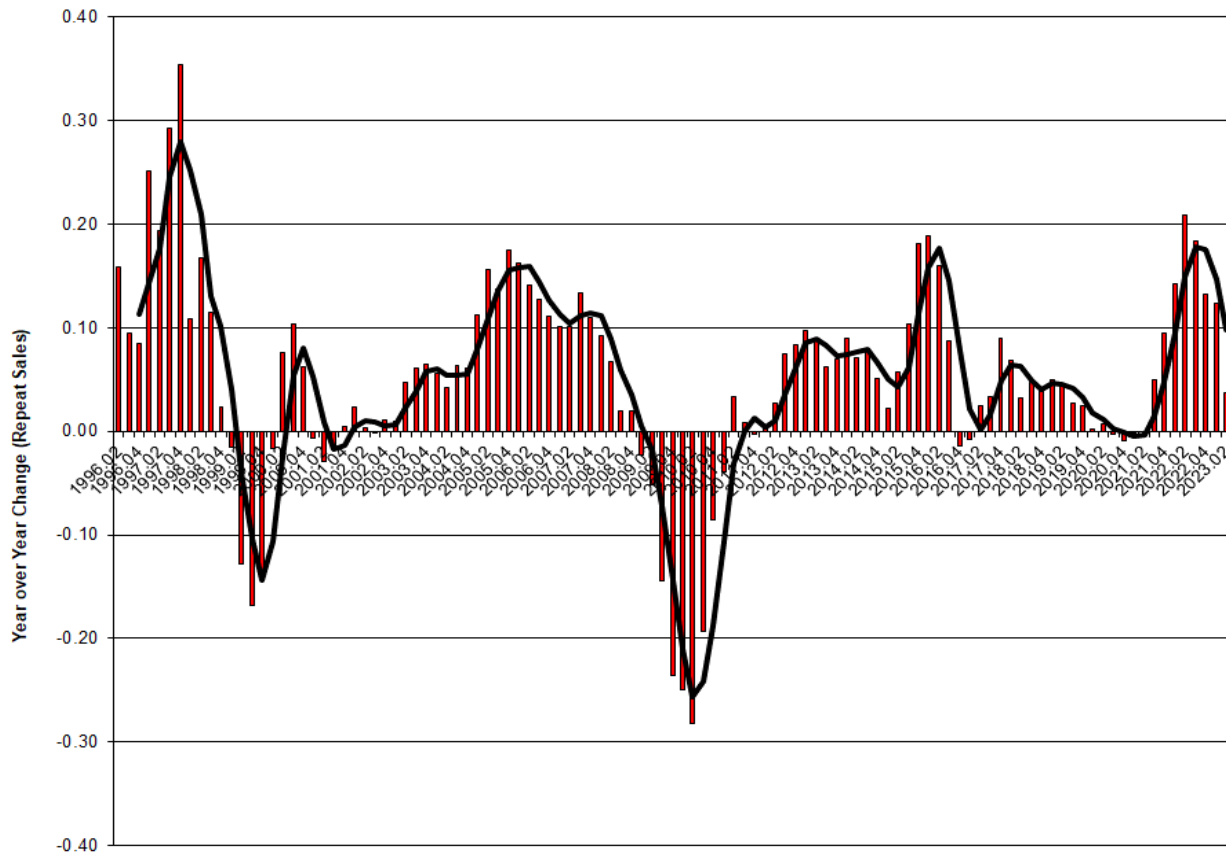
Standardized unexpected price (SUP) for hotel repeat-sale index (full sample)



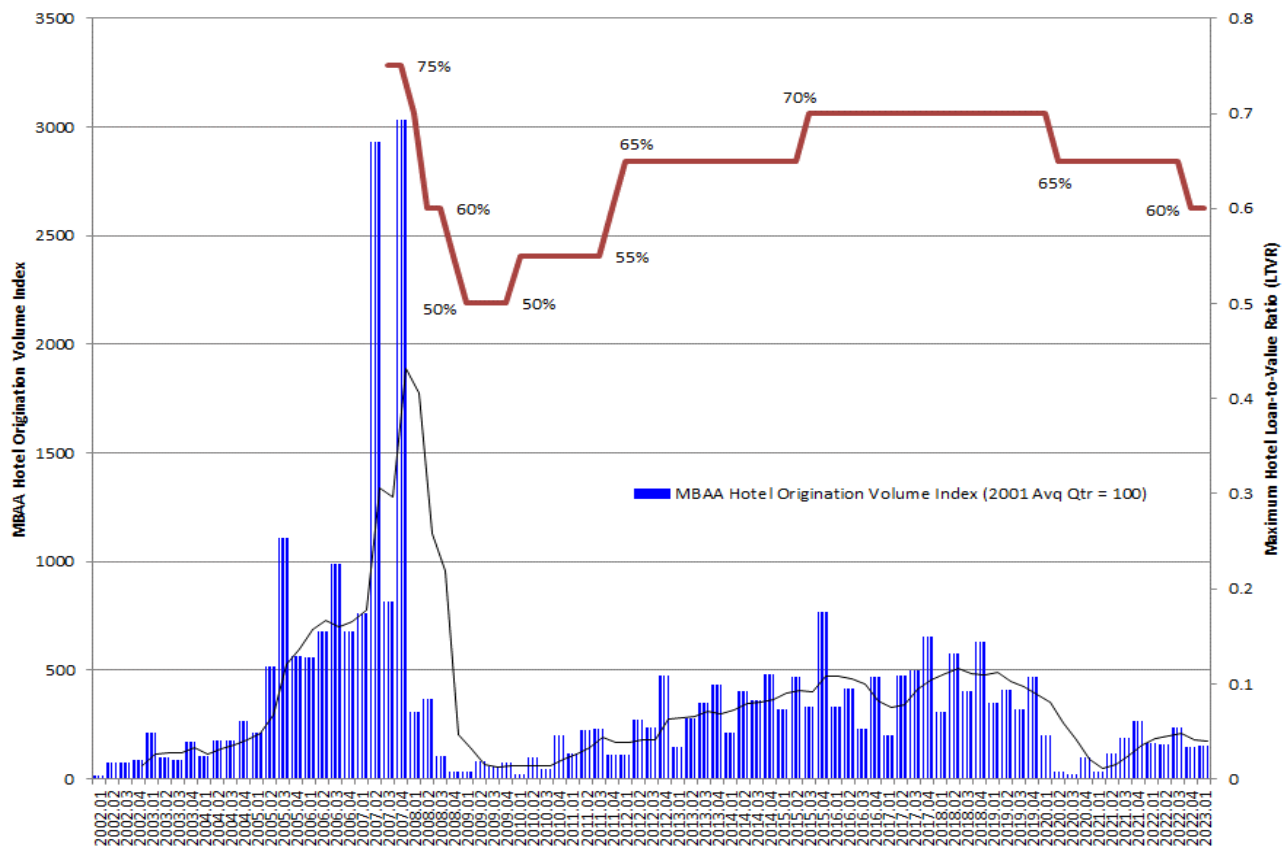
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

performance metric (in Exhibit 15) indicates that the standardized price based its 5-year moving average continues to remain above its statistical upper boundary, although it remains below its 3-year moving average.

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



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

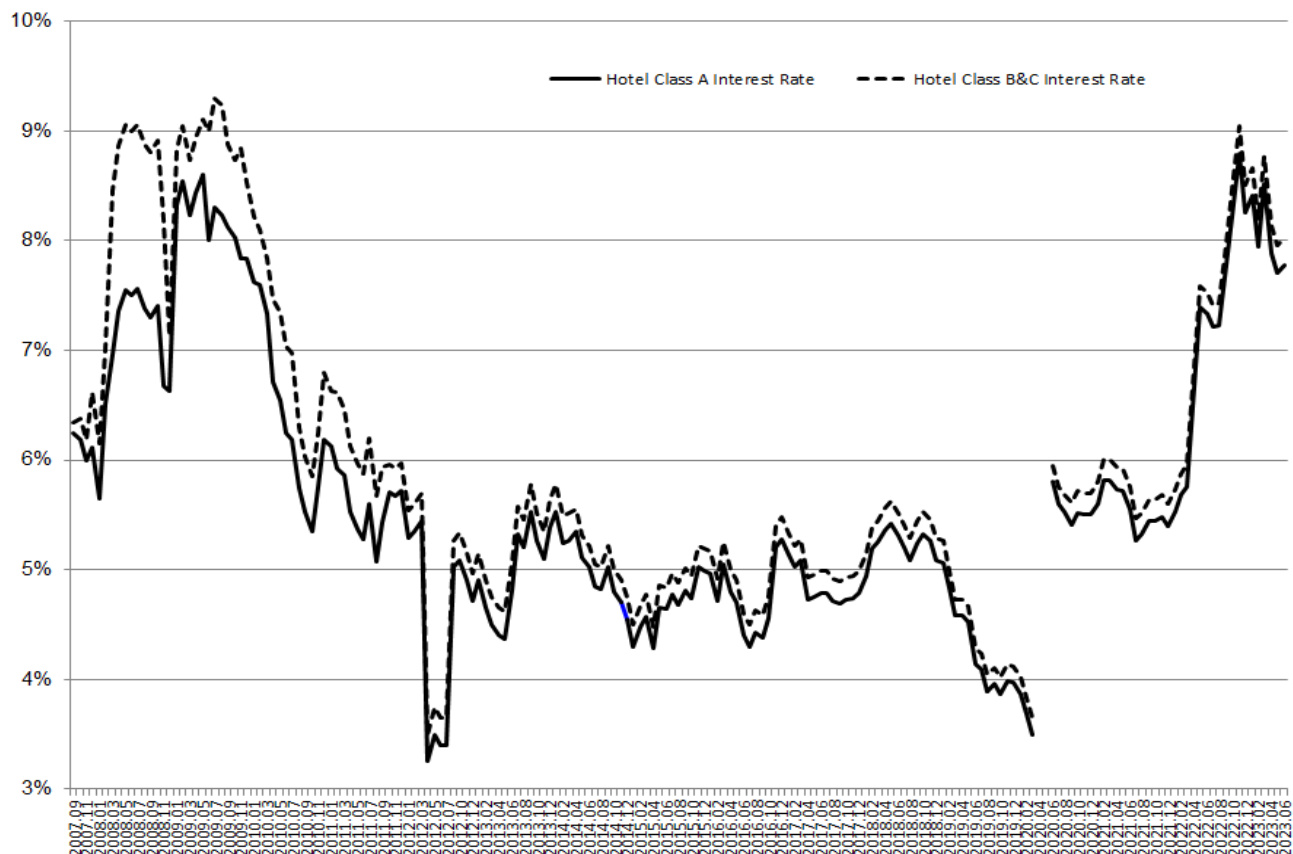
	MBAA Hotel Origination Volume Index (2001 Avq Qtr = 100)
2022Q1	166
2022Q4	145
2022Q1	152
Quarter over Quarter	4.8%
Year over Year	-8.4%

Mortgage financing volume rose nearly 5 percent for the most recent quarter reported. Exhibit 17 shows that the mortgage origination volume for hotels, as reported for the first quarter of 2023, rose almost 5 percent this quarter.

However, loan volume was 8-percent lower than the hotel loan origination volume from a year earlier (year over year). The maximum loan-to-value (LTV) ratio for hotels remained at 60 percent this quarter.

The cost of hotel debt financing declined in the recent quarter due to “main street” lenders lowering the amount of additional compensation required to make hotel loans relative to other commercial real estate (CRE) loans and lower relative risk, based on the relative volatility of hotel reits versus other property types. The cost of obtaining hotel debt financing, as reported by Cushman Wakefield Sonnenblick Goldman, fell this quarter but increased year over year.

Interest rates on Class A versus Class B & C hotels

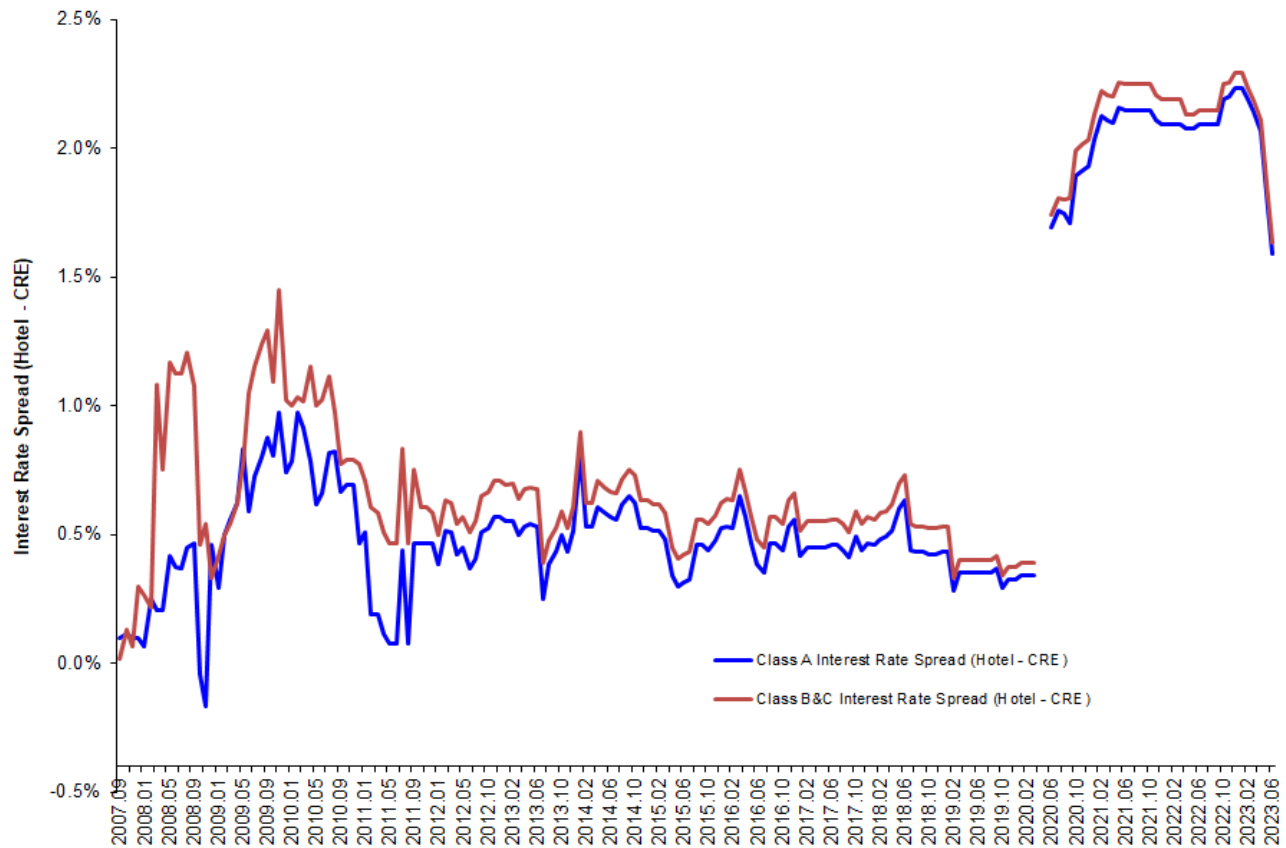


Sources: Cornell Center for Real Estate and Finance, Cushman Wakefield Sonnenblick Goldman

The interest rate as of June 5, 2023, was 7.78 percent for full-service Class A properties and 8.03 percent for Class B&C hotels, down from 8.52 percent (Class A) and 8.77 percent (Class B&C) in March 2023. This represents an interest-rate decline of 8 percent over a three-month period. Year over year, however, interest rates in the same current period (June 2023)

were slightly higher than in the prior year (June 2022) at 45 bps for Class A properties and 50 bps for class B hotels. This rise in interest rates continues to make hotel deals less financially feasible in the near term. Exhibit 18 displays the historical time series graph of hotel interest rates.

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



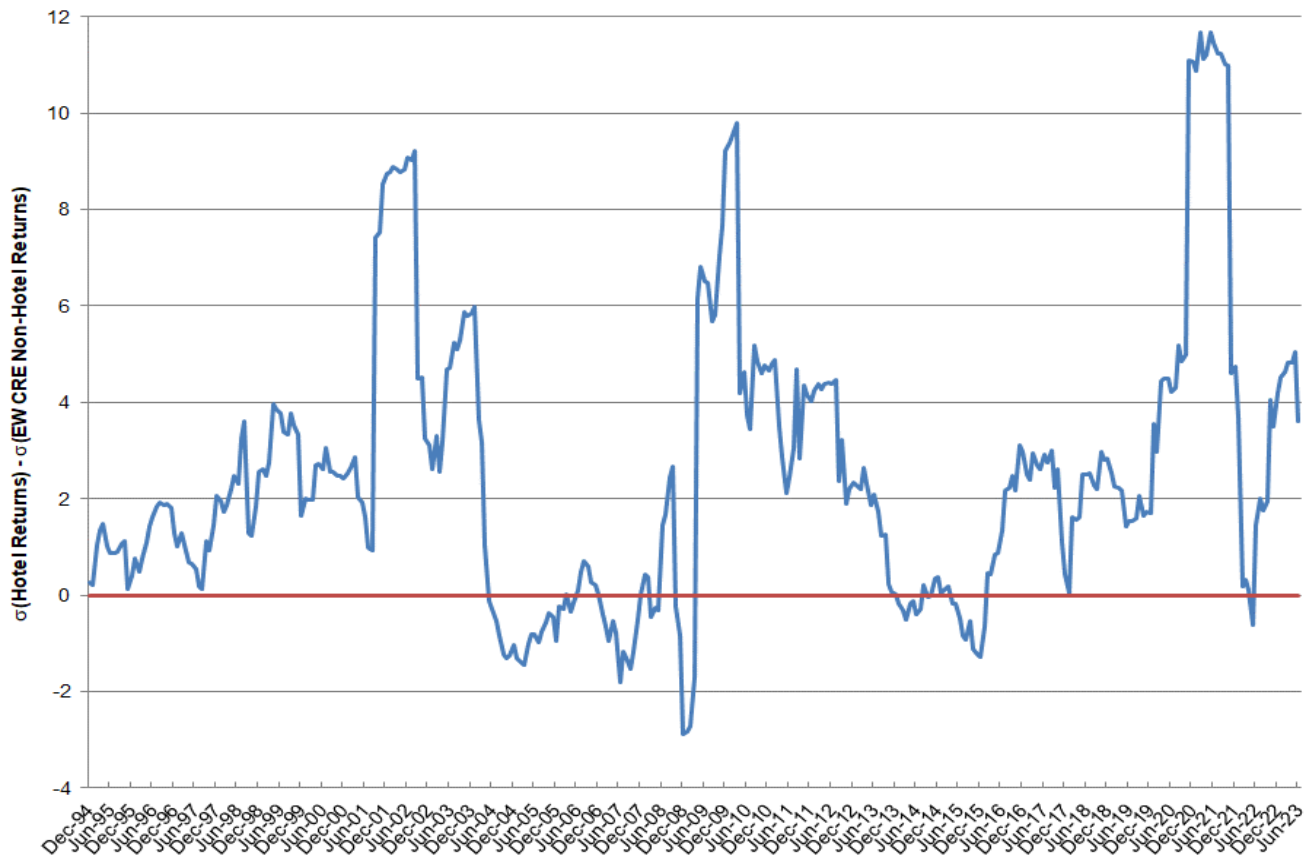
Sources: Cornell Center for Real Estate and Finance, Cushman Wakefield Sonnenblick Goldman

	Interest Rates Full Service Hotels		Interest Rate Spread (Hotel – CRE)		Interest Rate Spread (Hotel – 10 Yr TBond)	
	Class A	Class B&C	Class A	Class B&C	Class A	Class B&C
June 2022	7.33%	7.53%	2.09%	2.15%	4.40%	4.60%
March 2023	8.52%	8.77%	2.14%	2.18%	4.55%	4.80%
June 2023	7.78%	8.03%	1.59%	1.63%	4.05%	4.30%
Quarter over Quarter	-8.7%	-8.4%	-25.7%	-25.2%	-11.0%	-10.4%
Year over Year	6.1%	6.6%	-23.9%	-24.0%	-8.0%	-6.5%

To evaluate how risky hotel interest rates are, we compare the interest rate on hotels to other CRE types (Exhibit 19). The interest rate spread for both higher quality (Class A) and lower quality (Class B&C) hotels have decreased approximately 55 bps this quarter from the previous quarter. This indicates that lenders have lowered the additional compensation they require to make hotel loans, compared to loans on other major property

types, given the relative riskiness of hotels. To obtain further insights, we also compared the interest rate on hotels to the yield on a 10-year Treasury bond. The interest rate spread on this metric has narrowed 50 bps for both Class A and Class B&C hotels, from 4.55 percent to 4.05 percent (Class A) and from 4.80 percent to 4.3 percent (Class B) over a three-month period.

Risk differential between hotel REITs and non-hotel commercial-property REITs



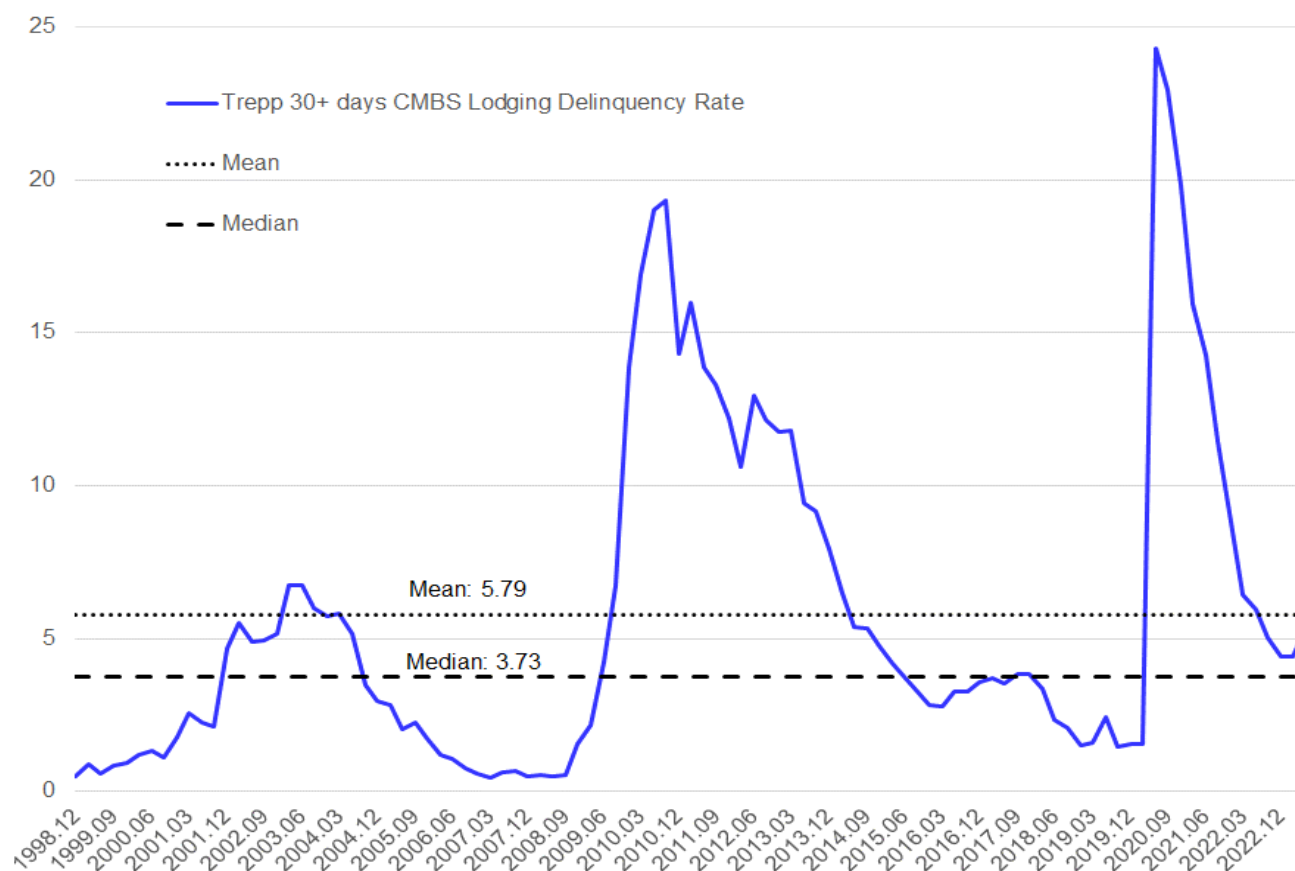
Sources: NAREIT, Cornell Center for Real Estate and Finance

Another way to view default risk is to look at the equity market. Exhibit 20 shows that the total risk of Hotel REITs relative to the total risk of an equally weighted portfolio of commercial real estate equity REITs (i.e., office, industrial, retail, and multifamily).

The risk differential, which should reflect the risk that is unique to hotel properties, is currently at 3.61 percent ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}}$

$= 10.83\% - 7.22\%$) down from 4.82 percent ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 12.38\% - 7.56\%$) in the prior quarter. This indicates that the expected default risk for hotels has decreased relative to other major types of commercial real estate. This further suggests that, in the short run, the cost of financing for hotels is moderating for hotels relative to other major property types.

30-plus-day delinquency rate for hotels



Source: Trepp

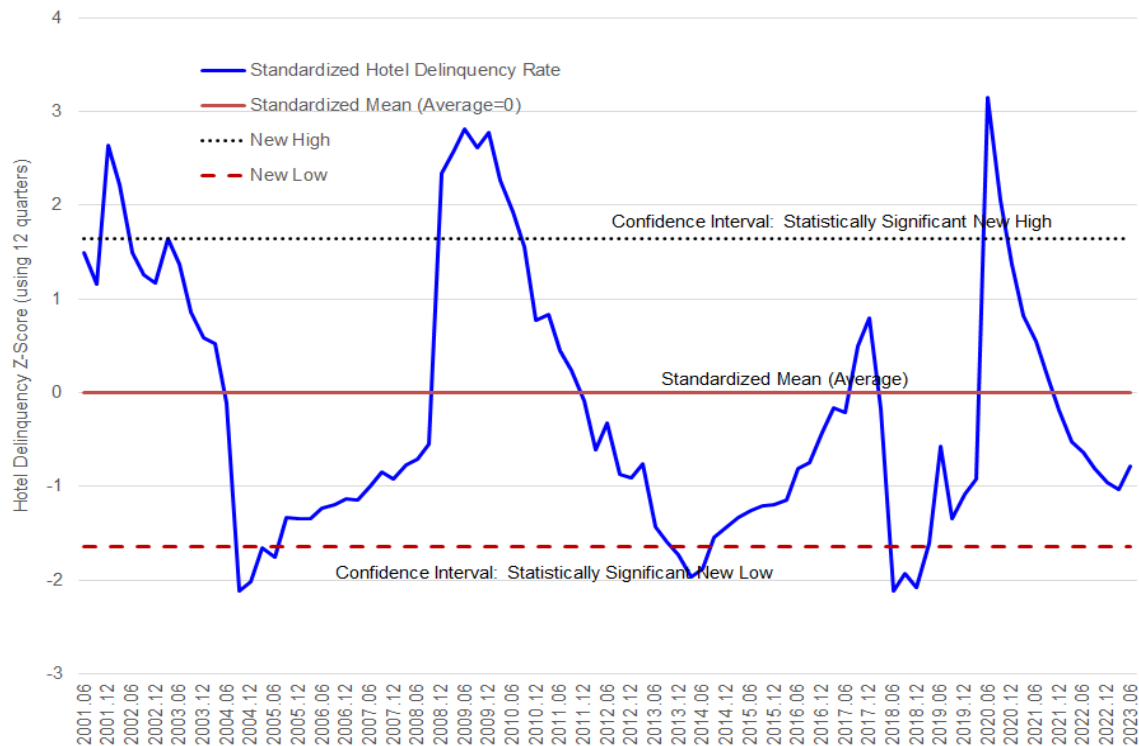
	Trepp 30+ days CMBS Lodging Delinquency Rate				
	Lodging	Industrial	Multifamily	Office	Retail
June 2022	5.94	0.49	1.03	1.68	6.69
March 2023	4.41	0.37	1.91	2.61	6.23
June 2023	5.35	0.42	1.59	4.50	6.48
Quarter over Quarter	21.3%	13.5%	-16.8%	72.4%	4.0%
Year over Year	-9.9%	-14.3%	54.4%	167.9%	-3.1%

The delinquency rate on hotel loans rose this quarter. The CMBS delinquency rate (30+ days) of 5.35 percent for lodging properties in June is higher than the previous quarter's rate of 4.41 percent (recorded in March 2023). However, it is lower than the 5.94-percent delinquency rate in same period for the prior year (June 2022). The hotel delinquency rate is

lower than the retail delinquency rate of 6.48 percent, but higher than that of all other property types, including office (4.5%), multifamily (1.59%), and industrial (.42%). 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.

EXHIBIT 22

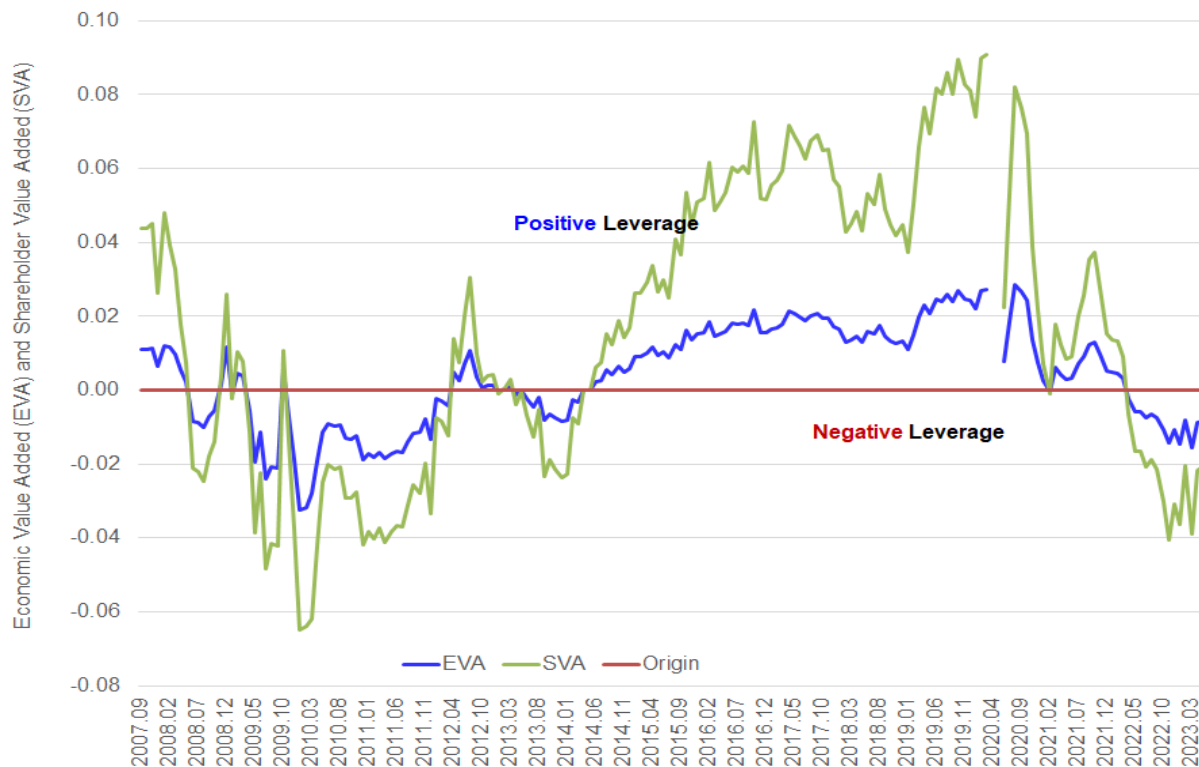
Standardized 30-plus-day delinquency rate for hotels



Source: Trepp

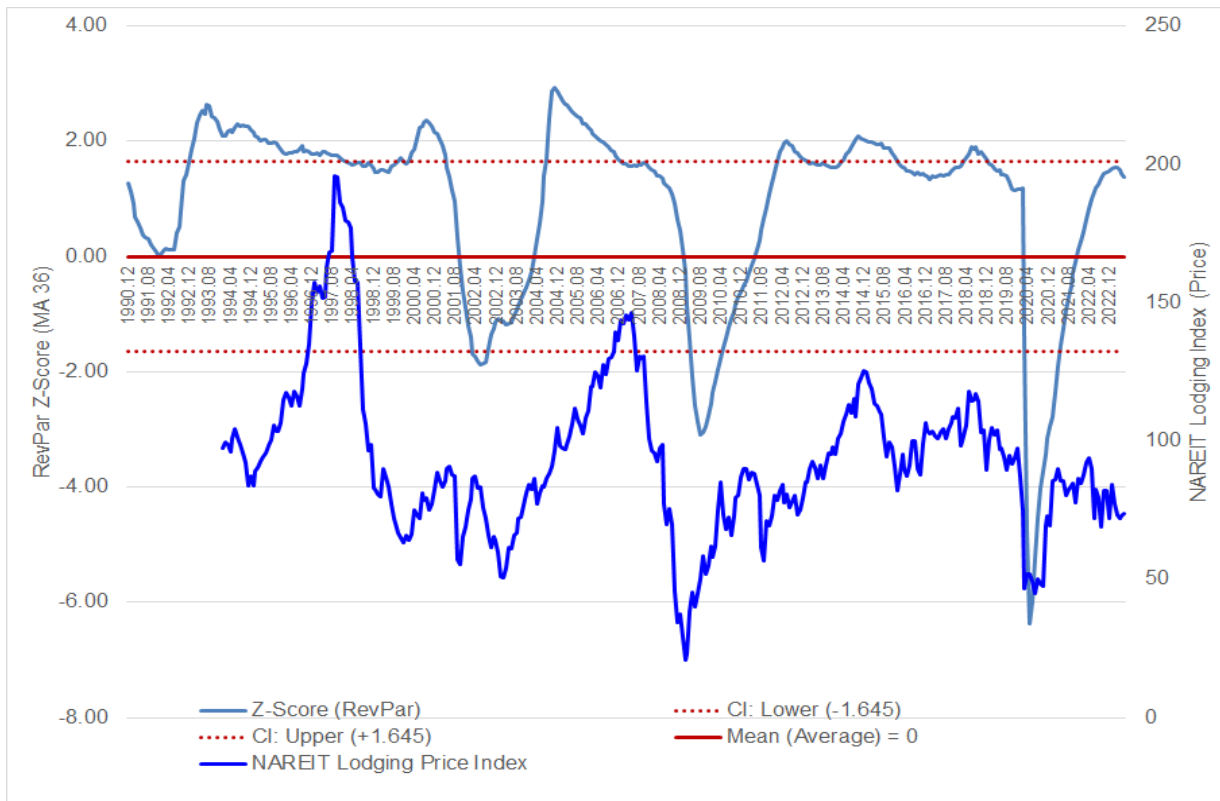
EXHIBIT 23

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



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

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



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

	ROIC	WACC	EVA	ROE	Cost of Equity	SVA
September 2022	8.41%	9.16%	-.75%	7.88%	10.03%	-2.15%
December 2022	8.50%	9.58%	-1.08%	7.34%	10.43%	-3.08%
March 2023	8.50%	10.01%	-1.55%	7.12%	11.00%	-3.88%
May 2023	8.50%	9.38%	-.83%	8.38%	10.45%	-2.07%

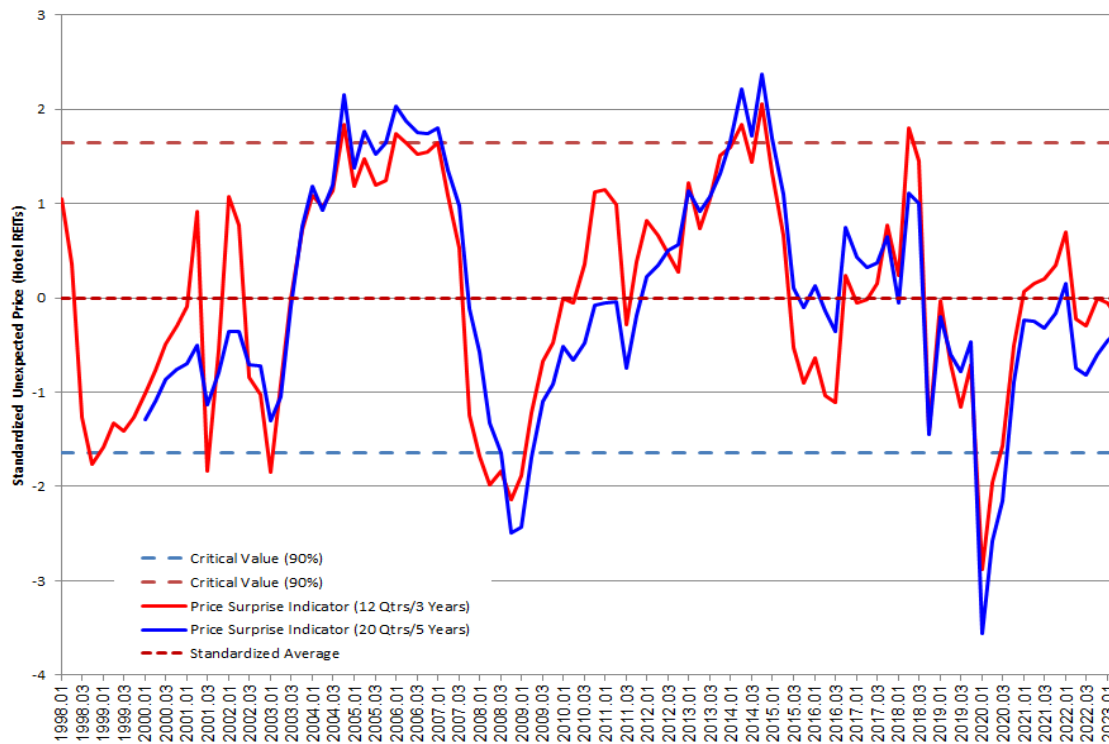
Note: ROIC is the return on invested capital (cap rate), WACC is the weighted average cost of capital, and ROE is the return on equity or cash on cash

The cost of borrowing exceeds return for hotels. Our economic value added (EVA) or economic profit is $-.83$ percent, while the shareholder value added (SVA) stands at -2.07 percent. Both the EVA and SVA have remained negative since April 2022. This indicates that economic profit for hotels is negative. That is, the return on hotels is less than their total borrowing cost (EVA), and the return on equity for hotels is less than their cost of equity (SVA). Consequently, the return on hotels is driven mainly from anticipated future price gains. Exhibit 23 depicts the historical EVA and SVA hotel performance.

Our reading of the tea leaves suggests that in the near term we should see slower to negative price momentum for both large and small hotels. Standardized unexpected RevPAR fell from 1.55 in March 2023 to 1.38 in June 2023, as shown in Exhibit 24. The NAREIT Lodging Price Index increased from 73.36 last quarter to 73.81 this quarter. The standardized unexpected price of the NAREIT Lodging Index is currently $-.21$, and it continues to hover around its standardized average of zero, as Exhibit 25 depicts. Based on the standardized unexpected price and also the 12-month moving average of the NAREIT Lodging Price Index, we expect our hotel prices, based on repeat sales, to decline near term.

EXHIBIT 25

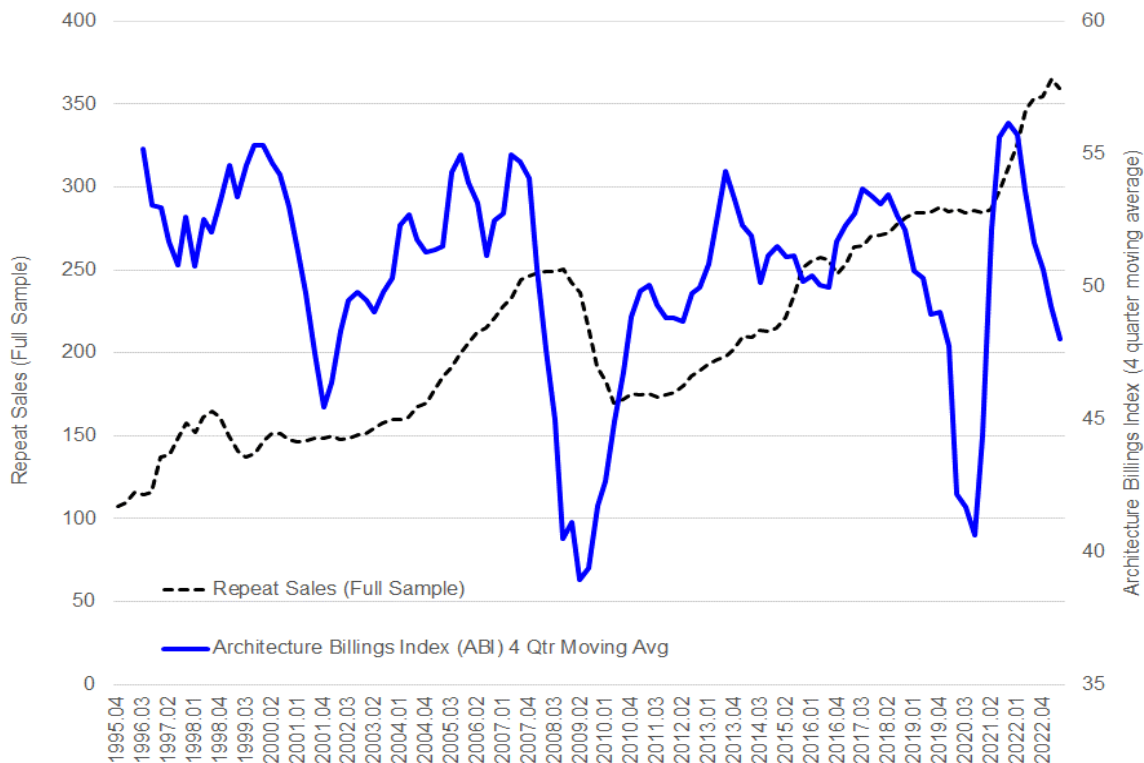
Standardized unexpected NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

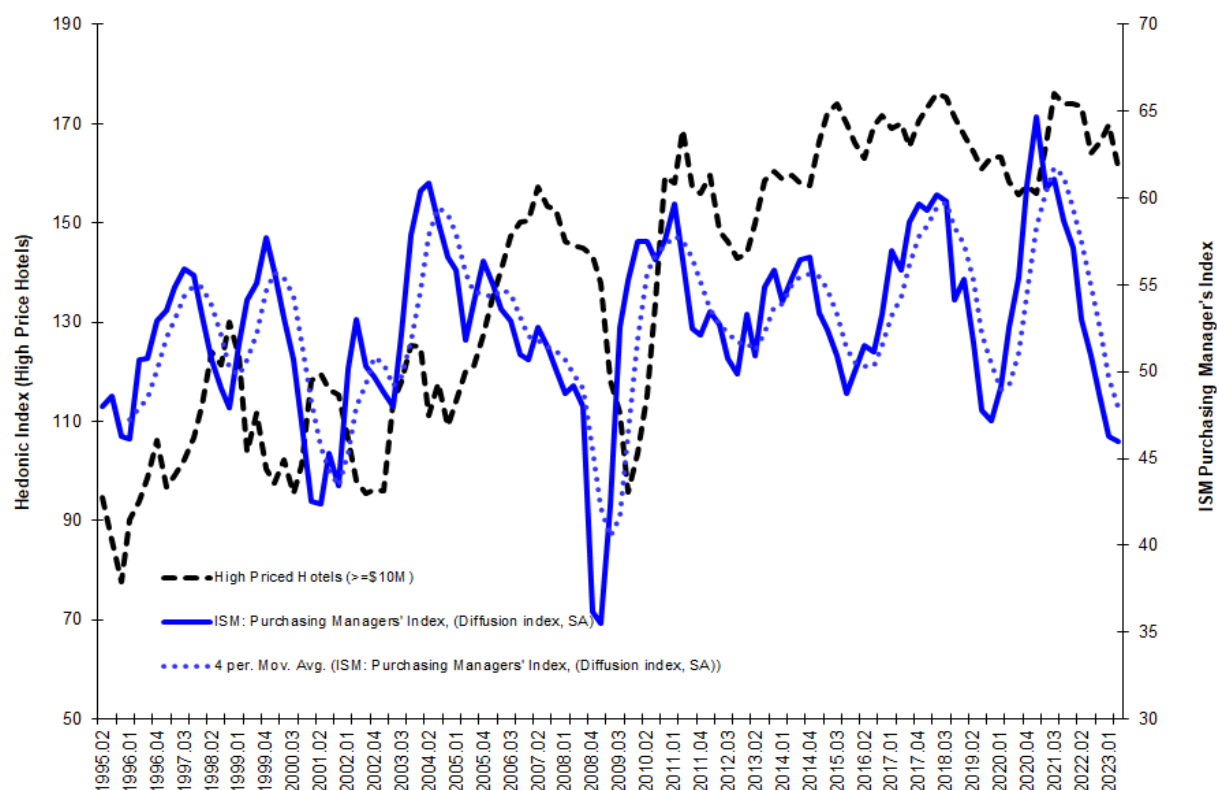
EXHIBIT 26

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



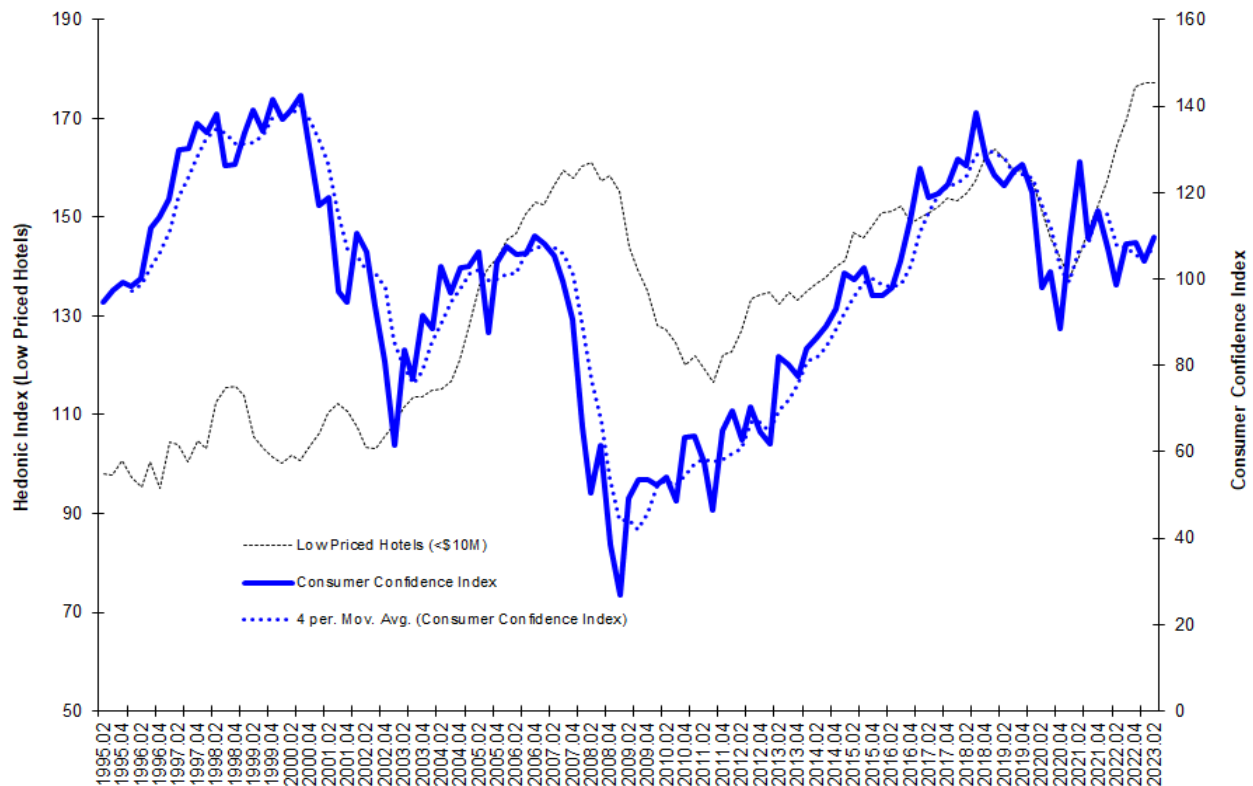
Sources: Cornell Center for Real Estate and Finance, Institute for Supply Management (ISM)

The architecture billings index (ABI) for commercial and industrial property, shown in Exhibit 26, fell 4.4 percent this quarter from 49.7 to 47.50 (based on the May 2023 report). Year over year, the index was also down 9.5 percent, declining from 52.5 to 47.50. Based on the moving average of the ABI index, which trended down on both a quarter-over-quarter (-2.5%) and year-over-year (-10.4%) basis, we should expect price momentum to trend downwards in the next period.

The National Association of Purchasing Managers (NAPM) index, which is an indicator of anticipated business confidence, currently stands at 46, as shown in Exhibit 27.

It declined slightly this quarter (-0.6%, from 46.3 to 46), compared to a 4.3-percent decline last quarter (48.4 to 46.3). Year over year, the NAPM index also declined 13.2 percent (53 to 46), continuing its descent from an 18.9-percent decrease (57.1 to 46.3) in the prior period. Thus, we can expect large, high-price hotels to decline in price near term.

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, our proxy for anticipated consumer demand for leisure travel and a leading indicator of the hedonic index for low price hotels, increased 5 percent this quarter and 11 percent year over year. Thus, we expect low-price hotels to rise in the near term, based on a four-quarter moving average of the Consumer Confidence Index.

Analysts' forecasts of hotel REIT earnings and revenue growth

	Quarterly Expected EPS		Annual Expected EPS	
	Median	Mean	Median	Mean
2022Q2	393.8%	933.1%	207.1%	580.2%
2023Q1	35.3%	21.9%	163.5%	481.9%
2023Q2	-4.4%	-11.9%	176.5%	459.8%
Quarter over Quarter	-112.5%	-154.3%	8.0%	-4.6%
Year over Year	-101.1%	-101.3%	-14.8%	-20.7%

Source: <https://www.earningswhispers.com>

Finally, 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 annual EPS, shown in Exhibit 29.

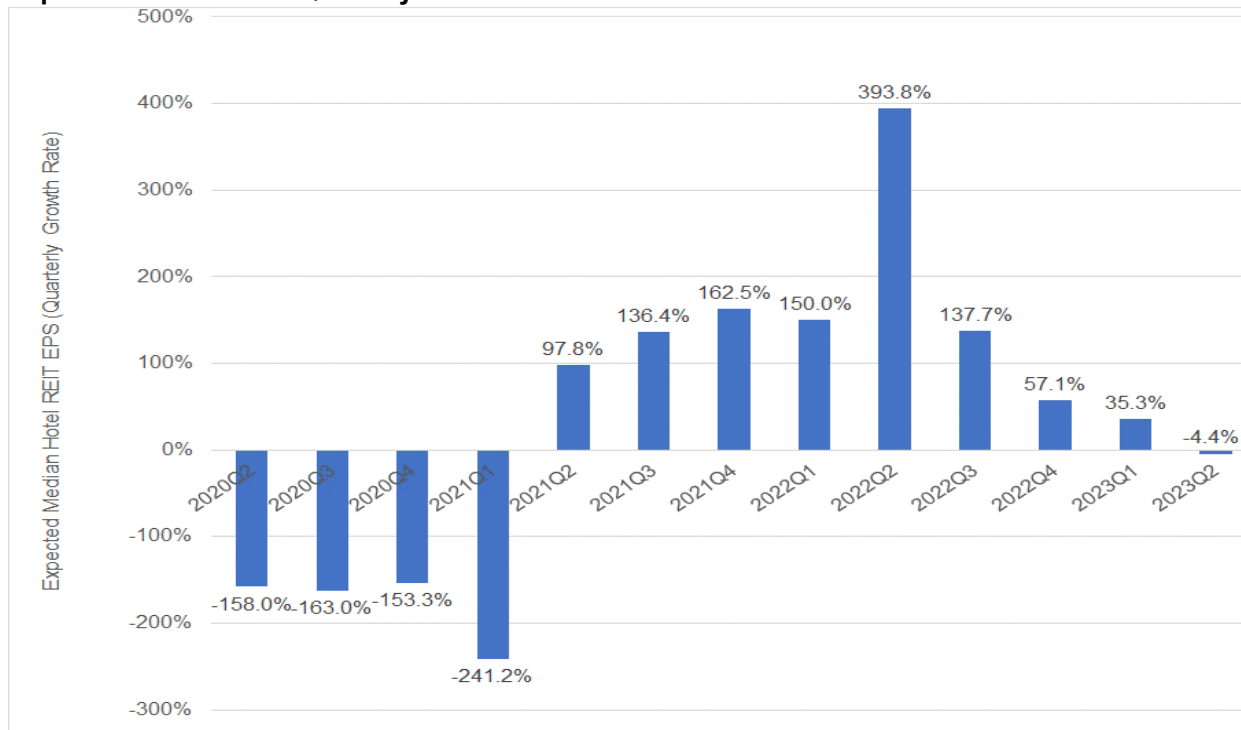
Analysts are expecting the quarterly EPS growth rate to fall between -4.4% (median) to -12% (mean). Year over year, the expected annual EPS growth rate declined a median of 15 percent and a mean of 21 percent. Exhibit 30 graphs the median expected EPS growth rates for hotel REITs. Taken together, the expected growth rate in hotel REIT EPS is decreasing. Since analysts' estimates reflect earnings guidance from management, this suggests that we should expect prices to decrease in the near term. ■

Hotel Valuation Model (HOTVAL) Has Been Updated

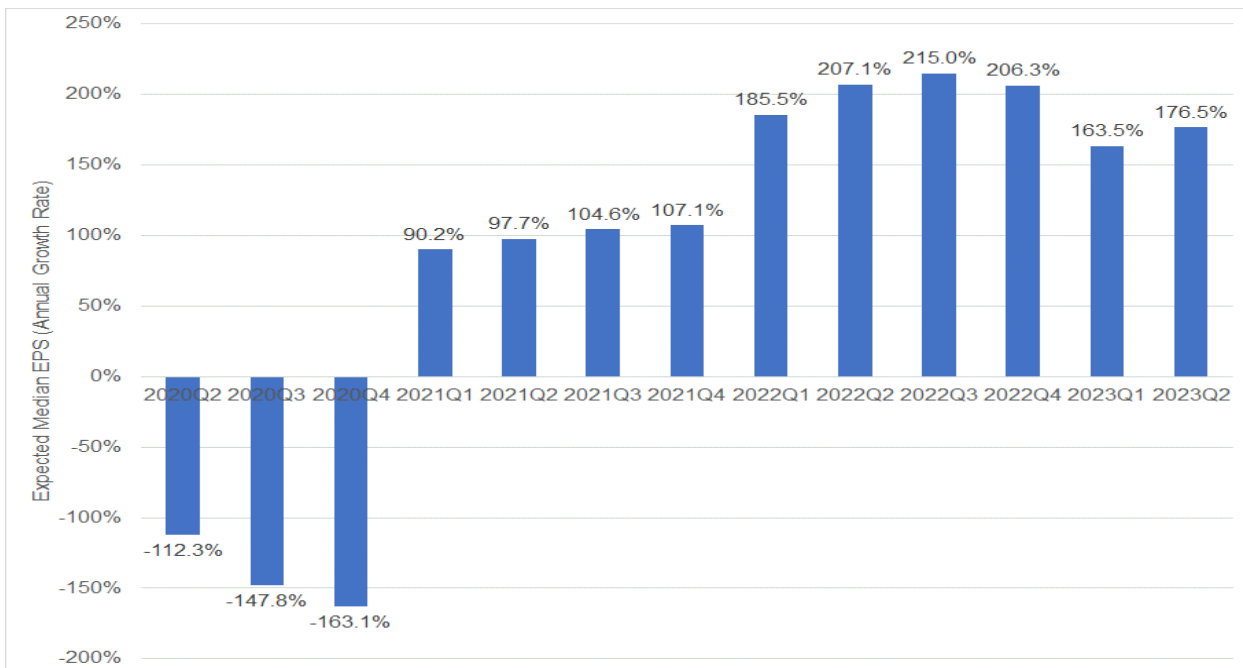
We have updated our hotel valuation regression model to include the transaction data used to generate this report. We provide this user-friendly hotel valuation model in an Excel spreadsheet entitled HOTVAL Toolkit as a complement to this report, which is available for download from our [CREF website](http://cref.cornell.edu)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

Analysts' quarterly and annual REIT forecasts

Expected Median EPS: Quarterly Growth Rate



Expected Median EPS: Annual Growth Rate



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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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-sale 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.* 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 earnings 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 (SVA) as a complementary metric to EVA so that readers can now compare the profitability of hotel real estate to investors' equity return.

* 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.