

Cornell Hotel Indices: Second Quarter 2022

Heading into Economic Headwinds

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

EXECUTIVE SUMMARY

The price of hotels rose in all regions except the Mid-Atlantic this quarter. Hotel prices in the Mountain and South Atlantic regions reached new statistical highs, while hotel prices in the Pacific region continued to remain above their statistical high. Hotels in non-gateway cities posted higher quarterly gains relative to gateway cities, as non-gateway prices increased 5 percent, compared to 3 percent for hotels in gateway cities. The transaction volume on all hotel transactions ((both large hotels and small hotels combined) surged 27 percent this quarter (61% year over year). Median prices also rose this quarter for both large and small hotels as well as hotels in non-gateway cities while hotels in gateway cities declined 23 percent. The prices of large and small hotels appear to be undervalued based on moving averages. However, the cost of hotel debt financing rose sharply this quarter, as well as year over year. Lenders are requiring relatively more compensation for hotel loans relative to other commercial real estate, and to the 10-year risk-free rate due to increased perceived risk. The rise in borrowing cost will dampen enthusiasm for undervalued hotel properties, since our EVA and SVA metrics indicate that the cost of borrowing exceeds the return for hotels.

Looking towards the next quarter, our leading indicators of hotel price performance indicate that we should expect slower or declining near-term price momentum for both larger and smaller hotels near term.

ABOUT THE AUTHORS

Crocker H. Liu is a professor of real estate at the Nolan School of Hotel Administration at Cornell, where he is 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 *Review of Financial Studies*, *Journal of Financial Economics*, *Journal of Business*, *Journal of Financial and Quantitative Analysis*, *Journal of Law and Economics*, *Journal of Financial Markets*, *Journal of Corporate Finance*, *Review of Finance*, *Real Estate Economics*, *Journal of Urban Economics*, *Regional Science and Urban Economics*, *Journal of Real Estate Research*, and *Journal of Real Estate Finance and Economics*. He is the former co-editor of *Real Estate Economics*, the leading real estate academic journal, for which he continues to be on the editorial board. He is also an associate editor of *Financial Review*. He previously served on the editorial boards of *Journal of Real Estate Finance and Economics*, *Journal of Property Research*, and *Journal of Real Estate Finance*. He is a past president of AREUEA (2019), the leading real estate academic organization. Professor Liu earned his BBA in real estate and finance from the University of Hawaii, an M.S. in real estate from Wisconsin under Dr. James A. Graaskamp, and a Ph.D. in finance and real estate from the University of Texas under Dr. Vijay S. Bawa.



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 *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 *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*, 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 *Journal of Real Estate Finance and Economics*.



Acknowledgments

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Disclaimer

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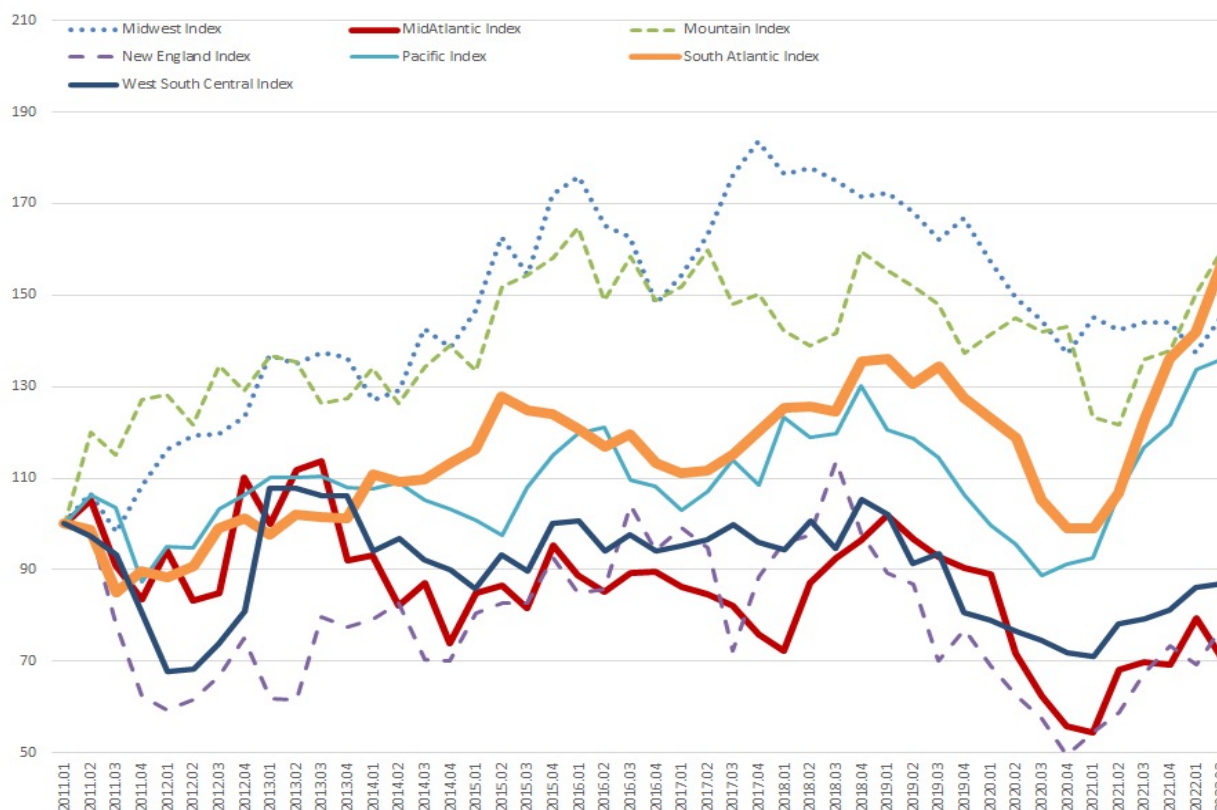
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Analysis of Indices through Q2, 2022

Hotel prices in all regions rose this quarter, except for those in the Mid-Atlantic region. Exhibits 1A through 1D show that for the second quarter (2022Q2), all regions exhibited a positive year-over-year price increase. Quarter over quarter, however, the Mid-Atlantic region declined 10.6 percent, while the West South Central region experienced little growth in prices. With respect to standardized unexpected prices (Z-scores), hotel prices reached a new statistical high in the Mountain and South Atlantic regions, while hotel prices in the Pacific region continued to remain above their statistical high. Hotel prices in the Midwest and Mid-Atlantic are around their average standardized unexpected price, but hotel prices in New England and West South Central have broken above their average and are trending toward a new statistical high.

EXHIBIT 1A

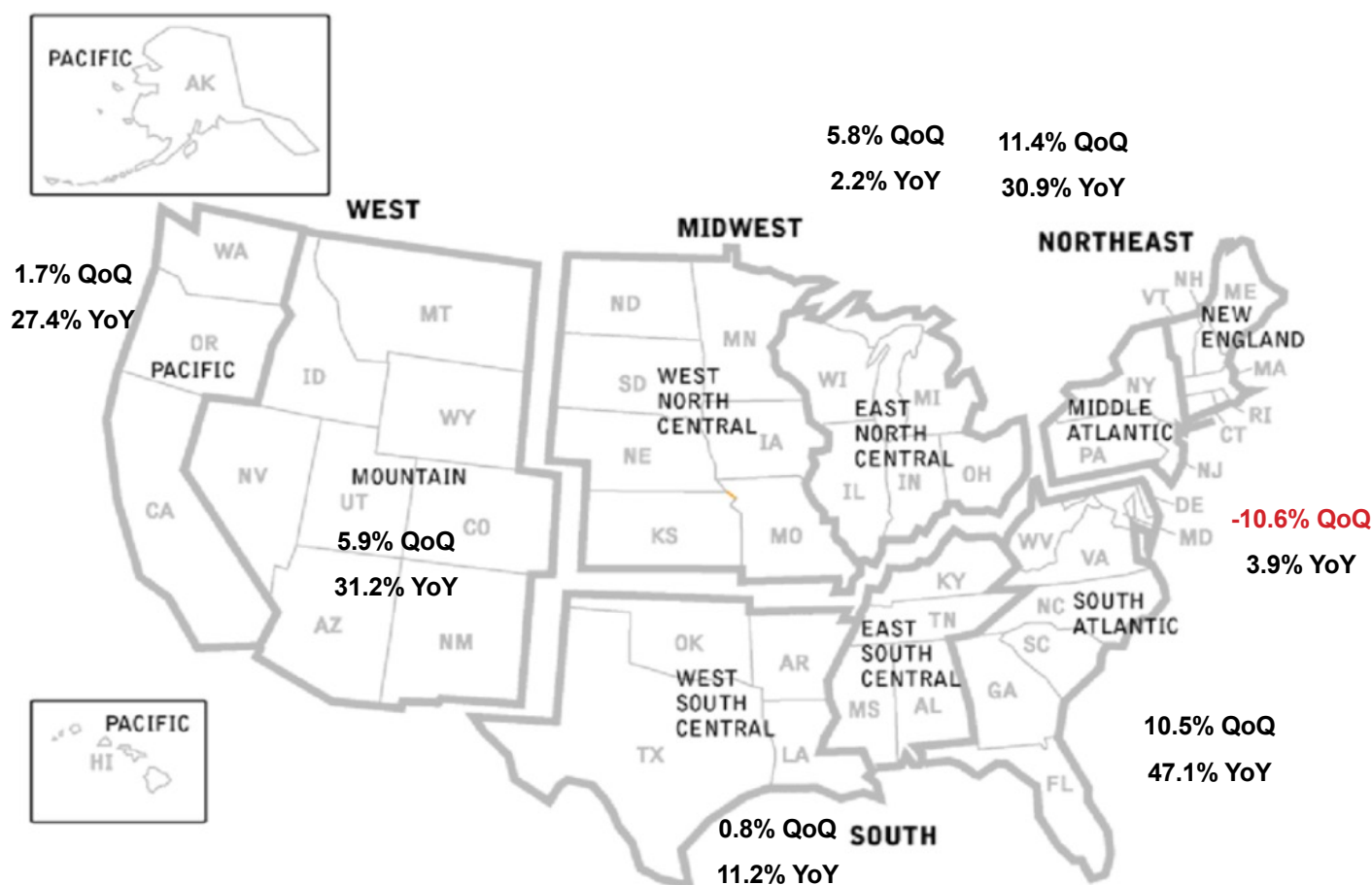
Time series hotel performance for seven regions



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

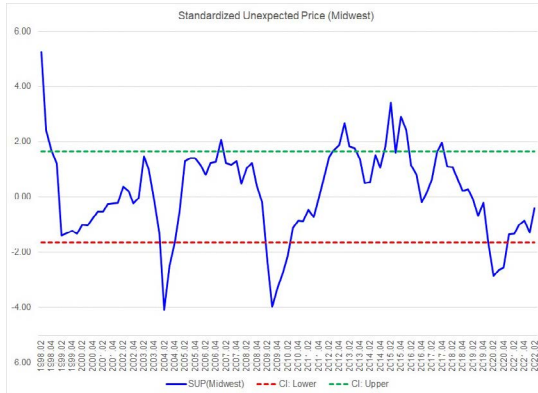
EXHIBIT 1c

Changes in regional price indices, year over year and quarter over quarter

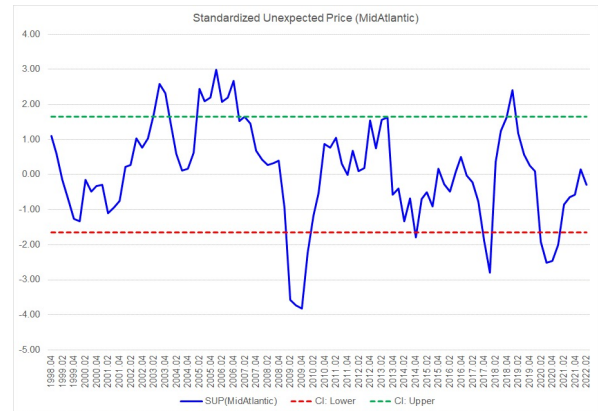
Y-o-Y	Midwest	Mid Atlantic	Mountain	New England	Pacific	South Atlantic	West South Central
Current	2.2%	3.9%	31.2%	31.0%	27.4%	47.1%	11.2%
Prior	-5.2%	45.5%	22.1%	27.1%	44.3%	43.5%	21.0%
Q-o-Q							
Current	5.8%	-10.6%	5.9%	11.4%	1.7%	10.5%	0.8%
Prior	-4.6%	14.6%	9.2%	-5.6%	9.9%	4.4%	6.1%

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

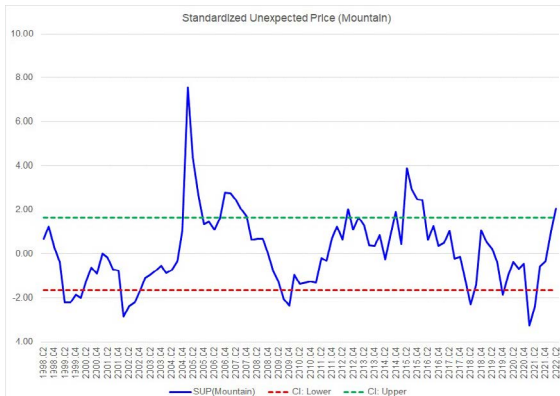
Midwest



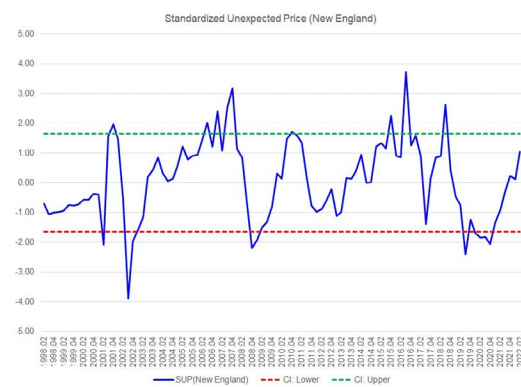
Middle Atlantic



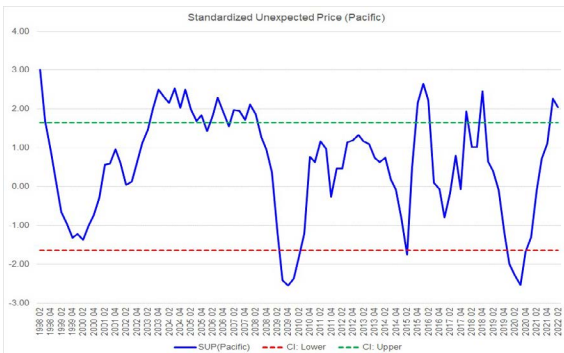
Mountain



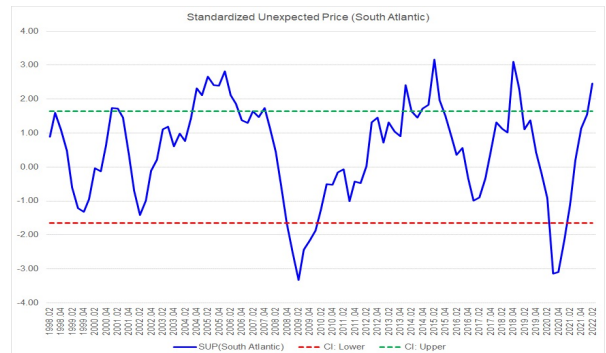
New England



Pacific



South Atlantic

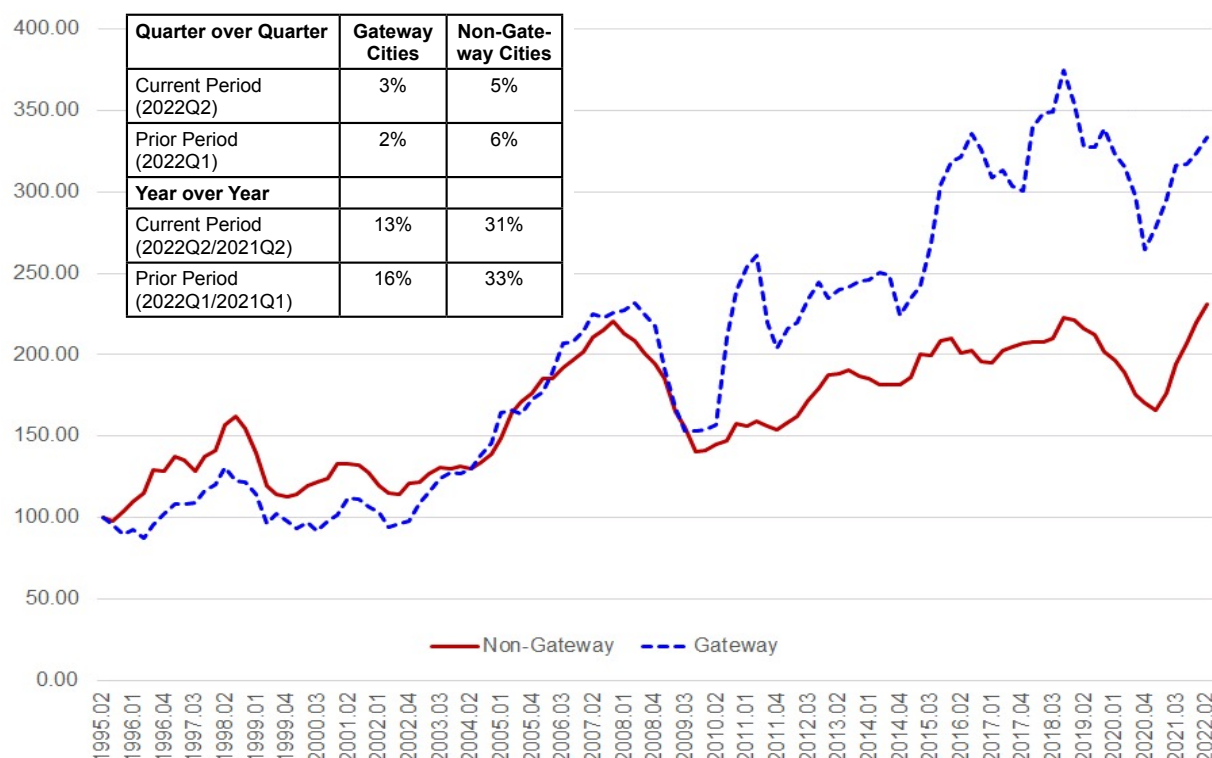


West South Central



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

Hotel performance for gateway cities versus non-gateway cities



Cities that we define as gateway cities are Boston, Chicago, Honolulu, Los Angeles, Miami, New York, San Francisco, and Washington, DC.

	Full Sample		Gateway Hotels		Non-Gateway Hotels	
	Median Price	No. of Sales	Median Price	No. of Sales	Median Price	No. of Sales
2022Q2	\$5,300,000	557	\$9,250,000	50	\$5,100,000	507
Quarter over Quarter	3%	27%	-23%	19%	4%	27%
Year over Year	51%	61%	-4%	47%	52%	63%

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

Hotels in non-gateway cities posted higher gains relative to gateway cities. Exhibit 2 shows that prices of hotels in non-gateway cities increased 5 percent, compared to a 3-percent price rise in gateway cities this quarter compared to last quarter. Year over year, a similar price momentum exists, as hotel prices in non-gateway cities rose 31 percent compared to a 13-percent hotel price increase in gateway cities.

Transaction volume surged this quarter, but prices also increased regardless of hotel size. The transaction volume on all hotel transactions (both large hotels and small hotels combined) surged 27 percent this quarter (61%

year over year).¹ Sales volume for small hotels (priced under \$10,000,000) accounted for the bulk of this quarterly increase, rising 35 percent, while the transaction volume for large hotels (over \$10,000,000) rose a modest 5 percent. The transaction volume for both non-gateway and gateway hotels also rose this quarter. Volume in non-gateway properties exceeded that of gateway properties by a margin of 27 percent to 19 percent. Median prices also rose this quarter for both large and small hotels, as well as hotels in

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

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

Year	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%	2357500	20	100%	3400000	7	35%	2100000	13	65%
1995	2	3150000	29	15712500	6	20.68%	2670000	23	79.31%	3800000	12	41.37%	2906150	17	58.62%
1995	3	2562500	44	12400000	4	9.09%	2378000	40	90.90%	3500000	20	45.45%	2.00E+06	24	54.54%
1995	4	3400000	41	27750000	10	24.39%	2625000	31	75.60%	5075000	14	34.14%	3100000	27	65.85%
1996	1	2500000	39	14475000	8	20.51%	1700000	31	79.48%	2500000	13	33.33%	2687500	26	66.66%
1996	2	2925000	43	29150000	12	27.90%	2500000	31	72.09%	3200000	15	34.88%	2730000	28	65.11%
1996	3	6500000	57	17740000	20	35.08%	3.00E+06	37	64.91%	5500000	25	43.85%	6890500	32	56.14%
1996	4	2735000	58	1.90E+07	17	29.31%	2200000	41	70.68%	4650000	27	46.55%	2400000	31	53.44%
1997	1	5053250	74	16635500	23	31.08%	3500000	51	68.91%	6300000	29	39.18%	4075000	45	60.81%
1997	2	2862500	72	17750000	17	23.61%	2150000	55	76.38%	2445000	24	33.33%	3047350	48	66.66%
1997	3	3437500	90	1.90E+07	21	23.33%	2400000	69	76.66%	5140000	38	42.22%	2550000	52	57.77%
1997	4	4330950	78	1.70E+07	27	34.61%	2300000	51	65.38%	10435445	27	34.61%	3600000	51	65.38%
1998	1	4698800	92	2.00E+07	31	33.69%	3100000	61	66.30%	6353000	33	35.86%	4600000	59	64.13%
1998	2	3630000	96	23765000	21	21.87%	3.00E+06	75	78.12%	3998239.5	28	29.16%	3575000	68	70.83%
1998	3	2961059	92	16740000	12	13.04%	2690550	80	86.95%	2255000	30	32.60%	3365000	62	67.39%
1998	4	2550000	84	3.50E+07	15	17.85%	2375000	69	82.14%	4225000	30	35.71%	2500000	54	64.28%
1999	1	2425000	88	24638095	10	11.36%	2125000	78	88.63%	3500000	32	36.36%	2300000	56	63.63%
1999	2	2100000	95	6.70E+07	5	5.26%	1950000	90	94.73%	2067500	28	29.47%	2100000	67	70.52%
1999	3	2500000	99	20711100	10	10.10%	2130000	89	89.89%	1800000	19	19.19%	2522500	80	80.80%
1999	4	2440000	87	18190000	14	16.09%	2090000	73	83.90%	2210000	23	26.43%	2575000	64	73.56%
2000	1	2400000	110	23253894.5	10	9.09%	2300000	100	90.90%	2325000	44	40%	2428500	66	60%
2000	2	2450000	88	14500000	9	10.22%	2275000	79	89.77%	2325000	24	27.27%	2450000	64	72.72%
2000	3	2600000	95	20346875	16	16.84%	2250000	79	83.15%	2925000	24	25.26%	2525000	71	74.73%
2000	4	2475000	101	18050000	14	13.86%	2300000	87	86.13%	4500000	26	25.74%	2350000	75	74.25%
2001	1	2970650	104	28437500	18	17.30%	2422500	86	82.69%	2650000	29	27.88%	3.00E+06	75	72.11%
2001	2	2800000	110	23795000	12	10.90%	2687150	98	89.09%	5825000	25	22.72%	2684300	85	77.27%
2001	3	2700000	87	1.60E+07	6	6.89%	2500000	81	93.10%	3150000	21	24.13%	2600000	66	75.86%
2001	4	2400000	73	20500000	5	6.84%	2300000	68	93.15%	2800000	17	23.28%	2300000	56	76.71%
2002	1	2125000	70	11518052	5	7.14%	2.00E+06	65	92.85%	1700000	17	24.28%	2200000	53	75.71%
2002	2	2400000	106	18125000	10	9.43%	2287500	96	90.56%	3125000	33	31.13%	2300000	73	68.86%
2002	3	2355400	81	12750000	5	6.17%	2237500	76	93.82%	2197500	24	29.62%	2470000	57	70.37%
2002	4	2907500	100	23500000	16	16%	2575000	84	84%	2907500	34	34%	2862500	66	66%
2003	1	2530000	94	1.30E+07	9	9.57%	2425000	85	90.42%	3850000	21	22.34%	2425000	73	77.65%
2003	2	2750000	110	18500000	10	9.09%	2509500	100	90.90%	3160000	31	28.18%	2600000	79	71.81%
2003	3	3333000	141	14359285.5	28	19.85%	2600000	113	80.14%	3660000	45	31.91%	3032500	96	68.08%
2003	4	2600000	149	16375000	18	12.08%	2425000	131	87.91%	2950000	35	23.48%	2500000	114	76.51%

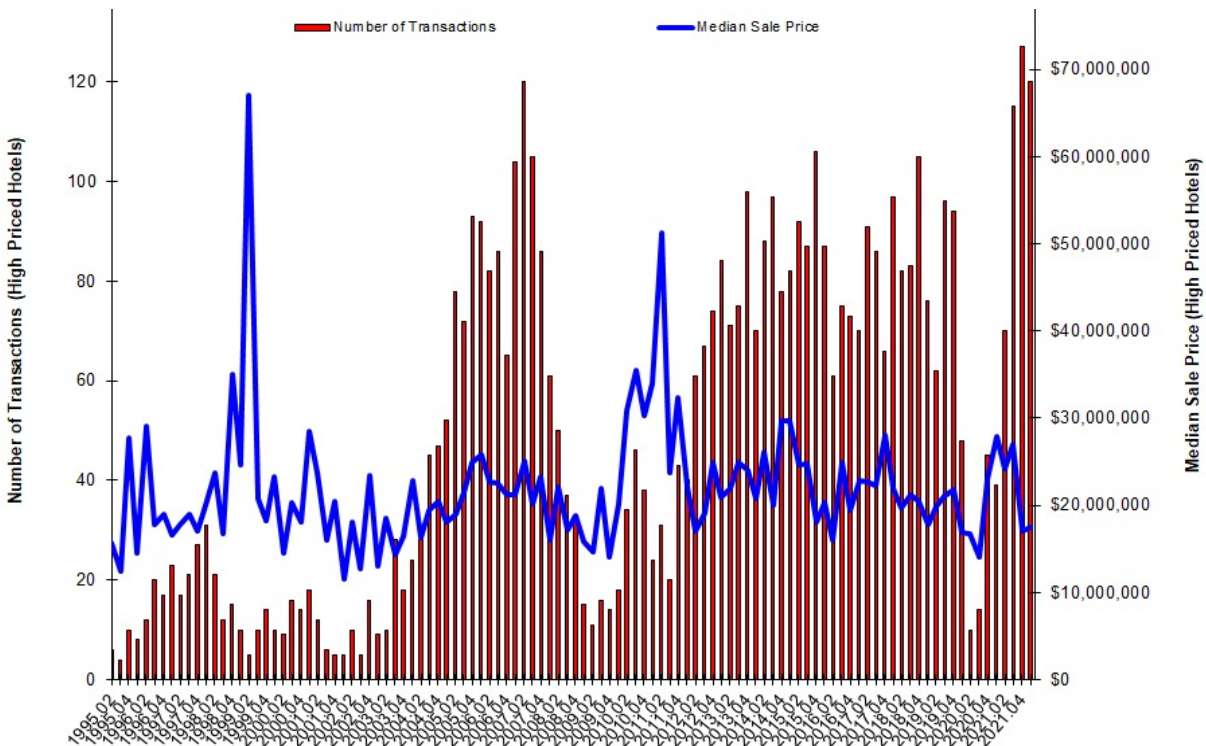
Transaction volume (observed) and median sale price (continued, 2004–2012)

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	14.45%	2536756	142	85.54%	3450000	41	24.69%	2894000	125	75.30%
2004	2	2700000	195	16280000	28	14.35%	2450000	167	85.64%	4500000	39	20%	2540000	156	80%
2004	3	3491122	216	19350000	45	20.83%	2610000	171	79.16%	4600000	51	23.61%	3306500	165	76.38%
2004	4	4000000	177	20475000	47	26.55%	3085500	130	73.44%	8850000	36	20.33%	3600000	141	79.66%
2005	1	4330000	231	18100000	52	22.51%	3300000	179	77.48%	6687500	40	17.31%	3800000	191	82.68%
2005	2	4566250	316	18956812	78	24.68%	3255150	238	75.31%	6475000	68	21.51%	4385000	248	78.48%
2005	3	4150000	273	21475000	72	26.37%	3100000	201	73.62%	6100000	61	22.34%	3750000	212	77.65%
2005	4	4425000	300	25000000	93	31%	3150000	207	68.99%	11200000	65	21.66%	4000000	235	78.33%
2006	1	5300000	301	25750000	92	30.56%	3800000	209	69.43%	18000000	64	21.26%	4943744	237	78.73%
2006	2	4750000	313	22750000	82	26.19%	3500000	231	73.80%	6175000	56	17.89%	4500000	257	82.10%
2006	3	5000000	285	22500000	86	30.17%	3650000	199	69.82%	7000000	59	20.70%	4705399	226	79.29%
2006	4	4587500	248	21200000	65	26.20%	3550000	183	73.79%	8093750	56	22.58%	4270000	192	77.41%
2007	1	6155805	286	21225000	104	36.36%	3700000	182	63.63%	9500000	63	22.02%	5700000	223	77.97%
2007	2	5650000	385	25125000	120	31.16%	3750000	265	68.83%	9000000	67	17.40%	5450000	318	82.59%
2007	3	5450000	330	20100161	105	31.81%	3900000	225	68.18%	8325000	53	16.06%	5011554	277	83.93%
2007	4	4680000	249	23250000	86	34.53%	3150000	163	65.46%	9375000	36	14.45%	4500000	213	85.54%
2008	1	5000000	255	16000000	61	23.92%	3985000	194	76.07%	5990000	46	18.03%	4650000	209	81.96%
2008	2	5062900	228	22150000	50	21.92%	3890000	178	78.07%	8725000	38	16.66%	4800000	190	83.33%
2008	3	4190500	172	17133333	37	21.51%	3350000	135	78.48%	5500000	27	15.69%	3900000	145	84.30%
2008	4	4050000	159	18850000	32	20.12%	3500000	127	79.87%	4972500	27	16.98%	3920000	132	83.01%
2009	1	4150000	81	15800000	15	18.51%	3600000	66	81.48%	7375000	16	19.75%	3700000	65	80.24%
2009	2	3090231	86	14722500	11	12.79%	2864310	75	87.20%	5410250	16	18.60%	3000000	70	81.39%
2009	3	3400000	90	22000000	16	17.77%	3000000	74	82.22%	4608750	14	15.55%	3195271	76	84.44%
2009	4	3562500	84	14100000	14	16.66%	3010250	70	83.33%	4520000	12	14.28%	3400000	72	85.71%
2010	1	3900000	89	20162500	18	20.22%	2825000	71	79.77%	8450000	15	16.85%	3825000	74	83.14%
2010	2	3700000	138	30833449	34	24.63%	3000000	104	75.36%	15400000	34	24.63%	3100000	104	75.36%
2010	3	4912500	120	35500000	46	38.33%	2850000	74	61.66%	25000000	37	30.83%	3117000	83	69.16%
2010	4	3988800	100	30353182	38	38%	2420000	62	62%	38500000	23	23%	3265000	77	77%
2011	1	4200000	85	34050000	24	28.23%	2795500	61	71.76%	12275000	15	17.64%	3775000	70	82.35%
2011	2	4200000	97	51200000	31	31.95%	2250000	66	68.04%	15600000	23	23.71%	3175000	74	76.28%
2011	3	3350000	73	23772500	20	27.39%	2800000	53	72.60%	3700000	17	23.28%	3275000	56	76.71%
2011	4	5000000	157	32400000	43	27.38%	3229250	114	72.61%	10950000	34	21.65%	4300000	123	78.34%
2012	1	5233961	131	22100000	40	30.53%	3275000	91	69.46%	13837500	28	21.37%	4200000	103	78.62%
2012	2	4000000	209	17000000	61	29.18%	2779500	148	70.81%	15900000	22	10.52%	3700000	187	89.47%
2012	3	7000000	169	19100000	67	39.64%	2720250	102	60.35%	16050000	32	18.93%	5250000	137	81.06%
2012	4	5622500	207	24866613	74	35.74%	3125000	133	64.25%	16174794	39	18.84%	5070000	168	81.15%

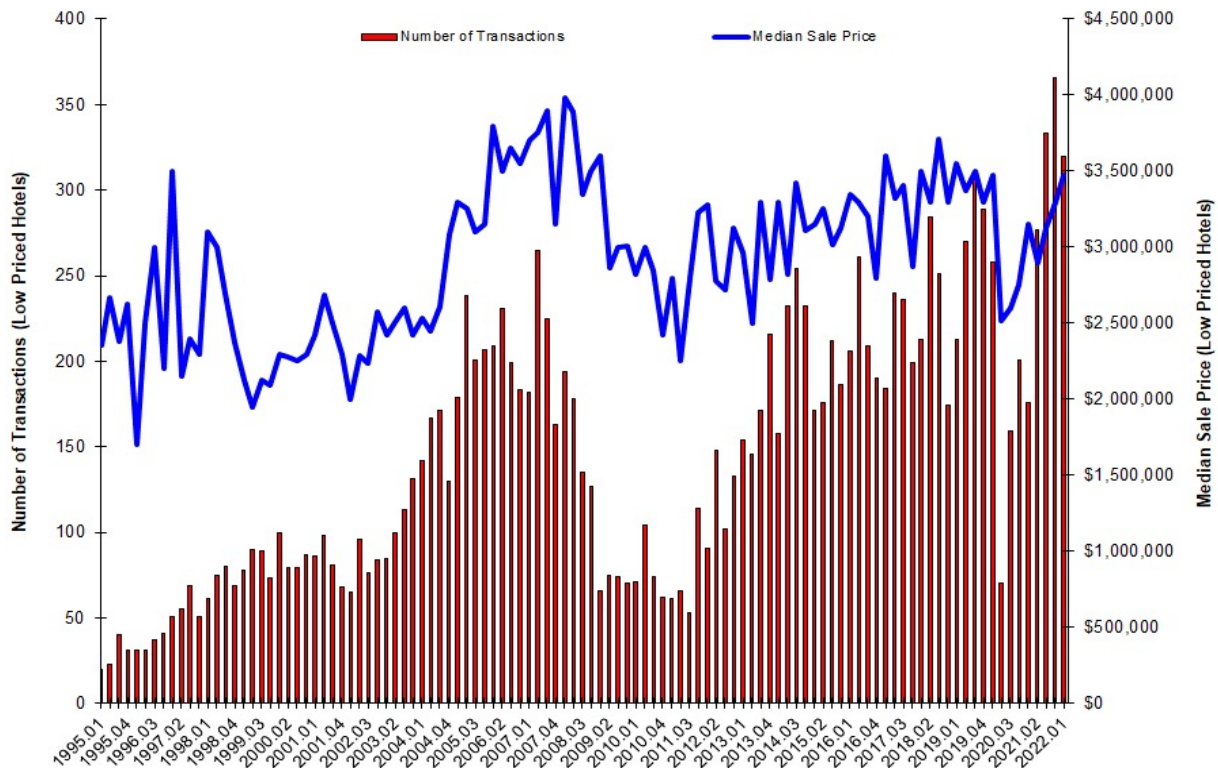
Transaction volume (observed) and median sale price (concluded, 2013–2022)

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	238	20927291	84	35.29%	2962500	154	64.70%	6500000	51	21.42%	5575000	187	78.57%
2013	2	4700000	217	22000000	71	32.71%	2500000	146	67.28%	16000000	38	17.51%	4200000	179	82.48%
2013	3	5260855	246	25000000	75	30.48%	3300000	171	69.51%	9949500	35	14.22%	4750000	211	85.77%
2013	4	4537500	314	24000000	98	31.21%	2790000	216	68.78%	13500000	55	17.51%	4000000	259	82.48%
2014	1	5625000	228	20750000	70	30.70%	3300000	158	69.29%	8825900	59	25.87%	5000000	169	74.12%
2014	2	4300000	320	26125000	88	27.50%	2818750	232	72.50%	11200000	59	18.43%	3700000	261	81.56%
2014	3	5500000	351	20000000	97	27.63%	3425000	254	72.36%	10567078	66	18.80%	5000000	285	81.19%
2014	4	4550000	310	29625000	78	25.16%	3107500	232	74.83%	8225000	72	23.22%	3950000	238	76.77%
2015	1	5950000	252	29750000	82	32.53%	3156050	170	67.46%	8280000	47	18.65%	5500000	205	81.34%
2015	2	6300000	267	25000000	91	34.08%	3250000	176	65.91%	18765000	46	17.22%	5525000	221	82.77%
2015	3	5050000	299	24800000	87	29.09%	3012500	212	70.90%	12100000	53	17.72%	4275000	246	82.27%
2015	4	6650000	292	18080000	106	36.30%	3125000	186	63.69%	14415000	51	17.46%	5400000	241	82.53%
2016	1	5600000	293	20375000	87	29.69%	3350000	206	70.30%	13600000	45	15.35%	5275000	248	84.64%
2016	2	4100000	322	16000000	61	18.94%	3300000	261	81.05%	11600000	48	14.90%	3725000	274	85.09%
2016	3	4862500	284	25000000	75	26.40%	3200000	209	73.59%	24500000	34	11.97%	4362500	250	88.02%
2016	4	4000000	263	19480000	73	27.75%	2800000	190	72.24%	13352600	28	10.64%	3664706	235	89.35%
2017	1	5275000	254	22880750	70	27.55%	3600000	184	72.44%	14726254	28	11.02%	4950000	226	88.97%
2017	2	5100000	331	22660000	91	27.49%	3325000	240	72.50%	16450000	37	11.17%	4462500	294	88.82%
2017	3	5000000	321	22250000	86	26.79%	3431000	235	73.20%	22250000	38	11.83%	4525000	283	88.16%
2017	4	4500000	265	28000000	66	24.90%	2875000	199	75.09%	12208000	26	9.81%	4250000	239	90.18%
2018	1	5500000	310	21882400	97	31.29%	3500000	213	68.70%	14750000	40	12.90%	5000000	270	87.09%
2018	2	4805200	366	19750000	82	22.40%	3300000	284	77.59%	17625000	40	10.92%	4300000	326	89.07%
2018	3	5125000	334	21265000	83	24.85%	3710000	251	75.14%	13342500	22	6.58%	5000000	312	93.41%
2018	4	6490000	279	20500000	105	37.63%	3300000	174	62.36%	14440000	33	11.82%	5580556	246	88.17%
2019	1	5350000	289	17802698	76	26.29%	3550000	213	73.70%	15750000	34	11.76%	4800000	255	88.23%
2019	2	4045000	332	19848485	62	18.67%	3372500	270	81.32%	6300000	35	10.54%	3900000	297	89.45%
2019	3	4707500	402	21000000	96	23.88%	3500000	306	76.11%	15850000	42	10.44%	4362500	360	89.55%
2019	4	4950000	383	21855650	94	24.54%	3300000	289	75.45%	11000000	35	9.13%	4600000	340	88.77%
2020	1	4100000	306	16900000	48	15.68%	3470000	258	84.31%	6313000	22	7.18%	4095000	284	92.81%
2020	2	3380000	80	16787500	10	12.50%	2515000	70	87.50%	6700000	7	8.75%	3360000	73	91.25%
2020	3	2800000	173	14062500	14	8.09%	2600000	159	91.90%	7219750	12	6.93%	2667500	161	93.06%
2020	4	3600000	246	23053000	45	18.29%	2750000	201	81.70%	10725000	36	14.63%	3000000	210	85.36%
2021	1	3951500	215	27900000	39	18.13%	3150000	176	81.86%	11431000	20	9.30%	3750000	195	90.69%
2021	2	3500000	346	24352000	69	19.94%	2900000	277	80.05%	9675000	34	9.82%	3337500	312	90.17%
2021	3	4350000	448	27000000	115	25.66%	3125000	333	74.33%	33820000	38	8.48%	4000000	410	91.51%
2021	4	4750000	493	17100000	127	25.76%	3300000	366	74.23%	9687500	36	7.30%	4400000	457	92.69%
2022	1	5131250	440	17550000	120	27.27%	3475000	320	72.72%	12025000	42	9.54%	4887500	398	90.45%
2022	2	5300000	557	21140000	126	22.62%	3750000	431	77.37%	9250000	50	8.97%	5100000	507	91.02%

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)**

Sources: CoStar, Real Capital Analytics

EXHIBIT 5**Median sale price and number of sales, small hotels (sale prices less than \$10 million)**

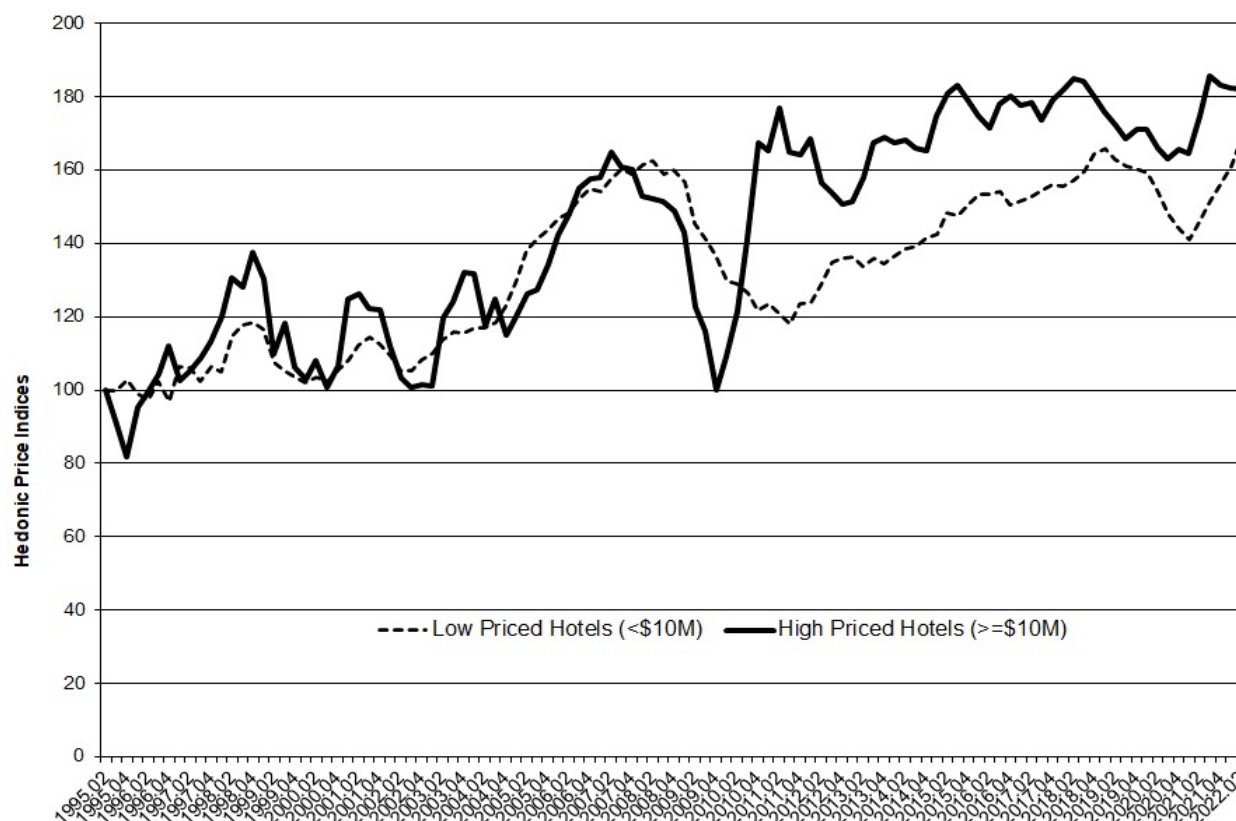
Sources: CoStar, Real Capital Analytics

Hotel indices through 2022, quarter 2

YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales	YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales
1995.02	98.096	94.98837	82.6295	103.749	64.618	NA	2009.01	153.677	135.7505	152.934	198.684	154.928468	160.984746
1995.03	97.93	86.03371	81.1665	99.4303	67.492	NA	2009.02	142.561	116.4178	136.409	173.601	151.438565	155.487788
1995.04	100.696	77.75873	85.9291	92.9895	68.999	NA	2009.03	138.198	110.0744	128.662	159.32	137.751059	142.226628
1996.01	97.1052	90.43519	90.9649	95.8732	70.743	NA	2009.04	133.943	95.066	116.069	159.088	123.855562	128.511153
1996.02	95.2963	94.30531	95.2191	90.6197	73.035	NA	2010.01	127.15	103.7537	116.58	159.823	118.010442	122.628367
1996.03	100.389	99.00153	106.637	99.2514	72.034	NA	2010.02	126.43	115.5285	119.87	163.003	109.792151	114.814916
1996.04	95.0046	106.5715	106.314	105.974	73.552	NA	2010.03	123.964	134.1695	121.763	218.013	110.932222	116.142192
1997.01	104.39	97.35899	113.516	112.56	87.178	NA	2010.04	119.528	158.8777	130.529	248.424	112.857022	116.021347
1997.02	103.913	99.8779	111.788	112.571	89.721	NA	2011.01	121.107	157.1027	129.078	263.424	111.860327	112.04946
1997.03	100.384	103.2502	106.39	113.267	95.759	NA	2011.02	118.654	168.1022	131.837	270.913	112.26626	111.520449
1997.04	104.497	107.4973	113.544	120.827	102.04	NA	2011.03	115.791	156.5422	128.987	227.775	110.763737	109.910437
1998.01	102.939	114.0697	116.57	125.086	98.728	NA	2011.04	121.069	156.0387	127.472	211.603	112.223501	111.590828
1998.02	112.762	124.248	129.708	136.038	104.19	NA	2012.01	121.403	160.129	130.822	224.36	113.650153	112.531723
1998.03	115.509	121.6853	133.769	126.987	106.25	NA	2012.02	126.016	148.5294	133.811	227.783	117.803142	118.846956
1998.04	116.113	130.5173	127.844	126.617	104.04	NA	2012.03	132.399	146.1504	141.964	242.458	121.886924	122.370046
1999.01	114.382	123.7916	115.516	118.682	97.327	NA	2012.04	133.379	143.0297	148.106	253.85	123.312654	124.007992
1999.02	105.618	104.3276	98.742	100.287	91.417	NA	2013.01	133.844	143.9142	155.312	243.764	125.000416	127.156425
1999.03	103.209	112.2639	94.1836	106.323	88.838	NA	2013.02	131.144	150.0227	155.593	249.117	125.61786	128.147407
1999.04	101.641	100.7265	93.0805	101.222	89.531	NA	2013.03	133.438	159.1079	157.319	250.45	126.675008	130.598554
2000.01	100.087	97.76631	94.554	96.8643	94.274	98.255	2013.04	131.88	160.5223	154.644	254.203	129.54668	134.738141
2000.02	101.557	102.5159	98.9886	100.758	97.831	98.255	2014.01	134.186	159.0066	153.222	255.513	135.390372	140.089374
2000.03	100.552	95.69367	100.615	95.2722	97.688	93.199	2014.02	135.796	159.6156	150.293	259.912	134.629576	137.792576
2000.04	103.279	101.3618	102.357	101.639	97.216	93.795	2014.03	136.461	157.5635	150.222	258.386	136.791809	139.078651
2001.01	106.058	118.4862	109.726	105.154	96.18	92.239	2014.04	138.618	157.1245	150.331	232.591	137.110677	138.042502
2001.02	110.01	120.0217	110.165	116.202	96.115	90.488	2015.01	139.817	166.1016	153.836	243.852	138.988079	139.295974
2001.03	112.136	116.2803	109.064	115.776	96.917	93.713	2015.02	145.479	171.813	165.796	251.386	144.008302	144.275403
2001.04	110.297	115.8546	105.654	110.695	96.102	90.452	2015.03	144.903	174.0844	164.753	278.737	153.255321	154.515243
2002.01	107.347	106.5371	98.9767	106.647	96.809	93.243	2015.04	147.632	169.9289	172.208	316.071	162.518027	163.656126
2002.02	103.445	98.2012	95.2977	97.5518	95.136	92.327	2016.01	150.333	165.8498	173.385	330.321	164.912425	166.583377
2002.03	103.277	95.6358	94.5477	99.6788	95.497	91.17	2016.02	150.39	162.7554	165.932	333.883	165.335881	167.749244
2002.04	106.003	96.30154	99.7475	101.422	96.959	95.818	2016.03	151.331	169.0064	167.562	347.967	164.542548	165.462683
2003.01	108.064	96.19748	100.363	112.926	97.97	94.932	2016.04	147.641	171.3222	161.868	338.175	159.253501	161.224152
2003.02	111.569	113.6077	104.913	120.175	100.16	98.558	2017.01	148.684	168.6713	161.37	320.144	163.523482	165.409182
2003.03	113.695	117.6945	108.095	128.486	102.41	102.62	2017.02	149.805	169.5912	167.686	325.095	171.093763	173.675964
2003.04	113.226	125.4882	107.645	132.361	103.73	105.4	2017.03	151.503	164.9219	169.528	314.682	171.890916	175.295272
2004.01	114.626	125.2295	108.882	131.777	103.42	106.8	2017.04	153.019	170.0728	170.854	311.981	176.701313	179.131316
2004.02	114.794	111.7729	107.67	135.296	103.93	107.71	2018.01	152.514	172.5279	171.986	351.936	177.23732	180.216288
2004.03	116.097	118.4246	110.242	143.076	108.4	112.68	2018.02	154.141	175.5377	171.549	361.409	177.261769	178.833963
2004.04	120.52	109.348	115.093	151.126	109.69	112.74	2018.03	156.61	174.9993	173.695	361.921	180.905689	182.249547
2005.01	127.657	114.0832	123.113	170.544	114.41	116.71	2018.04	161.312	170.7663	184.201	388.436	182.741985	183.843137
2005.02	135.353	119.8613	135.999	172.228	120.51	123.67	2019.01	162.461	167.1673	182.856	366.948	184.189608	184.330891
2005.03	138.749	120.999	141.403	169.999	123.37	126.05	2019.02	159.653	163.4617	178.483	339.777	184.659669	184.007736
2005.04	140.848	127.4235	145.618	179.508	129.07	132.56	2019.03	157.902	159.991	175.241	340.092	185.429493	185.150313
2006.01	144.224	135.1083	153.141	183.639	133.51	137.26	2019.04	157.414	162.471	166.497	351.642	186.927675	187.111115
2006.02	145.43	140.7034	153.347	196.259	136.77	140.07	2020.01	156.104	162.4438	162.489	335.123	185.005202	185.885933
2006.03	149.365	147.2442	158.909	215.146	138.75	141.87	2020.02	151.58	157.754	156.132	327.022	185.500785	187.106066
2006.04	151.867	149.8402	162.524	215.59	143.32	144.5	2020.03	145.296	154.7753	145.454	308.503	184.058189	185.778994
2007.01	151.313	150.0462	166.729	222.619	147.49	148.04	2020.04	141.49	157.1612	140.97	274.365	185.128559	187.367961
2007.02	154.55	156.5717	174.494	233.107	151.47	152.02	2021.01	138.303	156.1142	136.886	288.858	184.600791	186.613444
2007.03	157.267	152.7767	178.219	230.786	157.54	159.76	2021.02	142.84	165.808	146.073	306.351	186.474197	187.95435
2007.04	155.8	152.0676	182.297	233.9	158.96	161.97	2021.03	148.603	176.2235	160.846	327.858	194.057618	194.405176
2008.01	158.253	145.3569	176.119	235.718	160.05	166.28	2021.04	152.836	173.7824	171.186	328.747	203.710527	201.477598
2008.02	159.49	144.3802	172.374	240.639	159.92	167.16	2022.01	157.854	173.3065	181.649	335.651	211.247222	208.437731
2008.03	155.917	143.644	166.279	233.74	158.7	163.45	2022.02	165.129	172.9955	191.113	346.006	225.019349	222.649728
2008.04	156.847	141.4408	160.582	225.825	159.73	165.87							

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

non-gateway cities. However, prices for hotels in gateway cities declined 23 percent. A similar picture emerges from a year-over-year perspective, except that the median price of large hotels fell, particularly those in gateway cities. 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.

The prices of large and small hotels continue to represent a buying opportunity, based on moving averages. According to our standardized price metric, small hotels reached a new statistical high this quarter. Exhibit 7 graphs the prices reported in Exhibit 6. The price of large hotels fell .2 percent this quarter, compared to a 4.6-percent gain for small hotels. However, both large and small hotel prices

posted gains relative to their respective price point the previous year—prices of small hotels increased 15.6 percent year over year, while those of large hotels increased a more modest 4.3 percent. Exhibit 8 and Exhibit 9 show the historical year-over-year change in large and small hotel indices. To gauge whether the prices of large and small hotels signal a buy or sell, we compare the hedonic price relative to the 3-year and 5-year moving averages.

Having the hedonic price for large hotels still above its moving averages (Exhibit 10) indicates that large hotels are still a great buying opportunity (3-year calculation: $173 > 164.4$; 5-year calculation: $173 > 166.61$). As shown in Exhibit 11, small hotels are also worth purchasing (3-year calculation: $165.13 > 151.28$; 5-year calculation: $165.13 > 153.3$). To assess whether the price of a hotel has reached a new statistical high or low, we use the statistical

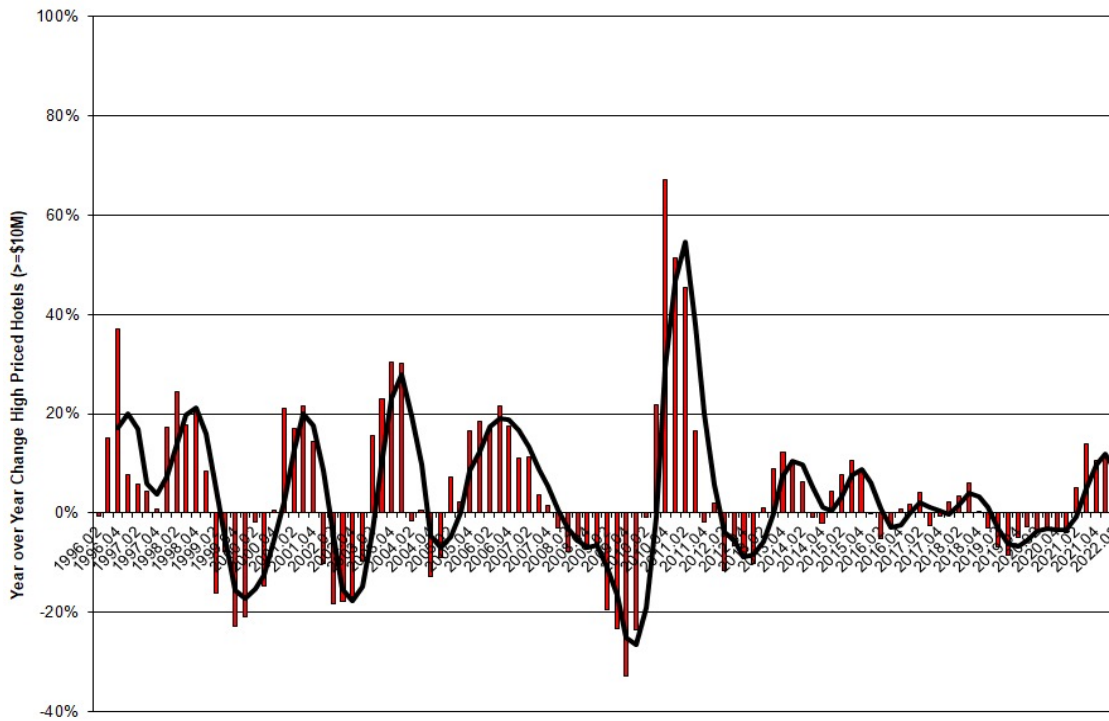
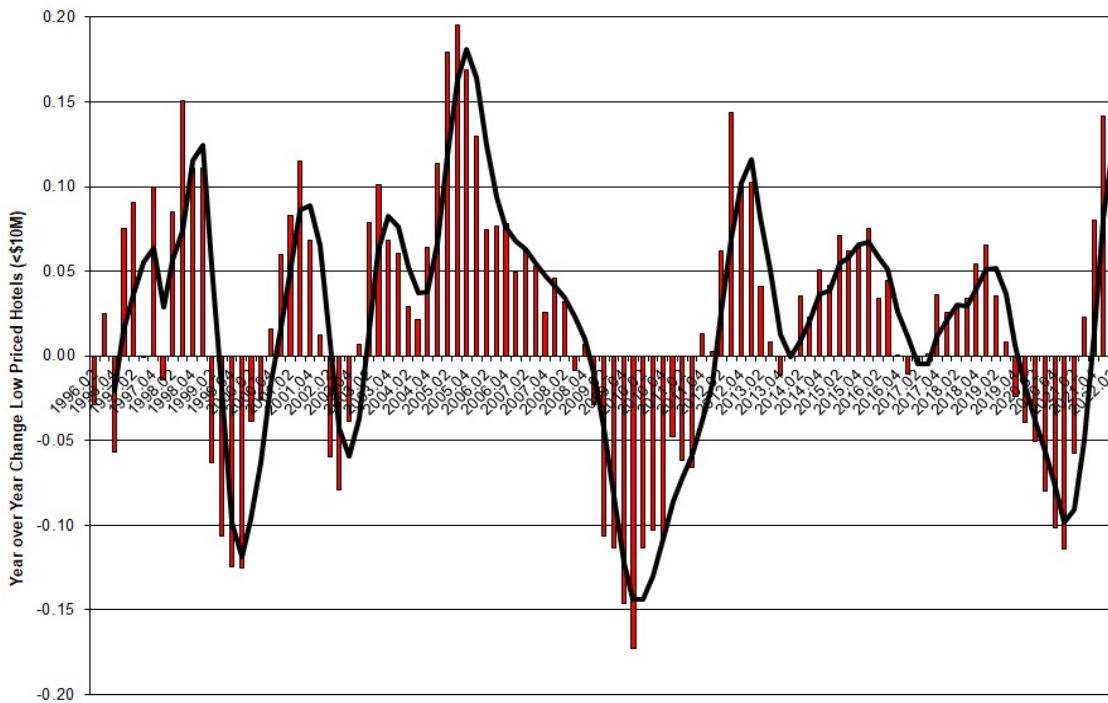
EXHIBIT 8**Year-over-year change in large-hotel index with a moving average trendline****EXHIBIT 9****Year-over-year change in small-hotel index with a moving average trendline**

EXHIBIT 10

Moving average trendlines for large hotel index

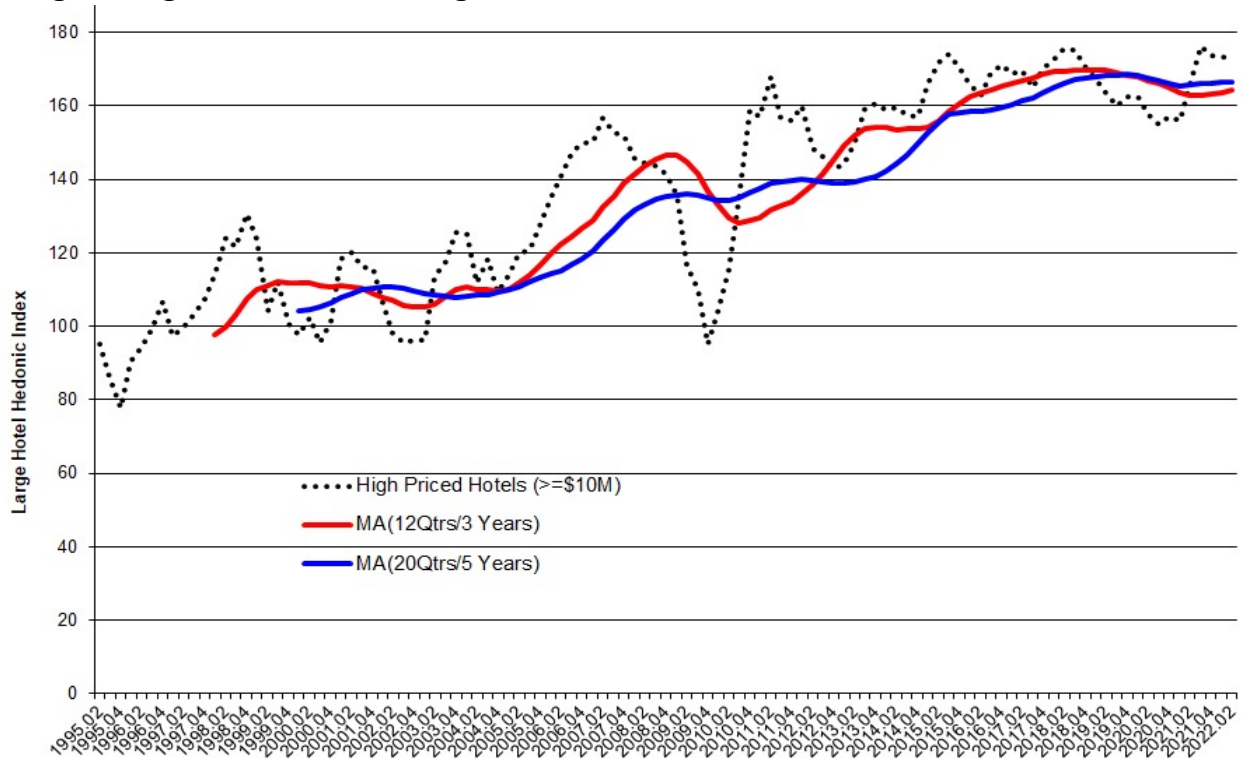


EXHIBIT 11

Moving average trendlines for small hotel index

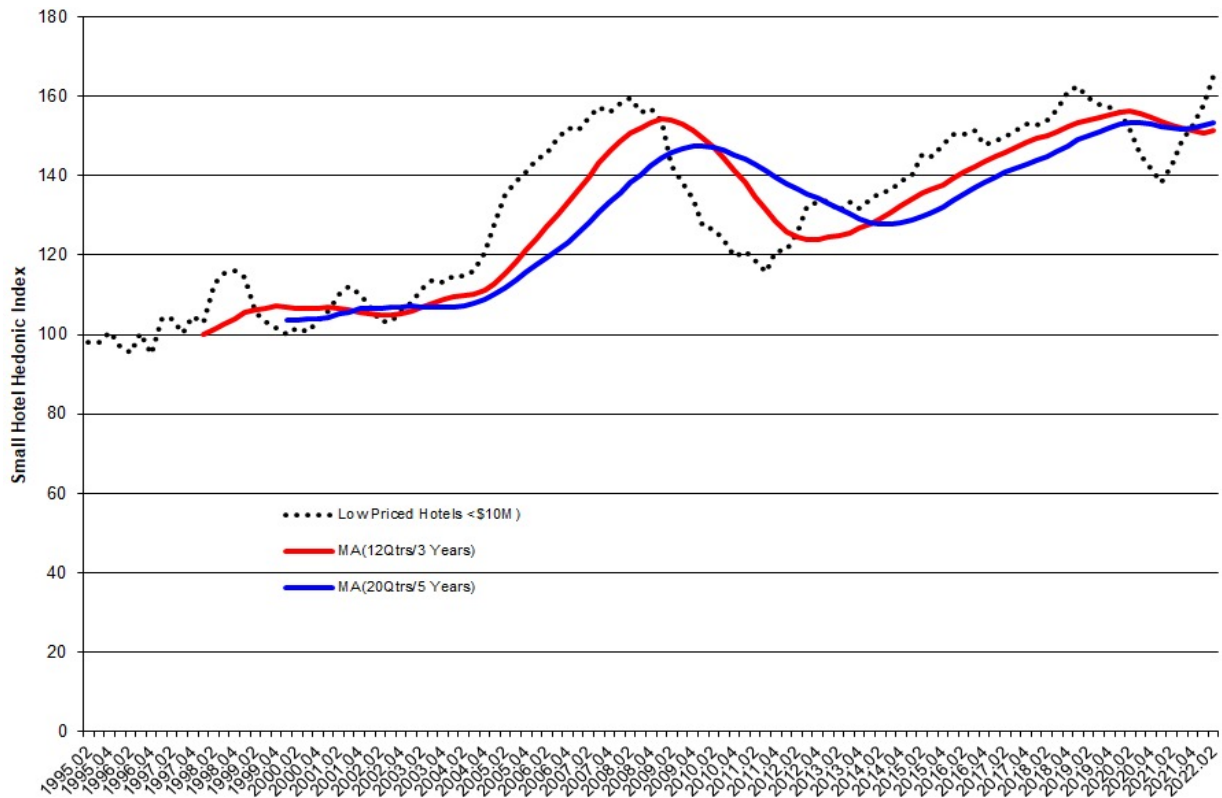
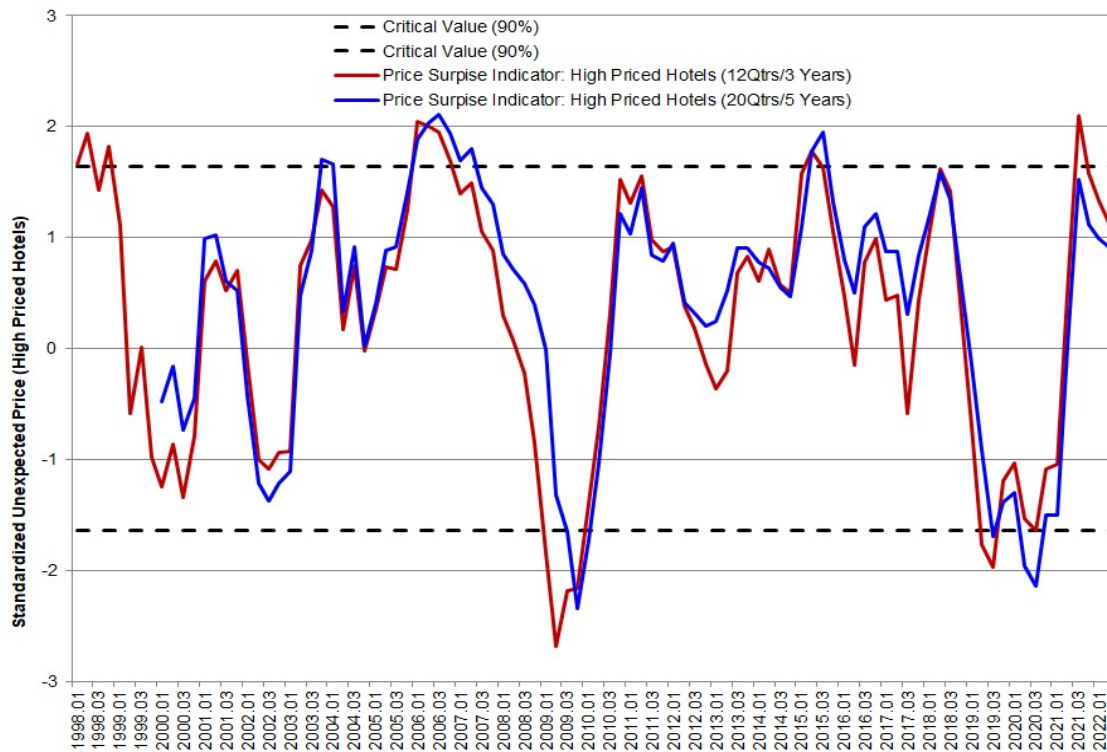


EXHIBIT 12

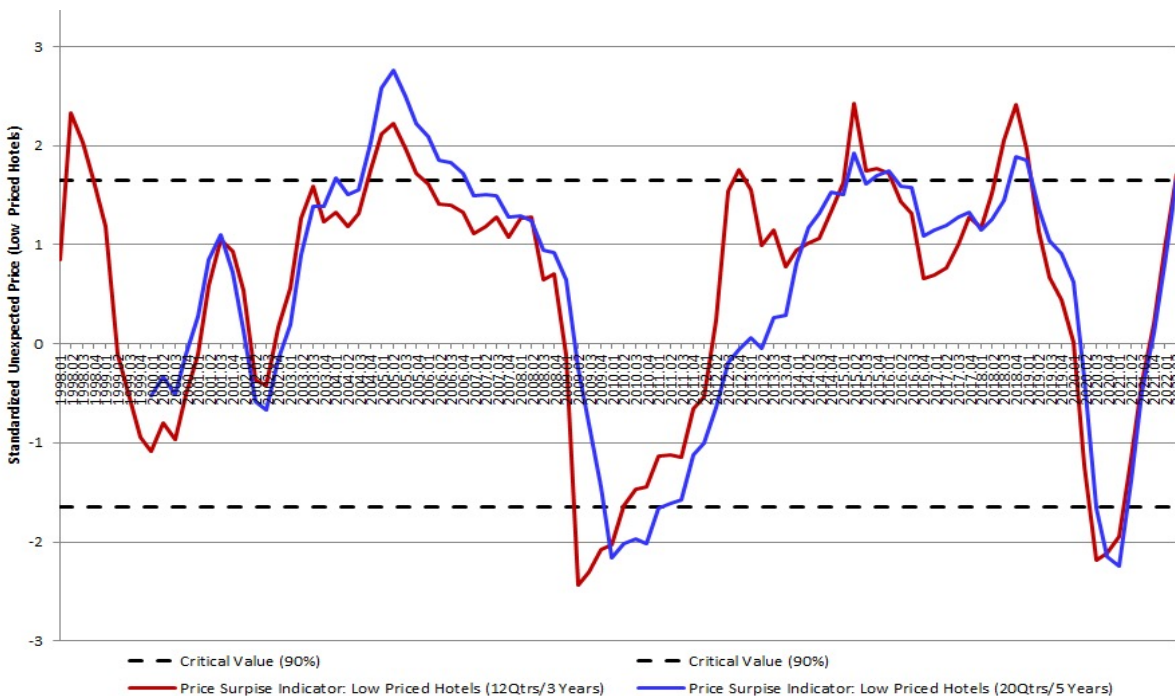
Standardized unexpected price (SUP) for large hotel index



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

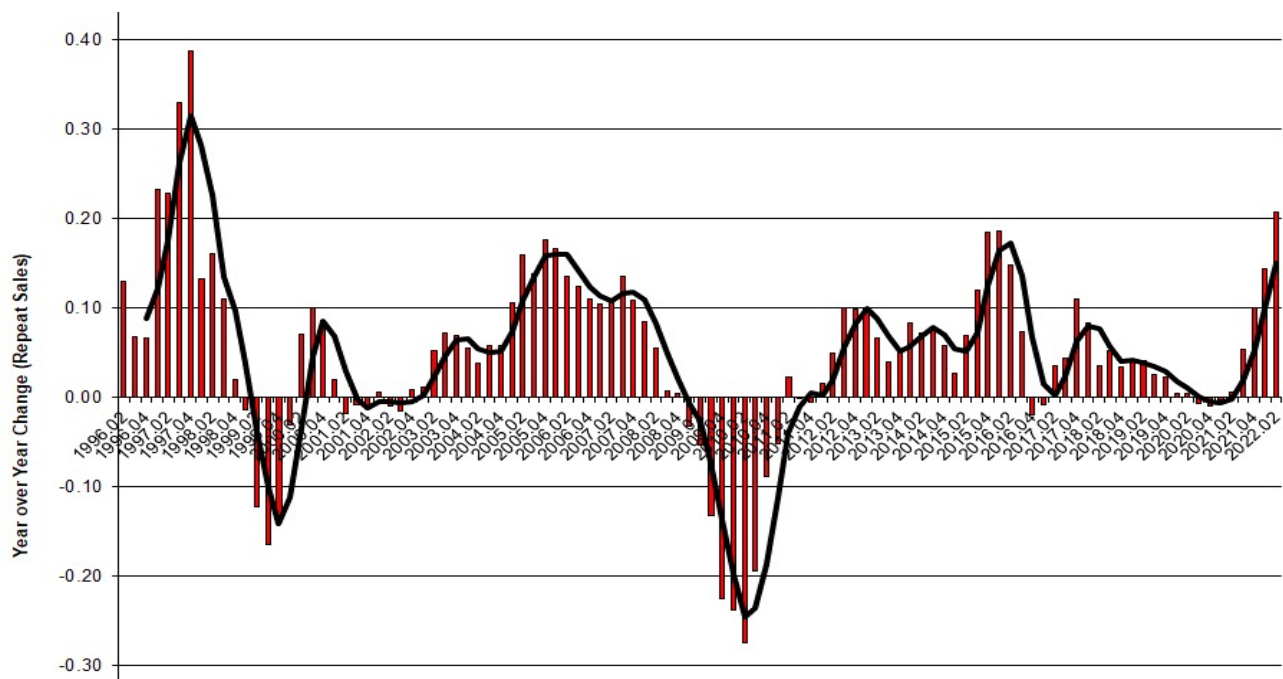
EXHIBIT 13

Standardized unexpected price (SUP) for small hotel index



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

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



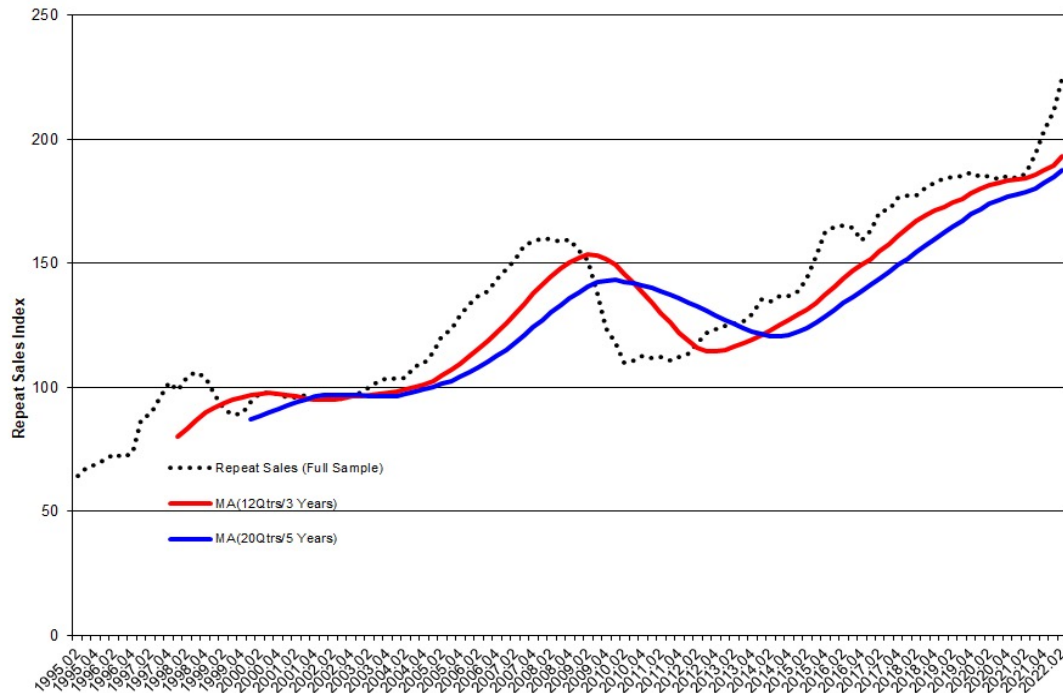
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

	Hedonic Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Large Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q2	165.81				
2022Q1	173.31				
2022Q2	173.00	164.40	166.61	1.10	0.90
Quarter over Quarter	-.2%				
Year over Year	4.3%				
Small Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q2	142.84				
2022Q1	157.85				
2022Q2	165.13	151.28	153.33	1.71*	1.65*
Quarter over Quarter	4.6%				
Year over Year	15.6%				

technique known as a Z-score to standardize prices so that the mean price is at zero (see Appendix, p. 28). If prices rise above 1.645, this indicates a new statistical high. (By the same token, a Z-score below -1.645 indicates a new statistical low.) Using this metric, the price of small hotels has reached a new statistical, high both in terms of using 3-year

or 5-year standard price calculations. In contrast, the standardized price of large hotels continues to decline, reverting towards its mean. Exhibit 12 and Exhibit 13, along with the table above, show standardized prices for large hotels and small hotels.

Moving average trend line for repeat-sale index

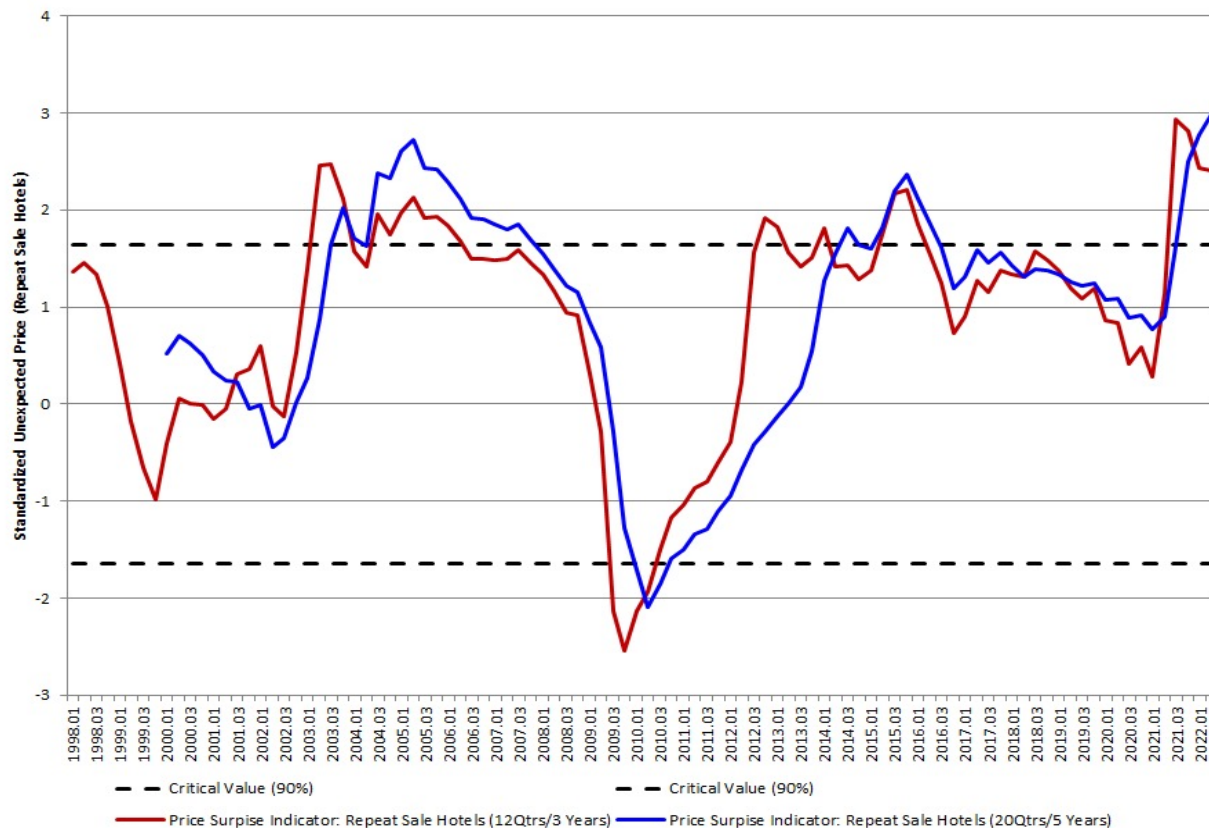


Sources: Cornell Center for Real Estate and Finance; CoStar, Real Capital Analytics

Repeat-sale metrics: Prices remain above their moving average, indicating a continued buy. Indeed, hotel prices continue to reach new statistical highs. Since most hotels that sell frequently tend to be small hotels, it isn't surprising that hotels that tend to sell frequently rose in price this quarter (6.5% increase), as well as year over year

(20.7% increase from 2021Q2 to 2022Q2; see also Exhibit 14). Like both large and small hotels, our repeat-sale indicator remains above both its short-term moving average ($225.02 > 193.10$) and its long-term moving average ($225.02 > 187.64$; see Exhibit 15), indicating that these hotels continue to remain a buying opportunity.

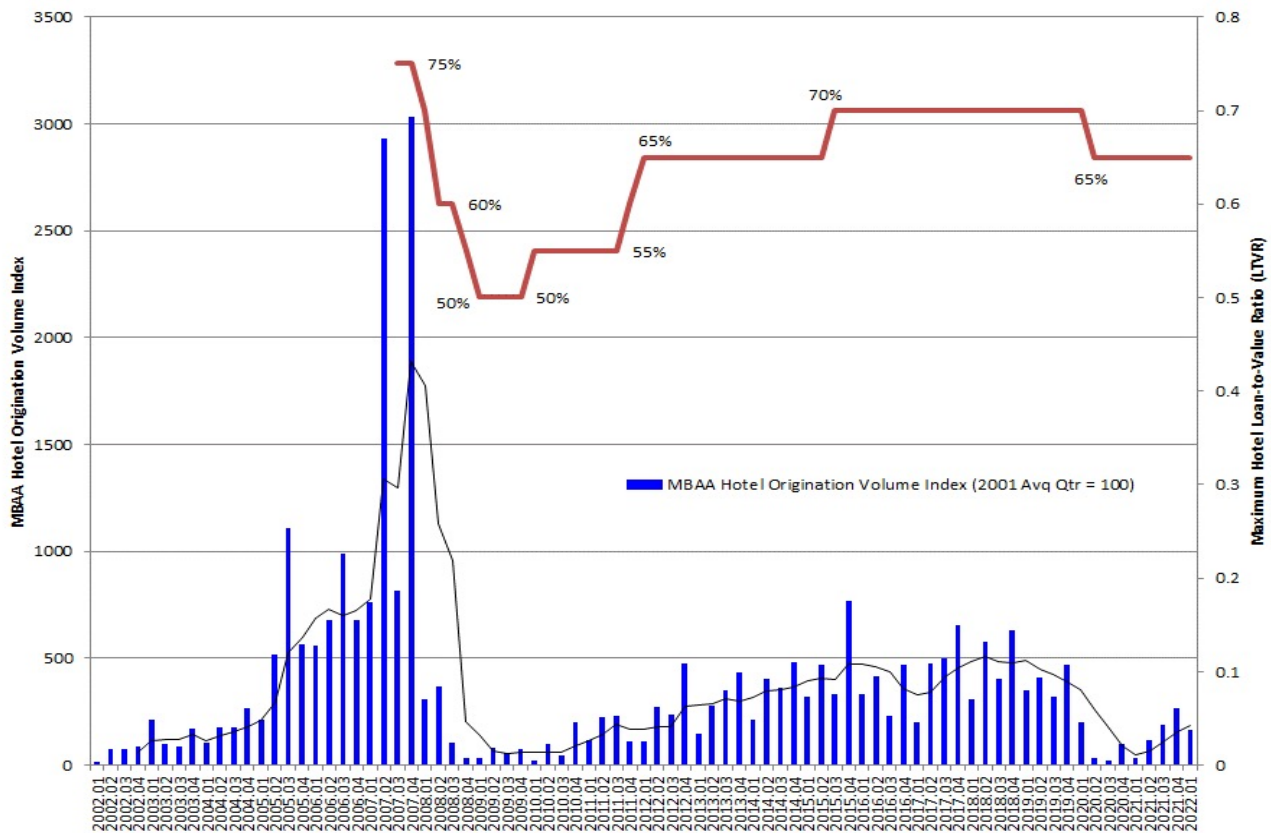
Standardized unexpected price (SUP) for hotel repeat-sale index (full sample)



	Repeat Sale Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Repeat Sale Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q2	186.47				
2022Q1	211.25				
2022Q2	225.02	193.10	187.64	2.40*	2.99*
Quarter over Quarter	6.5%				
Year over Year	20.7%				

Our SUP performance metric in Exhibit 16 (together with the accompanying table) indicates that the standardized price continues to remain above its statistical upper boundary based on either its 3-year moving average or its 5-year moving average.

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

Mortgage financing volume fell for the most recent quarter. Exhibit 17 shows that the mortgage origination volume for hotels as reported for the first quarter of 2022 fell 38.1 percent this quarter.² Nevertheless, loan volume was still 361 percent ahead of the volume from a year earlier (that is, year over year, as shown in the table at right). The maximum loan-to-value (LTV) ratio for hotels remained at 65 percent.

The cost of hotel debt financing rose sharply this quarter as well as year over year. Due to increased perceived risk, lenders are requiring relatively more compensation for hotel loans relative to other commercial real estate and relative to the 10-year risk-free rate. The cost of obtaining hotel debt financing as reported by Cushman Wakefield Sonnenblick Goldman continues to rise this quarter, as well as year over year.³ The interest rate as of July 5, 2022, was 7.2 percent for full-service Class A hotels

	MBAA Hotel Origination Volume Index (2001 Avg Qtr = 100)
2021Q1	36
2021Q4	268
2022Q1	166
Quarter over Quarter	-38%
Year over Year	361%

and 7.4 percent for Class B&C properties. This is a substantial three-month increase of 8 percent over the corresponding figures in March 2022 of 6.7 percent (Class A) and 6.9 percent (Class B&C). Even more telling, these figures represent a 30-percent rise in year-over-year hotel interest rates, compared to the prior June/July period when interest rates on Class A properties were 5.55 percent and those for Class B&C hotels stood at 5.75 percent. This rise in interest rates is worrisome, as it might hinder penciling hotel deals near term. Exhibit 18 displays the time series graph of hotel interest rates.

² This is the latest information reported by the Mortgage Bankers Association as of the writing of this report.

³ 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 18

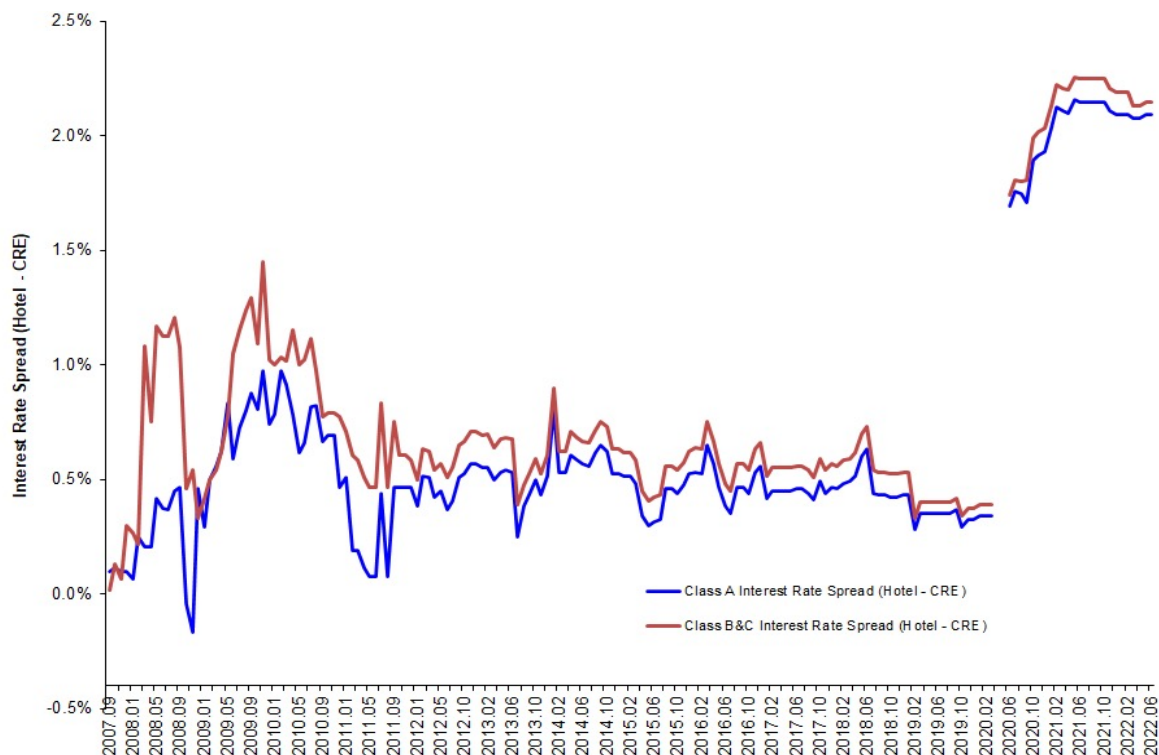
Interest rates on Class A versus Class B & C hotels



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

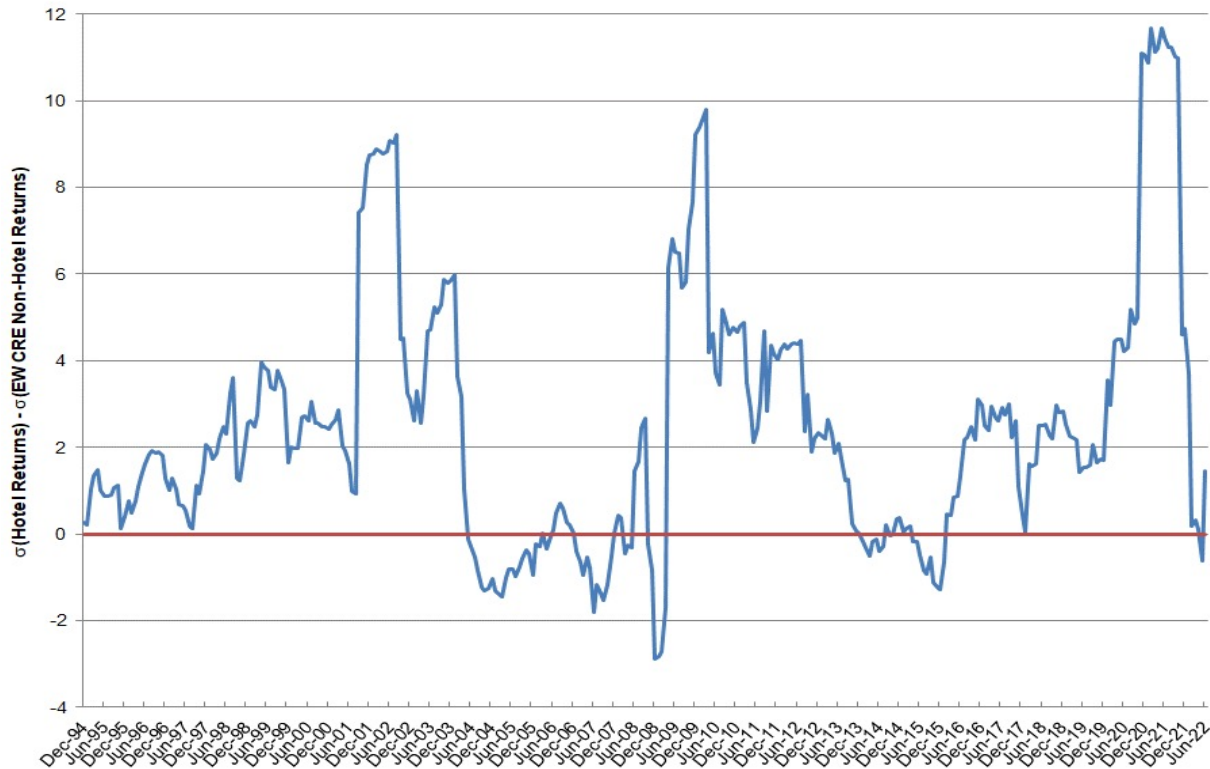
EXHIBIT 19

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



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

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



Sources: NAREIT, Cornell Center for Real Estate and Finance

	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 2021	5.55%	5.75%	2.15%	2.25%	4.10%	4.30%
March 2022	6.66%	6.86%	2.075%	2.133%	4.25%	4.45%
June 2022	7.21%	7.41%	2.092%	2.150%	4.40%	4.60%
Quarter over Quarter	8.3%	8%	0.8%	0.8%	3.5%	3.4%
Year over Year	30%	29%	-2.7%	-4.4%	7.3%	7.0%

To evaluate the perceived risk embedded in hotel interest rates, we compare the interest rates on hotels to those of other types of commercial real estate (CRE), as shown in Exhibit 19 and the table above. The interest rate spreads for both higher quality (Class A) and lower quality (Class B&C) hotels have widened imperceptibly this quarter, indicating that lenders are demanding a tad more compensation (approximately 2 basis points) to make hotel loans compared to those on other major property types. Again, this is based on lenders' perception of the increased relative riskiness for hotels. To obtain further insights, we also compared the interest rate on hotels to the yield on the 10-year U.S. Treasury bond. The interest rate spread on this

metric has also widened. For Class A properties the spread went from 4.25 percent to 4.4 percent, and for Class B&C hotels the spread went from 4.45 percent to 4.6 percent. In sum, lenders are requiring higher compensation relative to the risk-free rate represented by Treasuries.

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 CRE equity REITs (comprising office, industrial, retail, and multifamily equities).⁴ The risk differential, which should reflect the risk that is unique to hotel properties, is current-

⁴ We calculate the total risk for hotel REITs using a 12-month rolling window of monthly returns on hotel REITs.

EXHIBIT 21

30-plus-day delinquency rate for hotels

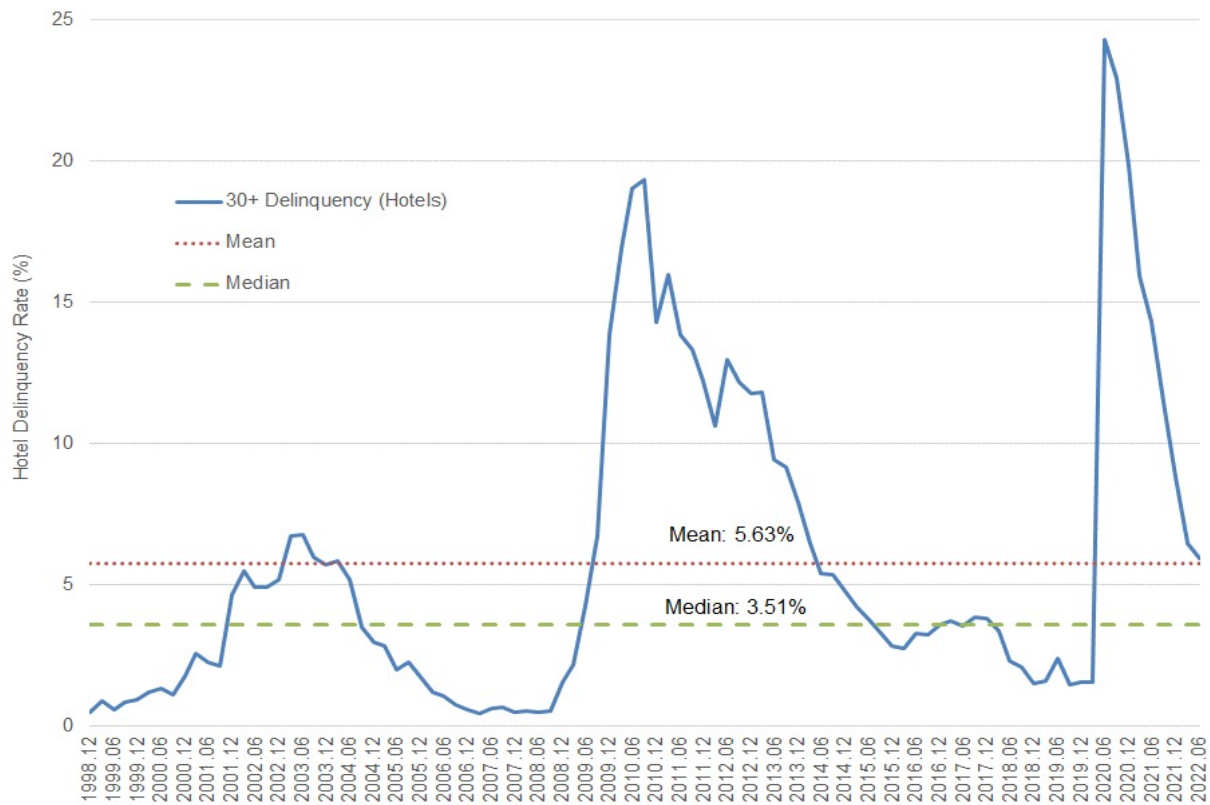
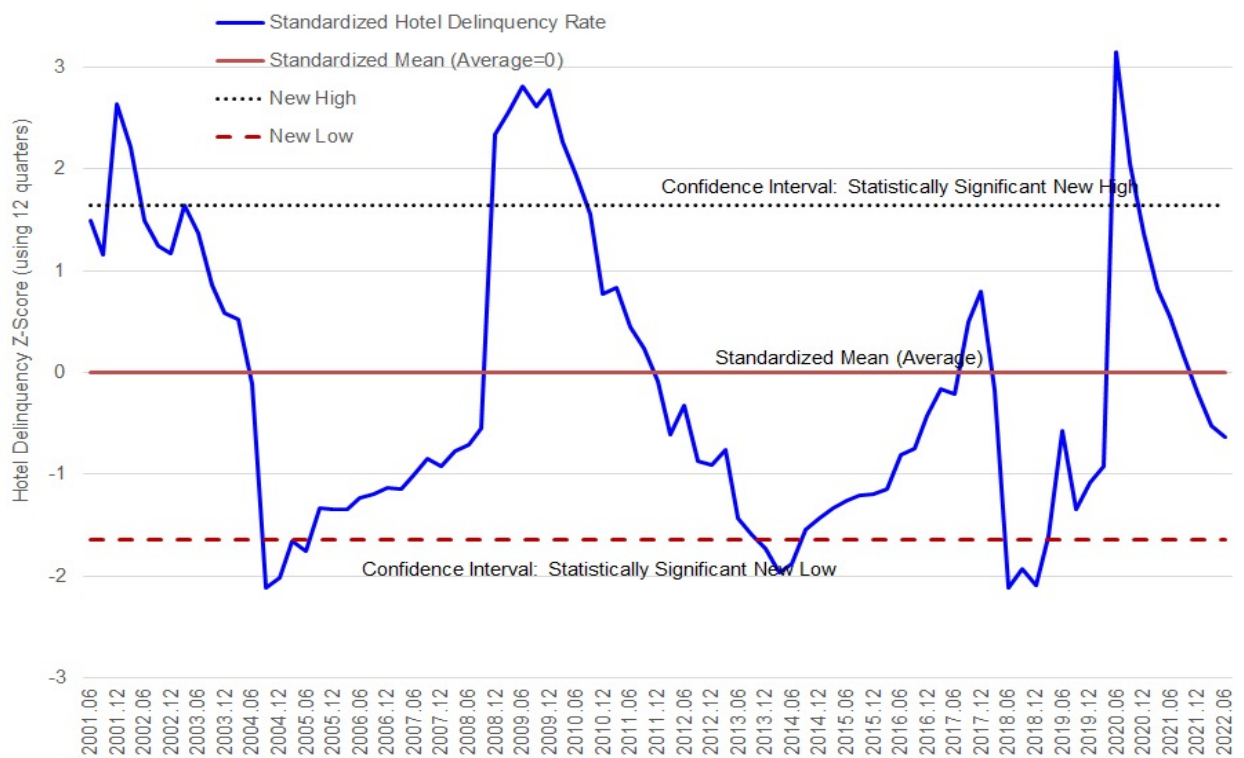
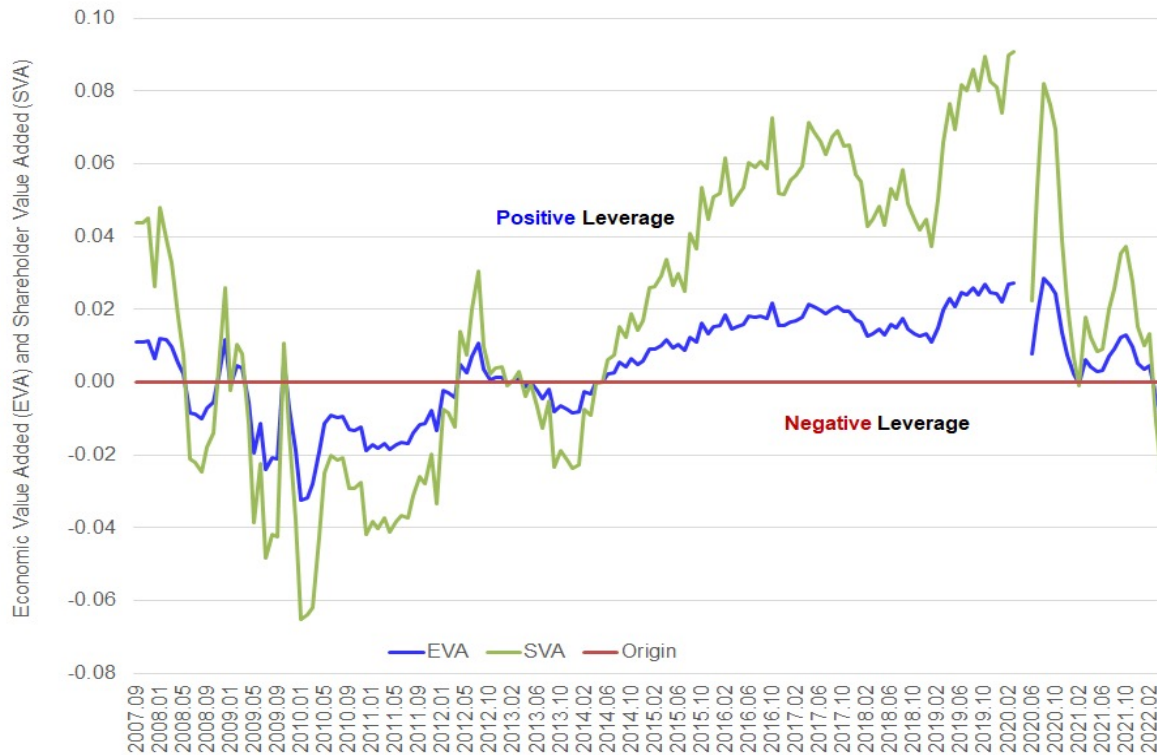


EXHIBIT 22

Standardized 30-plus-day delinquency rate for hotels



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

	Trepp 30+ days CMBS Lodging Delinquency Rate				
	Lodging	Industrial	Multifamily	Office	Retail
2021 June	14.27	0.65	2.02	2.09	10.71
2022 March	6.45	0.33	0.26	1.56	7.19
2022 June	5.94	0.49	1.03	1.68	6.69
Quarter over Quarter	-7.9%	48.5%	296.2%	7.7%	-7.0%
Year over Year	-58.4%	-24.6%	-49.0%	-19.6%	-37.5%

Source: Trepp

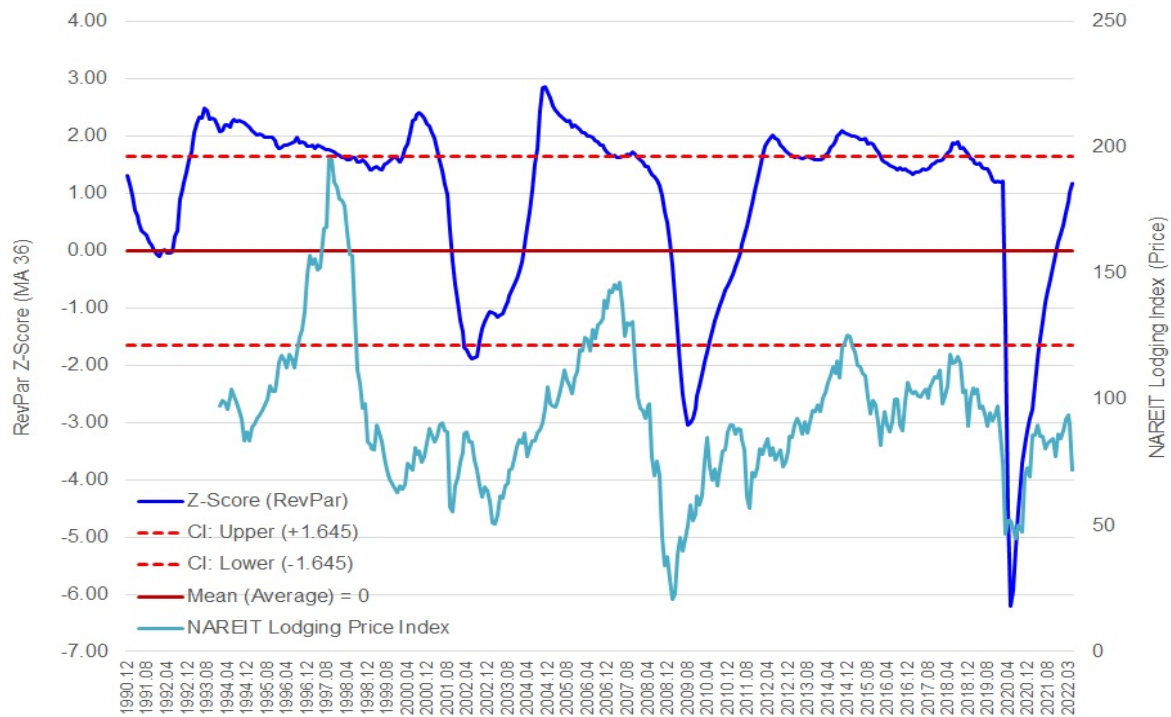
ly at 1.45 percent ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 7.85\% - 6.39\%$) compared to .34% ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 5.39\% - 5.06\%$) in the prior quarter. This indicates that the perceived default risk for hotels has started to inch up relative to other major types of commercial real estate. This is another confirmatory sign that the cost of financing for hotels should be pricier for hotels relative to other major property types.

The delinquency rate on hotel loans continues to decline toward its pre-pandemic level. The CMBS delinquency rate (30+ days) for lodging properties in June is 5.94 percent, down from 6.45 percent last quarter (March 2022) and 14.3 percent a year ago (June 2021), as shown in the ta-

ble above. This is a good sign that hotels continue to revert to their pre-pandemic delinquency level of approximately 1.5 percent (December 2018 – March 2020). The 5.94-percent hotel delinquency rate is lower than the retail delinquency rate of 6.7 percent, but it's higher than all other property types, including office (1.7%), multifamily (1%), and industrial (.5%). The continued slide in hotel delinquencies (and also retail delinquencies) runs counter to delinquencies for all other property types, which rose this quarter. Exhibit 21 displays the historical 30-plus-day delinquency rate for hotels, while Exhibit 22 shows the standardized version of that delinquency rate.

EXHIBIT 24

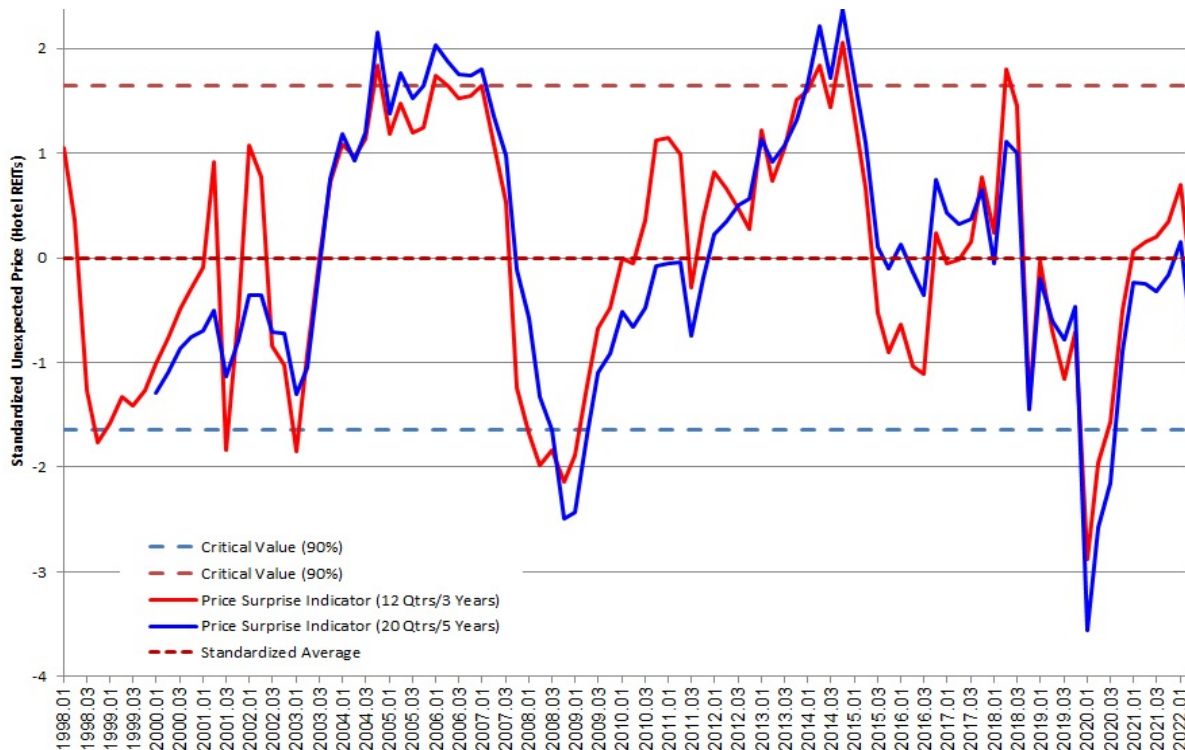
Standardized unexpected RevPAR (36-month moving average) vs. NAREIT lodging-price index



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

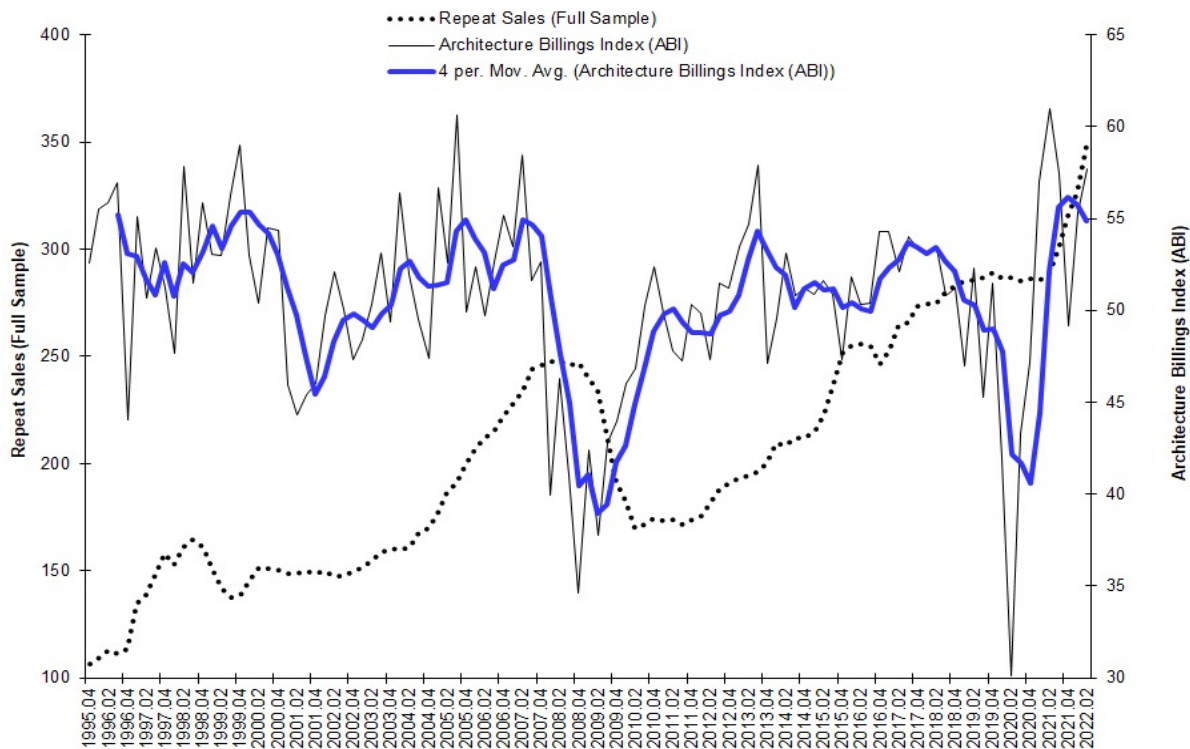
EXHIBIT 25

Standardized unexpected NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

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

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 -2.4 percent, as shown in the table below. Both the EVA and SVA continue to be negative, which indicates that on average economic profit 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, this indicates that 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 we should see slower positive or negative price momentum for both large and small hotels near term. As predicted in our prior report, the Standardized Unexpected RevPAR continued to exhibit positive price momentum, as shown in Exhibit 24. However, not only has the NAREIT Lodging Price Index turned downwards, but the standardized unexpected price of the NAREIT Lodging Index has also fallen below its standardized average and is currently negative, as Exhibit

25 depicts. We therefore expect our hotel prices based on repeat sales to fall near term.

While the architecture billings index (ABI) for commercial and industrial property increased 4 percent this quarter in spite of economic headwinds (based on the May 2022 report), it fell 5.4 percent from the prior year, as shown in Exhibit 26.⁵ Based on the moving average of the ABI index, we should expect price momentum to trend downwards in the next period.

The National Association of Purchasing Managers (NAPM) index, shown in Exhibit 27, an indicator of anticipated business confidence, fell 7.2 percent this quarter compared to a 3-percent decline last quarter.⁶ It also

⁵ www.aia.org/practicing/economics/aia076265

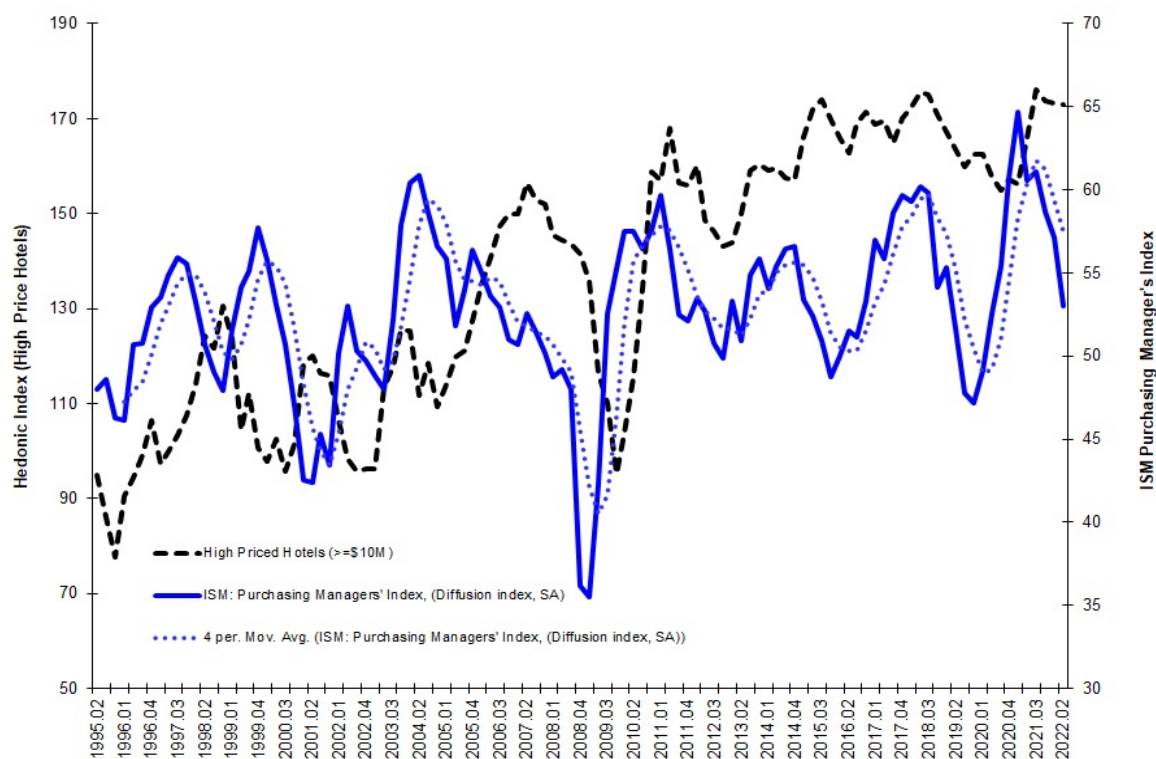
⁶ The ISM: Purchasing Managers' Index, (Diffusion index, SA) also known as the National Association of Purchasing Managers (NAPM) index is based on a survey of over 250 companies within twenty-one industries covering all 50 states. It not only measures the health of the manufacturing sector but is a proxy for the overall economy. It is calculated by surveying purchasing managers for data about new orders, production, employment, deliveries, and inventory, in descending order of importance. A reading over 50% indicates that manufacturing is growing, while a reading below 50% means it is shrinking.

	ROIC	WACC	EVA	ROE	Cost of Equity	SVA
December 2021	8.12%	7.6%	.53%	10.5%	9%	1.5%
March 2022	8.05%	8.44%	-.38%	8.54%	9.64%	-1.1%
April 2022	8.02%	8.84%	-.83%	7.34%	9.7%	-2.4%

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

EXHIBIT 27

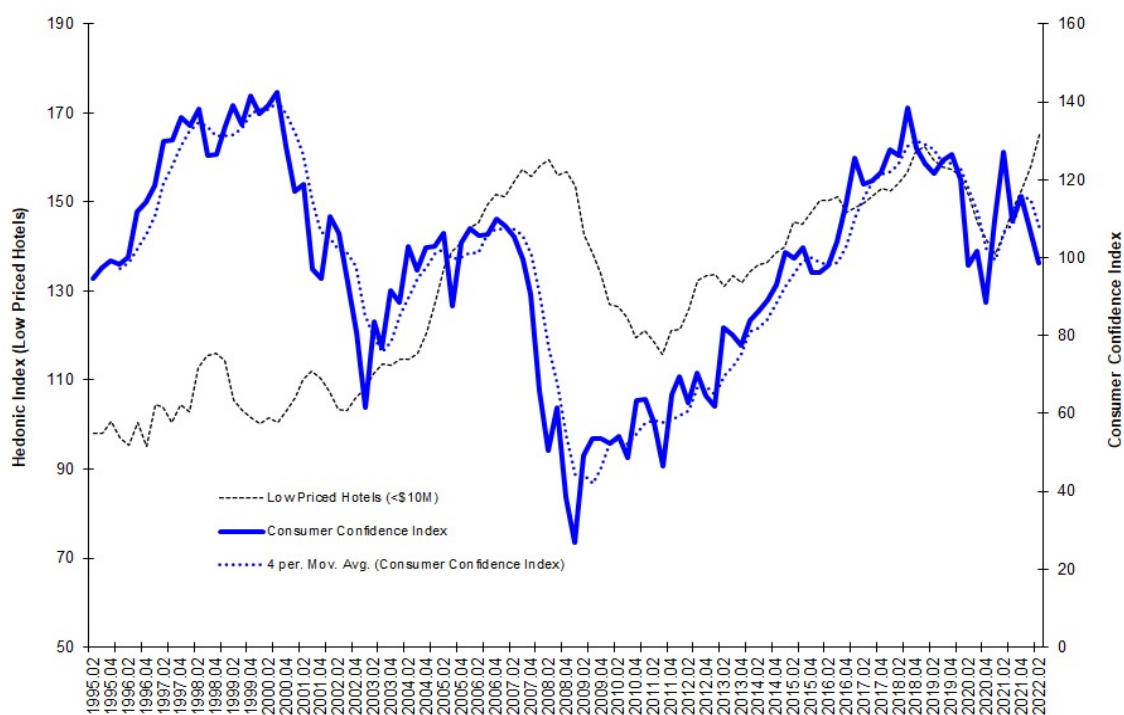
Business confidence and high-price hotels index



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

EXHIBIT 28

Consumer confidence and low-price hotels



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

Analysts' forecasts of hotel REIT earnings

Earnings Growth						
E(QEPS)		Median	Mean	StDev	Min	Max
2020Q2		-158.0%	-162.2%	26.9%	-226.2%	-116.3%
2020Q3		-163.0%	-305.3%	529.9%	-2214.3%	-91.1%
2020Q4		-153.3%	-239.9%	229.9%	-866.7%	-90.6%
2021Q1		-241.2%	-389.5%	352.1%	-1400.0%	-76.5%
2021Q2		97.8%	101.6%	52.0%	59.7%	272.7%
2021Q3		136.4%	191.1%	137.4%	99.6%	625.0%
2021Q4		162.5%	381.5%	669.0%	97.1%	2700.0%
2022Q1		150.0%	313.3%	568.6%	-30.0%	2300.0%
2022Q2		393.8%	933.1%	1474.1%	-271.4%	5566.7%
E(AEPS)		Median	Mean	StDev	Min	Max
2020Q2		-112.3%	-79.3%	107.6%	-222.2%	175.0%
2020Q3		-147.8%	-93.5%	187.6%	-307.9%	290.6%
2020Q4		-163.1%	-106.0%	196.6%	-325.4%	366.7%
2021Q1		90.2%	96.5%	24.6%	70.9%	170.1%
2021Q2		97.7%	103.8%	25.4%	76.1%	184.4%
2021Q3		104.6%	112.5%	29.1%	87.7%	203.9%
2021Q4		107.1%	114.2%	32.8%	88.1%	220.8%
2022Q1		185.5%	714.8%	1438.0%	108.9%	5650.0%
2022Q2		207.1%	580.2%	899.1%	114.6%	3350.0%
Revenue Growth						
E(QRev)		Median	Mean	StDev	Min	Max
2020Q2		-73.4%	-72.1%	15.6%	-92.7%	-46.1%
2020Q3		-73.7%	-71.9%	7.5%	-81.6%	-59.5%
2020Q4		-65.4%	-66.0%	11.4%	-79.6%	-45.1%
2021Q1		-58.7%	-57.3%	10.9%	-74.2%	-36.2%
2021Q2		379.3%	444.1%	249.3%	157.2%	1047.7%
2021Q3		157.6%	176.8%	87.0%	67.5%	368.9%
2021Q4		151.3%	173.0%	73.5%	77.2%	361.1%
2022Q1		123.6%	136.0%	69.3%	57.6%	318.2%
2022Q2		69.2%	70.5%	29.1%	14.0%	127.4%
E(ARev)		Median	Mean	StDev	Min	Max
2020Q2		-43.7%	-45.1%	10.2%	-66.1%	-28.2%
2020Q3		-63.1%	-61.8%	5.5%	-69.2%	-53.2%
2020Q4		-66.4%	-63.3%	7.4%	-73.7%	-50.6%
2021Q1		45.0%	47.7%	10.7%	32.7%	66.0%
2021Q2		49.9%	47.7%	7.7%	35.0%	60.6%
2021Q3		57.4%	56.4%	10.1%	40.2%	73.5%
2021Q4		66.1%	64.8%	12.5%	43.4%	89.4%
2022Q1		47.8%	49.6%	13.1%	26.4%	69.3%
2022Q2		50.2%	51.4%	15.0%	26.4%	76.0%

declined 12.5 percent year over year, down from the 11.7-percent year-over-year decrease in the prior period. Expect high-price hotels to decline in price near term.

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 declined 7.9 percent this quarter and decreased 22.5 percent year over year. Expect low-price hotels to decline near term.

Finally, we also looked 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 projected annual EPS.⁷ Exhibit 29 indicates that analysts are expecting the quarterly EPS growth rate to rise between 394 percent (median) to 933 percent (mean) and the annual EPS growth rate to rise between 207 percent (median) to 580 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. This is converse to other indicators. ■

⁷ We obtain the growth rate in earnings and revenue estimates from <https://www.earningswhispers.com>

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

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

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

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

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 (cref.cornell.edu).

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.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 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.

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

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