

Cornell Hotel Indices: **Third Quarter 2022**

Long Small Hotels, Short Large Hotels

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

Executive Summary

The price of hotels showed particular strength in the Mid-Atlantic, Pacific, and West South Central regions, while other regions experienced positive growth albeit at a slower rate relative to the previous period. Hotels in non-gateway cities posted higher quarterly gains relative to those in gateway cities, increasing 2 percent compared to a drop of 4 percent for gateway hotels. With regard to yearly prices, hotels in non-gateway cities increased 21 percent as compared to a rise of 1 percent in gateway cities. The transaction volume on all hotel transactions (both large hotels and small hotels combined) mimicked the previous quarter's sales volume. The prices of small hotels appear undervalued (while those of large hotels appear overvalued), based on both 3-year and 5-year moving averages. Mortgage volume for hotels fell slightly for the most recent quarter, while the cost of hotel debt financing has continued to rise quarter to quarter, as well as year over year. In short, lenders are requiring relatively more compensation for hotel loans relative 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 continue to indicate that the cost of borrowing exceeds the return for hotels. Looking toward the next quarter, our near-term leading indicators of hotel price performance indicate that we should expect slower or declining price momentum for large hotels but not necessarily for small hotels.

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 *Journal of Real Estate Finance and Economics*. He is the former co-editor of *Real Estate Economics*, the leading real estate academic journal. He continues to be on the editorial board of *Real Estate Economics*. He is also an associate editor of *Financial Review*. He previously served on the editorial boards of *Journal of Real Estate Finance and Economics*, *Journal of Property Research*, and *Journal of Real Estate Finance*. He is a past president of AREUEA (2019), the leading real estate academic organization. Professor Liu earned his BBA in real estate and finance from the University of Hawaii, an M.S. in real estate from Wisconsin under Dr. James A. Graaskamp, and a Ph.D. in finance and real estate from the University of Texas under Dr. Vijay S. Bawa.

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. In addition to the publications listed above, White's research has been published in the *Journal of Real Estate Finance and Economics*.

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Disclaimer

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Analysis of Indices through Q3, 2022

Hotel prices rose substantially this quarter only in the Mid-Atlantic, Pacific, and West South Central regions. Exhibits 1a through 1c show that, in contrast to the second quarter (2022Q2) where all regions exhibited a positive year-over-year price increase, only three regions—namely, Midwest, Mid-Atlantic, and West South Central—enjoyed a year-over-year rise in price in the third quarter (2022Q3). The Mid-Atlantic and West South Central regions also enjoyed a price increase quarter over quarter. The Pacific region also showed an increase in price quarter over quarter.

EXHIBIT 1A

Time series hotel performance for seven regions

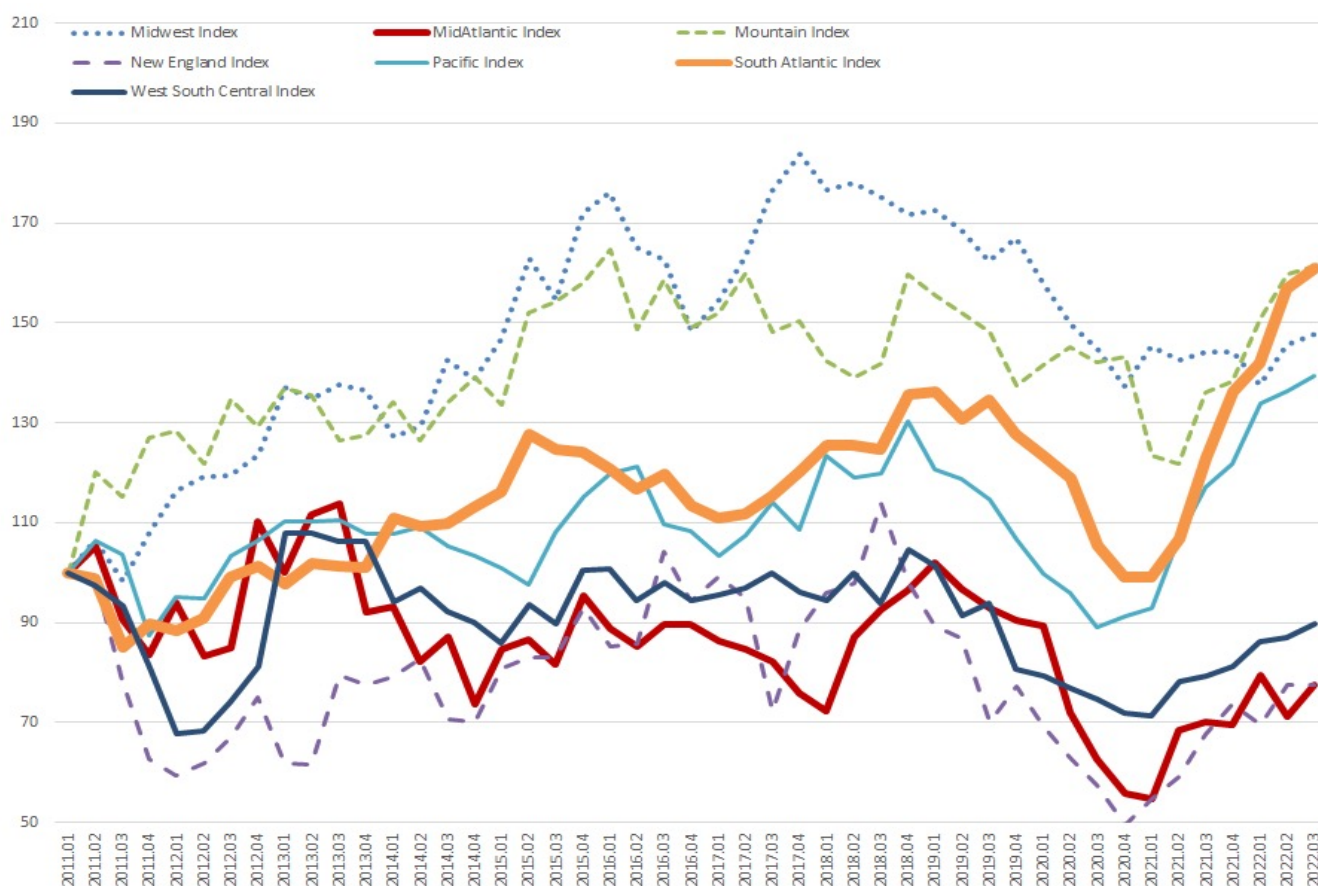
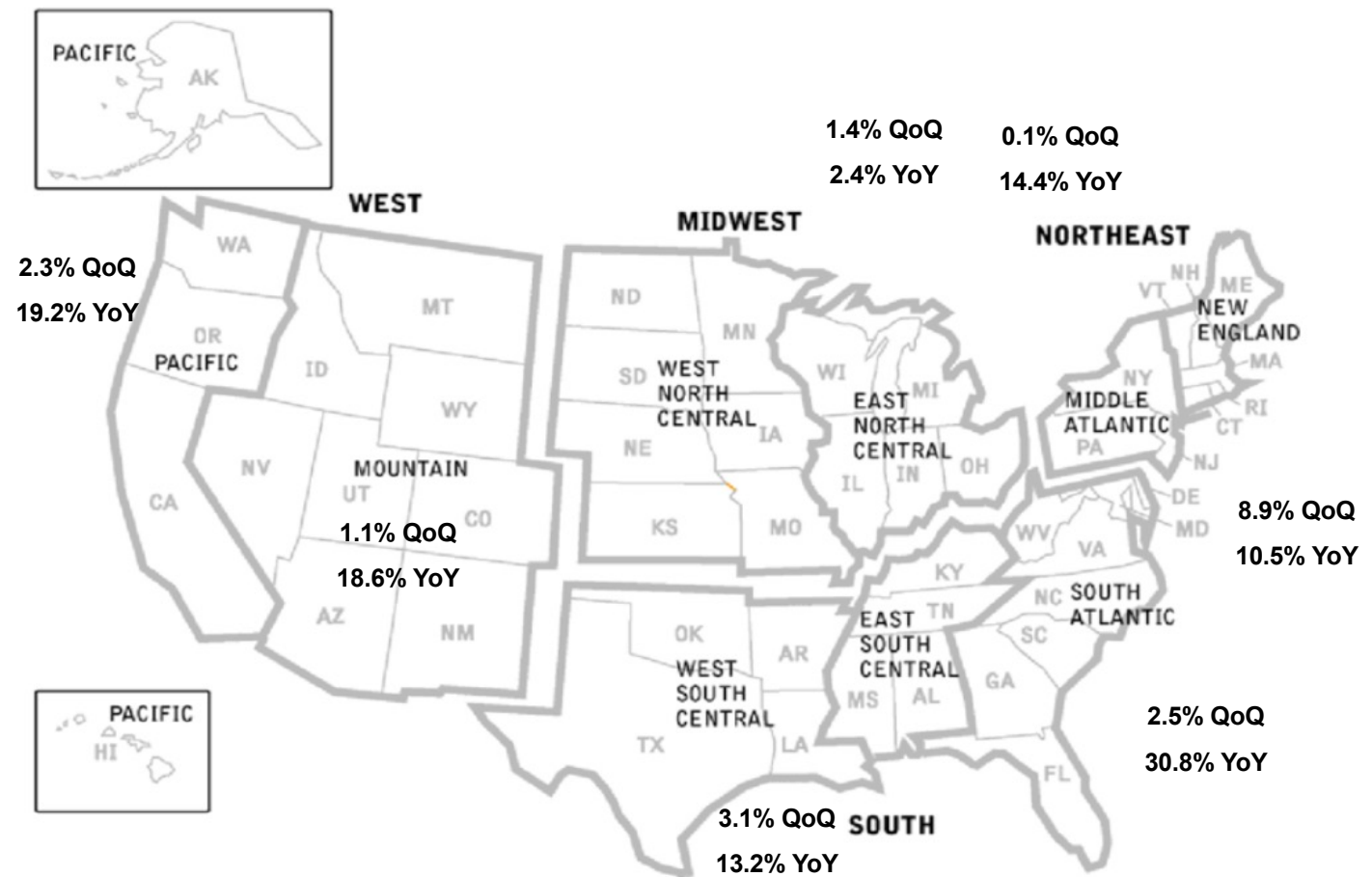


EXHIBIT 1b
Cross-section hotel performance for seven regions


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

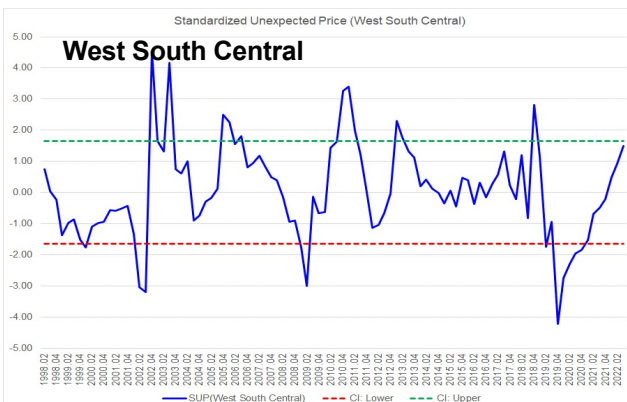
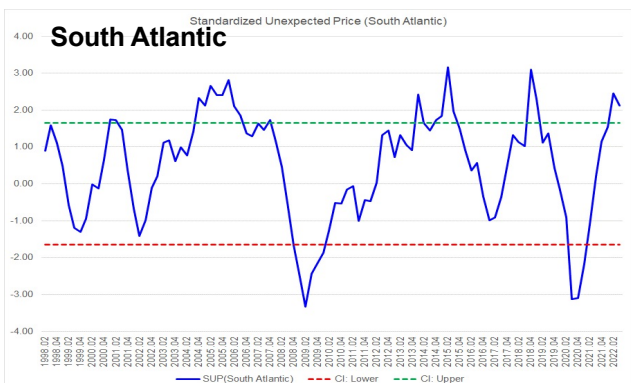
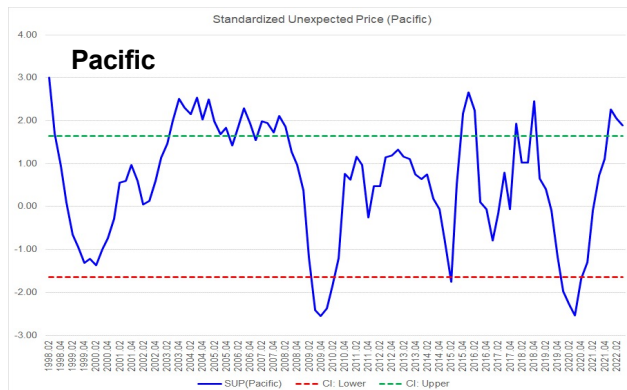
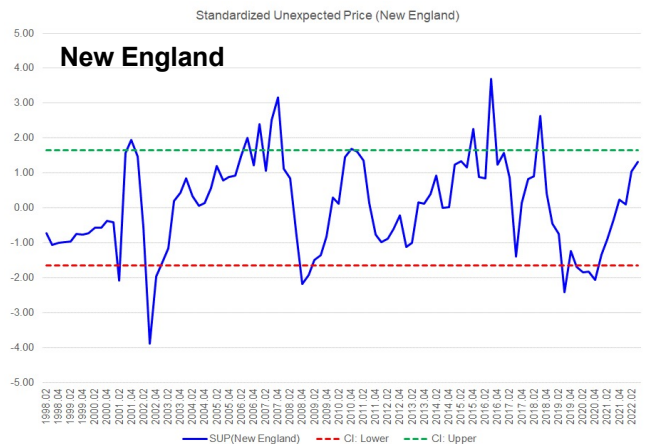
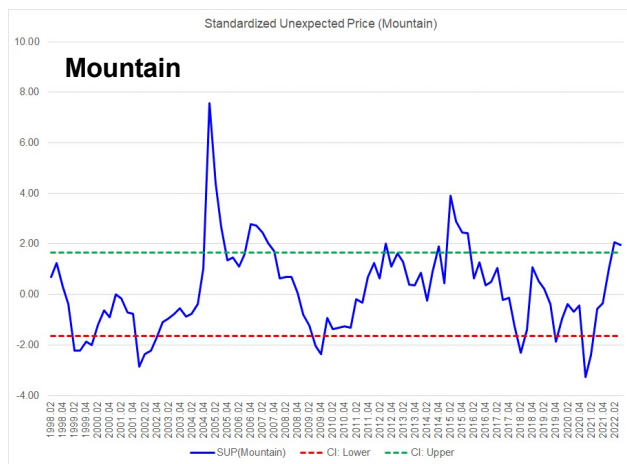
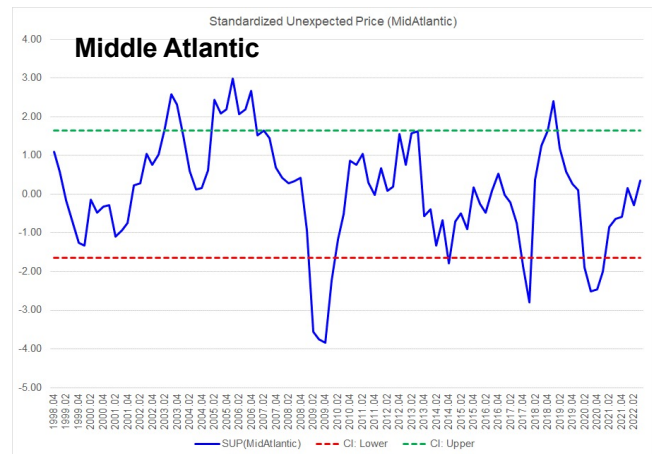
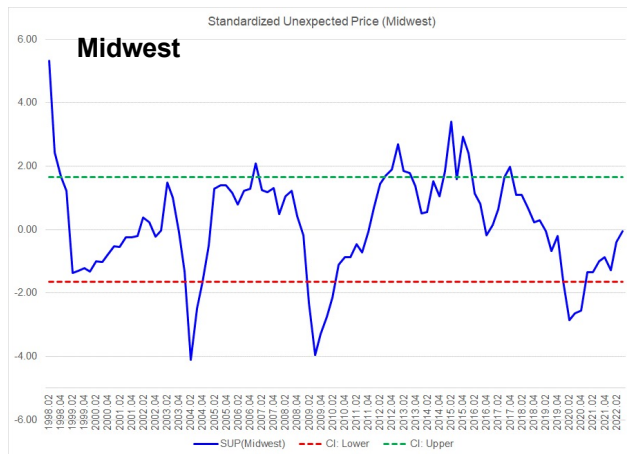
Y-o-Y	Midwest	MidAtlantic	Mountain	New England	Pacific	South Atlantic	West South Central
Current	2.4%	10.5%	18.6%	14.4%	19.2%	30.8%	13.2%
Prior	2.2%	3.8%	31.1%	30.9%	27.4%	46.8%	11.2%
Q-to-Q	Midwest	MidAtlantic	Mountain	New England	Pacific	South Atlantic	West South Central
Current	1.4%	8.9%	1.1%	0.1%	2.3%	2.5%	3.1%
Prior	5.8%	-10.7%	5.9%	11.4%	1.7%	10.5%	0.9%

In terms of standardized unexpected prices (Z-scores), hotel prices continued to remain above their statistical high in the Mountain, Pacific, and South Atlantic regions although they all trended down this quarter. Hotel prices in the Midwest and Mid-Atlantic continued to hover around their average standardized unexpected price (SUP), while hotel prices in New England and West South Central continue to trend towards new statistical highs.

Standardized Unexpected Prices (Z-Scores)

	Midwest	Mid-Atlantic	Mountain	New England	Pacific	South Atlantic	West South Central
2022.02	-0.40	-0.28	2.07	1.05	2.05	2.46	0.93
2022.03	-0.05	0.34	1.96	1.31	1.89	2.12	1.49

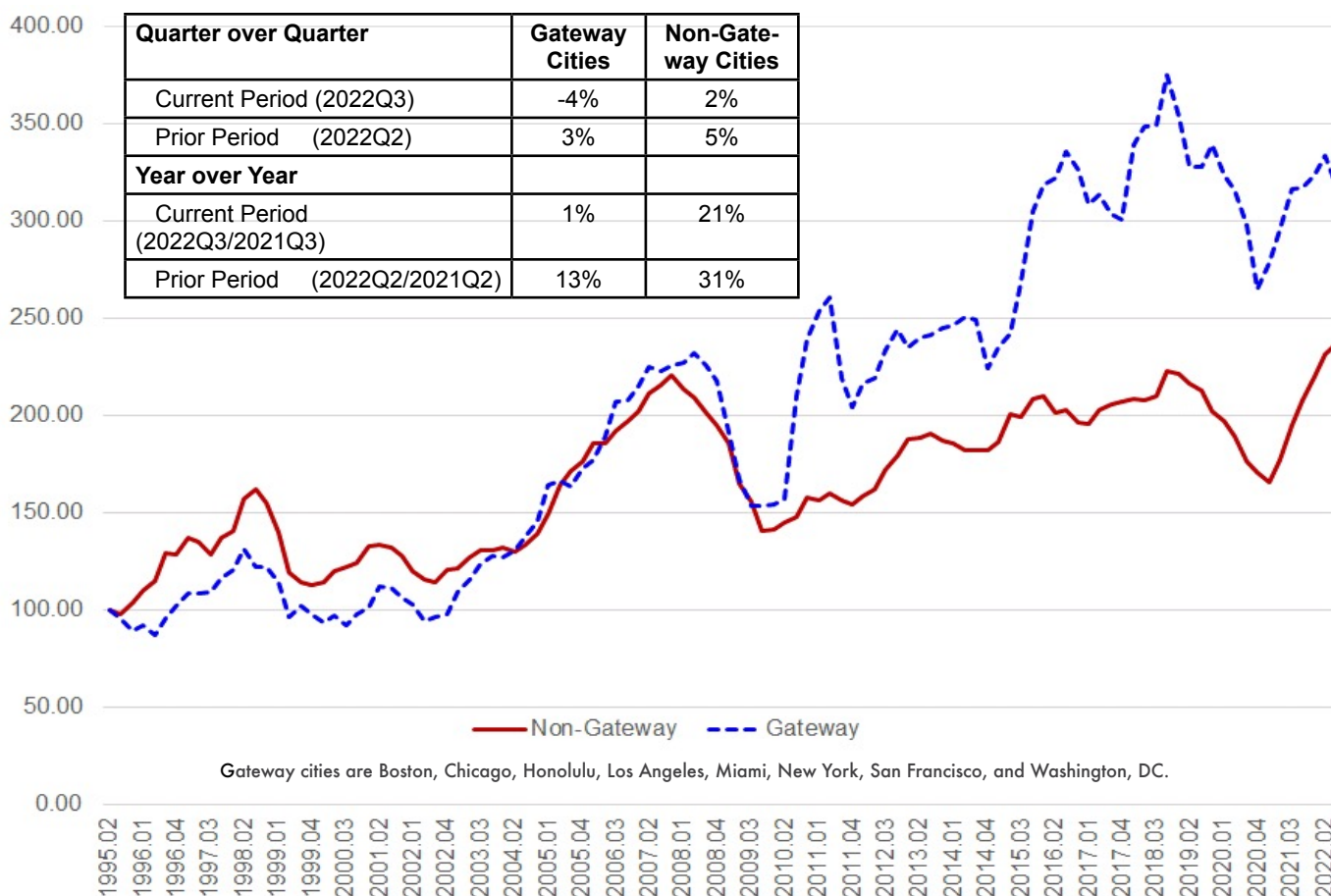
Regional comparison of standardized unexpected prices (SUP), with confidence boundaries



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.

EXHIBIT 2

Hotel performance for gateway cities versus non-gateway cities



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

Hotels in non-gateway cities continued to outperform those in gateway cities. Continuing the trend in the prior period, hotels in non-gateway cities outperformed those in gateway cities, increasing 2 percent in price (non-gateway) compared to a 4 percent quarterly price decline (gate-

way), as shown in Exhibit 2. Year over year, hotel prices in non-gateway cities rose 21 percent compared to only a 1-percent hotel price gain in gateway cities. However, the rate of hotel-price growth declined in both gateway and non-gateway cities.

	Full Sample		Gateway Hotels		Non-Gateway Hotels	
	Median Price	No. of Sales	Median Price	No. of Sales	Median Price	No. of Sales
2022Q2	\$5,277,500	550	\$11,000,000	61	\$5,000,000	489
Quarter over Quarter	-.4%	-1%	19%	22%	-2%	-4%
Year over Year	21%	23%	-67%	61%	25%	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	2,357,500	20	NA	0	0.0%	2,357,500	20	100.0%	3,400,000	7	35.0%	2,100,000	13	65.0%
1995	2	3,150,000	29	15,712,500	6	20.7%	2,670,000	23	79.3%	3,800,000	12	41.4%	2,906,150	17	58.6%
1995	3	2,562,500	44	12,400,000	4	9.1%	2,378,000	40	90.9%	3,500,000	20	45.5%	2,000,000	24	54.5%
1995	4	3,400,000	41	27,750,000	10	24.4%	2,625,000	31	75.6%	5,075,000	14	34.1%	3,100,000	27	65.9%
1996	1	2,500,000	39	14,475,000	8	20.5%	1,700,000	31	79.5%	2,500,000	13	33.3%	2,687,500	26	66.7%
1996	2	2,925,000	43	29,150,000	12	27.9%	2,500,000	31	72.1%	3,200,000	15	34.9%	2,730,000	28	65.1%
1996	3	6,500,000	57	17,740,000	20	35.1%	3,000,000	37	64.9%	5,500,000	25	43.9%	6,890,500	32	56.1%
1996	4	2,735,000	58	19,000,000	17	29.3%	2,200,000	41	70.7%	4,650,000	27	46.6%	2,400,000	31	53.4%
1997	1	5,053,250	74	16,635,500	23	31.1%	3,500,000	51	68.9%	6,300,000	29	39.2%	4,075,000	45	60.8%
1997	2	2,862,500	72	17,750,000	17	23.6%	2,150,000	55	76.4%	2,445,000	24	33.3%	3,047,350	48	66.7%
1997	3	3,437,500	90	19,000,000	21	23.3%	2,400,000	69	76.7%	5,140,000	38	42.2%	2,550,000	52	57.8%
1997	4	4,330,950	78	17,000,000	27	34.6%	2,300,000	51	65.4%	10,435,445	27	34.6%	3,600,000	51	65.4%
1998	1	4,698,800	92	20,000,000	31	33.7%	3,100,000	61	66.3%	6,353,000	33	35.9%	4,600,000	59	64.1%
1998	2	3,630,000	96	23,765,000	21	21.9%	3,000,000	75	78.1%	3,998,240	28	29.2%	3,575,000	68	70.8%
1998	3	2,961,059	92	16,740,000	12	13.0%	2,690,550	80	87.0%	2,255,000	30	32.6%	3,365,000	62	67.4%
1998	4	2,550,000	84	35,000,000	15	17.9%	2,375,000	69	82.1%	4,225,000	30	35.7%	2,500,000	54	64.3%
1999	1	2,425,000	88	24,638,095	10	11.4%	2,125,000	78	88.6%	3,500,000	32	36.4%	2,300,000	56	63.6%
1999	2	2,100,000	95	67,000,000	5	5.3%	1,950,000	90	94.7%	2,067,500	28	29.5%	2,100,000	67	70.5%
1999	3	2,500,000	99	20,711,100	10	10.1%	2,130,000	89	89.9%	1,800,000	19	19.2%	2,522,500	80	80.8%
1999	4	2,440,000	87	18,190,000	14	16.1%	2,090,000	73	83.9%	2,210,000	23	26.4%	2,575,000	64	73.6%
2000	1	2,400,000	110	23,253,895	10	9.1%	2,300,000	100	90.9%	2,325,000	44	40.0%	2,428,500	66	60.0%
2000	2	2,450,000	88	14,500,000	9	10.2%	2,275,000	79	89.8%	2,325,000	24	27.3%	2,450,000	64	72.7%
2000	3	2,600,000	95	20,346,875	16	16.8%	2,250,000	79	83.2%	2,925,000	24	25.3%	2,525,000	71	74.7%
2000	4	2,475,000	101	18,050,000	14	13.9%	2,300,000	87	86.1%	4,500,000	26	25.7%	2,350,000	75	74.3%
2001	1	2,970,650	104	28,437,500	18	17.3%	2,422,500	86	82.7%	2,650,000	29	27.9%	3,000,000	75	72.1%
2001	2	2,800,000	110	23,795,000	12	10.9%	2,687,150	98	89.1%	5,825,000	25	22.7%	2,684,300	85	77.3%
2001	3	2,700,000	87	16,000,000	6	6.9%	2,500,000	81	93.1%	3,150,000	21	24.1%	2,600,000	66	75.9%
2001	4	2,400,000	73	20,500,000	5	6.8%	2,300,000	68	93.2%	2,800,000	17	23.3%	2,300,000	56	76.7%
2002	1	2,125,000	70	11,518,052	5	7.1%	2,000,000	65	92.9%	1,700,000	17	24.3%	2,200,000	53	75.7%
2002	2	2,400,000	106	18,125,000	10	9.4%	2,287,500	96	90.6%	3,125,000	33	31.1%	2,300,000	73	68.9%
2002	3	2,355,400	81	12,750,000	5	6.2%	2,237,500	76	93.8%	2,197,500	24	29.6%	2,470,000	57	70.4%
2002	4	2,907,500	100	23,500,000	16	16.0%	2,575,000	84	84.0%	2,907,500	34	34.0%	2,862,500	66	66.0%
2003	1	2,530,000	94	13,000,000	9	9.6%	2,425,000	85	90.4%	3,850,000	21	22.3%	2,425,000	73	77.7%
2003	2	2,750,000	110	18,500,000	10	9.1%	2,509,500	100	90.9%	3,160,000	31	28.2%	2,600,000	79	71.8%
2003	3	3,333,000	141	14,359,286	28	19.9%	2,600,000	113	80.1%	3,660,000	45	31.9%	3,032,500	96	68.1%
2003	4	2,600,000	149	16,375,000	18	12.1%	2,425,000	131	87.9%	2,950,000	35	23.5%	2,500,000	114	76.5%

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

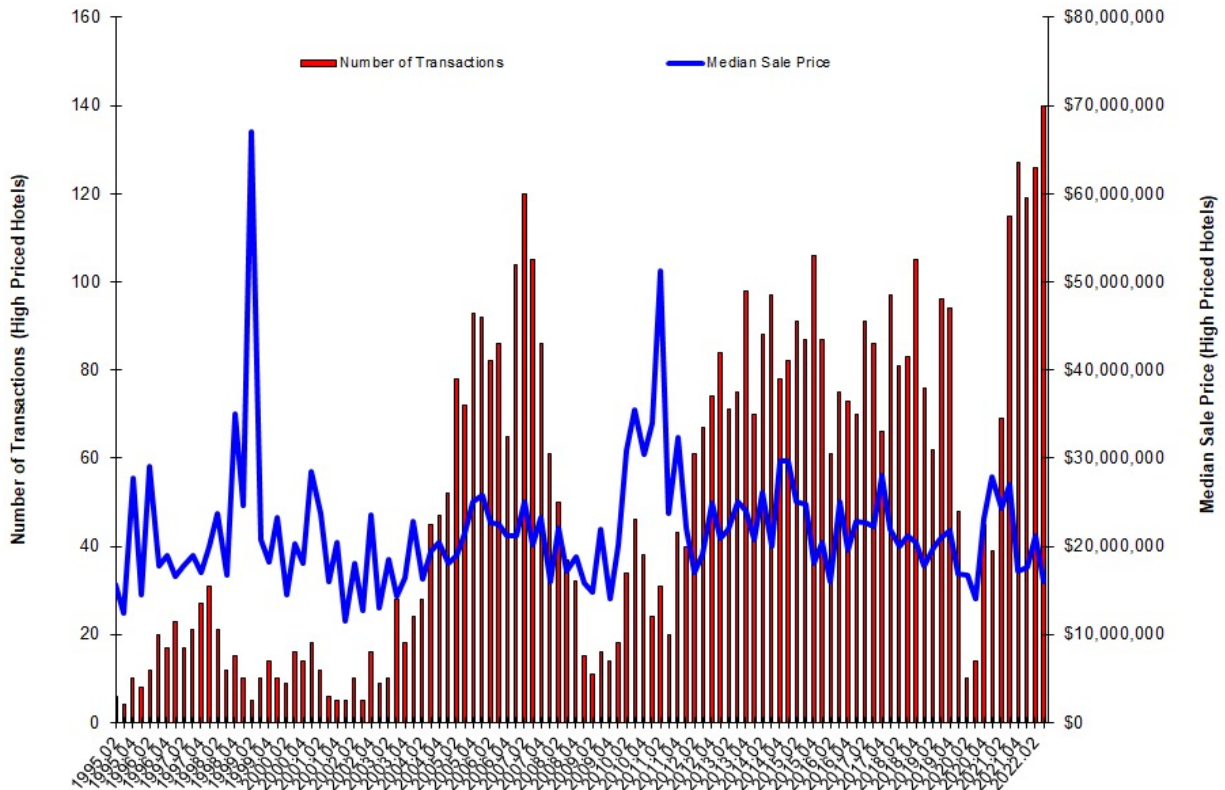
Year	Quarter	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	N	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2004	1	2,925,000	166	22,875,250	24	14.5%	2,536,756	142	85.5%	3,450,000	41	24.7%	2,894,000	125	75.3%
2004	2	2,700,000	195	16,280,000	28	14.4%	2,450,000	167	85.6%	4,500,000	39	20.0%	2,540,000	156	80.0%
2004	3	3,491,122	216	19,350,000	45	20.8%	2,610,000	171	79.2%	4,600,000	51	23.6%	3,306,500	165	76.4%
2004	4	4,000,000	177	20,475,000	47	26.6%	3,085,500	130	73.4%	8,850,000	36	20.3%	3,600,000	141	79.7%
2005	1	4,330,000	231	18,100,000	52	22.5%	3,300,000	179	77.5%	6,687,500	40	17.3%	3,800,000	191	82.7%
2005	2	4,566,250	316	18,956,812	78	24.7%	3,255,150	238	75.3%	6,475,000	68	21.5%	4,385,000	248	78.5%
2005	3	4,150,000	273	21,475,000	72	26.4%	3,100,000	201	73.6%	6,100,000	61	22.3%	3,750,000	212	77.7%
2005	4	4,425,000	300	25,000,000	93	31.0%	3,150,000	207	69.0%	11,200,000	65	21.7%	4,000,000	235	78.3%
2006	1	5,300,000	301	25,750,000	92	30.6%	3,800,000	209	69.4%	18,000,000	64	21.3%	4,943,744	237	78.7%
2006	2	4,750,000	313	22,750,000	82	26.2%	3,500,000	231	73.8%	6,175,000	56	17.9%	4,500,000	257	82.1%
2006	3	5,000,000	285	22,500,000	86	30.2%	3,650,000	199	69.8%	7,000,000	59	20.7%	4,705,399	226	79.3%
2006	4	4,587,500	248	21,200,000	65	26.2%	3,550,000	183	73.8%	8,093,750	56	22.6%	4,270,000	192	77.4%
2007	1	6,155,805	286	21,225,000	104	36.4%	3,700,000	182	63.6%	9,500,000	63	22.0%	5,700,000	223	78.0%
2007	2	5,650,000	385	25,125,000	120	31.2%	3,750,000	265	68.8%	9,000,000	67	17.4%	5,450,000	318	82.6%
2007	3	5,450,000	330	20,100,161	105	31.8%	3,900,000	225	68.2%	8,325,000	53	16.1%	5,011,554	277	83.9%
2007	4	4,680,000	249	23,250,000	86	34.5%	3,150,000	163	65.5%	9,375,000	36	14.5%	4,500,000	213	85.5%
2008	1	5,000,000	255	16,000,000	61	23.9%	3,985,000	194	76.1%	5,990,000	46	18.0%	4,650,000	209	82.0%
2008	2	5,062,900	228	22,150,000	50	21.9%	3,890,000	178	78.1%	8,725,000	38	16.7%	4,800,000	190	83.3%
2008	3	4,190,500	172	17,133,333	37	21.5%	3,350,000	135	78.5%	5,500,000	27	15.7%	3,900,000	145	84.3%
2008	4	4,050,000	159	18,850,000	32	20.1%	3,500,000	127	79.9%	4,972,500	27	17.0%	3,920,000	132	83.0%
2009	1	4,150,000	81	15,800,000	15	18.5%	3,600,000	66	81.5%	7,375,000	16	19.8%	3,700,000	65	80.2%
2009	2	3,090,231	86	14,722,500	11	12.8%	2,864,310	75	87.2%	5,410,250	16	18.6%	3,000,000	70	81.4%
2009	3	3,400,000	90	22,000,000	16	17.8%	3,000,000	74	82.2%	4,608,750	14	15.6%	3,195,271	76	84.4%
2009	4	3,562,500	84	14,100,000	14	16.7%	3,010,250	70	83.3%	4,520,000	12	14.3%	3,400,000	72	85.7%
2010	1	3,900,000	89	20,162,500	18	20.2%	2,825,000	71	79.8%	8,450,000	15	16.9%	3,825,000	74	83.1%
2010	2	3,700,000	138	30,833,449	34	24.6%	3,000,000	104	75.4%	15,400,000	34	24.6%	3,100,000	104	75.4%
2010	3	4,912,500	120	35,500,000	46	38.3%	2,850,000	74	61.7%	25,000,000	37	30.8%	3,117,000	83	69.2%
2010	4	3,988,800	100	30,353,182	38	38.0%	2,420,000	62	62.0%	38,500,000	23	23.0%	3,265,000	77	77.0%
2011	1	4,200,000	85	34,050,000	24	28.2%	2,795,500	61	71.8%	12,275,000	15	17.6%	3,775,000	70	82.4%
2011	2	4,200,000	97	51,200,000	31	32.0%	2,250,000	66	68.0%	15,600,000	23	23.7%	3,175,000	74	76.3%
2011	3	3,350,000	73	23,772,500	20	27.4%	2,800,000	53	72.6%	3,700,000	17	23.3%	3,275,000	56	76.7%
2011	4	5,000,000	157	32,400,000	43	27.4%	3,229,250	114	72.6%	10,950,000	34	21.7%	4,300,000	123	78.3%
2012	1	5,233,961	131	22,100,000	40	30.5%	3,275,000	91	69.5%	13,837,500	28	21.4%	4,200,000	103	78.6%
2012	2	4,000,000	209	17,000,000	61	29.2%	2,779,500	148	70.8%	15,900,000	22	10.5%	3,700,000	187	89.5%
2012	3	7,000,000	169	19,100,000	67	39.6%	2,720,250	102	60.4%	16,050,000	32	18.9%	5,250,000	137	81.1%
2012	4	5,622,500	207	24,866,613	74	35.7%	3,125,000	133	64.3%	16,174,794	39	18.8%	5,070,000	168	81.2%

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	5,997,496	238	20,927,291	84	35.3%	2,962,500	154	64.7%	6,500,000	51	21.4%	5,575,000	187	78.6%
2013	2	4,700,000	217	22,000,000	71	32.7%	2,500,000	146	67.3%	16,000,000	38	17.5%	4,200,000	179	82.5%
2013	3	5,260,855	246	25,000,000	75	30.5%	3,300,000	171	69.5%	9,949,500	35	14.2%	4,750,000	211	85.8%
2013	4	4,537,500	314	24,000,000	98	31.2%	2,790,000	216	68.8%	13,500,000	55	17.5%	4,000,000	259	82.5%
2014	1	5,625,000	228	20,750,000	70	30.7%	3,300,000	158	69.3%	8,825,900	59	25.9%	5,000,000	169	74.1%
2014	2	4,300,000	320	26,125,000	88	27.5%	2,818,750	232	72.5%	11,200,000	59	18.4%	3,700,000	261	81.6%
2014	3	5,500,000	351	20,000,000	97	27.6%	3,425,000	254	72.4%	10,567,078	66	18.8%	5,000,000	285	81.2%
2014	4	4,550,000	310	29,625,000	78	25.2%	3,107,500	232	74.8%	8,225,000	72	23.2%	3,950,000	238	76.8%
2015	1	5,950,000	252	29,750,000	82	32.5%	3,156,050	170	67.5%	8,280,000	47	18.7%	5,500,000	205	81.3%
2015	2	6,300,000	267	25,000,000	91	34.1%	3,250,000	176	65.9%	18,765,000	46	17.2%	5,525,000	221	82.8%
2015	3	5,050,000	299	24,800,000	87	29.1%	3,012,500	212	70.9%	12,100,000	53	17.7%	4,275,000	246	82.3%
2015	4	6,650,000	292	18,080,000	106	36.3%	3,125,000	186	63.7%	14,415,000	51	17.5%	5,400,000	241	82.5%
2016	1	5,600,000	293	20,375,000	87	29.7%	3,350,000	206	70.3%	13,600,000	45	15.4%	5,275,000	248	84.6%
2016	2	4,100,000	322	16,000,000	61	18.9%	3,300,000	261	81.1%	11,600,000	48	14.9%	3,725,000	274	85.1%
2016	3	4,862,500	284	25,000,000	75	26.4%	3,200,000	209	73.6%	24,500,000	34	12.0%	4,362,500	250	88.0%
2016	4	4,000,000	263	19,480,000	73	27.8%	2,800,000	190	72.2%	13,352,600	28	10.6%	3,664,706	235	89.4%
2017	1	5,275,000	254	22,880,750	70	27.6%	3,600,000	184	72.4%	14,726,254	28	11.0%	4,950,000	226	89.0%
2017	2	5,100,000	331	22,660,000	91	27.5%	3,325,000	240	72.5%	16,450,000	37	11.2%	4,462,500	294	88.8%
2017	3	5,000,000	321	22,250,000	86	26.8%	3,431,000	235	73.2%	22,250,000	38	11.8%	4,525,000	283	88.2%
2017	4	4,500,000	265	28,000,000	66	24.9%	2,875,000	199	75.1%	12,208,000	26	9.8%	4,250,000	239	90.2%
2018	1	5,500,000	310	21,882,400	97	31.3%	3,500,000	213	68.7%	14,750,000	40	12.9%	5,000,000	270	87.1%
2018	2	4,800,000	365	20,000,000	81	22.2%	3,300,000	284	77.8%	17,625,000	40	11.0%	4,250,000	325	89.0%
2018	3	5,125,000	334	21,265,000	83	24.9%	3,710,000	251	75.1%	13,342,500	22	6.6%	5,000,000	312	93.4%
2018	4	6,490,000	279	20,500,000	105	37.6%	3,300,000	174	62.4%	14,440,000	33	11.8%	5,580,556	246	88.2%
2019	1	5,350,000	289	17,802,698	76	26.3%	3,550,000	213	73.7%	15,750,000	34	11.8%	4,800,000	255	88.2%
2019	2	4,045,000	332	19,848,485	62	18.7%	3,372,500	270	81.3%	6,300,000	35	10.5%	3,900,000	297	89.5%
2019	3	4,707,500	402	21,000,000	96	23.9%	3,500,000	306	76.1%	15,850,000	42	10.4%	4,362,500	360	89.6%
2019	4	4,950,000	383	21,855,650	94	24.5%	3,300,000	289	75.5%	11,000,000	35	9.1%	4,600,000	340	88.8%
2020	1	4,100,000	306	16,900,000	48	15.7%	3,470,000	258	84.3%	6,313,000	22	7.2%	4,095,000	284	92.8%
2020	2	3,380,000	80	16,787,500	10	12.5%	2,515,000	70	87.5%	6,700,000	7	8.8%	3,360,000	73	91.3%
2020	3	2,800,000	173	14,062,500	14	8.1%	2,600,000	159	91.9%	7,219,750	12	6.9%	2,667,500	161	93.1%
2020	4	3,600,000	246	23,053,000	45	18.3%	2,750,000	201	81.7%	10,725,000	36	14.6%	3,000,000	210	85.4%
2021	1	3,951,500	215	27,900,000	39	18.1%	3,150,000	176	81.9%	11,431,000	20	9.3%	3,750,000	195	90.7%
2021	2	3,500,000	346	24,352,000	69	19.9%	2,900,000	277	80.1%	9,675,000	34	9.8%	3,337,500	312	90.2%
2021	3	4,350,000	448	27,000,000	115	25.7%	3,125,000	333	74.3%	33,820,000	38	8.5%	4,000,000	410	91.5%
2021	4	4,750,000	493	17,100,000	127	25.8%	3,300,000	366	74.2%	9,687,500	36	7.3%	4,400,000	457	92.7%
2022	1	5,062,500	439	17,600,000	119	27.1%	3,475,000	320	72.9%	12,025,000	42	9.6%	4,875,000	397	90.4%
2022	2	5,300,000	557	21,140,000	126	22.6%	3,750,000	431	77.4%	9,250,000	50	9.0%	5,100,000	507	91.0%
2022	3	5,277,500	550	16,050,000	140	25.5%	3,650,000	410	74.5%	11,000,000	61	11.1%	5,000,000	489	88.9%

Source: Cornell Center for Real Estate and Finance

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



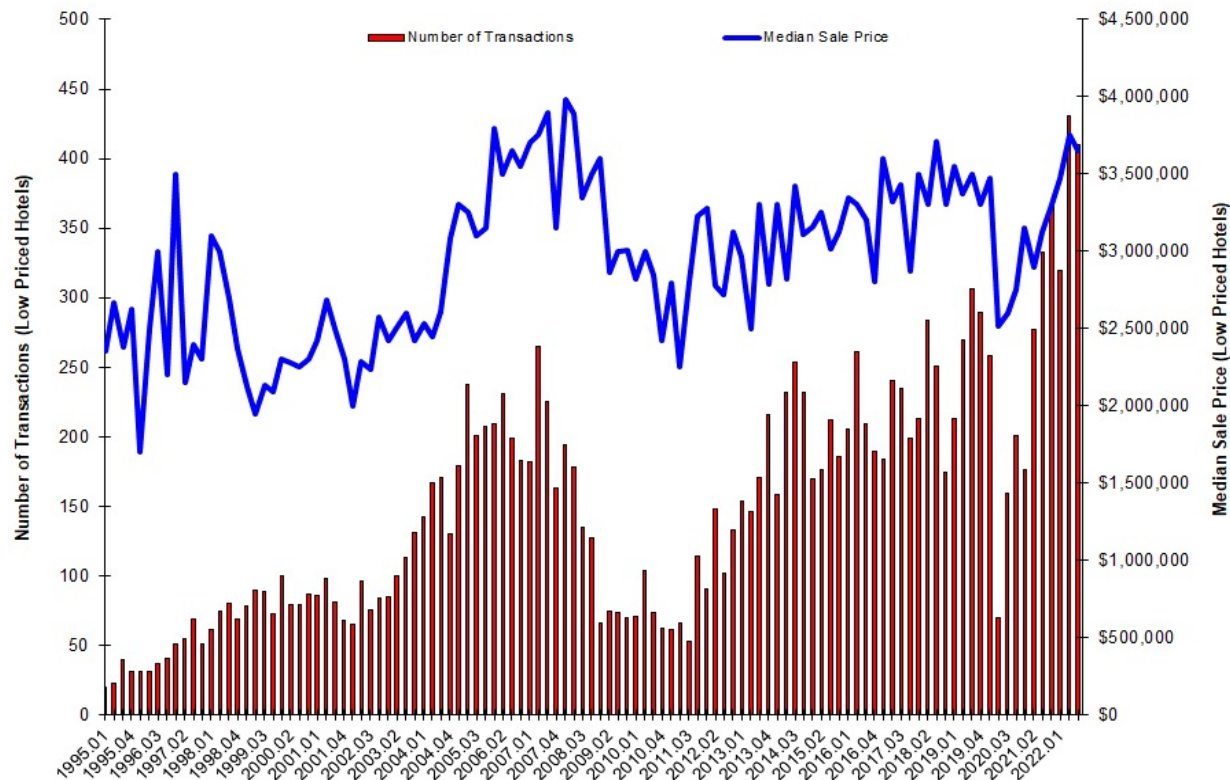
	Full Sample		Large Hotels		Small Hotels	
	Median Price	No. of Sales	Median Price	No. of Sales	Median Price	No. of Sales
2022Q3	\$5,277,500	550	\$16,050,000	140	\$3,650,000	410
Quarter over Quarter	-.4%	-1%	-24%	11%	-3%	-5%
Year over Year	21%	23%	-41%	22%	17%	23%

Transaction volume mimicked that of the previous quarter. The transaction volume on all hotel transactions (both large hotels and small hotels combined) remained fairly constant this quarter (23 percent year over year).¹ Sales volume for small hotels declined 5 percent, while

the transaction volume for large hotels rose 11 percent this quarter. A similar situation occurred for non-gateway and gateway hotels; non-gateway hotel transaction volume declined 4 percent, while the sales volume for gateway hotels rose 22 percent in this quarter. Median prices declined this quarter for both large and small hotels, as well as hotels in non-gateway cities. In contrast, the median price of hotels in gateway cities rose 19 percent quarter over quarter. Year

¹ Note that the number of transactions is limited to the sales that are included in the hedonic index. As such, this figure should not be construed necessarily as being representative of the total market activity. Hotels selling for less than \$10 million are considered small hotels, while those at \$10 million or more are termed large hotels.

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



over year, however, a contrasting picture emerges, with the median price of small hotels and non-gateway city hotels achieving a double-digit increase in price (17 percent increase for small hotels; 25 percent for those in non-gateway cities), while the median price of large hotels and hotels in gateway cities experienced a double-digit decline (a drop of 41 percent year over year for large hotels; a 67-percent decrease for gateway hotels). 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.

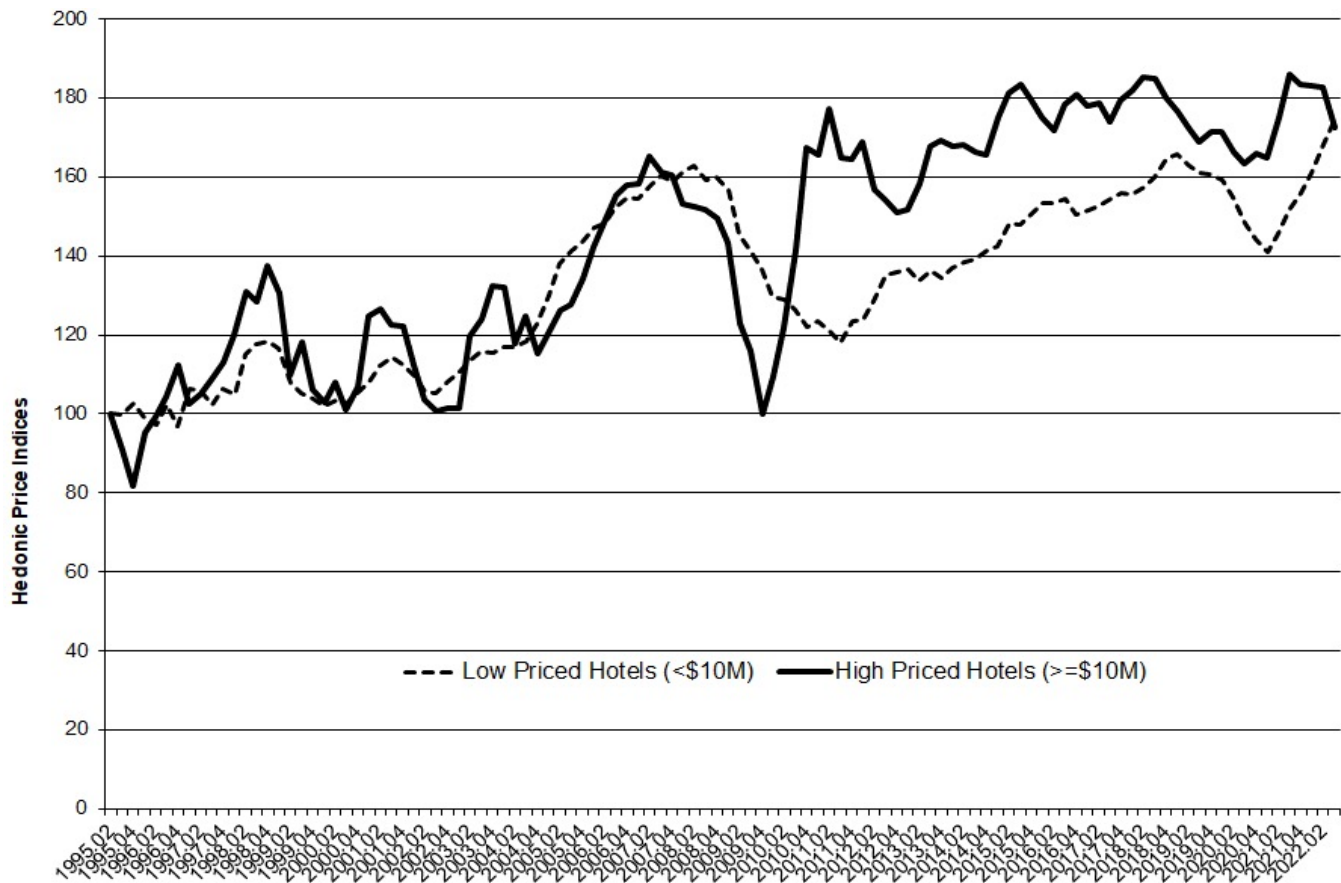
The price of small hotels continues to represent a buying opportunity based on moving averages. On the other hand, a sell signal exists for large hotels. According to our standardized price metric, smaller hotels remain at a statistical high this quarter. Exhibit 7 graphs the prices reported in Exhibit 6. Similar to the prior quarter, the price of large hotels fell 5.5 percent, compared to a 3.3-percent gain for smaller hotels. Year-over-year results were similar, with large hotels declining 7.1 percent, compared to nearly a 15-percent increase in the price of smaller hotels. Exhibit 8 and Exhibit 9 show the historical year-over-year change in large and small hotel indices.

Hotel indices through 2022, quarter 3

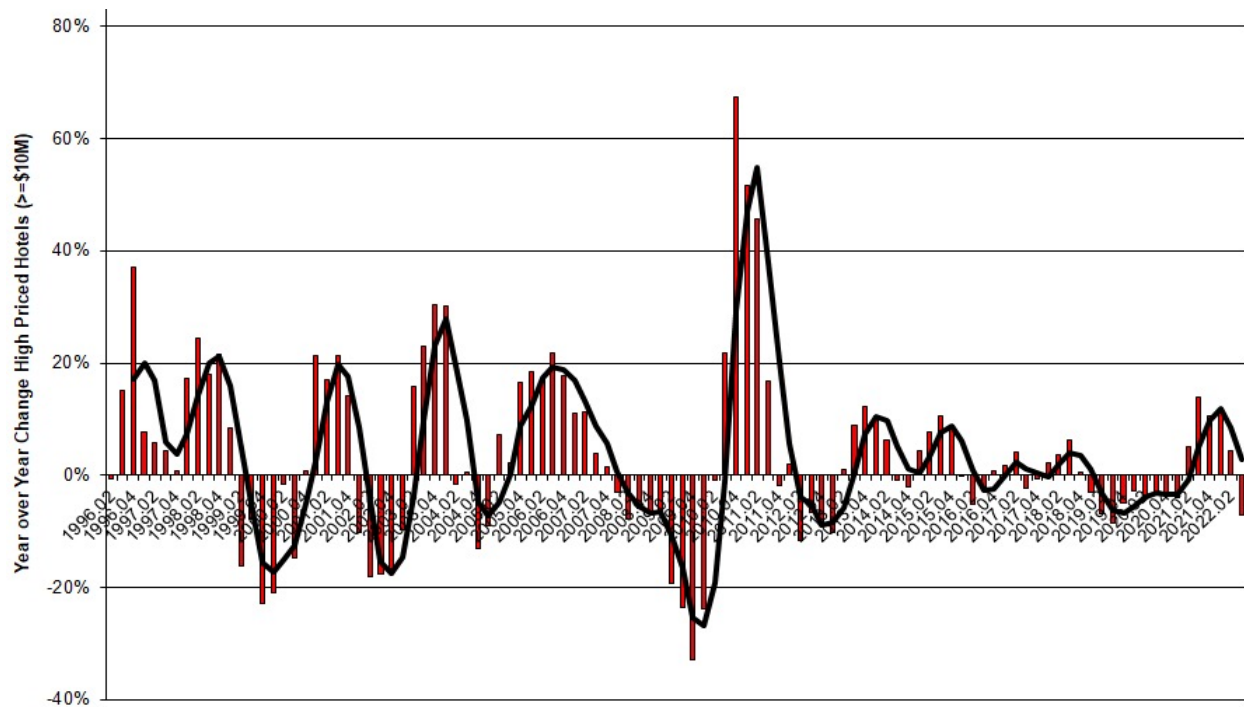
YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales	YrQtr	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Non Gateway Index	Gateway Index	Repeat Sales Index	Index Value Repeat Sales
1995.02	98.05	94.72	82.52	103.46	64.21	NA	2009.01	153.71	135.78	153.09	198.43	154.66	161.13
1995.03	97.88	85.91	81.06	99.17	67.07	NA	2009.02	142.59	116.39	136.55	173.41	151.27	155.79
1995.04	100.66	77.57	85.82	92.71	68.55	NA	2009.03	138.23	109.95	128.77	159.04	137.36	142.18
1996.01	97.07	90.30	90.86	95.62	70.31	NA	2009.04	133.99	94.84	116.14	158.75	123.43	128.13
1996.02	95.28	94.17	95.14	90.34	72.61	NA	2010.01	127.20	103.52	116.68	159.43	117.76	122.39
1996.03	100.39	98.81	106.52	98.94	71.61	NA	2010.02	126.45	115.31	119.95	162.57	109.84	114.92
1996.04	95.00	106.41	106.20	105.65	73.13	NA	2010.03	123.99	133.99	121.85	217.45	111.01	116.31
1997.01	104.39	97.15	113.36	112.19	86.68	NA	2010.04	119.54	158.73	130.64	247.61	112.98	116.59
1997.02	103.91	99.68	111.61	112.27	89.20	NA	2011.01	121.12	156.90	129.14	262.58	111.96	112.58
1997.03	100.38	103.05	106.24	113.00	95.16	NA	2011.02	118.69	167.88	131.89	270.04	112.01	111.67
1997.04	104.47	107.31	113.37	120.56	101.44	NA	2011.03	115.82	156.31	129.03	227.09	110.45	109.94
1998.01	102.90	113.87	116.38	124.84	98.16	NA	2011.04	121.09	155.79	127.47	211.14	111.46	111.07
1998.02	112.74	124.09	129.56	135.79	103.58	NA	2012.01	121.41	159.95	130.84	223.93	112.92	112.04
1998.03	115.48	121.57	133.63	126.76	105.72	NA	2012.02	126.02	148.41	133.87	227.32	116.32	117.26
1998.04	116.10	130.35	127.74	126.43	103.50	NA	2012.03	132.41	146.00	141.99	241.75	120.45	120.88
1999.01	114.36	123.57	115.47	118.48	96.80	NA	2012.04	133.38	142.91	148.11	253.12	122.04	122.73
1999.02	105.60	104.02	98.70	100.09	91.05	NA	2013.01	133.87	143.80	155.33	243.08	123.89	126.06
1999.03	103.20	111.95	94.16	106.14	88.56	NA	2013.02	131.15	149.88	155.56	248.49	125.27	128.12
1999.04	101.63	100.48	93.07	101.09	89.53	NA	2013.03	133.46	158.94	157.31	249.85	126.86	131.18
2000.01	100.09	97.55	94.57	96.77	94.39	97.96	2013.04	131.91	160.37	154.68	253.55	129.59	135.10
2000.02	101.56	102.44	99.02	100.71	97.81	97.96	2014.01	134.21	158.86	153.28	254.81	135.17	140.15
2000.03	100.57	95.58	100.64	95.20	97.57	92.95	2014.02	135.82	159.45	150.35	259.24	134.79	138.27
2000.04	103.30	101.24	102.41	101.55	96.47	93.06	2014.03	136.49	157.45	150.30	257.84	136.82	139.40
2001.01	106.08	118.35	109.77	105.03	95.31	91.51	2014.04	138.64	156.97	150.40	232.07	136.51	137.67
2001.02	110.04	119.77	110.21	115.99	95.00	89.44	2015.01	139.86	165.93	153.91	243.34	138.31	138.86
2001.03	112.16	116.04	109.12	115.56	95.80	92.66	2015.02	145.53	171.66	165.88	250.81	142.28	142.69
2001.04	110.33	115.60	105.70	110.48	95.37	89.89	2015.03	144.95	173.92	164.83	278.14	151.15	152.50
2002.01	107.37	106.40	99.01	106.49	96.07	92.65	2015.04	147.67	169.82	172.30	315.46	161.58	163.07
2002.02	103.47	98.11	95.35	97.45	94.68	92.07	2016.01	150.36	165.75	173.48	329.76	164.10	166.12
2002.03	103.30	95.57	94.60	99.64	95.03	90.88	2016.02	150.43	162.68	166.07	333.28	165.43	168.27
2002.04	106.02	96.23	99.78	101.38	96.46	95.50	2016.03	151.39	168.91	167.70	347.32	164.71	166.11
2003.01	108.09	96.08	100.41	112.85	97.47	94.64	2016.04	147.71	171.20	162.00	337.56	158.91	161.16
2003.02	111.60	113.52	104.97	120.07	99.64	98.24	2017.01	148.75	168.54	161.48	319.38	162.63	164.77
2003.03	113.72	117.58	108.14	128.33	102.17	102.67	2017.02	149.86	169.45	167.77	324.41	169.56	172.25
2003.04	113.26	125.38	107.71	132.21	103.33	105.17	2017.03	151.55	164.84	169.64	313.90	170.35	173.82
2004.01	114.65	125.06	108.92	131.63	102.85	106.38	2017.04	153.08	169.99	170.96	311.32	174.39	176.88
2004.02	114.80	111.58	107.68	135.12	103.57	107.58	2018.01	152.58	172.46	172.10	351.39	175.22	178.22
2004.03	116.10	118.21	110.26	142.89	107.62	112.05	2018.02	154.20	175.56	171.53	360.84	175.71	177.48
2004.04	120.50	109.13	115.06	150.83	109.06	112.38	2018.03	156.68	175.01	173.68	361.54	179.05	180.54
2005.01	127.63	113.90	123.06	170.25	113.94	116.58	2018.04	161.39	170.80	184.21	387.85	182.08	183.45
2005.02	135.33	119.69	135.94	171.95	119.76	123.07	2019.01	162.54	167.22	182.91	366.22	183.50	184.01
2005.03	138.72	120.83	141.35	169.66	122.80	125.62	2019.02	159.75	163.46	178.72	339.13	183.62	183.31
2005.04	140.83	127.23	145.58	179.15	128.41	132.04	2019.03	157.99	159.98	175.47	339.49	184.14	184.23
2006.01	144.23	134.90	153.13	183.09	133.07	137.03	2019.04	157.51	162.44	166.72	351.19	185.44	185.99
2006.02	145.44	140.48	153.34	195.68	136.32	140.08	2020.01	156.22	162.40	162.71	334.90	183.37	184.50
2006.03	149.38	147.04	158.89	214.61	138.25	141.80	2020.02	151.69	157.66	156.34	326.87	184.62	186.50
2006.04	151.88	149.68	162.53	215.11	142.58	144.43	2020.03	145.39	154.76	145.66	308.35	183.64	185.65
2007.01	151.34	149.90	166.75	222.21	146.34	147.59	2020.04	141.59	157.16	141.20	274.12	184.46	186.95
2007.02	154.59	156.44	174.52	232.71	150.26	151.37	2021.01	138.38	156.07	137.08	288.46	184.67	187.07
2007.03	157.32	152.65	178.26	230.41	156.34	159.13	2021.02	142.92	165.81	146.27	305.84	185.96	187.81
2007.04	155.88	151.94	182.35	233.54	158.03	161.42	2021.03	148.68	176.12	161.03	327.10	193.09	193.82
2008.01	158.35	145.27	176.21	235.48	159.19	165.68	2021.04	152.90	173.68	171.36	328.06	202.66	200.86
2008.02	159.58	144.33	172.51	240.33	159.10	166.58	2022.01	157.92	173.30	181.76	335.04	209.76	207.36
2008.03	156.00	143.66	166.46	233.50	158.10	163.19	2022.02	165.21	172.98	191.24	345.39	223.53	221.60
2008.04	156.92	141.52	160.80	225.64	159.52	166.00	2022.03	170.72	163.53	195.28	330.72	227.33	226.04

Source: Cornell Center for Real Estate and Finance

Hedonic hotel indices for large and small hotel transactions



	Hedonic Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Large Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q3	176.12				
2022Q2	172.98				
2022Q3	163.53	164.66	166.52	-0.15	-0.42
Quarter over Quarter	-5.5%				
Year over Year	-7.1%				
Small Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q3	148.68				
2022Q2	165.21				
2022Q3	170.72	152.43	154.37	1.88*	2.01*
Quarter over Quarter	3.3%				
Year over Year	14.8%				

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

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

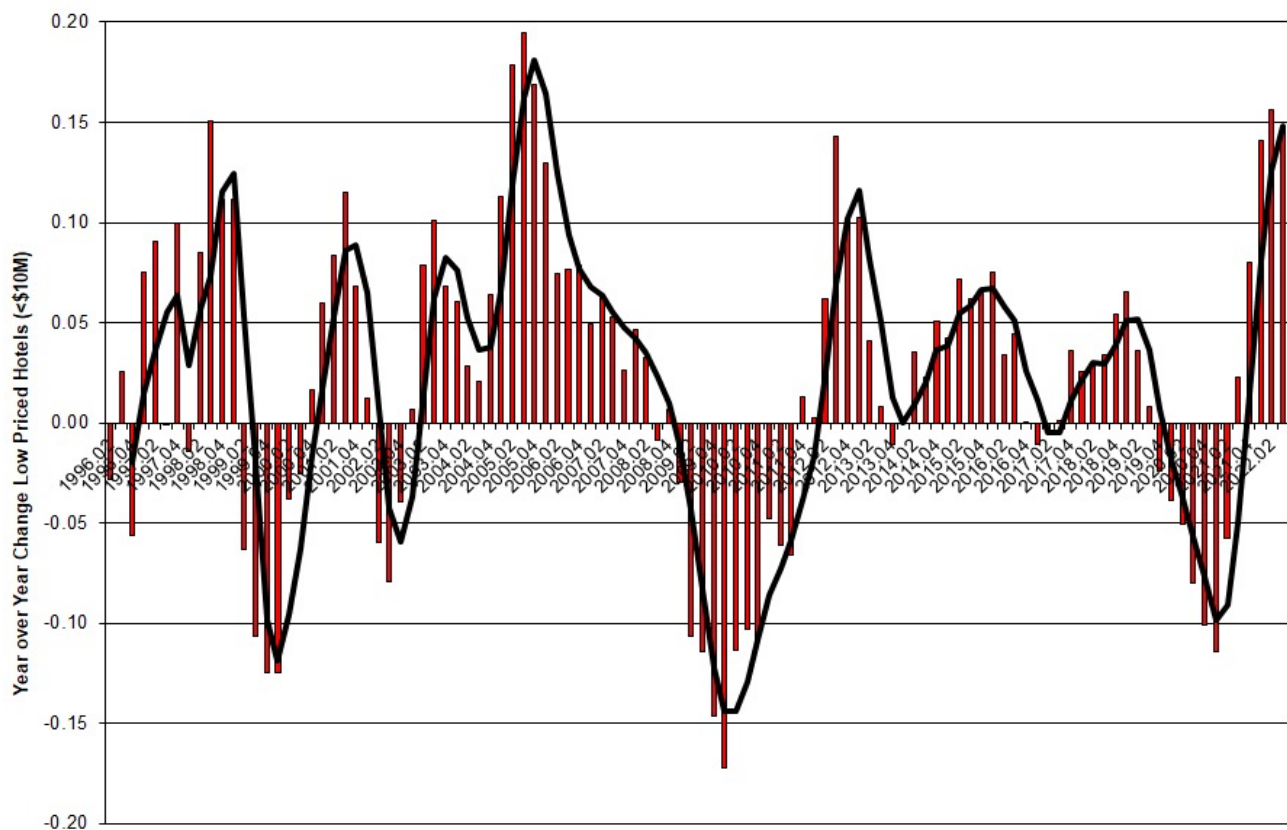
EXHIBIT 9**Year-over-year change in small-hotel index with a moving average trendline**

EXHIBIT 10

Moving average trendlines for large hotel index

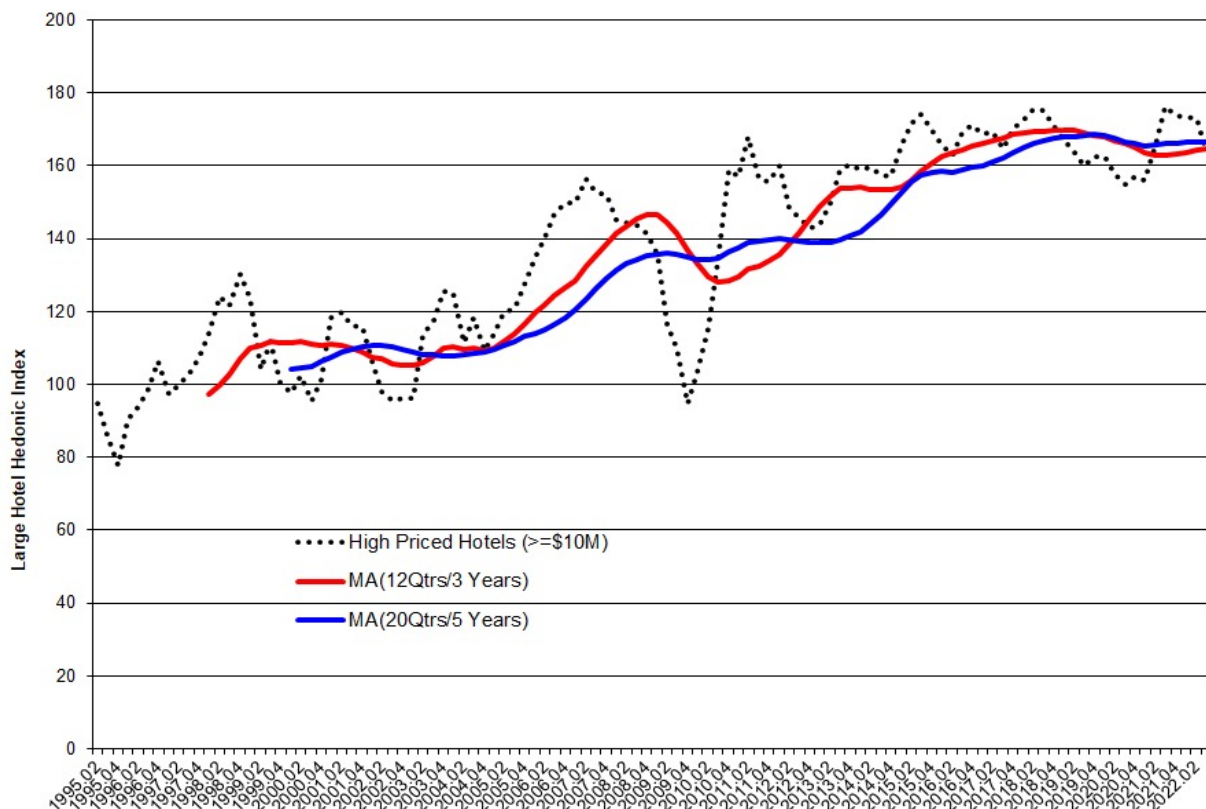


EXHIBIT 11

Moving average trendlines for small hotel index

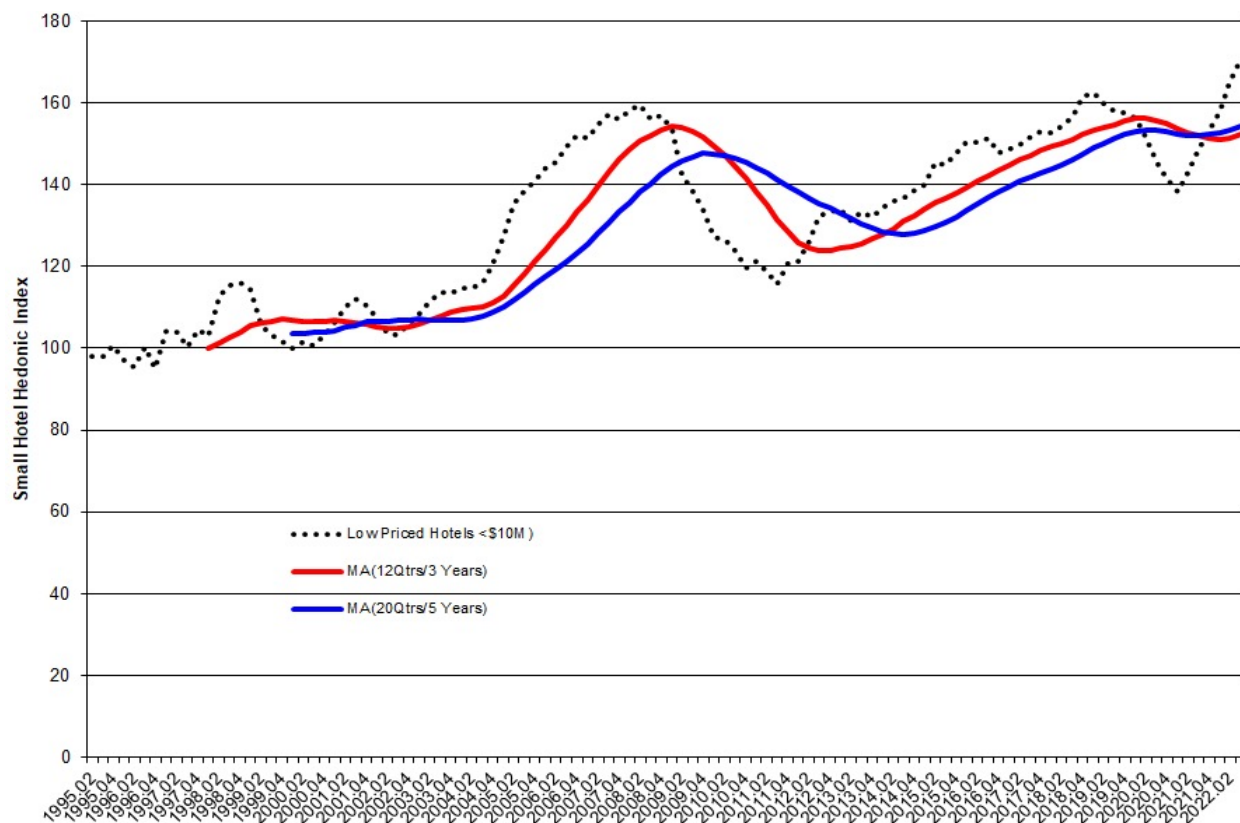
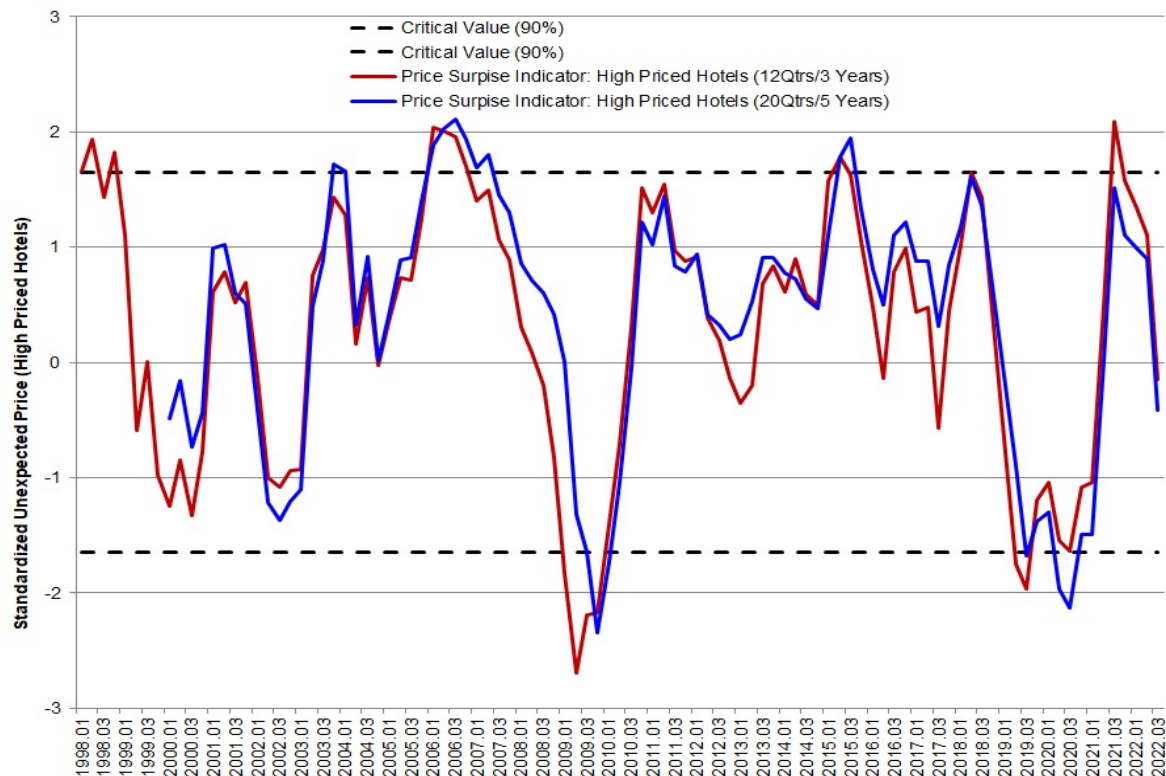


EXHIBIT 12

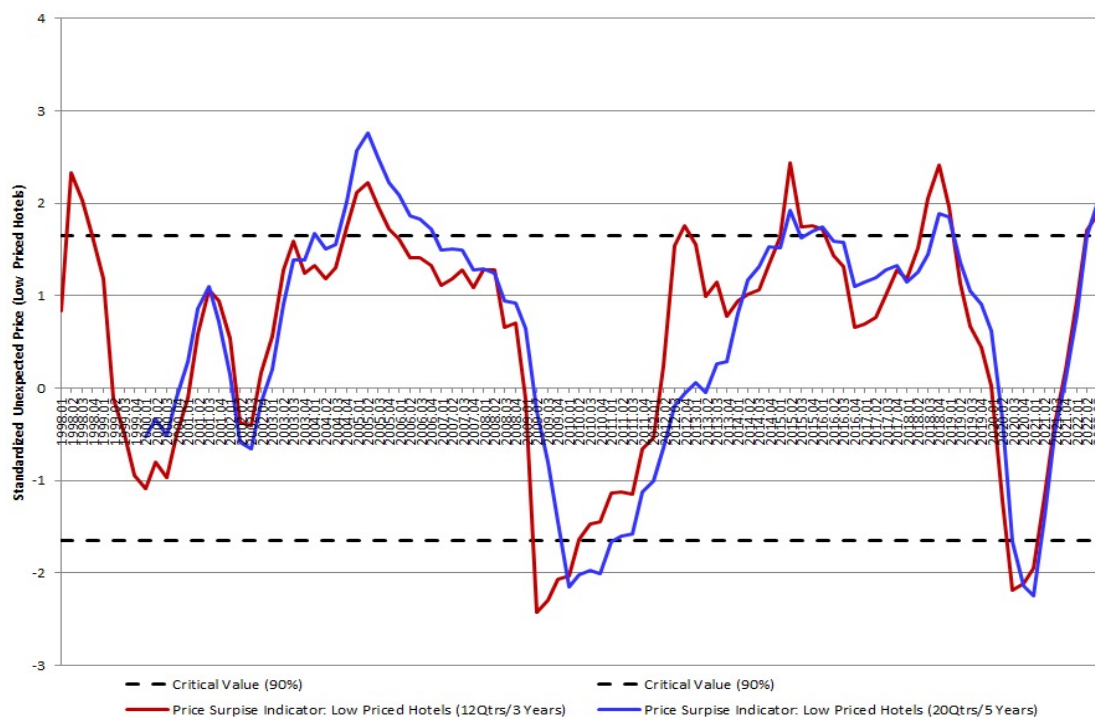
Standardized unexpected price (SUP) for large hotel index



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

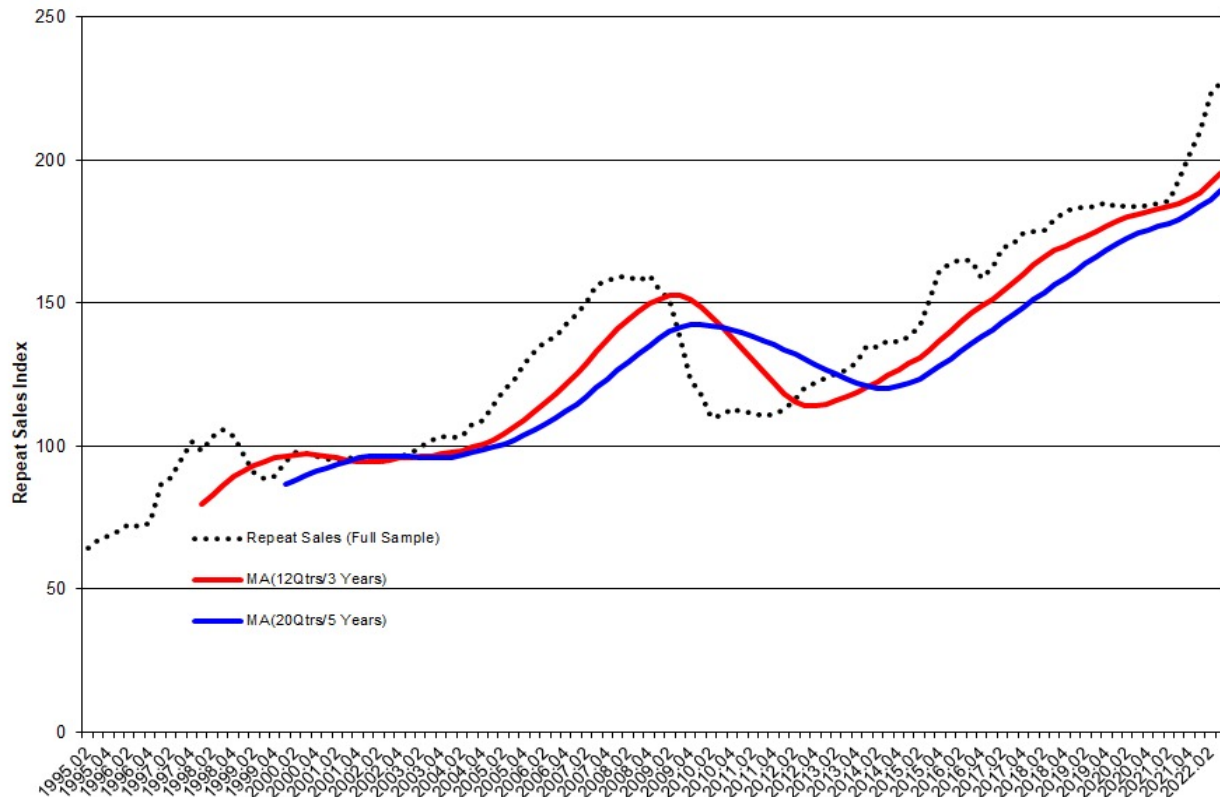
EXHIBIT 13

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

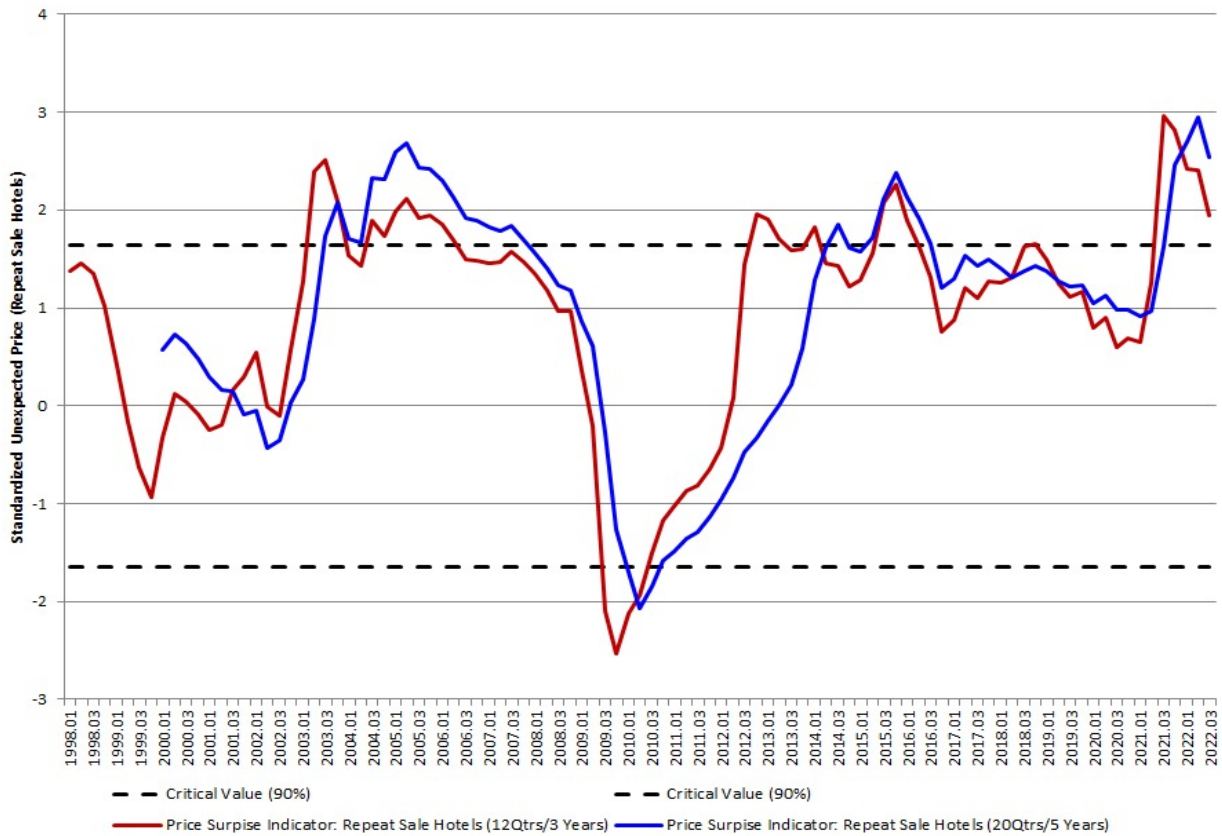


	Repeat Sale Price	Moving Average		Standardized Unexpected Price (Z-Score)	
Repeat Sale Hotels	Price	3 Year	5 Year	3 Year	5 Year
2021Q3	193.09				
2022Q2	223.53				
2022Q3	227.33	195.71	189.31	1.95*	2.54*
Quarter over Quarter	1.7%				
Year over Year	17.7%				

To gauge whether the price 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. Since the hedonic price for large hotels is below its moving averages, this indicates a technical sell signal for large hotels (i.e., $163.53 < 164.66$ and $163.53 < 166.52$). Smaller hotels in contrast remain a buy (that is, $170.72 > 152.43$ and $170.72 > 154.37$). To assess whether the price of a large or small hotel has reached a new statistical high or low, we use the statistical technique known as Z-scores (see Appendix) to standard-

ize prices so that the average price is at zero. If prices rise above 1.645, then this indicates a new statistical high. By the same token, if prices fall below -1.645, that indicates a new statistical low. Using this metric, the price of small hotels remains above its statistical high in terms of either a 3-year or a 5-year mean and standard deviation to calculate standardized prices. Exhibit 12 and Exhibit 13 show the standardized prices for large hotels and small hotels. Note that the standardized price of large hotels continues to hover around its mean.

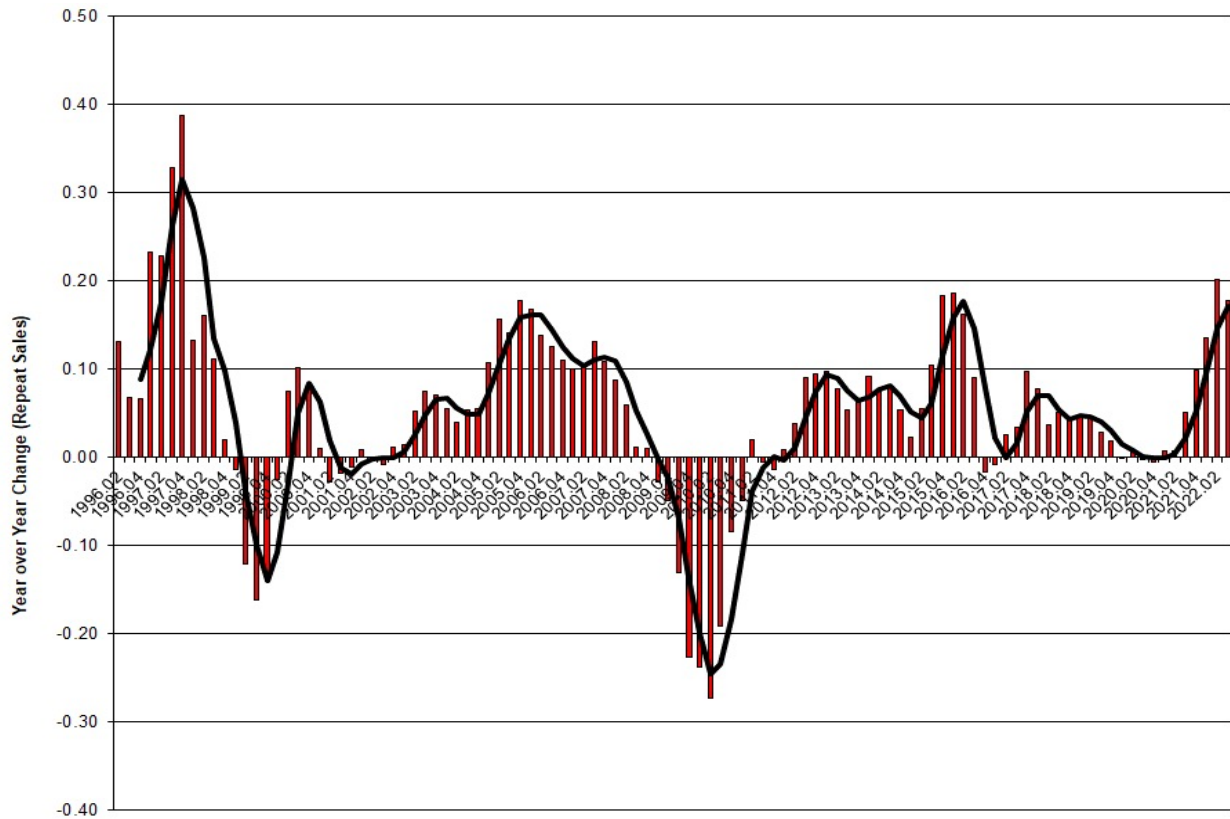
Moving average trend line for repeat-sale index



Repeat sales metrics: Prices remain above their moving average indicating a continued buy. Hotel prices continue to remain above statistical highs. Since most hotels that sell frequently tend to be small hotels, it is not surprising that hotels that tend to sell frequently (i.e., have repeat

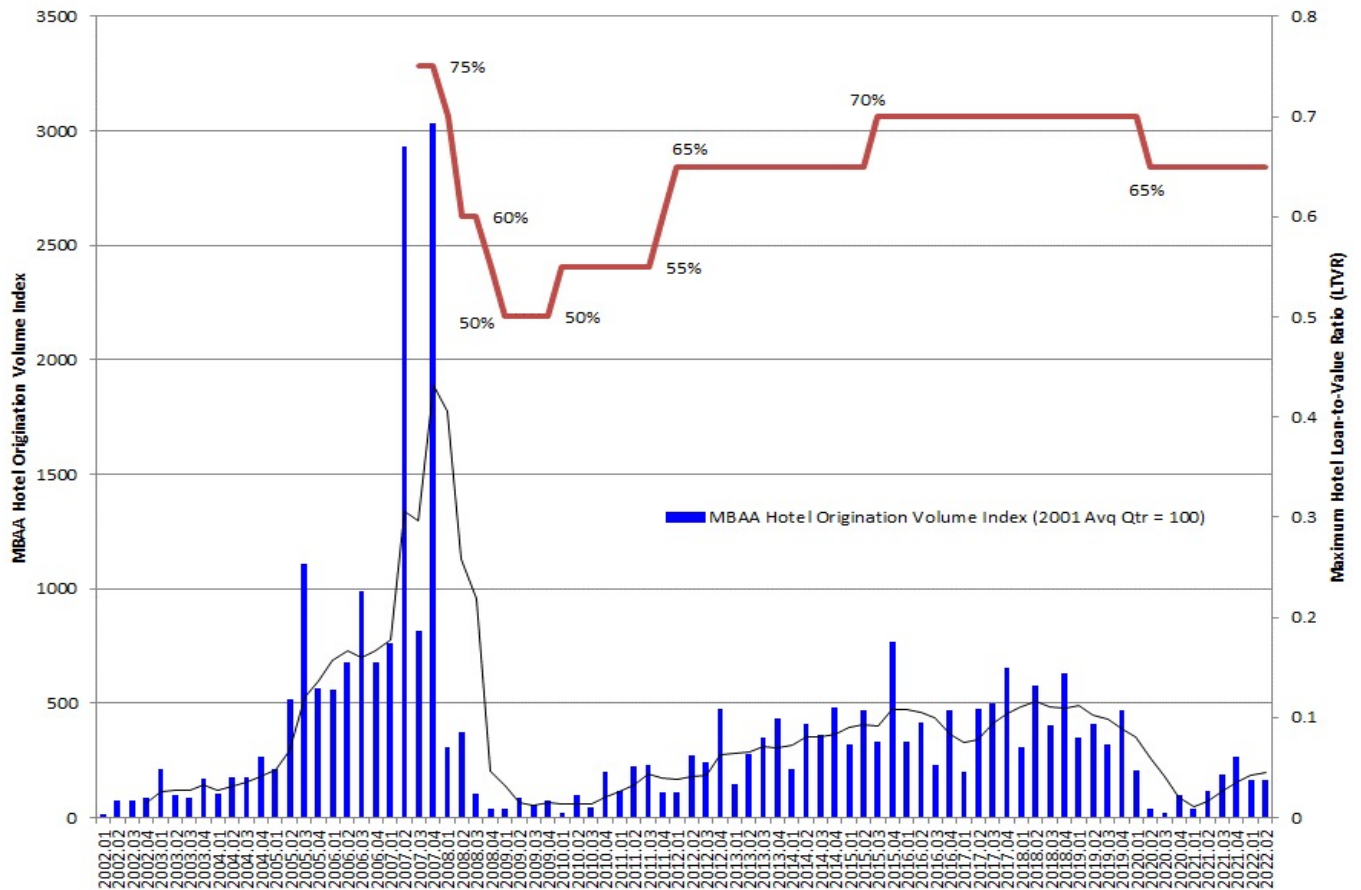
sales), rose in price this quarter (1.7%) as well as year over year (17.7%; see also Exhibit 16). Similar to small hotels, our repeat sale indicator continues to remain above both its short-term ($227.33 > 195.71$) and long-term ($227.33 > 189.31$) moving averages (see Exhibit 14), indicating that these ho-

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



tels continue to remain a buy opportunity. Our SUP performance metric in Exhibit 15 indicates that the standardized price, based both its 3-year moving average and its 5-year moving average, continues to remain above its statistical upper boundary.

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



MBAA Hotel Origination Volume Index (2001 Avg Qtr = 100)	
2021Q2	119
2022Q1	166
2022Q2	162
Quarter over Quarter	-2.4%
Year over Year	36.1%

Mortgage financing volume fell slightly for the most recent quarter. Exhibit 17 shows that the mortgage origination volume for hotels as reported for the second quarter of 2022 fell imperceptibly (-2%) this quarter.² However, this loan volume was still 36-percent ahead of the volume from a year earlier (year over year). The maximum loan to value (LTV) ratio for hotels remained at 65 percent.

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

Interest rates on Class A versus Class B & C hotels



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
September 2021	5.44%	5.64%	2.15%	2.25%	3.95%	4.15%
June 2022	7.33%	7.53%	2.09%	2.15%	4.40%	4.60%
September 2022	7.77%	7.97%	2.09%	2.15%	4.50%	4.70%
Quarter over Quarter	6.0%	5.8%	0.0%	0.0%	2.3%	2.2%
Year over Year	42.8%	41.3%	-2.7%	-4.4%	13.9%	13.3%

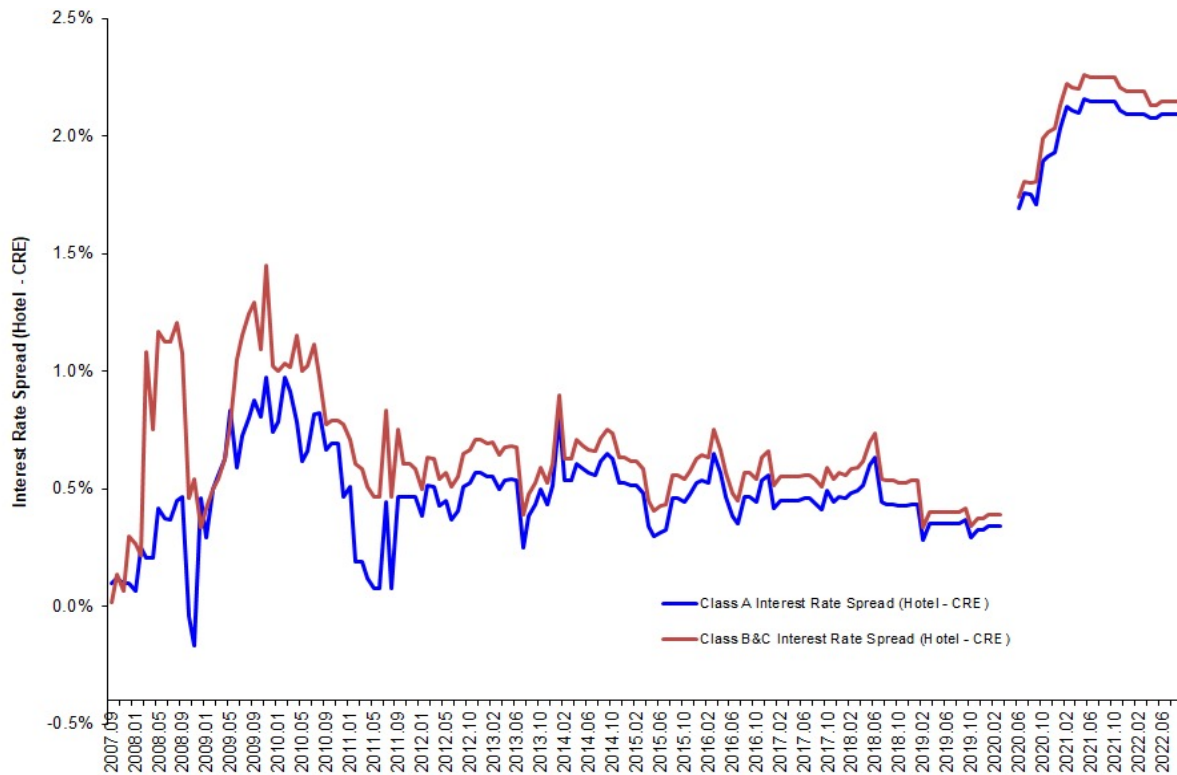
The cost of hotel debt financing rose sharply quarter over quarter, as well as year over year. Lenders are requiring relatively more compensation for hotel loans relative to other commercial real estate and also to the 10-year risk-free rate due to increased perceived risk. The cost of obtaining hotel debt financing, as reported by Cushman Wakefield Sonnenblick Goldman continued to rise this quarter as well as year over year.³ The interest rate

as of September 1, 2022, was 7.8 percent for full-service Class A hotels (up from 7.3% in June 2022), and almost 8.0 percent for Class B&C hotels (up from 7.5% in June). This represents a 6-percent increase in interest rates over a three-month period, and more than a 40-percent rise in hotel interest rates over the prior September period, when interest rates on Class A stood at 5.4 percent and those for Class B&C were 5.6 percent. This rapid rise in interest rates is worrisome, as it might hinder penciling hotel deals near term. Exhibit 18 displays the historical time series graph of hotel interest rates.

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 19

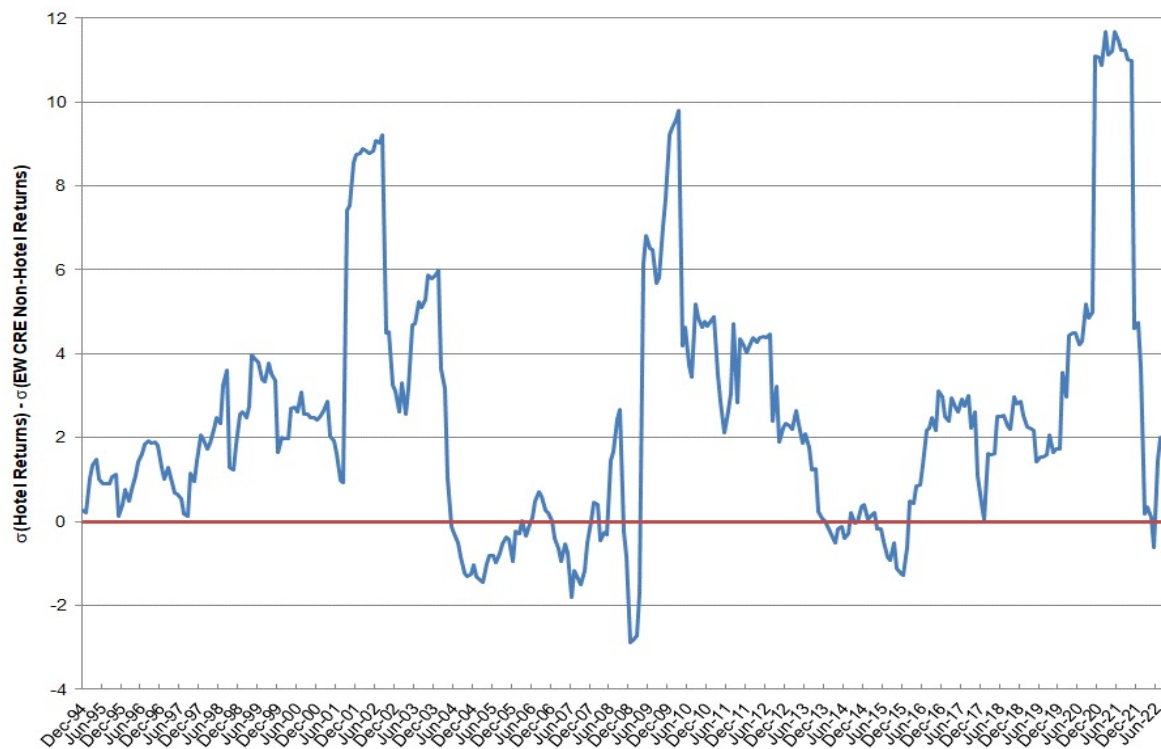
Interest rate spreads of hotels versus non-hotel commercial real estate



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

EXHIBIT 20

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



30-plus-day delinquency rate for hotels



Source: Trepp

					CMBS Spread on SASB (bps to swaps)							
					Fixed Rate			Floating Rate				
Date	Treas		Swap		Office		Retail	Indus		Hotel		
	5 Yr	10 Yr	5 Yr	10 Yr	AAA	BBB	AAA	AAA	BBB	AAA	BBB	
6/9/2020	0.40%	0.80%	0.45%	0.80%	140	285	280	135	245	210	395	
7/9/2020	0.30%	0.65%	0.30%	0.60%	115	250	265	105	220	180	345	
8/12/2020	0.30%	0.70%	0.35%	0.70%	105	240	257	95	190	182	350	

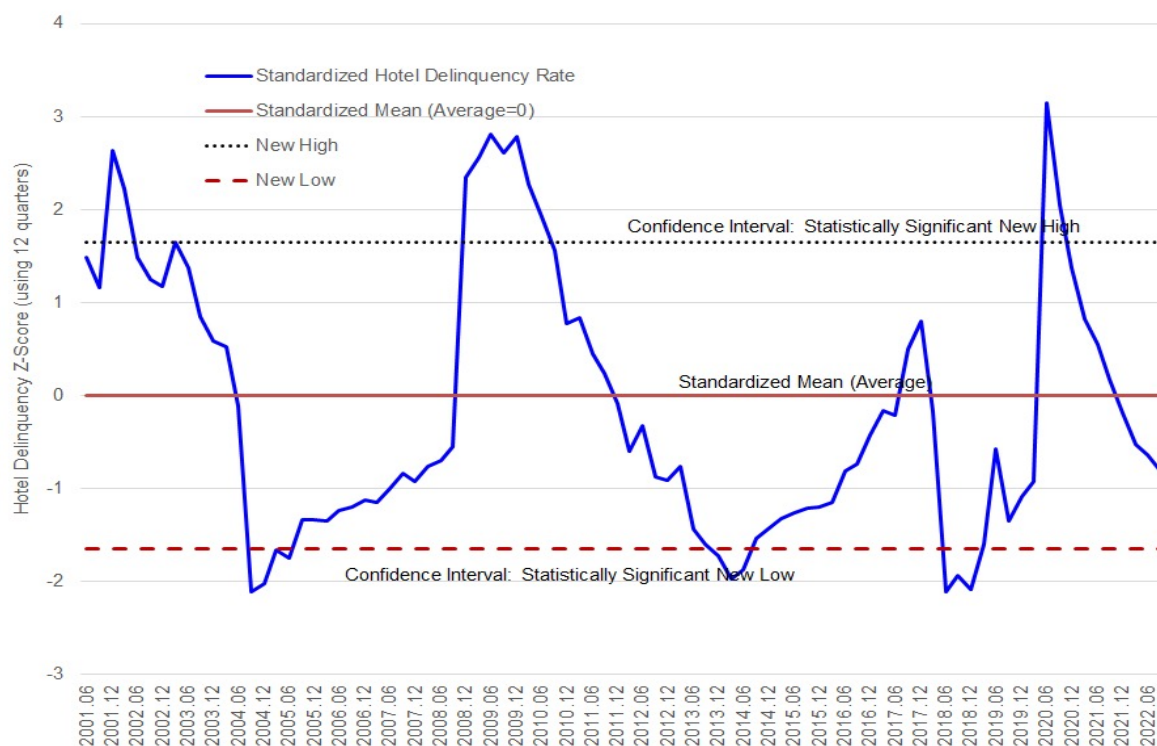
To evaluate the risk embodied in hotel interest rates, we compare the interest rate on hotels to those of other types of commercial real estate (CRE). The interest rate spreads for both higher quality (Class A) and lower quality (Class B&C) hotels have remained the same this quarter from the previous quarter, indicating that lenders are not demanding additional compensation to make hotel compared to loans on other major property types, even given the higher relative risk for hotels. To obtain further insights, we also compare the interest rate on hotels to the yield on a 10-year Treasury bond. The interest rate spread on this metric has widened slightly (by 10 basis points) for both Class A and Class B&C hotels: from 4.4 percent to 4.5 percent for Class A, and from 4.6 percent to 4.7 percent for

Class B&C. Thus we see that lenders are requiring somewhat higher compensation relative to the risk-free rate.

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).⁴ The risk differential, which should reflect the risk that is unique to hotel properties, is currently at 1.96 percent ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 9.63\% - 7.67\%$) up from 1.45 percent ($\sigma_{\text{Hotel}} - \sigma_{\text{CRE}} = 7.85\% - 6.39\%$) in the prior quarter. This indicates that the perceived default risk for hotels continues to climb relative

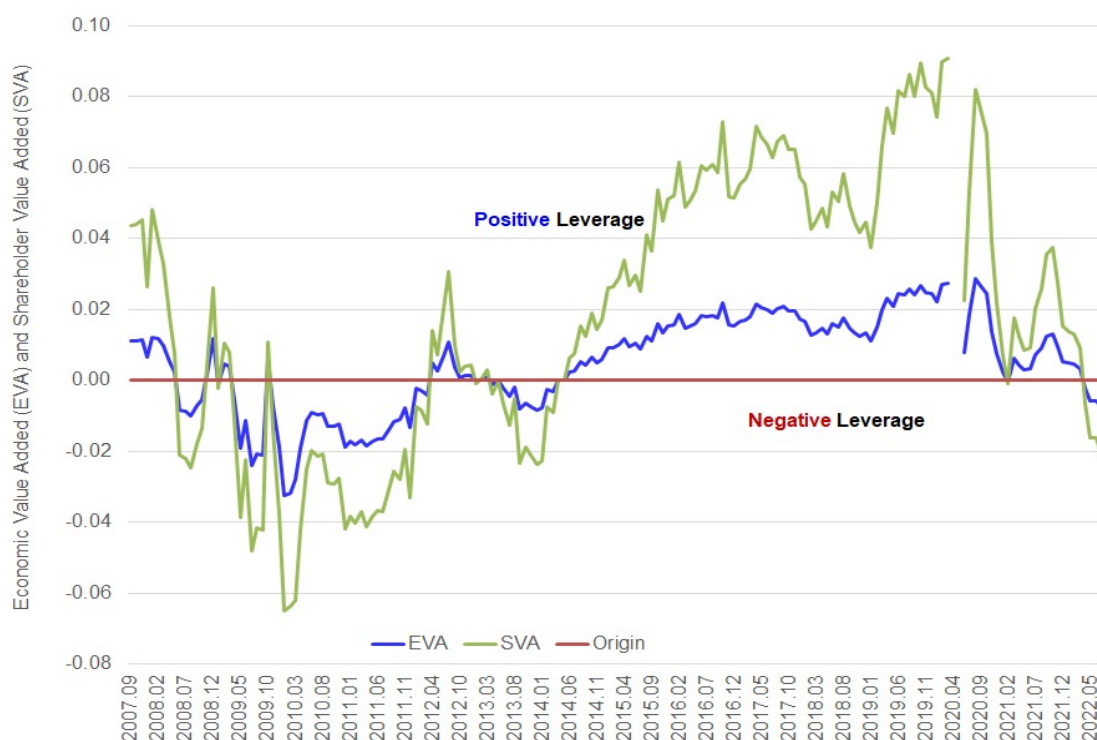
⁴ We calculate the total risk for hotel REITs using a 12-month rolling window of monthly returns on hotel REITs.

Standardized 30-plus-day delinquency rate for hotels



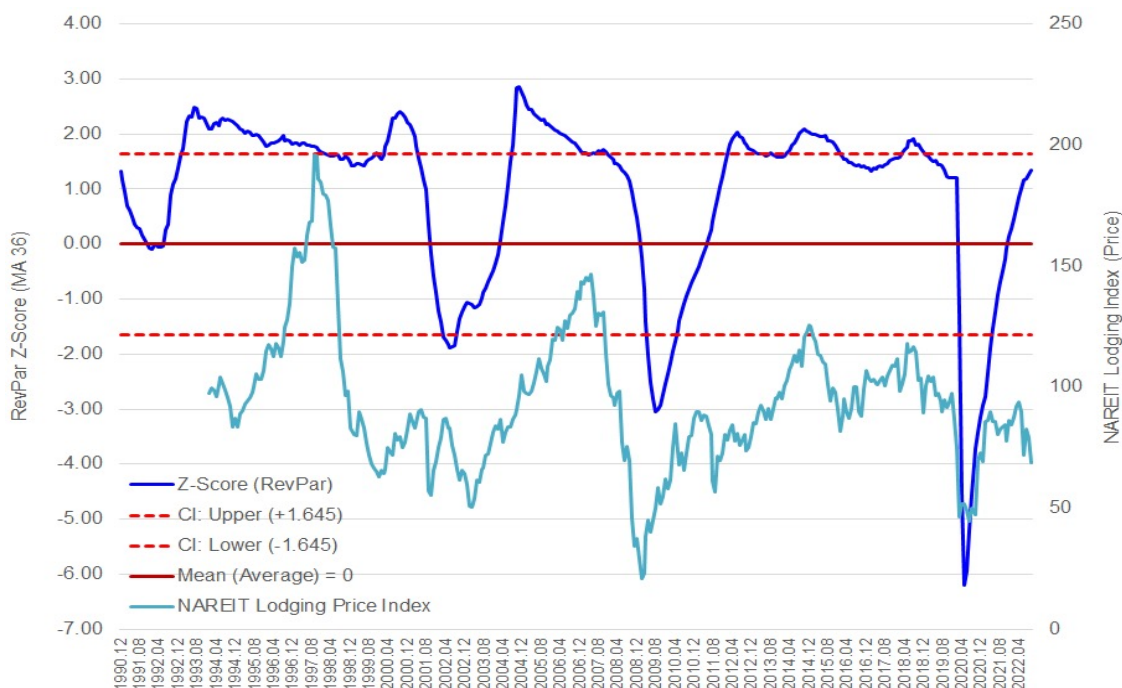
Source: Trepp

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

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
August 2021	8.52%	7.62%	.90%	11.8%	9.23%	2.57%
March 2022	8.05%	7.74%	.32%	9.85%	8.94%	.91%
June 2022	8.27%	8.84%	-.57%	8.14%	9.78%	-1.64%
August 2022	8.09%	8.75%	-.65%	7.80%	9.66%	-1.87%

to other major types of commercial real estate. Given the perceived risk, the cost of financing for hotels should be pricier for hotels relative to other major property types.

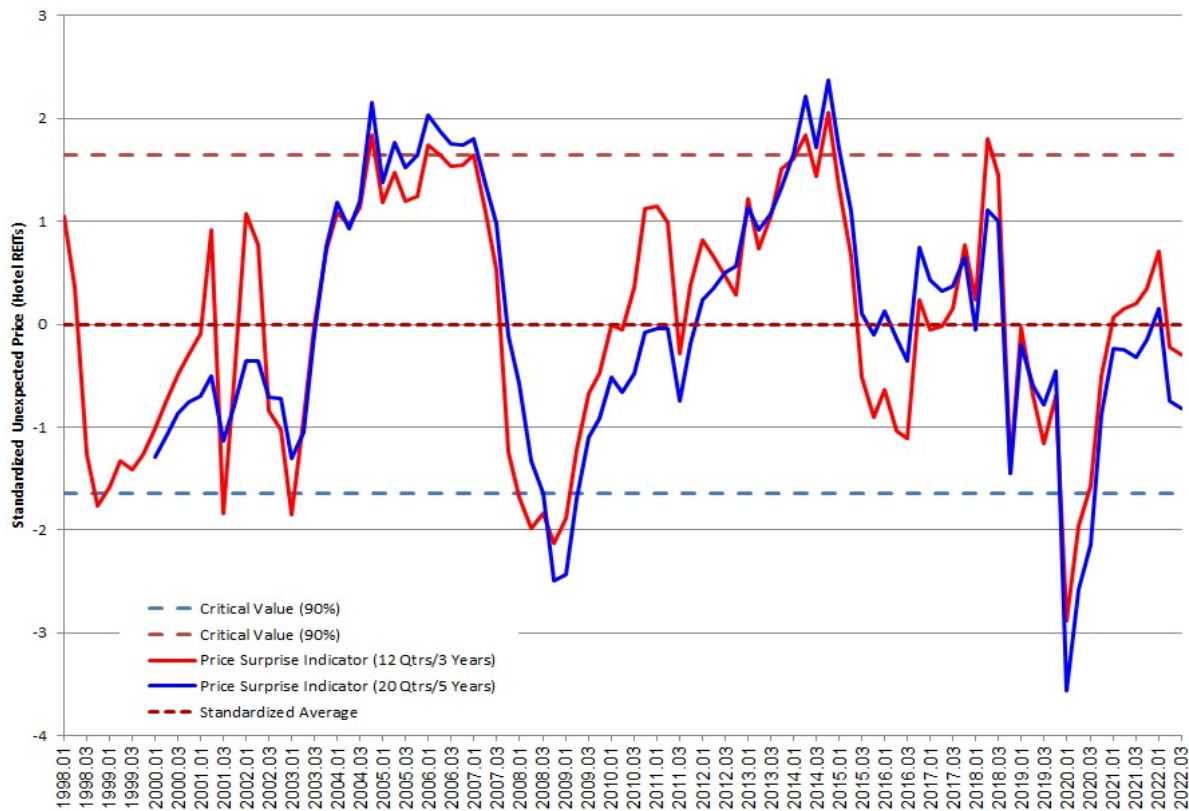
The delinquency rate on hotel loans continues to decline toward its pre-pandemic level. The CMBS delinquency rate (30+ days) for lodging properties in September was 5.02 percent, down from 5.94 percent in the previously measured quarter (June 2022) and 11.45 percent in the previous year (September 2021). 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 5.02-percent hotel delinquency rate is lower than the retail delinquency rate of 6.61 percent, but higher than all other property types, including office (1.58%), multifamily (.93%), and industrial (.43%). The continued slide in hotel delinquencies and also retail delinquencies this quarter mimic the decline in delinquencies for all other property types. 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.

Cost of borrowing exceeds return for hotels. Our economic value added (EVA) or economic profit is -.65 percent, while the shareholder value added stands at -1.87 percent. Both the EVA and SVA continue to decline. 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, where 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.

Our reading of the tea leaves suggests we should see slower to 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, increasing from 1.17 in June to 1.33 in September (as shown in Exhibit 24). However, not only has the NAREIT Lodging Price Index continued to decline (from 72.11 to 68.8), but also the standardized

EXHIBIT 25

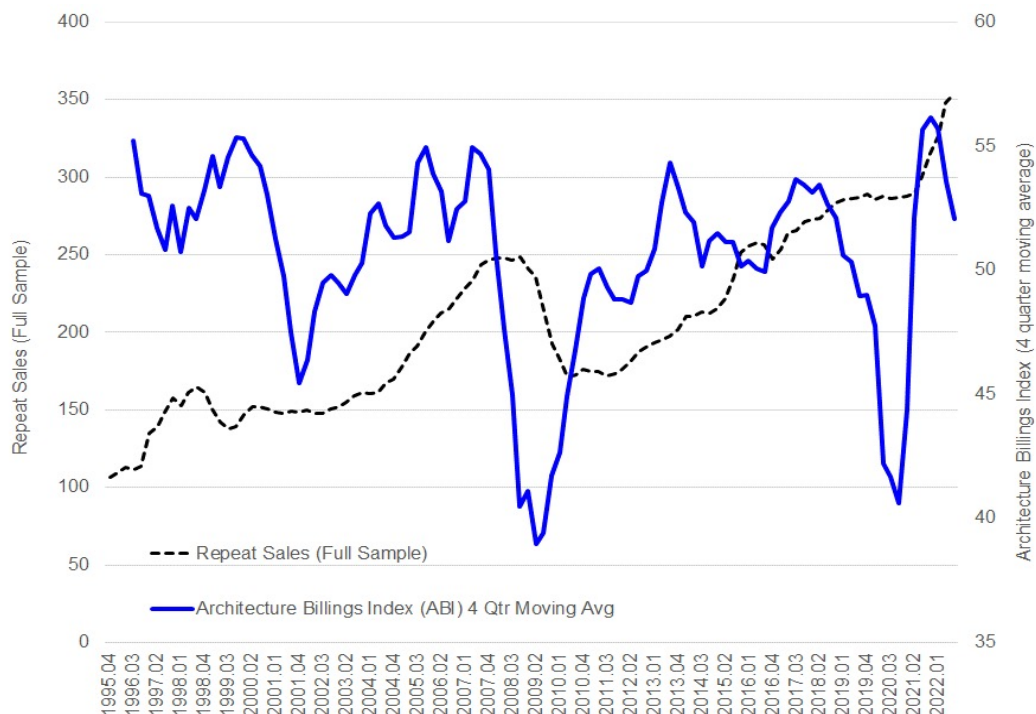
Standardized unexpected NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

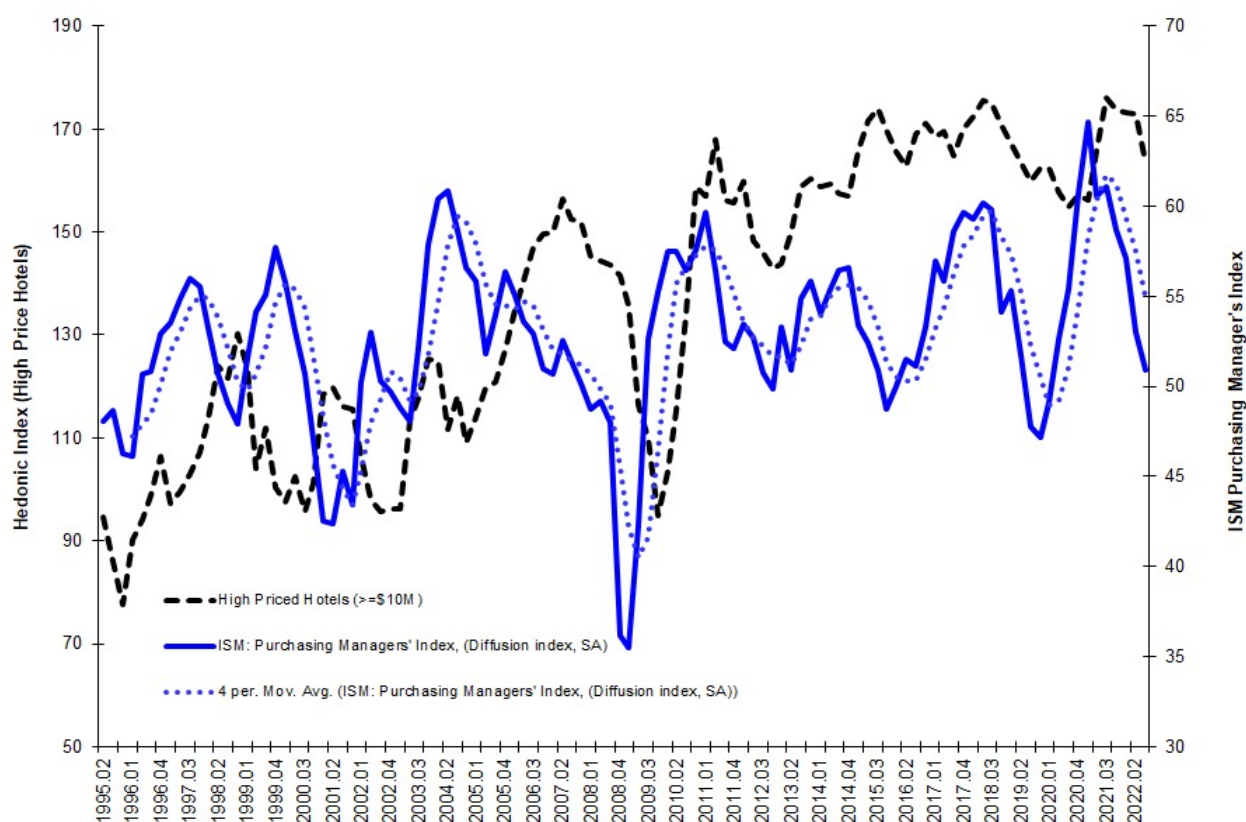
EXHIBIT 26

Repeat sales index versus the architecture billings index



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
 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: NAPM, Cornell Center for Real Estate and Finance Center for Real Estate and Finance

unexpected price of the NAREIT Lodging Index has fallen below its standardized average of zero and is currently negative ($z = -.297$), as Exhibit 25 depicts. We therefore expect our hotel price index based on repeat sales to fall near term.

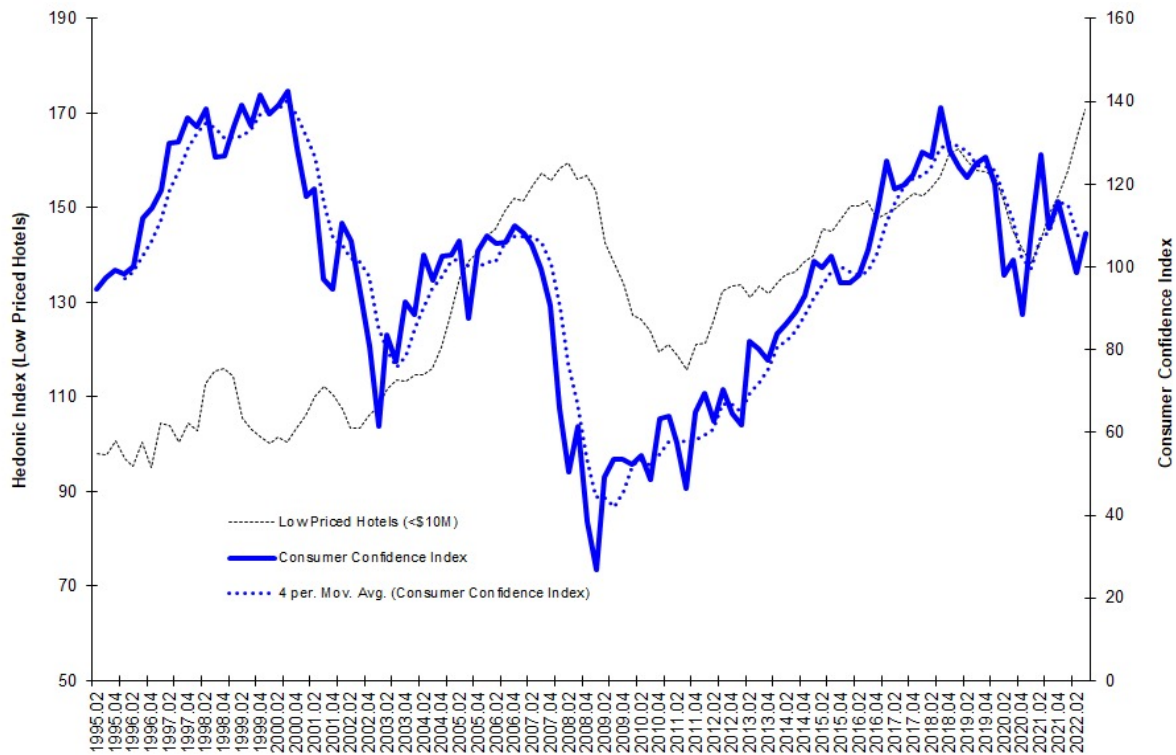
While the architecture billings index (ABI) for commercial/industrial property (shown in Exhibit 26) declined 2.5 percent this quarter (based on the August 2022 report), it also fell almost 11 percent from the prior year.⁵ Based on the moving average of the ABI index, we should expect price momentum to trend downwards in the next period.

⁵ www.aia.org/practicing/economics/aias076265

The National Association of Purchasing Managers (NAPM) index shown in Exhibit 27, an indicator of anticipated business confidence, fell 4 percent quarter over quarter, compared to a 7.2-percent decline in the previous quarter-to-quarter period.⁶ It also declined 16.7 percent year over year, down from the 12.5-percent year-over-year decrease in the prior period. Expect the prices of more expensive hotels to decline in near term.

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.

Consumer confidence and low-price hotels



Sources: Conference Board, Cornell Center for Real Estate and Finance 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 9.4 percent this quarter, although it decreased 1.2 percent year over year. Expect the prices of small hotels to rise near term.

We also look at the expected growth rate in Wall Street analysts' earnings (revenue) estimates for hotel REITs, both in terms of next-quarter earnings per share (EPS) and annual EPS.⁷ As shown by the averages in Exhibit 29, analysts are expecting the quarterly EPS growth rate to rise between 138 percent (median) and 285 percent (mean). They further expect annual EPS growth rate to rise between 215 percent (median) and 575 percent (mean). Since analysts' estimates reflect the earnings guidance from management, this suggests that we should expect prices to rise, in view of continued positive guidance regarding the EPS. This is the opposite of what our other indicators are indicating. ■

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).

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

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%
2022Q3	137.7%	285.0%	487.9%	11.8%	1900.0%

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%
2022Q3	215.0%	574.8%	848.7%	112.1%	3100.0%

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%
2022Q3	39.3%	38.6%	14.3%	18.1%	65.2%

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%
2022Q3	58.1%	59.8%	20.3%	29.6%	88.3%

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.

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

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

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

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

Arthur Adler '78
Chairman, CREF
President
Adler Hotel Advisors LLC

Jun Ahn MPSRE '00
CEO, Core Value, and Managing Director of
Real Estate Division
YIDO

Bob Alter '73
President
Seaview Investors LLC

Richard Baker '88
Governor and Executive Chairman
Hudson's Bay Company (HBC)

Michael Barnello '87
Former President & CEO
LaSalle Hotel Properties

Kenneth M. Blatt '81
Principal
CPG Real Estate

Robert Buccini A&S '90
Co-president
The Buccini/Pollin Group

Marty Burger P '17, P '20
Chief Executive Officer
Silverstein Properties

Adam Burinescu CALS '03
Managing Director
Centerbridge Partners

Rodney Clough '94
Managing Partner
HVS

Howard Cohen '89
Chief Executive Officer
Atlantic | Pacific Companies

Kevin Davis
Senior Managing Director—Hotels and
Hospitality Group
JLL

Navin Dimond P '14, P '19
Chairman and CEO
Stonebridge Companies

Adam Docks
Partner and Firmwide Co-chair,
Hotels and Leisure Industry Group
Perkins Coie LLP

Joel Eisemann, MPS RE '80
Chief Development Officer, The Americas
InterContinental Hotels Group (IHG)

Habib Enayetullah
SVP for Real Estate and Asset Management
Hilton Worldwide

Russell Galbut '74
Managing Principal
Crescent Heights

Nolan Hecht '97
Senior Managing Director and Head of Real Estate
Certares Management LLC

Kate Henrikson '96
SVP, Investment and Portfolio Analysis
RLJ Lodging Trust

Faron A. Hill, MBA '20
Founder and President
Peregrine Oak

Kenneth Himmel '70
President and CEO
Related Urban
Co-managing Partner
Gulf Related

David Hirschberg
Managing Director
H.I.G. Realty Partners

Jeffrey Horwitz
Senior Partner, Co-head of Private Equity Real
Estate
Proskauer LLP

David Israel '09
Senior Vice President, CHA
hotelAVE

Dana Jacobsohn '92
Senior Vice President, Global Mixed-use
Development
Marriott International, Inc.

David Jubitz '04
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Managing Partner
Brookfield Real Estate Group

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Cornell SC Johnson College of Business
Cornell Peter and Stephanie Nolan School of Hotel Administration
Statler Hall
Ithaca, NY 14853
607-254-3383 • www.chr.cornell.edu

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