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First Quarter 2020: Gird Your Loins

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First Quarter 2020: Gird Your Loins

Abstract

Hotels in all regions experienced negative price momentum this quarter with hotels in the New England area having the worst price performance. Hotels located in gateway cities were especially hard hit. Hotel financial operating performance based on economic value analysis (EVA) has turned negative, indicating that hotel returns are coming primarily from future price appreciation. The prices of large and small hotels have both trended downwards toward their long run average from the perspective of our moving average trendlines and standardized unexpected price performance metrics. The cost of hotel debt financing has fallen this quarter while the cost of equity financing has increased, making it costlier to borrow equity capital. In terms of risk premiums, the risk premium for hotels has risen compared to the risk-free rate. Besides this, the relative risk premium that lenders require for hotels over and above other commercial real estate has also increased, indicating that lenders are demanding a higher compensation for originating hotel loans. A reading of our tea leaves suggests that both large and small hotels are expected to decline in price. This is report number 34 of the index series.

Keywords

Cornell Hotel Indices, economic value analysis (EVA), hotel prices, hedonic hotel index, gateway cities

Disciplines

Real Estate

Comments

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Cornell Hotel Indices: First Quarter 2020

Gird Your Loins

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

Hotels in all regions experienced negative price momentum this quarter with hotels in the New England area having the worst price performance. Hotels located in gateway cities were especially hard hit. Hotel financial operating performance based on economic value analysis (EVA) has turned negative, indicating that hotel returns are coming primarily from future price appreciation. The prices of large and small hotels have both trended downwards toward their long run average from the perspective of our moving average trendlines and standardized unexpected price performance metrics. The cost of hotel debt financing has fallen this quarter while the cost of equity financing has increased, making it costlier to borrow equity capital. In terms of risk premiums, the risk premium for hotels has risen compared to the risk-free rate. Besides this, the relative risk premium that lenders require for hotels over and above other commercial real estate has also increased, indicating that lenders are demanding a higher compensation for originating hotel loans. A reading of our tea leaves suggests that both large and small hotels are expected to decline in price. This is report number 34 of the index series.

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



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Cornell Hotel Indices: First Quarter 2020

Gird Your Loins

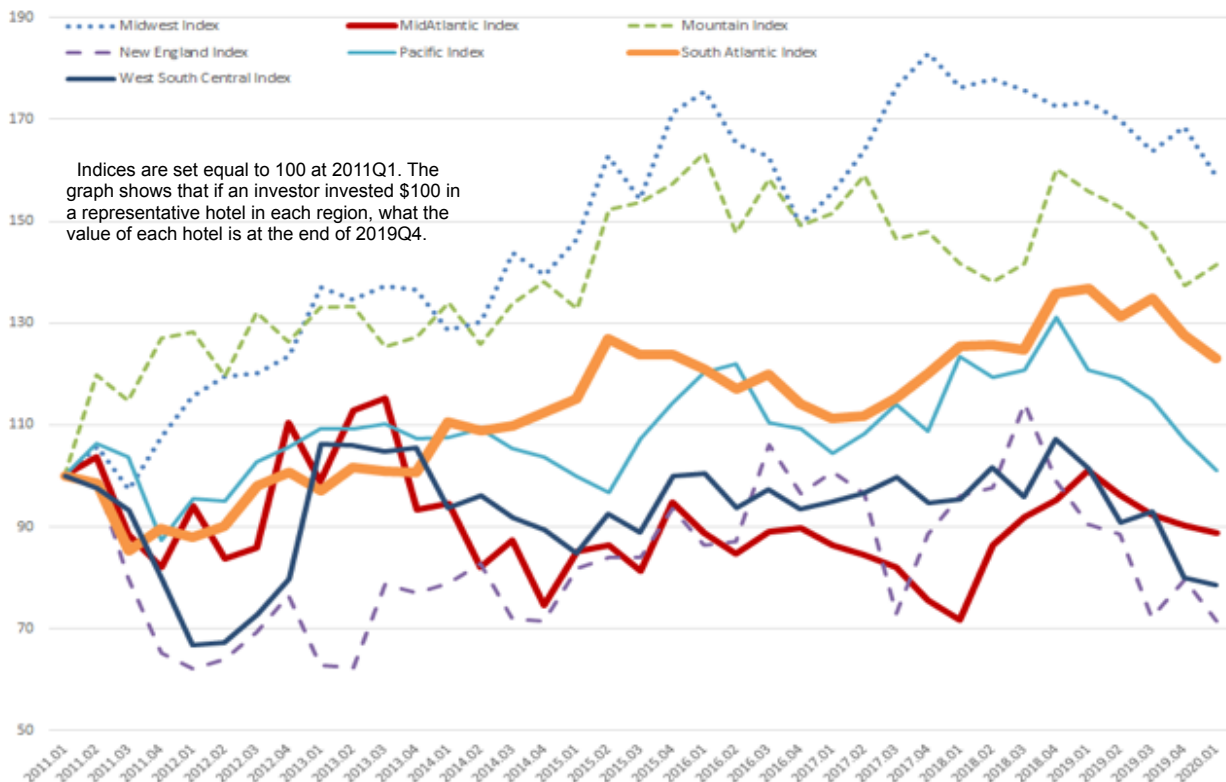
by Crocker H. Liu, Adam D. Nowak, and Robert M. White, Jr.

Analysis of Indices through Q1, 2020

Hotels in all regions exhibited **negative price momentum**. Exhibits 1a and 1b show that in the most recent quarter (2020Q1), hotels in the New England region (that is, hotels in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont) had the worst price performance, declining 10.3 percent quarter over quarter (and dropping 21.2 percent year over year).

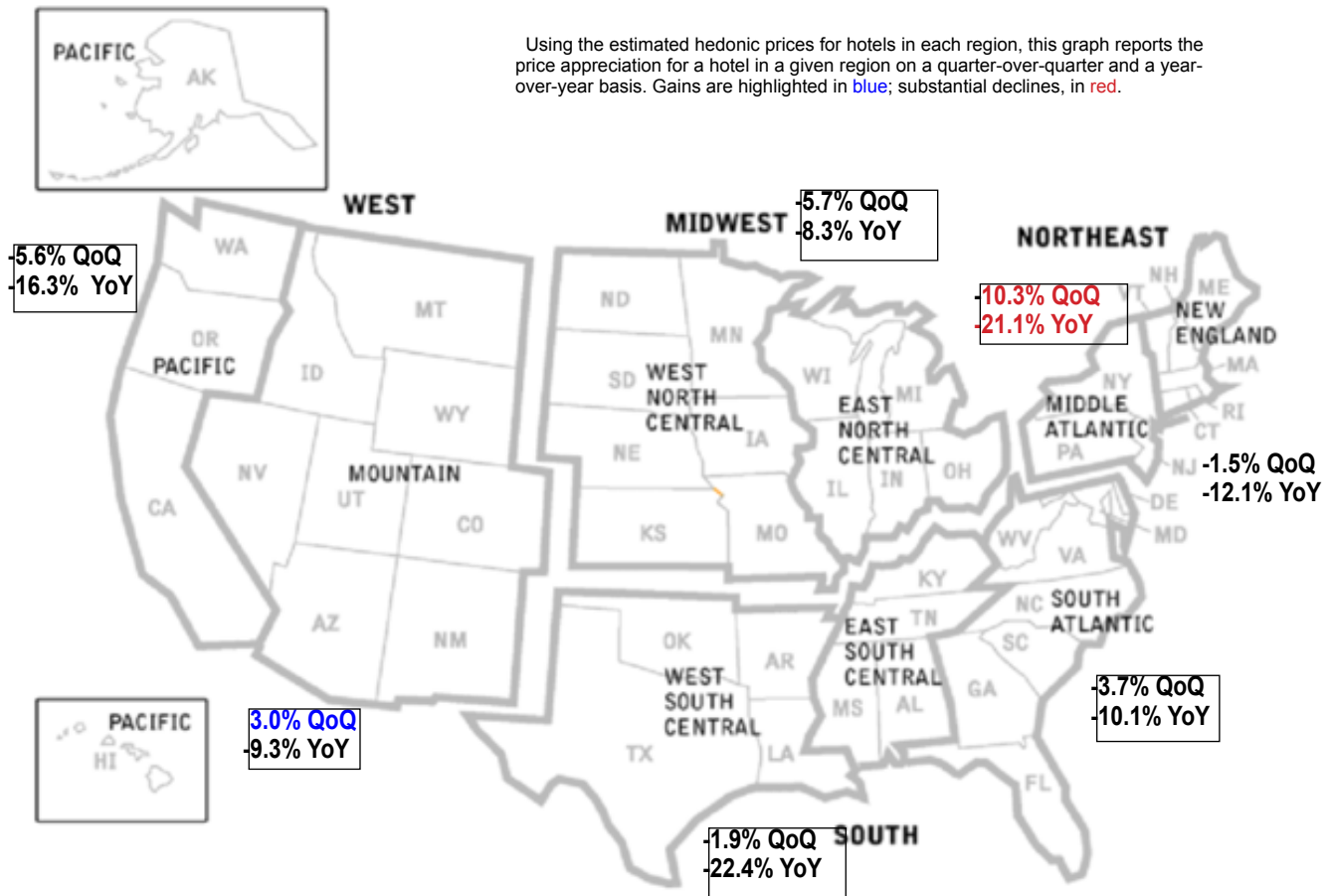
EXHIBIT 1A

Times series hotel performance for 7 regions (post-recession)



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

Cross-section hotel performance for 7 regions (post-recession)



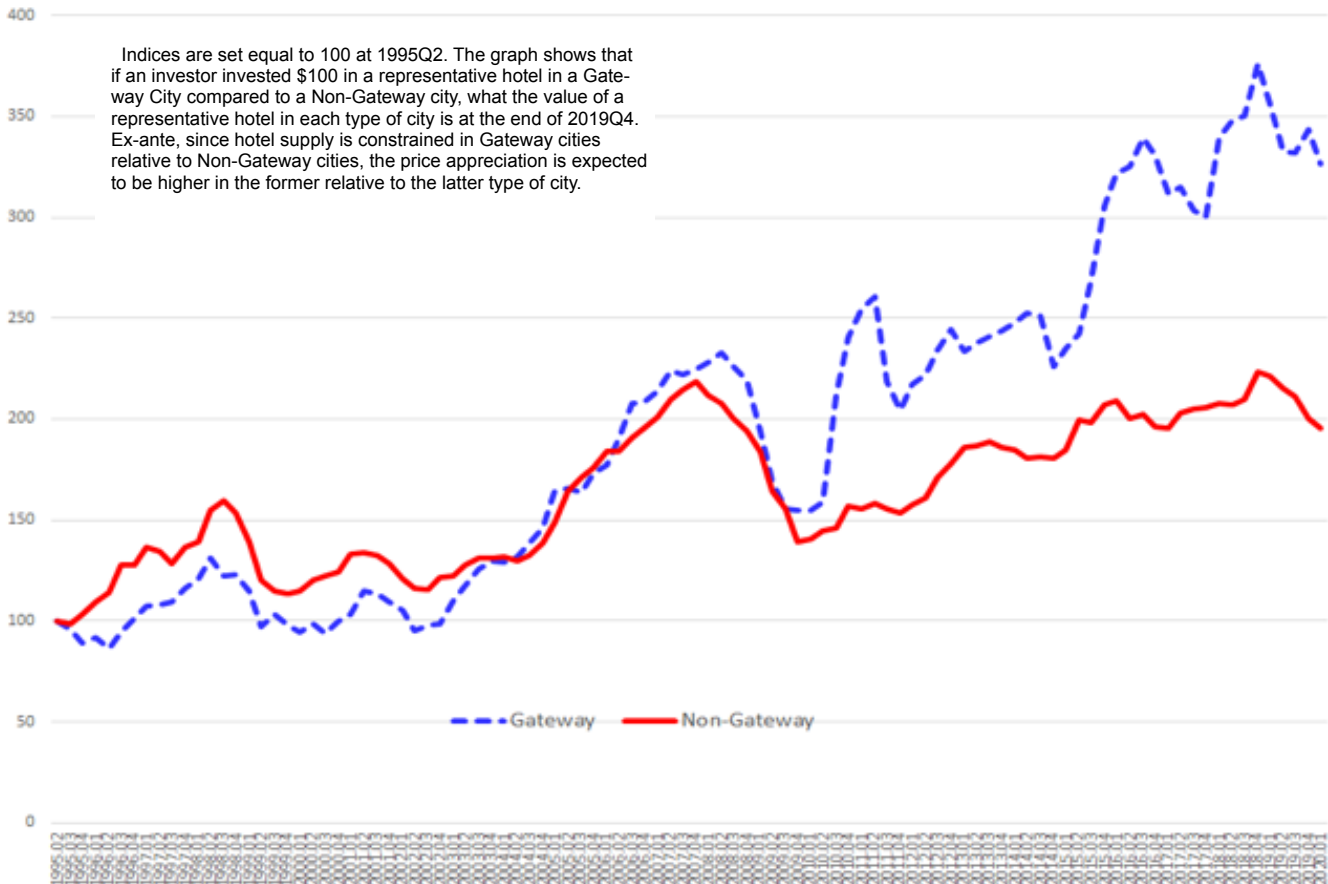
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Although hotels in the Mountain states were the only region that experienced a positive quarter-over-quarter price performance (gaining 3%), all hotels experienced price declines on a year-over-year basis, continuing the downward trend from the previous quarter. While the decline is partly due to Covid-19, rising unemployment in February appears to account for a larger portion of this decline as the following correlation table shows.¹

Correlation with the Change in Hotel Prices	Q-o-Q	Y-o-Y
February 2020 Unemployment	.46	.09
CoVid19 Cases (%)	.17	.20

¹ <https://www.bls.gov/news.release/laus.nr0.htm>

Hotel performance for gateway cities versus non-gateway cities

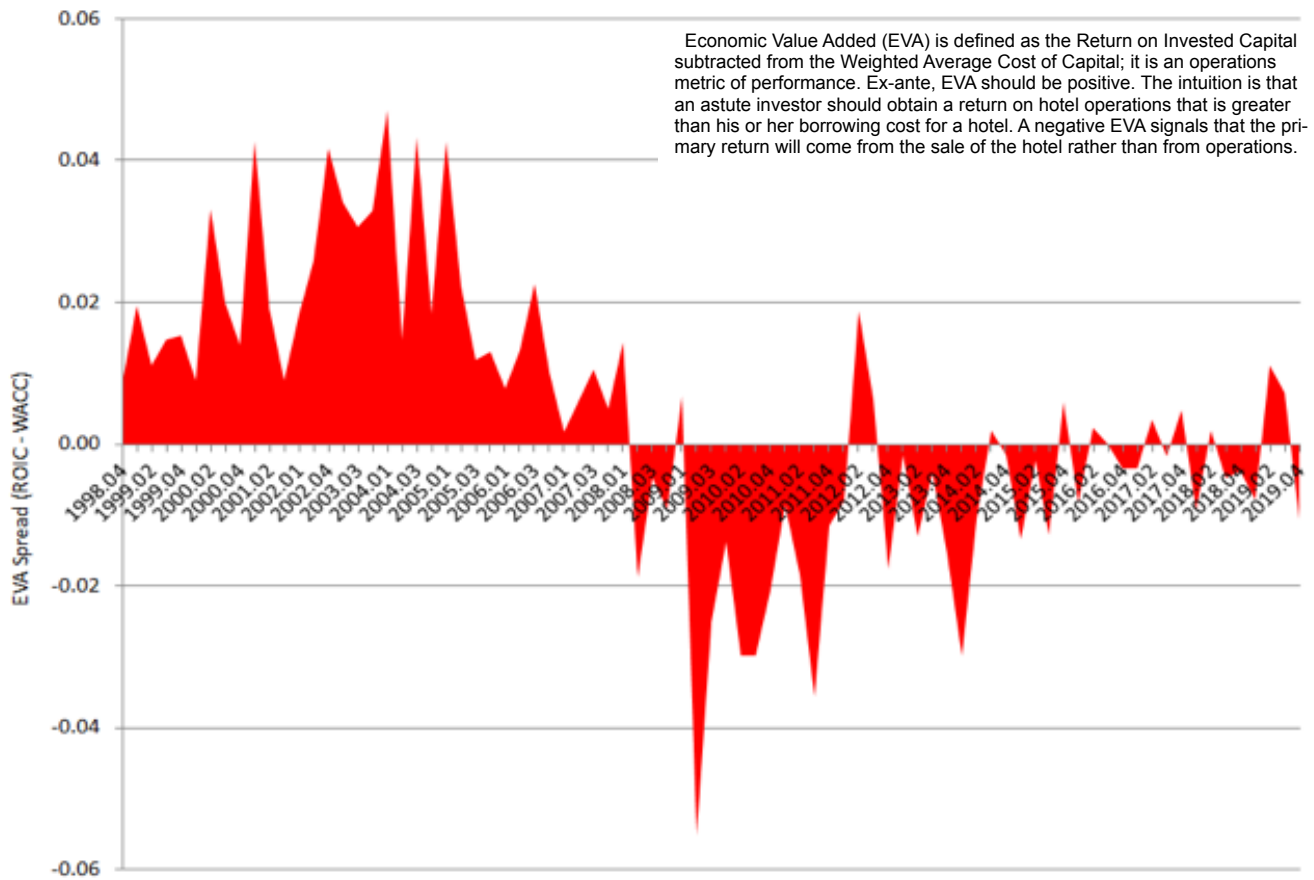


Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

The performance of hotels in gateway cities declined more than those in non-gateway cities this quarter. Exhibit 2 shows the relative price performance for hotels sold in gateway cities versus those in non-gateway cities. The price performance of hotels in gateway cities fell almost 5 percent compared to the 2.5-percent decline of hotels in non-gateway cities. Year-over-year however, the price of hotels in gateway cities fell 8.3 percent, and those in non-gateway cities fell 11.5 percent, continuing the nega-

tive momentum in the prior year-over-year periods (that is, a drop in gateway cities of 8.7 percent in 2019Q4, on top of a 5-percent drop in 2019Q3; and for non-gateway cities, a 10.2-percent decline in 2019Q4 after a .6-percent rise in 2019Q3). This makes intuitive sense since gateway cities such as New York City and Chicago are larger and denser and therefore are more likely to be harder hit by Covid-19.

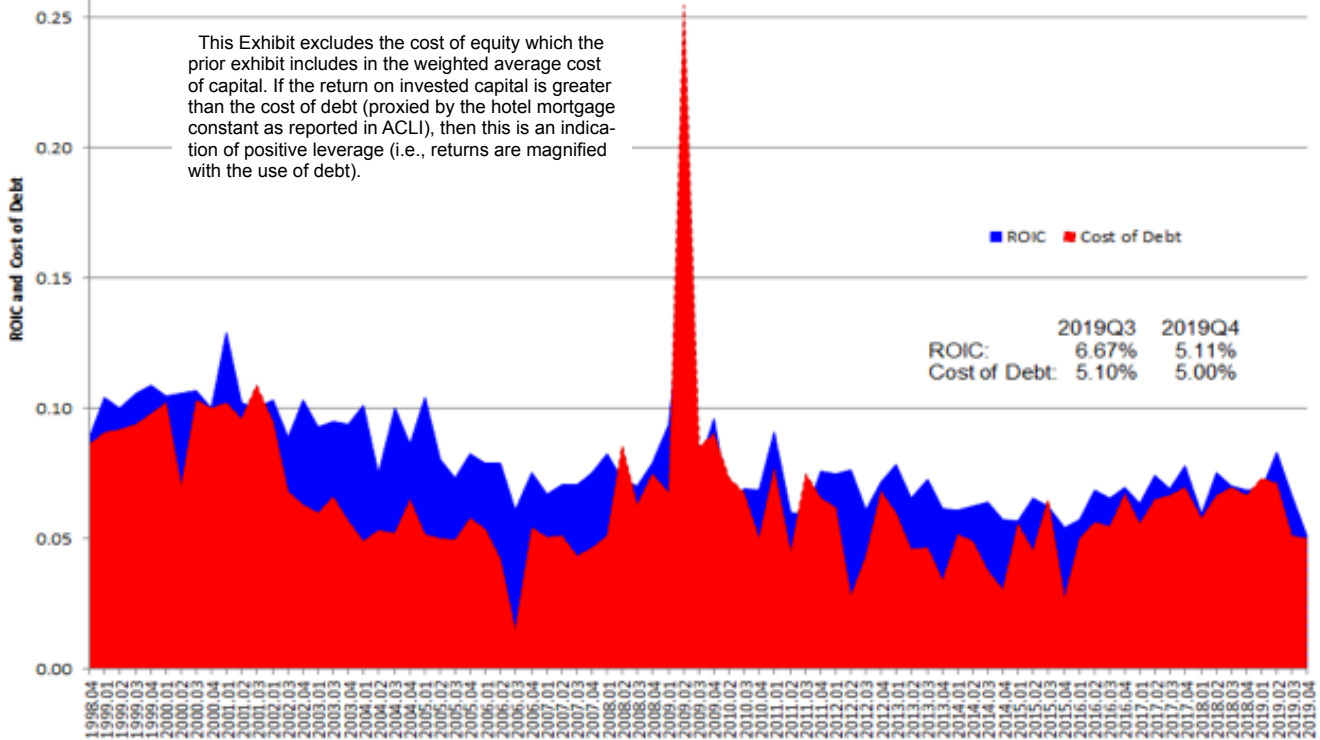
Economic value added (eva) for hotels)



Sources: ACLI, Cornell Center for Real Estate and Finance, NAREIT, Federal Reserve

Hotel investment based on operating performance is now in the red (loss). Our Economic Value Added (EVA) indicator in Exhibit 3 turned negative at -1.1 percent in the fourth quarter of 2019, the latest quarter for which data for the calculation of EVA are available. Although the EVA had declined in previous periods, it was still positive at .7 percent in 2019Q3, down from 1.1 percent in 2019Q2. This indicates that none of the return on hotels is coming from cash flow from operations. Taken from a slightly different

Return on investment capital versus cost of debt financing



Sources: ACLI, Cornell Center for Real Estate and Finance

perspective (no equity financing considered), the ACLI hotel cap rate, which is a proxy for the return on invested capital (ROIC), continued to fall in this period, from 6.67 percent (2019Q3) to 5.11 percent (2019Q4), while the cost of debt financing as measured by the mortgage constant also declined from 5.1 percent to 5 percent over the same

period. Thus, Exhibit 4 shows that *leverage was minimal at best* in 2019Q4 (again, the latest quarter for which ACLI data are available), making deals harder to pencil (less financially feasible). This means that the return that an investor receives from operations is approximately equal to his or her borrowing cost (cost of debt financing).

Transaction volume (obs) and median sale price, 1995–2004

Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
1995	1	\$2,357,500	20	NA	0	0.00%	\$2,357,500	20	100.00%	\$3,400,000	7	35.00%	\$2,100,000	13	65.00%
1995	2	\$3,150,000	29	\$15,712,500	6	20.68%	\$2,670,000	23	79.31%	\$3,800,000	12	41.37%	\$2,906,150	17	58.62%
1995	3	\$2,562,500	44	\$12,400,000	4	9.09%	\$2,378,000	40	90.90%	\$3,500,000	20	45.45%	\$2,000,000	24	54.54%
1995	4	\$3,400,000	41	\$27,750,000	10	24.39%	\$2,625,000	31	75.60%	\$5,075,000	14	34.14%	\$3,100,000	27	65.85%
1996	1	\$2,500,000	39	\$14,475,000	8	20.51%	\$1,700,000	31	79.48%	\$2,500,000	13	33.33%	\$2,687,500	26	66.66%
1996	2	\$2,925,000	43	\$29,150,000	12	27.90%	\$2,500,000	31	72.09%	\$3,200,000	15	34.88%	\$2,730,000	28	65.11%
1996	3	\$6,500,000	57	\$17,740,000	20	35.08%	\$3,000,000	37	64.91%	\$5,500,000	25	43.85%	\$6,890,500	32	56.14%
1996	4	\$2,735,000	58	\$19,000,000	17	29.31%	\$2,200,000	41	70.68%	\$4,650,000	27	46.55%	\$2,400,000	31	53.44%
1997	1	\$5,053,250	74	\$16,635,500	23	31.08%	\$3,500,000	51	68.91%	\$6,300,000	29	39.18%	\$4,075,000	45	60.81%
1997	2	\$2,862,500	72	\$17,750,000	17	23.61%	\$2,150,000	55	76.38%	\$2,445,000	24	33.33%	\$3,047,350	48	66.66%
1997	3	\$3,437,500	90	\$19,000,000	21	23.33%	\$2,400,000	69	76.66%	\$5,140,000	38	42.22%	\$2,550,000	52	57.77%
1997	4	\$4,330,950	78	\$17,000,000	27	34.61%	\$2,300,000	51	65.38%	\$10,435,445	27	34.61%	\$3,600,000	51	65.38%
1998	1	\$4,698,800	92	\$20,000,000	31	33.69%	\$3,100,000	61	66.30%	\$6,353,000	33	35.86%	\$4,600,000	59	64.13%
1998	2	\$3,630,000	96	\$23,765,000	21	21.87%	\$3,000,000	75	78.12%	\$3,998,240	28	29.16%	\$3,575,000	68	70.83%
1998	3	\$2,961,059	92	\$16,740,000	12	13.04%	\$2,690,550	80	86.95%	\$2,255,000	30	32.60%	\$3,365,000	62	67.39%
1998	4	\$2,550,000	84	\$35,000,000	15	17.85%	\$2,375,000	69	82.14%	\$4,225,000	30	35.71%	\$2,500,000	54	64.28%
1999	1	\$2,425,000	88	\$24,638,095	10	11.36%	\$2,125,000	78	88.63%	\$3,500,000	32	36.36%	\$2,300,000	56	63.63%
1999	2	\$2,100,000	95	\$67,000,000	5	5.26%	\$1,950,000	90	94.73%	\$2,067,500	28	29.47%	\$2,100,000	67	70.52%
1999	3	\$2,500,000	99	\$20,711,100	10	10.10%	\$2,130,000	89	89.89%	\$1,800,000	19	19.19%	\$2,522,500	80	80.80%
1999	4	\$2,440,000	87	\$18,190,000	14	16.09%	\$2,090,000	73	83.90%	\$2,210,000	23	26.43%	\$2,575,000	64	73.56%
2000	1	\$2,400,000	110	\$23,253,895	10	9.09%	\$2,300,000	100	90.90%	\$2,325,000	44	40.00%	\$2,428,500	66	60.00%
2000	2	\$2,450,000	88	\$14,500,000	9	10.22%	\$2,275,000	79	89.77%	\$2,325,000	24	27.27%	\$2,450,000	64	72.72%
2000	3	\$2,600,000	95	\$20,346,875	16	16.84%	\$2,250,000	79	83.15%	\$2,925,000	24	25.26%	\$2,525,000	71	74.73%
2000	4	\$2,475,000	101	\$18,050,000	14	13.86%	\$2,300,000	87	86.13%	\$4,500,000	26	25.74%	\$2,350,000	75	74.25%
2001	1	\$2,970,650	104	\$28,437,500	18	17.30%	\$2,422,500	86	82.69%	\$2,650,000	29	27.88%	\$3,000,000	75	72.11%
2001	2	\$2,800,000	110	\$23,795,000	12	10.90%	\$2,687,150	98	89.09%	\$5,825,000	25	22.72%	\$2,684,300	85	77.27%
2001	3	\$2,700,000	87	\$16,000,000	6	6.89%	\$2,500,000	81	93.10%	\$3,150,000	21	24.13%	\$2,600,000	66	75.86%
2001	4	\$2,400,000	73	\$20,500,000	5	6.84%	\$2,300,000	68	93.15%	\$2,800,000	17	23.28%	\$2,300,000	56	76.71%
2002	1	\$2,125,000	70	\$11,518,052	5	7.14%	\$2,000,000	65	92.85%	\$1,700,000	17	24.28%	\$2,200,000	53	75.71%
2002	2	\$2,400,000	106	\$18,125,000	10	9.43%	\$2,287,500	96	90.56%	\$3,125,000	33	31.13%	\$2,300,000	73	68.86%
2002	3	\$2,355,400	81	\$12,750,000	5	6.17%	\$2,237,500	76	93.82%	\$2,197,500	24	29.62%	\$2,470,000	57	70.37%
2002	4	\$2,907,500	100	\$23,500,000	16	16.00%	\$2,575,000	84	84.00%	\$2,907,500	34	34.00%	\$2,862,500	66	66.00%
2003	1	\$2,530,000	94	\$13,000,000	9	9.57%	\$2,425,000	85	90.42%	\$3,850,000	21	22.34%	\$2,425,000	73	77.65%
2003	2	\$2,750,000	110	\$18,500,000	10	9.09%	\$2,509,500	100	90.90%	\$3,160,000	31	28.18%	\$2,600,000	79	71.81%
2003	3	\$3,333,000	141	\$14,359,286	28	19.85%	\$2,600,000	113	80.14%	\$3,660,000	45	31.91%	\$3,032,500	96	68.08%
2003	4	\$2,600,000	149	\$16,375,000	18	12.08%	\$2,425,000	131	87.91%	\$2,950,000	35	23.48%	\$2,500,000	114	76.51%
2004	1	\$2,925,000	166	\$22,875,250	24	14.45%	\$2,536,756	142	85.54%	\$3,450,000	41	24.69%	\$2,894,000	125	75.30%
2004	2	\$2,700,000	195	\$16,280,000	28	14.35%	\$2,450,000	167	85.64%	\$4,500,000	39	20.00%	\$2,540,000	156	80.00%
2004	3	\$3,491,122	216	\$19,350,000	45	20.83%	\$2,610,000	171	79.16%	\$4,600,000	51	23.61%	\$3,306,500	165	76.38%
2004	4	\$4,000,000	177	\$20,475,000	47	26.55%	\$3,085,500	130	73.44%	\$8,850,000	36	20.33%	\$3,600,000	141	79.66%

The Median Sales Price, Number of Sold Transactions, and the Percent of Total Sales is reported for the Full Sample, Large Hotels (≥ \$10 Million), Small Hotels (<\$10 Million), Gateway Cities and Non-Gateway Cities.

Transaction volume (obs) and median sale price, 2005–2014

Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2005	1	\$4,330,000	231	\$18,100,000	52	22.51%	\$3,300,000	179	77.48%	\$6,687,500	40	17.31%	\$3,800,000	191	82.68%
2005	2	\$4,586,250	316	\$18,956,812	78	24.68%	\$3,255,150	238	75.31%	\$6,475,000	68	21.51%	\$4,385,000	248	78.48%
2005	3	\$4,150,000	273	\$21,475,000	72	26.37%	\$3,100,000	201	73.62%	\$6,100,000	61	22.34%	\$3,750,000	212	77.65%
2005	4	\$4,425,000	300	\$25,000,000	93	31.00%	\$3,150,000	207	68.99%	\$11,200,000	65	21.66%	\$4,000,000	235	78.33%
2006	1	\$5,300,000	301	\$25,750,000	92	30.56%	\$3,800,000	209	69.43%	\$18,000,000	64	21.26%	\$4,943,744	237	78.73%
2006	2	\$4,750,000	313	\$22,750,000	82	26.19%	\$3,500,000	231	73.80%	\$6,175,000	56	17.89%	\$4,500,000	257	82.10%
2006	3	\$5,000,000	285	\$22,500,000	86	30.17%	\$3,650,000	199	69.82%	\$7,000,000	59	20.70%	\$4,705,399	226	79.29%
2006	4	\$4,587,500	248	\$21,200,000	65	26.20%	\$3,550,000	183	73.79%	\$8,093,750	56	22.58%	\$4,270,000	192	77.41%
2007	1	\$6,155,805	286	\$21,225,000	104	36.36%	\$3,700,000	182	63.63%	\$9,500,000	63	22.02%	\$5,700,000	223	77.97%
2007	2	\$5,650,000	385	\$25,125,000	120	31.16%	\$3,750,000	265	68.83%	\$9,000,000	67	17.40%	\$5,450,000	318	82.59%
2007	3	\$5,450,000	330	\$20,100,161	105	31.81%	\$3,900,000	225	68.18%	\$8,325,000	53	16.06%	\$5,011,554	277	83.93%
2007	4	\$4,680,000	249	\$23,250,000	86	34.53%	\$3,150,000	163	65.46%	\$9,375,000	36	14.45%	\$4,500,000	213	85.54%
2008	1	\$5,000,000	255	\$16,000,000	61	23.92%	\$3,985,000	194	76.07%	\$5,990,000	46	18.03%	\$4,650,000	209	81.96%
2008	2	\$5,062,900	228	\$22,150,000	50	21.92%	\$3,890,000	178	78.07%	\$8,725,000	38	16.66%	\$4,800,000	190	83.33%
2008	3	\$4,190,500	172	\$17,133,333	37	21.51%	\$3,350,000	135	78.48%	\$5,500,000	27	15.69%	\$3,900,000	145	84.30%
2008	4	\$4,050,000	159	\$18,850,000	32	20.12%	\$3,500,000	127	79.87%	\$4,972,500	27	16.98%	\$3,920,000	132	83.01%
2009	1	\$4,150,000	81	\$15,800,000	15	18.51%	\$3,600,000	66	81.48%	\$7,375,000	16	19.75%	\$3,700,000	65	80.24%
2009	2	\$3,090,231	86	\$14,722,500	11	12.79%	\$2,864,310	75	87.20%	\$5,410,250	16	18.60%	\$3,000,000	70	81.39%
2009	3	\$3,400,000	90	\$22,000,000	16	17.77%	\$3,000,000	74	82.22%	\$4,608,750	14	15.55%	\$3,195,271	76	84.44%
2009	4	\$3,562,500	84	\$14,100,000	14	16.66%	\$3,010,250	70	83.33%	\$4,520,000	12	14.28%	\$3,400,000	72	85.71%
2010	1	\$3,900,000	89	\$20,162,500	18	20.22%	\$2,825,000	71	79.77%	\$8,450,000	15	16.85%	\$3,825,000	74	83.14%
2010	2	\$3,700,000	138	\$30,833,449	34	24.63%	\$3,000,000	104	75.36%	\$15,400,000	34	24.63%	\$3,100,000	104	75.36%
2010	3	\$4,912,500	120	\$35,500,000	46	38.33%	\$2,850,000	74	61.66%	\$25,000,000	37	30.83%	\$3,117,000	83	69.16%
2010	4	\$3,988,800	100	\$30,353,182	38	38.00%	\$2,420,000	62	62.00%	\$38,500,000	23	23.00%	\$3,265,000	77	77.00%
2011	1	\$4,200,000	85	\$34,050,000	24	28.23%	\$2,795,500	61	71.76%	\$12,275,000	15	17.64%	\$3,775,000	70	82.35%
2011	2	\$4,200,000	97	\$51,200,000	31	31.95%	\$2,250,000	66	68.04%	\$15,600,000	23	23.71%	\$3,175,000	74	76.28%
2011	3	\$3,350,000	73	\$23,772,500	20	27.39%	\$2,800,000	53	72.60%	\$3,700,000	17	23.28%	\$3,275,000	56	76.71%
2011	4	\$5,000,000	157	\$32,400,000	43	27.38%	\$3,229,250	114	72.61%	\$10,950,000	34	21.65%	\$4,300,000	123	78.34%
2012	1	\$5,233,961	131	\$22,100,000	40	30.53%	\$3,275,000	91	69.46%	\$13,837,500	28	21.37%	\$4,200,000	103	78.62%
2012	2	\$4,000,000	209	\$17,000,000	61	29.18%	\$2,779,500	148	70.81%	\$15,900,000	22	10.52%	\$3,700,000	187	89.47%
2012	3	\$7,000,000	169	\$19,100,000	67	39.64%	\$2,720,250	102	60.35%	\$16,050,000	32	18.93%	\$5,250,000	137	81.06%
2012	4	\$5,622,500	207	\$24,866,613	74	35.74%	\$3,125,000	133	64.25%	\$16,174,794	39	18.84%	\$5,070,000	168	81.15%
2013	1	\$5,999,992	239	\$21,154,582	85	35.56%	\$2,962,500	154	64.43%	\$7,750,000	52	21.75%	\$5,575,000	187	78.24%
2013	2	\$4,700,000	217	\$22,000,000	71	32.71%	\$2,500,000	146	67.28%	\$16,000,000	38	17.51%	\$4,200,000	179	82.48%
2013	3	\$5,260,855	246	\$25,000,000	75	30.48%	\$3,300,000	171	69.51%	\$9,949,500	35	14.22%	\$4,750,000	211	85.77%
2013	4	\$4,537,500	314	\$24,000,000	98	31.21%	\$2,790,000	216	68.78%	\$13,500,000	55	17.51%	\$4,000,000	259	82.48%
2014	1	\$5,625,000	228	\$20,750,000	70	30.70%	\$3,300,000	158	69.29%	\$8,825,900	59	25.87%	\$5,000,000	169	74.12%
2014	2	\$4,300,000	320	\$26,125,000	88	27.50%	\$2,818,750	232	72.50%	\$11,200,000	59	18.43%	\$3,700,000	261	81.56%
2014	3	\$5,500,000	351	\$20,000,000	97	27.63%	\$3,425,000	254	72.36%	\$10,567,078	66	18.80%	\$5,000,000	285	81.19%
2014	4	\$4,500,000	311	\$29,625,000	78	25.08%	\$3,040,000	233	74.91%	\$8,200,000	73	23.47%	\$3,950,000	238	76.52%

Transaction volume (obs) and median sale price, 2015–current

Year	Qtr	Full Sample		Big			Small			Gateway			No Gateway		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2015	1	\$5,752,500	254	\$29,750,000	82	32.28%	\$3,125,000	172	67.71%	\$8,280,000	47	18.50%	\$5,500,000	207	81.49%
2015	2	\$6,350,000	268	\$24,575,000	92	34.32%	\$3,250,000	176	65.67%	\$18,765,000	46	17.16%	\$5,612,500	222	82.83%
2015	3	\$5,050,000	299	\$24,800,000	87	29.09%	\$3,012,500	212	70.90%	\$12,100,000	53	17.72%	\$4,275,000	246	82.27%
2015	4	\$6,650,000	292	\$18,080,000	106	36.30%	\$3,125,000	186	63.69%	\$14,415,000	51	17.46%	\$5,400,000	241	82.53%
2016	1	\$5,600,000	293	\$20,375,000	87	29.69%	\$3,350,000	206	70.30%	\$13,600,000	45	15.35%	\$5,275,000	248	84.64%
2016	2	\$4,100,000	322	\$16,000,000	61	18.94%	\$3,300,000	261	81.05%	\$11,600,000	48	14.90%	\$3,725,000	274	85.09%
2016	3	\$4,862,500	284	\$25,000,000	75	26.40%	\$3,200,000	209	73.59%	\$24,500,000	34	11.97%	\$4,362,500	250	88.02%
2016	4	\$4,000,000	263	\$19,480,000	73	27.75%	\$2,800,000	190	72.24%	\$13,352,600	28	10.64%	\$3,664,706	235	89.35%
2017	1	\$5,275,000	254	\$22,880,750	70	27.55%	\$3,600,000	184	72.44%	\$14,726,254	28	11.02%	\$4,950,000	226	88.97%
2017	2	\$5,100,000	331	\$22,660,000	91	27.49%	\$3,325,000	240	72.50%	\$16,450,000	37	11.17%	\$4,462,500	294	88.82%
2017	3	\$5,000,000	324	\$22,250,000	86	26.54%	\$3,403,000	238	73.45%	\$22,250,000	38	11.72%	\$4,500,000	286	88.27%
2017	4	\$4,500,000	265	\$28,000,000	66	24.90%	\$2,875,000	199	75.09%	\$12,208,000	26	9.81%	\$4,250,000	239	90.18%
2018	1	\$5,600,000	311	\$21,691,200	98	31.51%	\$3,500,000	213	68.48%	\$14,750,000	40	12.86%	\$5,000,000	271	87.13%
2018	2	\$4,805,200	366	\$19,750,000	82	22.40%	\$3,300,000	284	77.59%	\$17,625,000	40	10.92%	\$4,300,000	326	89.07%
2018	3	\$5,125,000	334	\$21,265,000	83	24.85%	\$3,710,000	251	75.14%	\$13,342,500	22	6.58%	\$5,000,000	312	93.41%
2018	4	\$6,490,000	279	\$20,500,000	105	37.63%	\$3,300,000	174	62.36%	\$14,440,000	33	11.82%	\$5,580,556	246	88.17%
2019	1	\$5,340,000	290	\$17,802,698	76	26.20%	\$3,525,000	214	73.79%	\$15,750,000	34	11.72%	\$4,750,000	256	88.27%
2019	2	\$4,015,500	334	\$19,848,485	62	18.56%	\$3,335,000	272	81.43%	\$6,300,000	35	10.47%	\$3,900,000	299	89.52%
2019	3	\$4,707,500	402	\$21,000,000	96	23.88%	\$3,500,000	306	76.11%	\$15,850,000	42	10.44%	\$4,362,500	360	89.55%
2019	4	\$4,950,000	383	\$21,855,650	94	24.54%	\$3,300,000	289	75.45%	\$11,000,000	35	9.13%	\$4,600,000	340	88.77%
2020	1	\$4,100,000	306	\$17,300,000	47	15.35%	\$3,500,000	259	84.64%	\$5,500,000	23	7.51%	\$4,090,000	283	92.48%

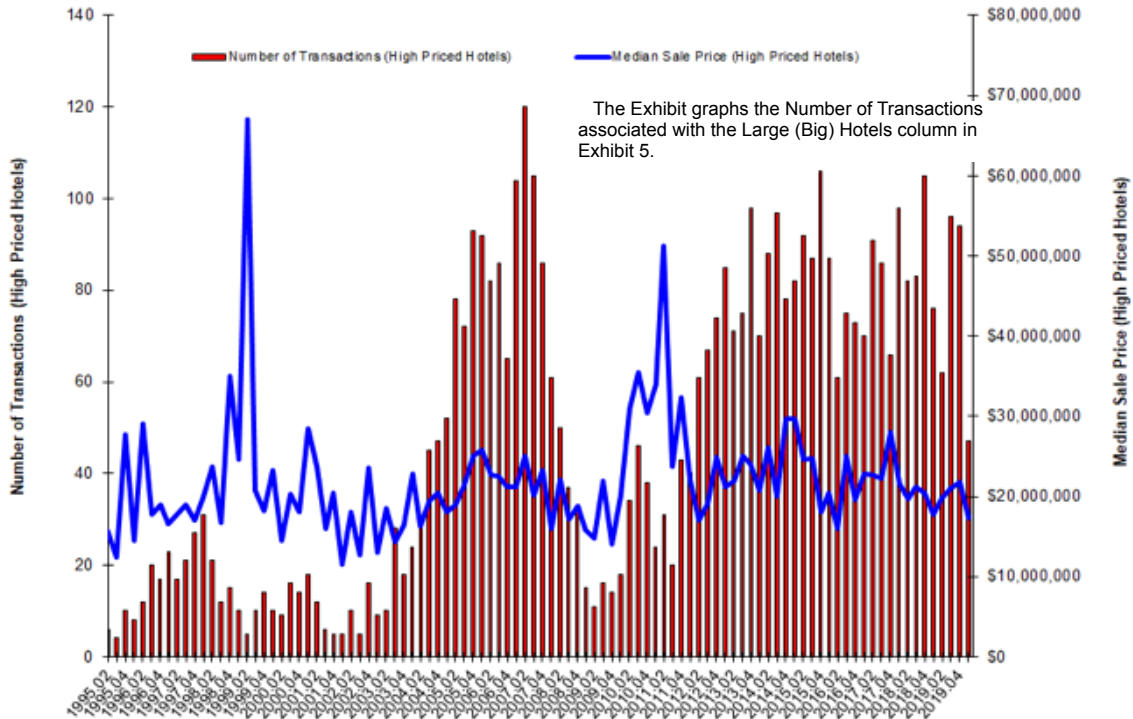
The median price of hotels fell on both a quarter-over-quarter and also on a year-over-year basis. The median price for all hotel transactions (both large hotels and small hotels combined) fell by 17 percent from the previous quarter (that is, \$4.1M in 2020Q1, versus \$4.95M in 2019Q4) on weaker volume (306 transactions for 2020Q1 versus 383 transactions for 2019Q4), as reported in Exhibit 5c. Year over year (2019Q1 versus 2020Q1), the median price of hotels fell 23.2 percent, similar to the 23.7 percent drop in the prior year-over-year period, albeit on weaker volume (5.5 percent in 2020Q1, compared to 37 percent in the prior period). A comparison of large hotels relative to small hotels on a year-over-year basis reveals that the median price of large hotels declined almost 3 percent

compared to a 6.6-percent gain in the prior period on weaker volume (-41%), while the median price of smaller hotels fell slightly (-.7%) on stronger volume (15%).² The situation was worst for larger hotels on a quarter-over-quarter basis, with the median sale price of large hotels falling 21 percent on weaker transaction volume (-37%), while the median sale price of small hotels rose 6 percent on stronger volume (12%). Exhibit 6 and Exhibit 7 show this year-over-year trend in the number of transactions for large hotels and small hotels.

² Note that the number of transactions is limited to the sales that are included in the hedonic index. As such, it should not be construed as being the total market activity.

EXHIBIT 6

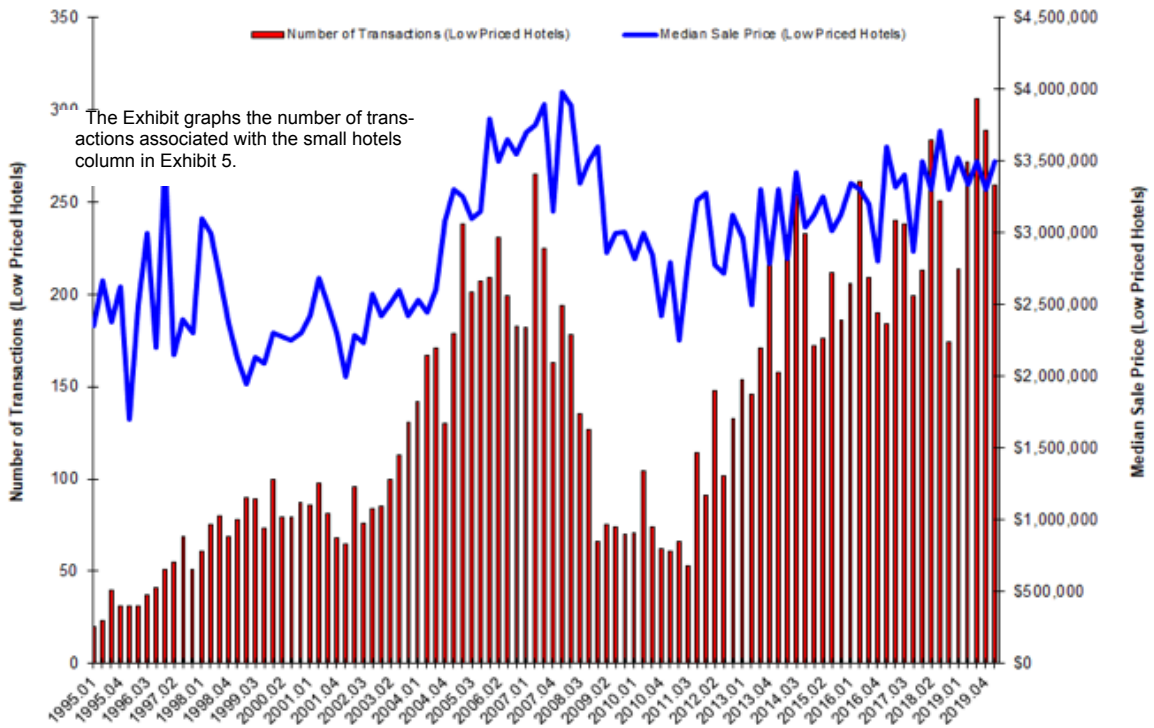
Median sale price and number of sales (hotels with sale prices of \$10 million or more)



Sources: CoStar, Real Capital Analytics

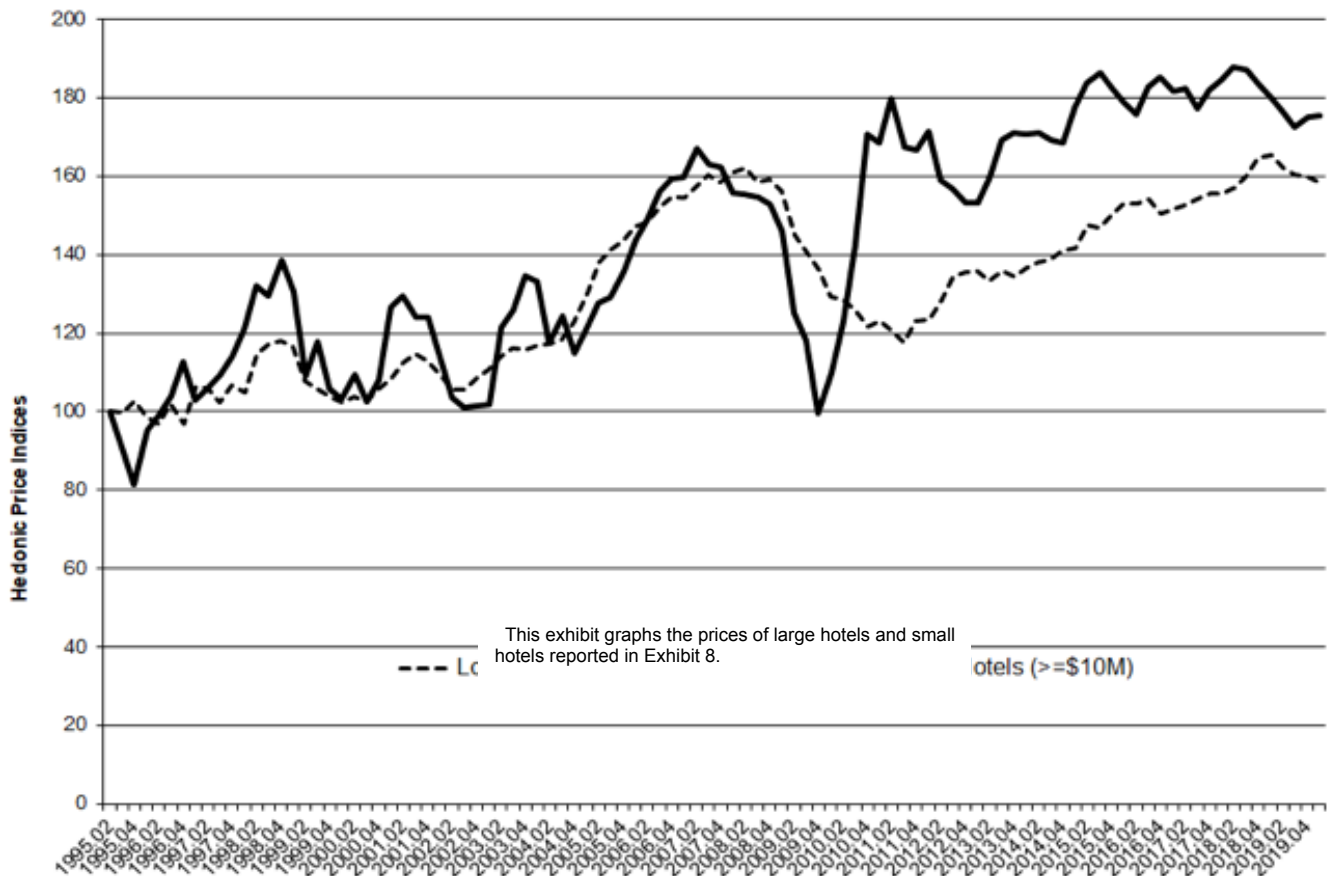
EXHIBIT 7

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



Sources: CoStar, Real Capital Analytics

Hedonic hotel indices for large and small hotel transactions

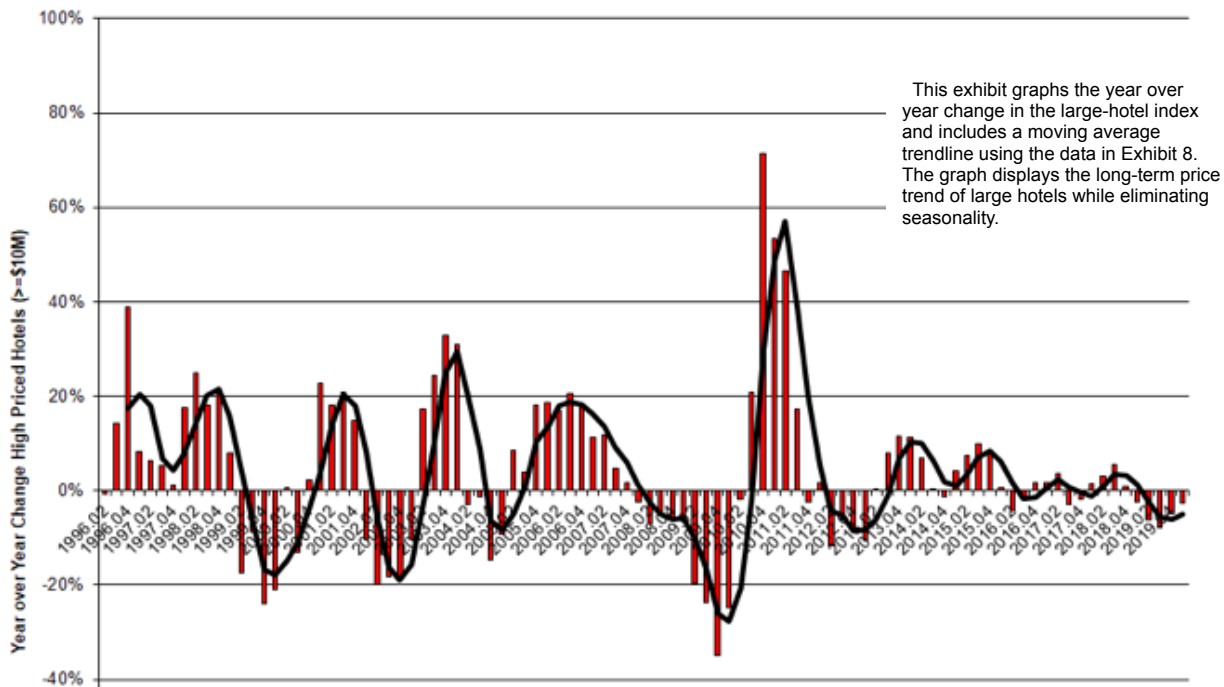


Source: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Our moving average trendlines and our Standardized Unexpected Price (SUP) performance metrics both point to the price for both large hotels and small hotels reverting toward their long-run average. Exhibit 9, which graphs the prices reported in Exhibit 8, shows that the price of large hotels remained relatively flat at .4 percent this quarter, compared to a rise of 1.3 percent last quarter. Smaller hotels fell by .8 percent this quarter compared to a drop

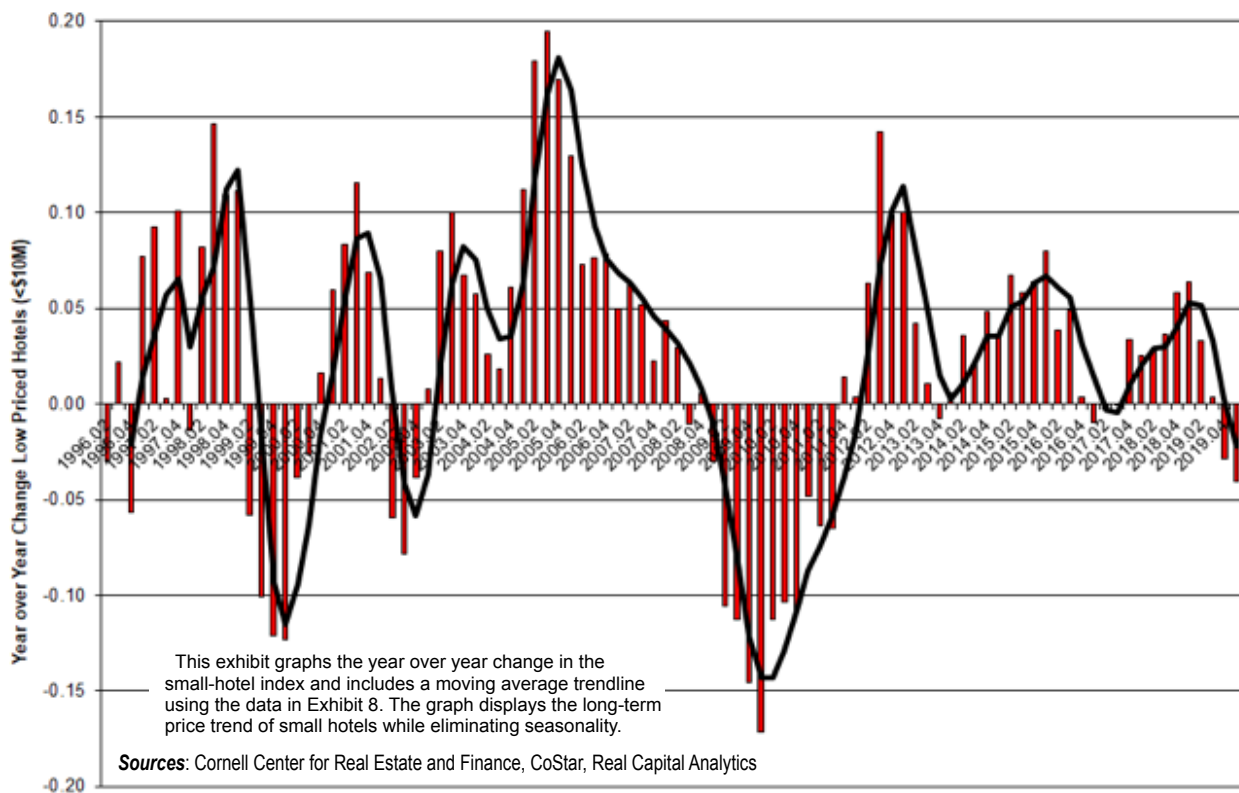
of .3 percent last quarter. Year over year, Exhibit 10 shows that large hotels fell 2.6 percent (2019Q1-2020Q1) compared to a drop of 4.7% posted in the prior-year-over year period (2018Q4-2019Q4). Exhibit 11 shows that smaller hotels declined 4% year over year (2019Q1-2020Q1), compared to a decrease of 2.8 percent in the prior period (2018Q4-2019Q4).

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



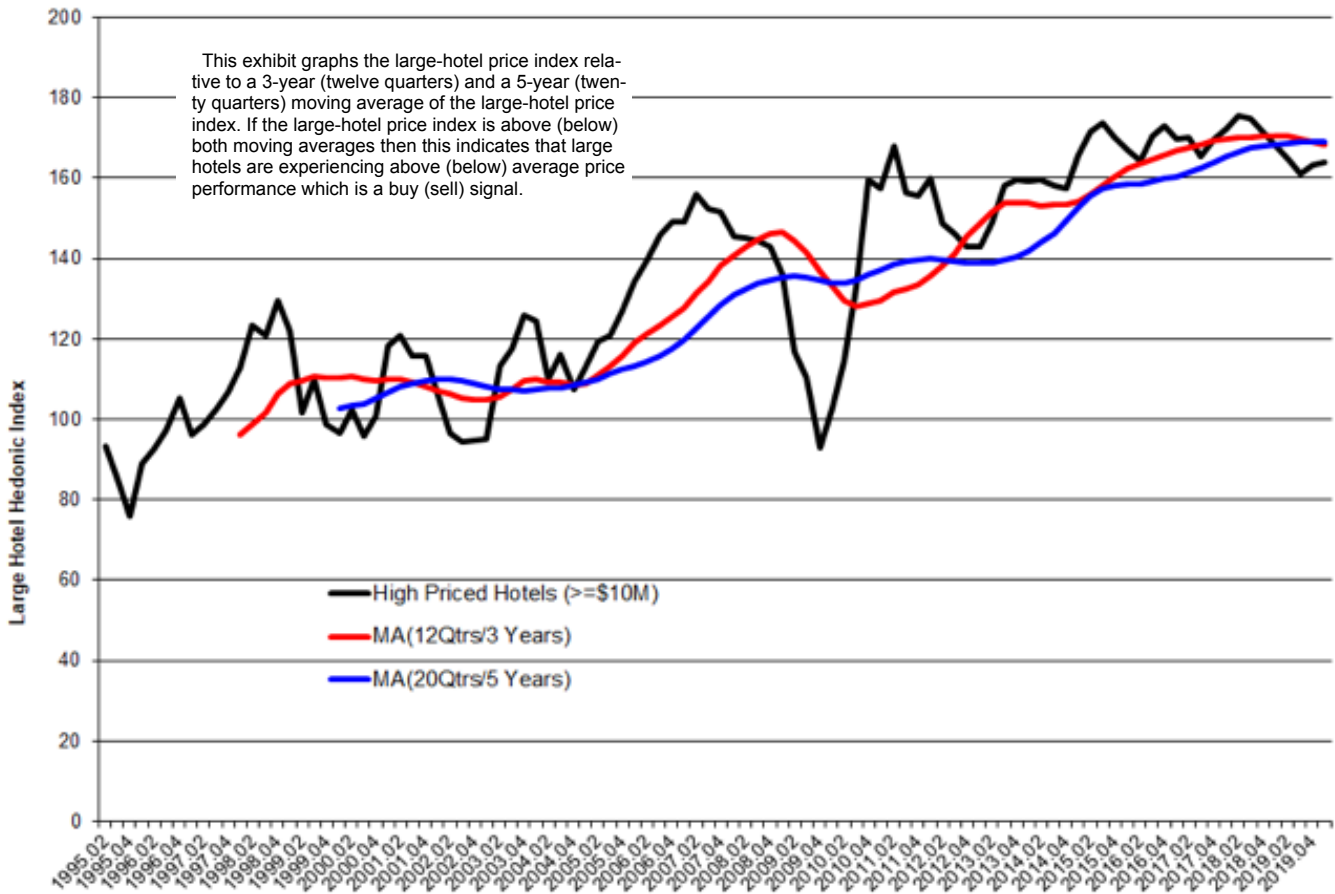
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

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



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

Moving average trendline for large-hotel index

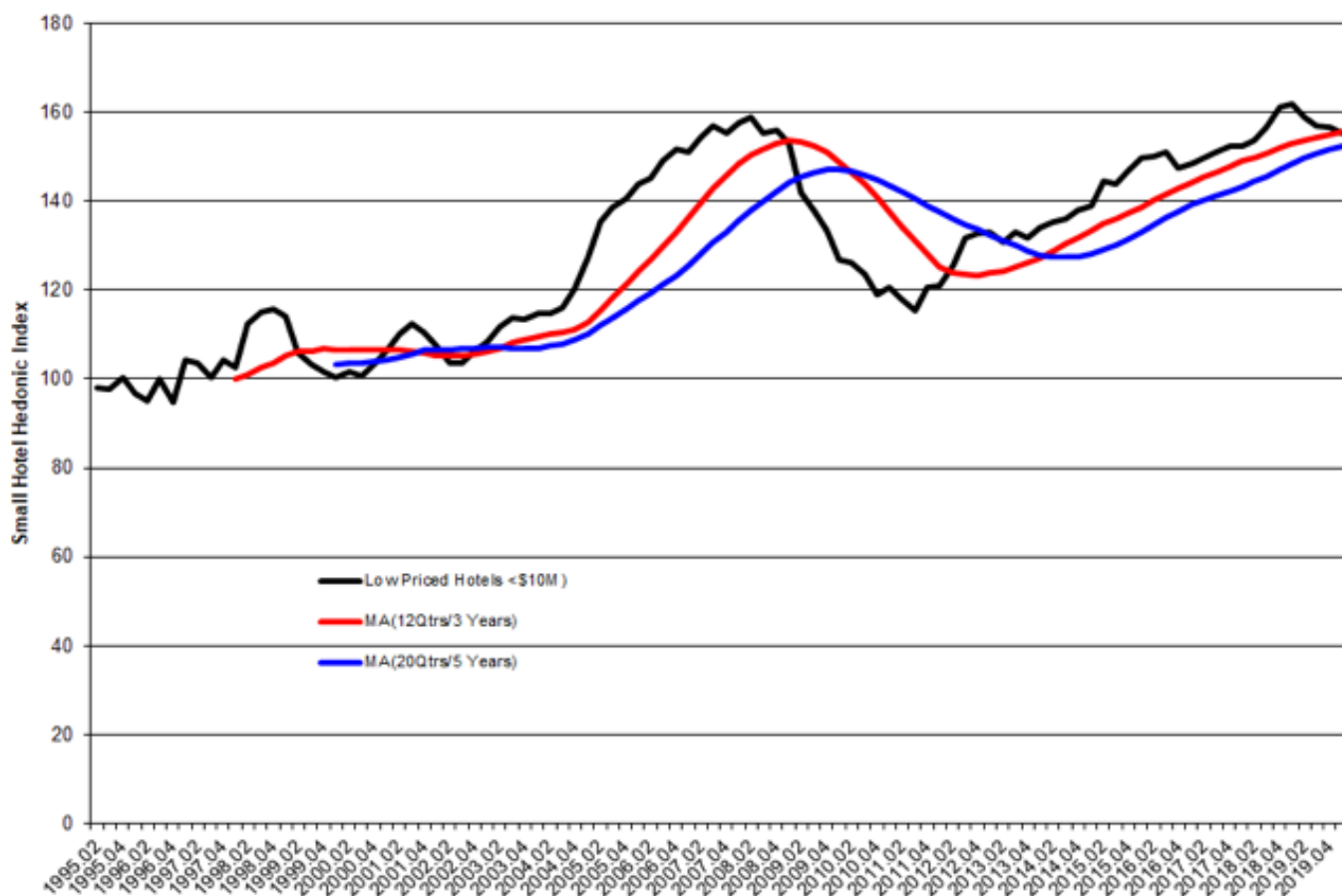


Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Consistent with our analysis thus far, our moving average trend lines for large hotels in Exhibit 12 show that the price for large hotels continues to hover below both

its short-term and long-term moving-average trend lines. This signals that large hotels continue to exhibit a weakness in price (negative price momentum). In contrast to this,

Moving average trendline for small-hotel index



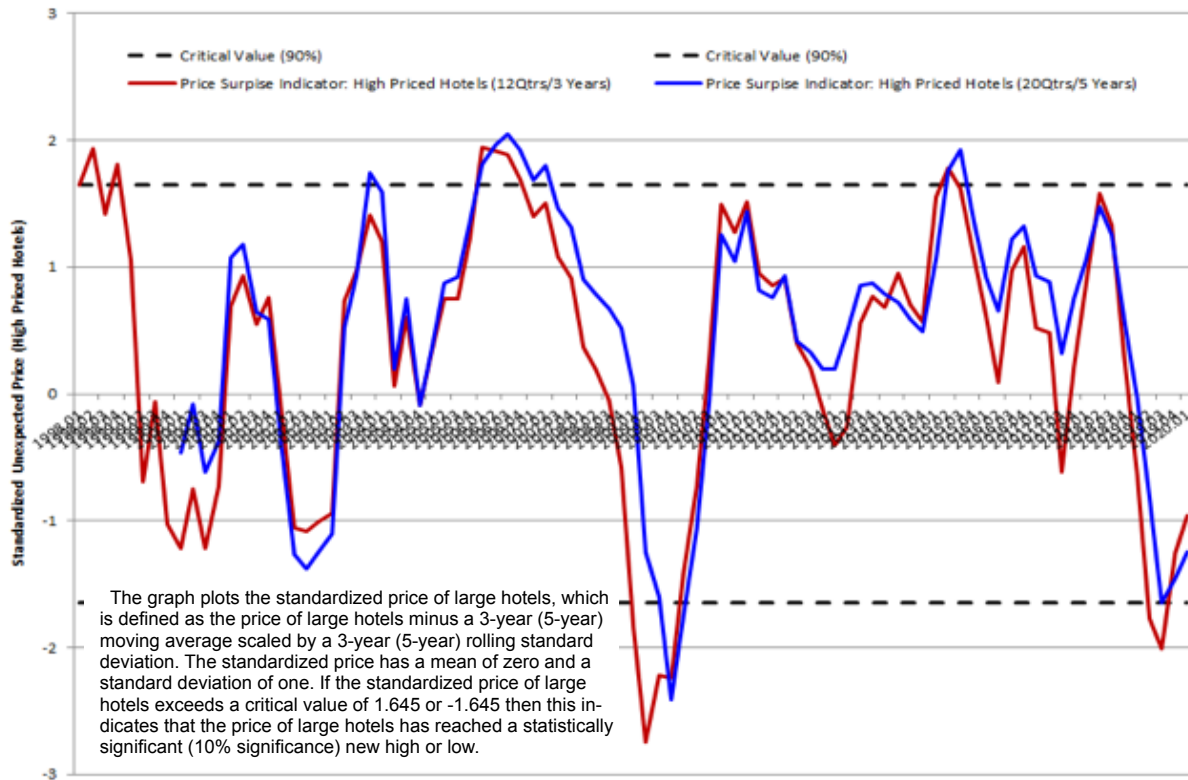
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Exhibit 13 shows that the price for smaller hotels has now crossed below its short-term moving average, although it is still above its long-term moving average trend line for the moment. As stated earlier, this is due to declining price momentum for small hotels this period. This indicates that a *sell* signal is warranted for both small and large hotels.

Our Standardized Unexpected Price (SUP) metrics in Exhibit 14 show that the standardized price for large

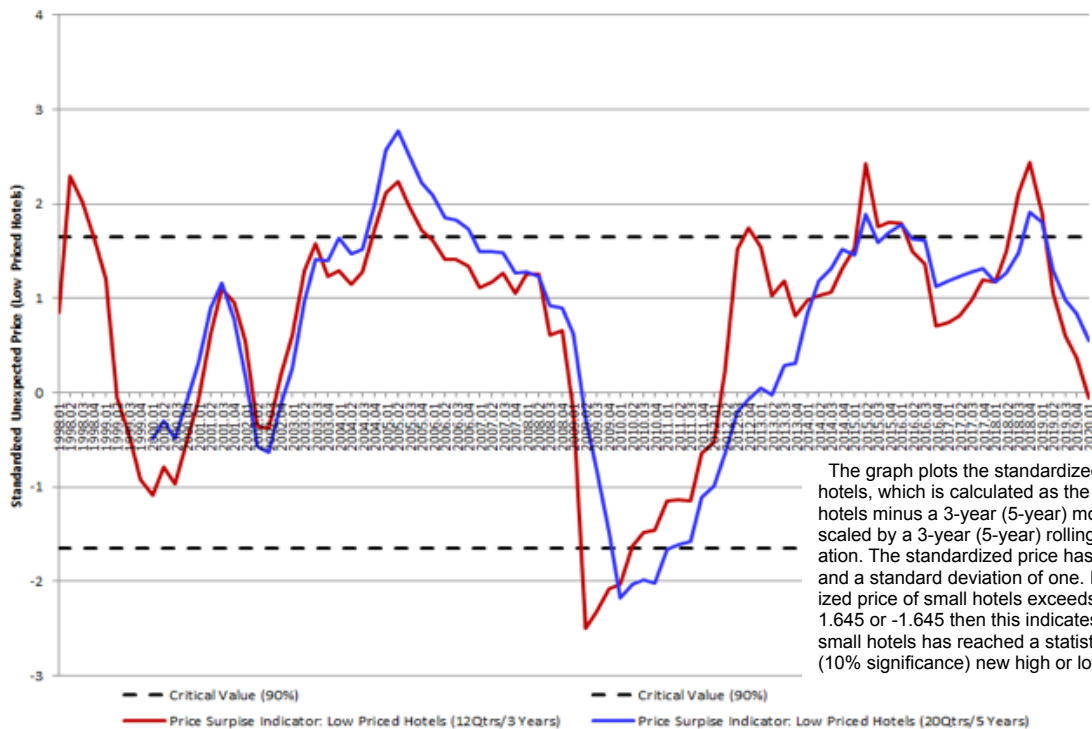
hotels continues to converge with its long-term average, although it is still below its standardized mean of zero. The standardized price for small hotels has now converged with its standardized mean of zero. In other words, Exhibit 15 shows that the standardized price of small hotels has reverted to its long-term average.

Standardized Unexpected Price (SUP) for large-hotel index



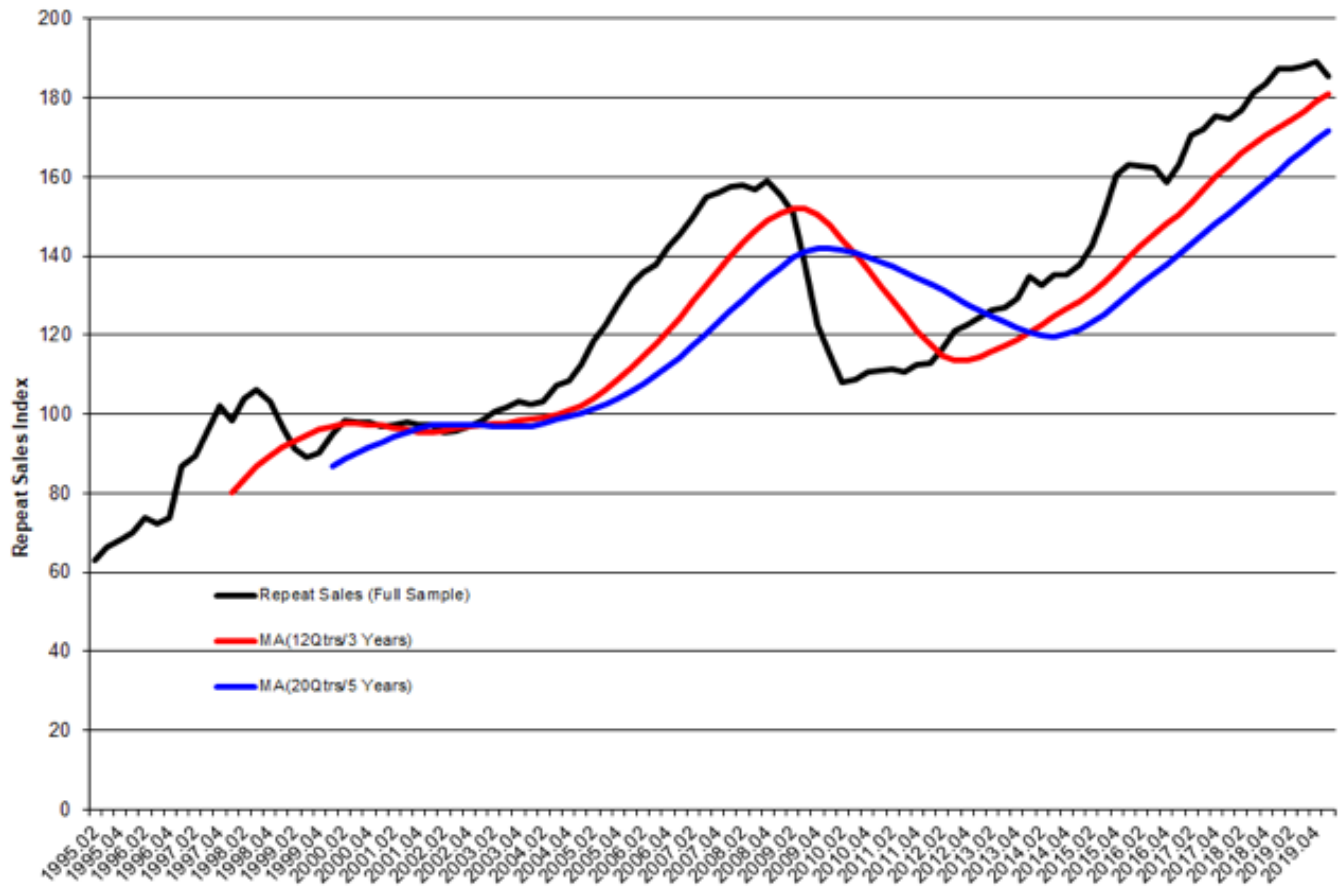
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Standardized unexpected price (sup) for small-hotel index



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

Moving average trendline for repeat-sale hotel index



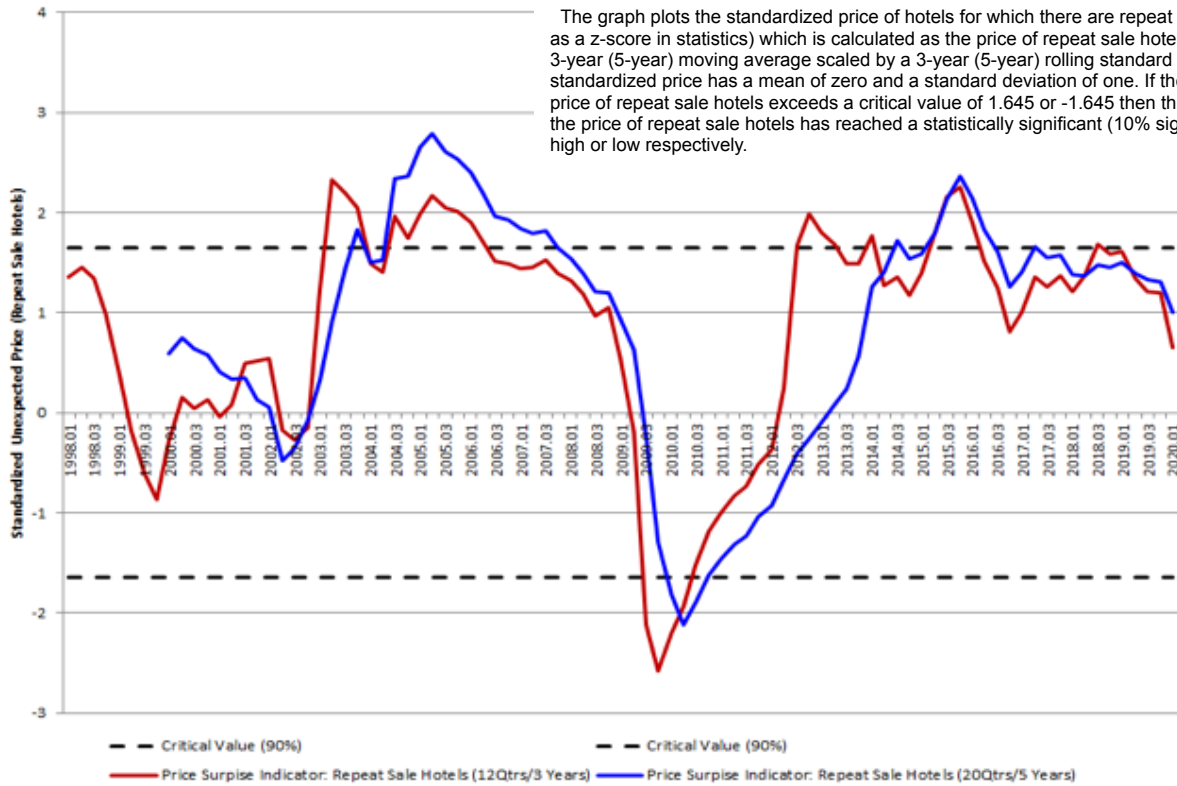
Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

Repeat-sales metrics: Prices continue to revert toward their average. Our repeat-sale indicator, which reflects the price of hotels that have sold more than once, continues to revert towards its short-term and long-term moving average, although the repeat-sale indicator is still higher than both averages, as displayed in Exhibit 16.³ Our SUP performance metric in Exhibit 17 indicates that standard-

³ We report two repeat-sale indices. The repeat-sale full sample index uses all repeat-sale pairs, whereas the repeat-sale index with a base of 100 at 2000Q1 uses only those sales that occurred on or after the first quarter of 2000. Consequently, this latter repeat sale index thus doesn't use information on sales prior to the first quarter of 2000. As such, if a hotel sold in 1995 and then sold again in 2012, it would be included in the first repeat sale index (that is, the repeat sale full sample index), but it would not be included in the latter repeat sale index.

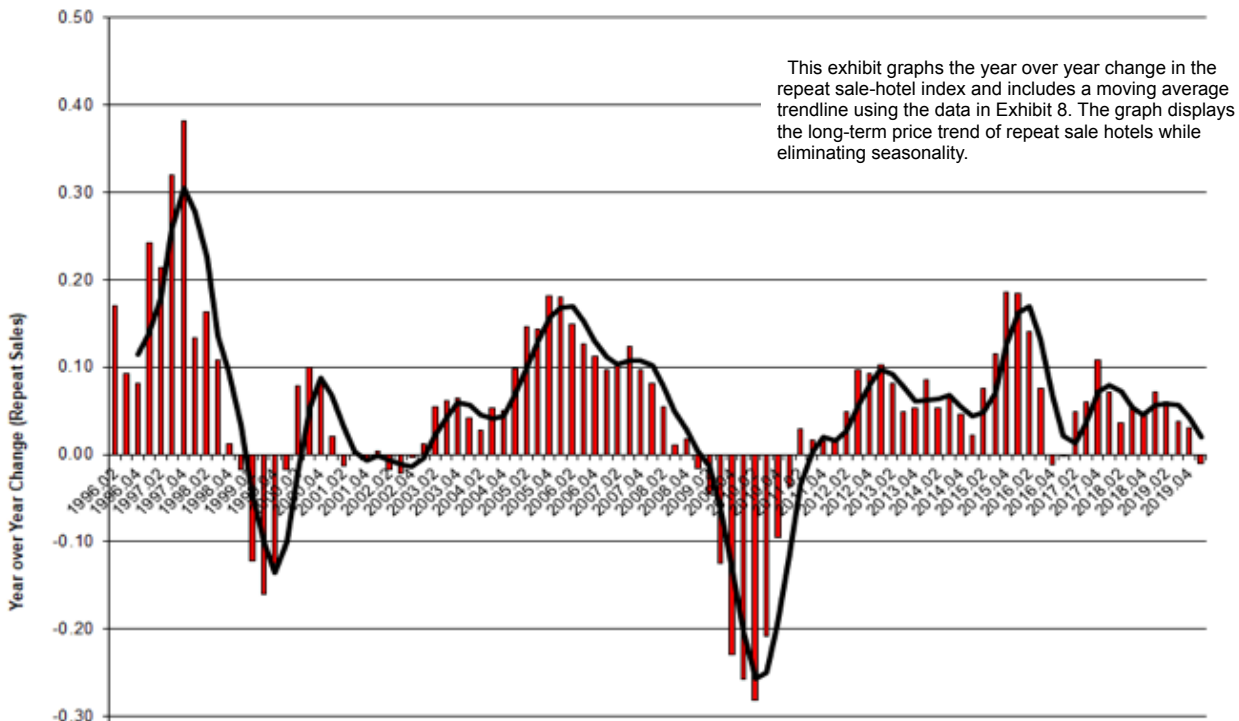
ized prices have started to revert to the mean, that is, to the standardized mean of zero this quarter with the 3-year SUP declining from 1.197 to .646, while the 5-year mean falls from 1.308 to 1.01. Exhibit 18 shows that the repeat sale price index fell by 1 percent year over year (2019Q1 to 2020Q1), compared to an increase of 3 percent in the prior period (2018Q4 to 2019Q4). From a quarter-over-quarter perspective, the index fell 2 percent in the current period (2019Q4-2020Q1), compared to .4 percent increase in the previous quarter (2019Q3-2019Q4).

Standardized Unexpected Price (SUP) for repeat-sale hotel index



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

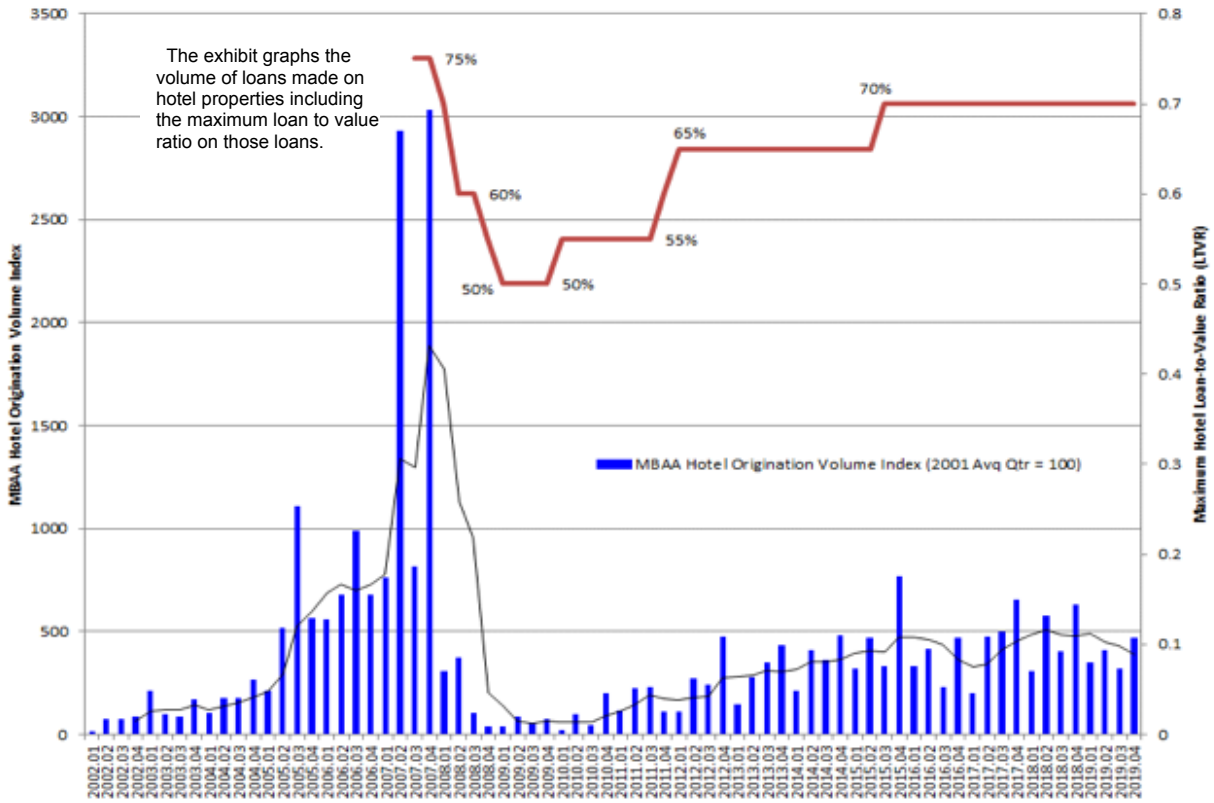
Year over year change in repeat-sale hotel index with a moving average trendline



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

EXHIBIT 19

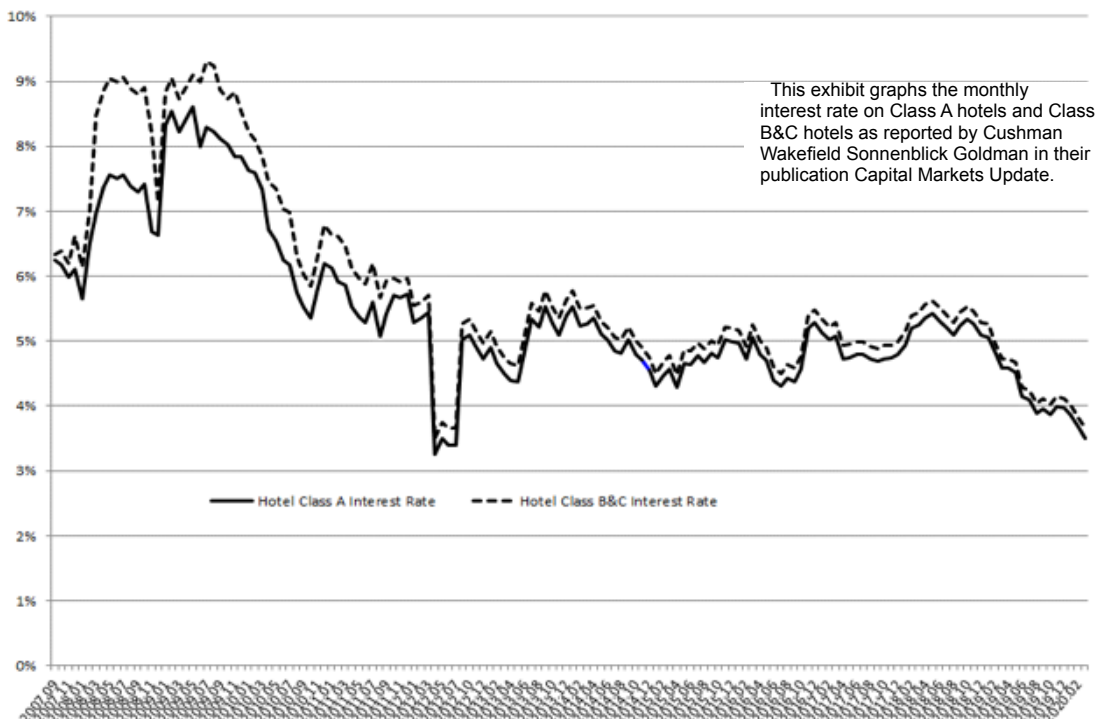
Mortgage origination volume versus the loan-to-value ratio for hotels



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

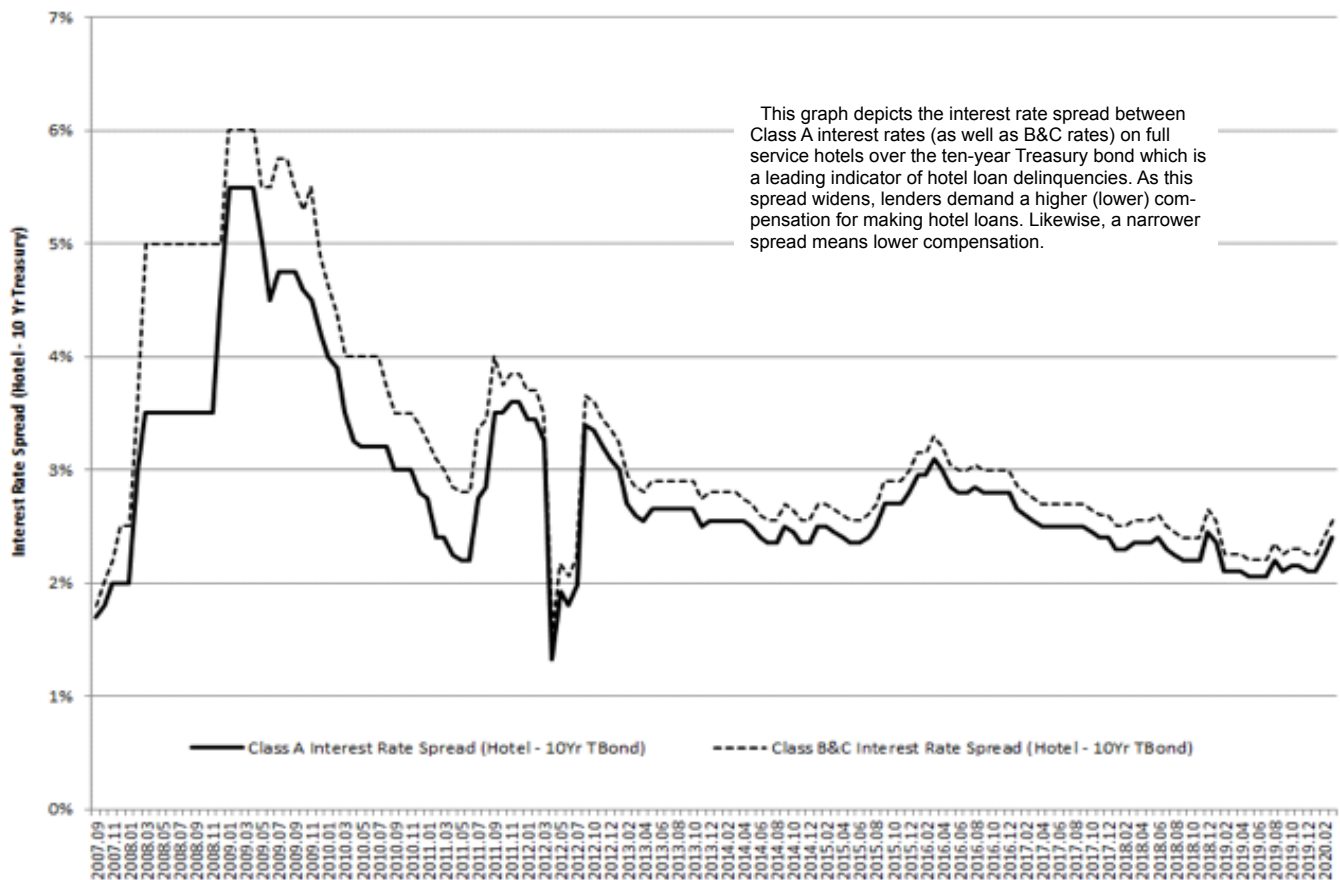
EXHIBIT 20

Interest rates on Class A versus Class B & C Hotels



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

Interest rate spreads of hotels versus U.S. Treasury ten-year bonds



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

Mortgage financing volume for hotels continued to fall year over year, but rose quarter over quarter. Exhibit 19 shows that the mortgage origination volume for hotels, fell 25 percent year over year, as reported for 2019Q4, continuing the declining trend from the prior period (-20%).⁴ From a quarterly perspective, however, mortgage origination volume rose 46 percent. The maximum loan-to-value (LTV) ratio for hotels remains at 70 percent.

The cost of hotel debt financing has declined this quarter and has fallen on a year-over-year basis. The cost of obtaining hotel debt financing, as reported by Cushman Wakefield Sonnenblick Goldman, declined this quarter for both Class A and Class B&C Hotels.⁵ Exhibit 20 shows that interest rates on Class A and Class B/C hotel deals declined

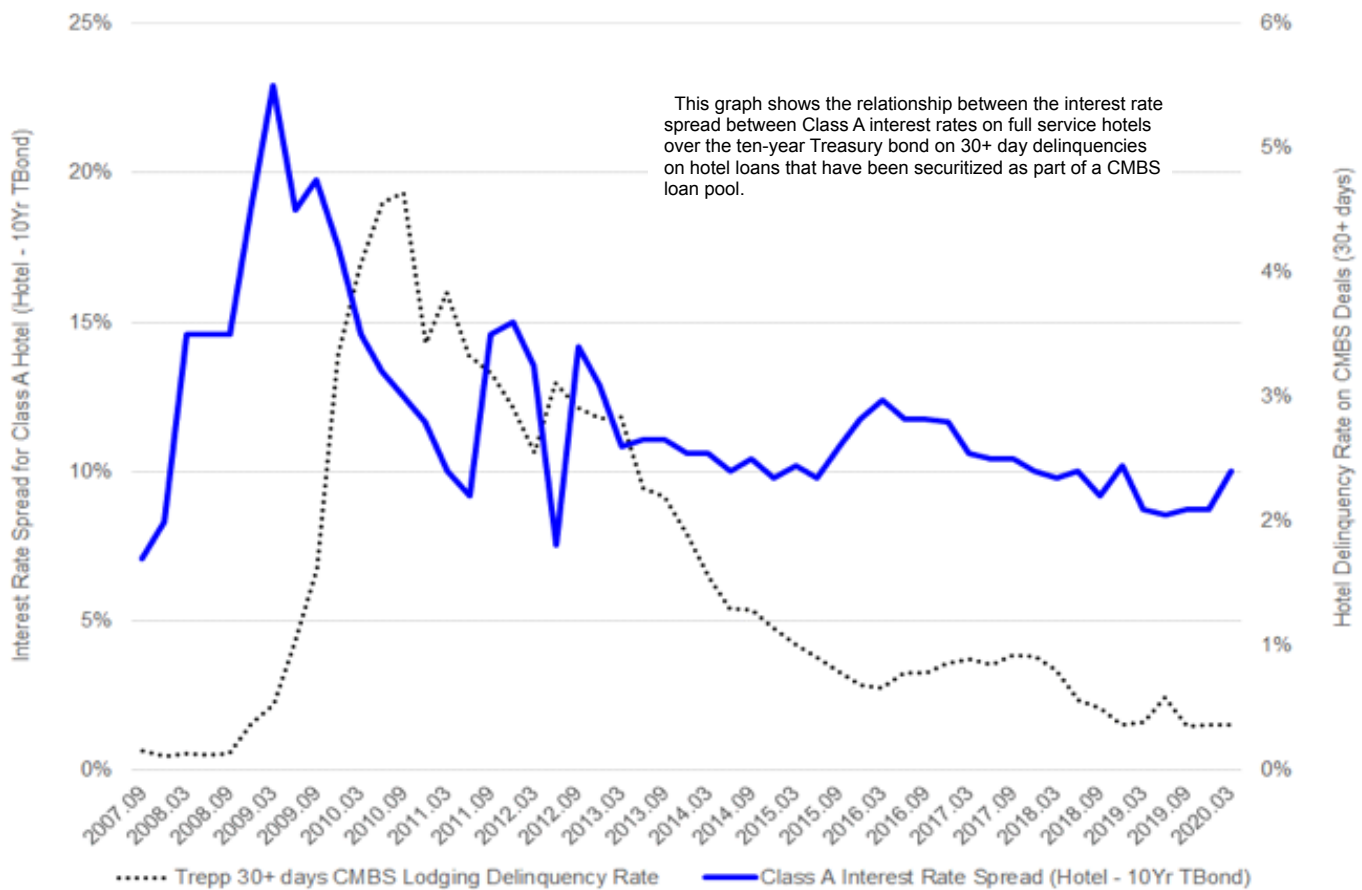
24 percent on a year-over-year basis, compared to a 22-percent fall in the prior period. Interest rates were 3.5 percent for Class A and 3.65 percent for Class B&C this quarter, compared to 3.97 percent for Class A and 4.12 percent for Class B&C in the fourth quarter (August) of 2019. Quarter over quarter, interest rates fell 12 percent for Class A Hotels and 11 percent for Class B&C Hotels. This downward trend in interest rates started in November 2018.

The risk premium for hotels has risen, indicating greater risk. Exhibit 21 depicts the interest rate spread between rates for Class A full-service hotels (and also class B&C properties) over the ten-year Treasury bond. On this metric, interest-rate spreads in the current quarter have (not surprisingly) risen from 210 basis points (bps) to 240 bps for Class A properties, while holding at 225 bps for Class B&C hotels relative to the prior quarter. The rise in the spread is a signal that lenders perceive hotels to be riskier in this quarter from the prior quarter. This spread is

⁴ This is the latest information reported by the Mortgage Bankers Association as of the writing of this report.

⁵ The interest rate reported by Cushman Wakefield Sonnenblick Goldman (CWSG) differs from the interest rate used to calculate our EVA metric, which is based on the interest rate reported by the American Council of Life Insurers (ACLI). The ACLI interest rate reflects what life insurers are charging for institutional size hotel deals. Our EVA calculation is based on property specific cap rates and the associated financing terms. The CWSG interest rate is based on deals that CWSG has brokered as well as their survey of rates on hotel deals. Those deals are not necessarily similar to deals that are reported by ACLI.

Interest rate spreads of hotels as a precursor of hotel delinquencies



Source: Cushman Wakefield Sonnenblick Goldman, Trepp

a leading indicator of hotel-loan delinquencies. Exhibit 22 indicates that a widening spread signals that lenders are demanding a higher compensation for making hotel loans. This demand is justified since delinquencies on hotel loans tend to rise in the subsequent quarters. By the same token, a narrowing spread indicates lower compensation for lenders, with the expectation of falling delinquencies.

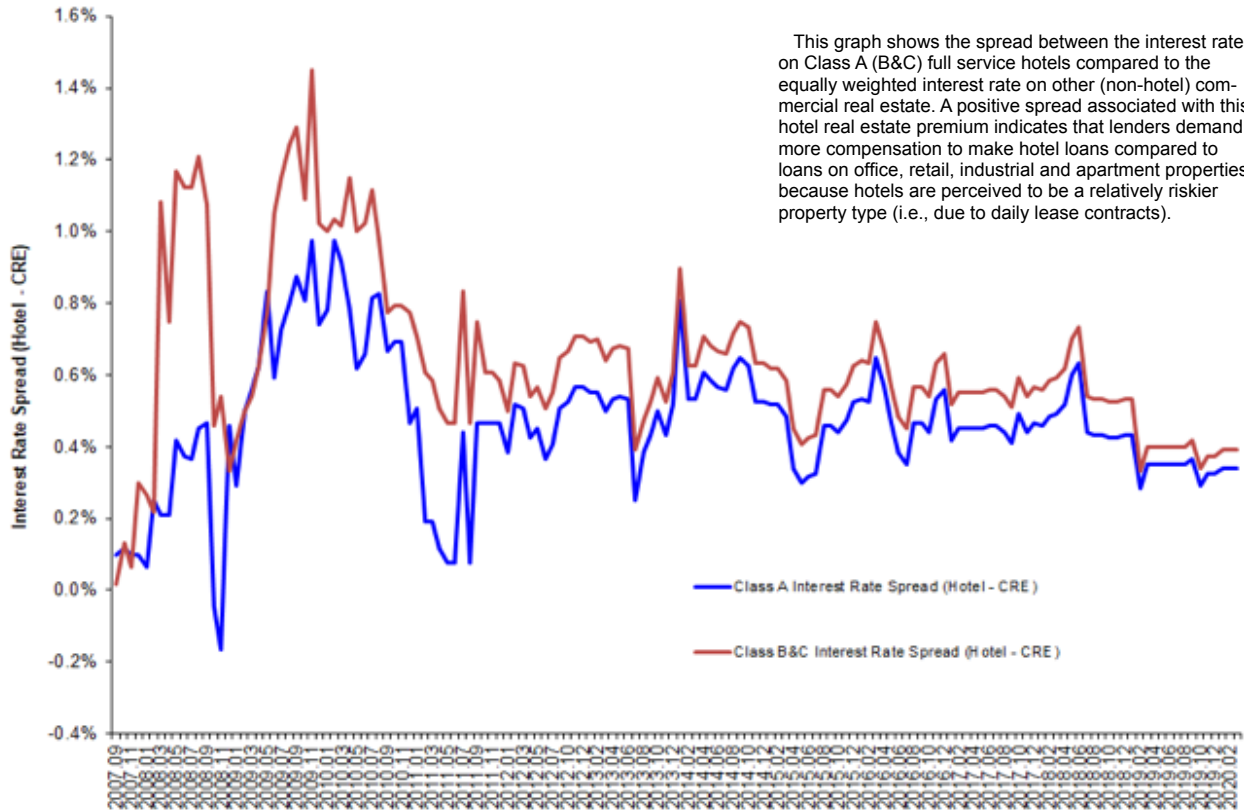
The relative risk premium that lenders require for hotels over other commercial real estate has widened. Exhibit 23 shows the spread between the interest rate on Class A (and B&C) full-service hotels compared to the (equally weighted) interest rate on other (non-hotel) commercial real estate. A positive spread associated with this hotel real estate risk premium indicates that lenders demand more compensation to make hotel loans compared to other commercial properties because hotels are perceived to be a relatively riskier property type.⁶ The monthly hotel real-estate premiums for Class A properties rose 5.1 percent, while the premium for lower quality Class B&C hotels

increased 4.4 percent relative to rates in the prior quarter (which had dropped 11.4 percent for Class A properties and had declined 10 percent for Class B hotels). This is a signal that the perceived default risk for hotel properties relative other commercial real estate (i.e., office, retail, industrial and apartments) has risen, making hotels relatively riskier bets for lending.

The delinquency rate on hotel loans has inched up, but there is no cause for concern. The CMBS delinquency rate (30+ days) for lodging properties remained at 1.53 percent in March 2020, invariant from 1.53 percent recorded in December 2019, although we expect this rate to rise unless loans are renegotiated in the wake of Covid-19 legislation. A year ago, the rate was 3.35 percent. For comparison purposes, the monthly delinquency rate in March for other property types as reported by Trepp is as follows: industrial, 1.35%; multifamily, 1.63 percent; office, 1.86 percent; and retail, 3.89 percent. Lodging had the second lowest delinquency rate after industrial properties, with retail the worst performing major property type. Exhibit 24 displays the historical 30+ day delinquency rate for hotels, while Exhibit

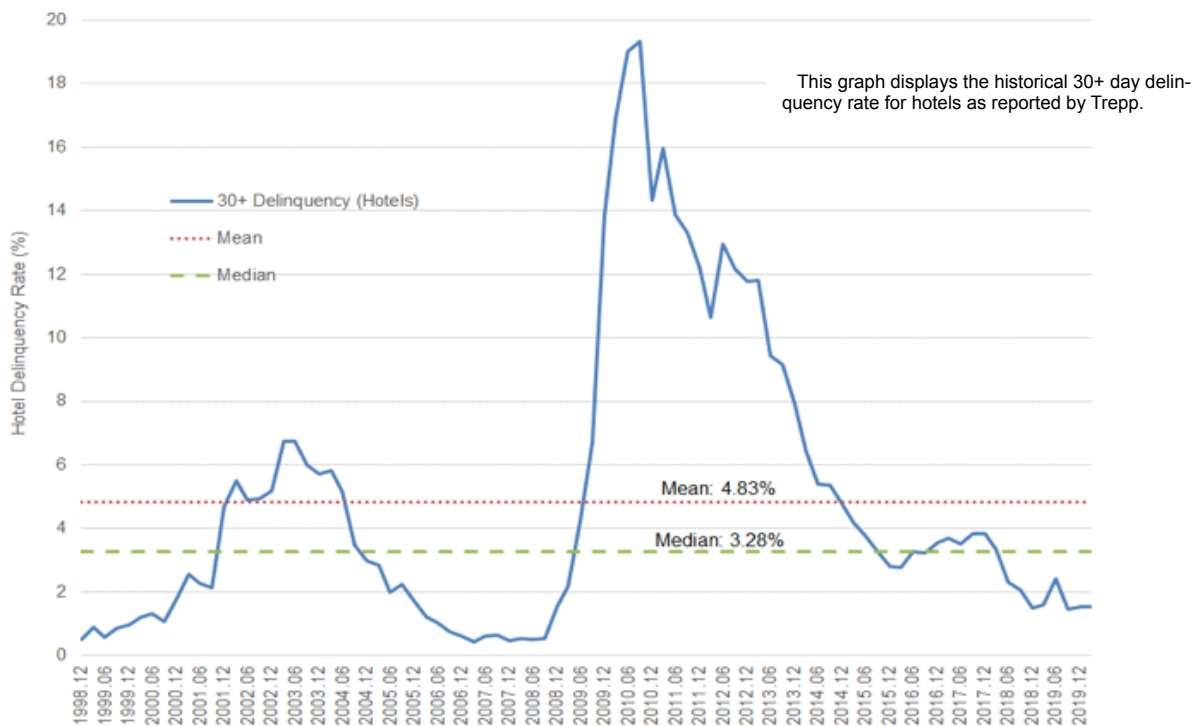
⁶ The interest rate on hotel properties is generally higher than that for apartment, industrial, office, and retail properties in part because hotels' cash flow is commonly more volatile than that of other commercial properties.

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



Source: Cushman Wakefield Sonnenblick Goldman

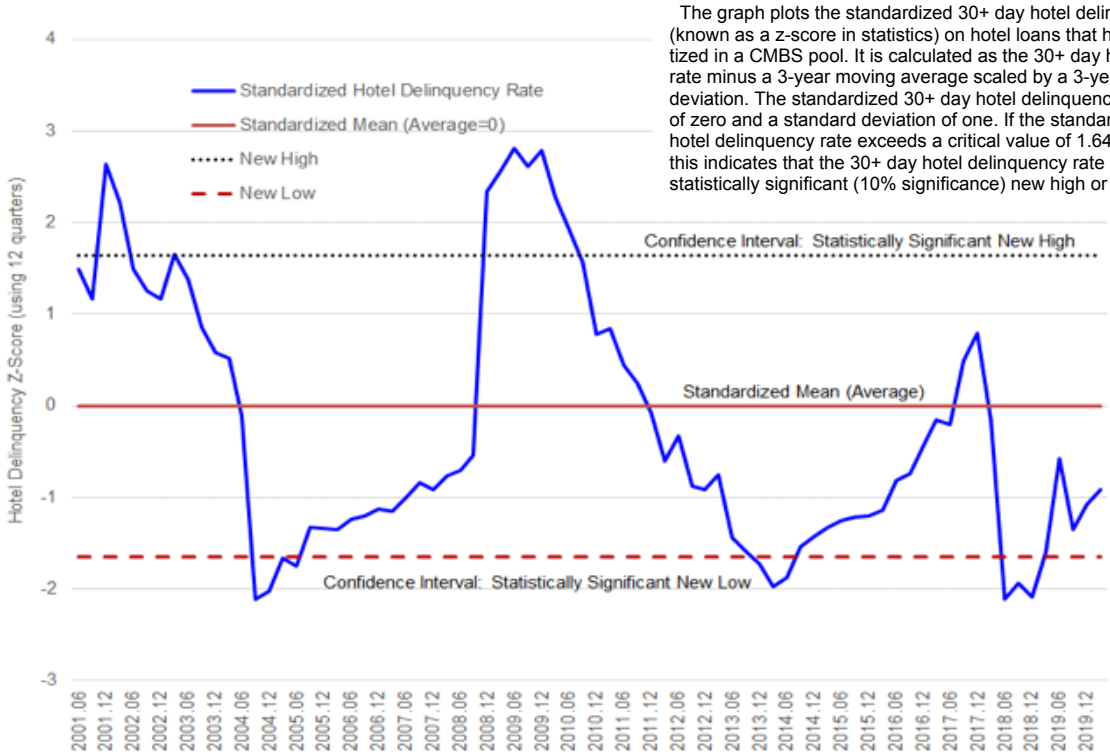
Thirty-plus-day delinquency rate for hotels



Source: Trepp

EXHIBIT 25

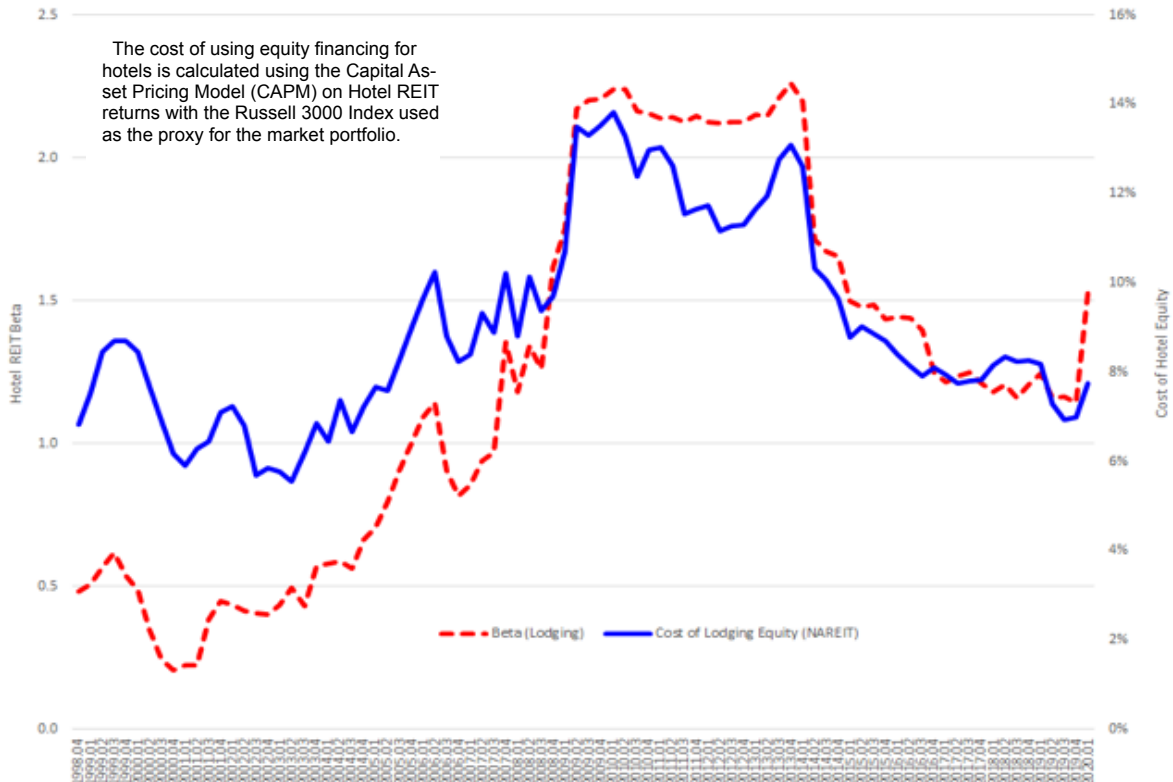
Standardized thirty-plus-day delinquency rate for hotels



Source: Trepp

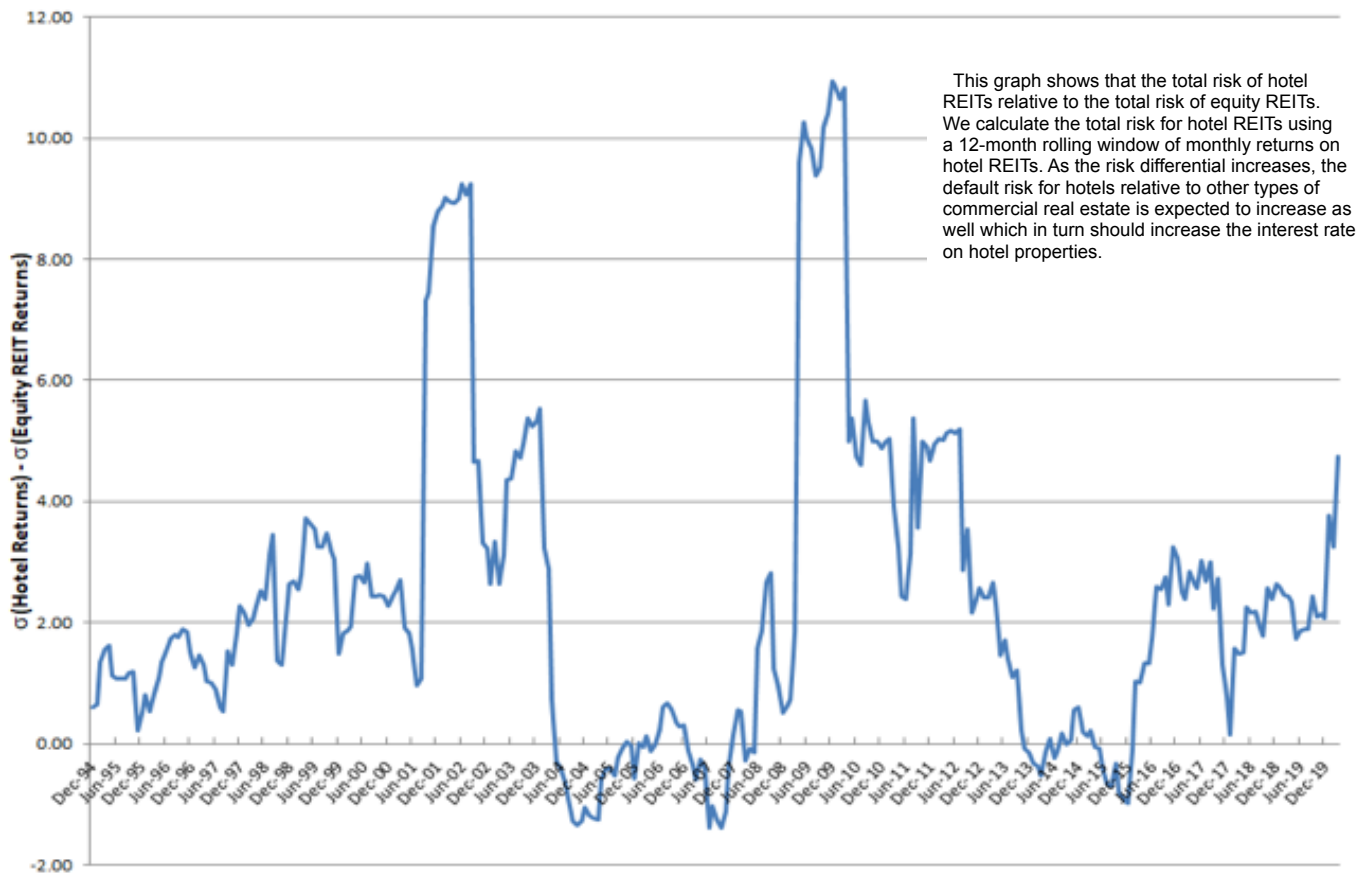
EXHIBIT 26

Cost of equity financing using the capital asset pricing model and hotel REITs



Sources: Cornell Center for Real Estate and Finance, NAREIT

Risk differential between hotel REITs and equity REITs



Sources: Cornell Center for Real Estate and Finance, NAREIT

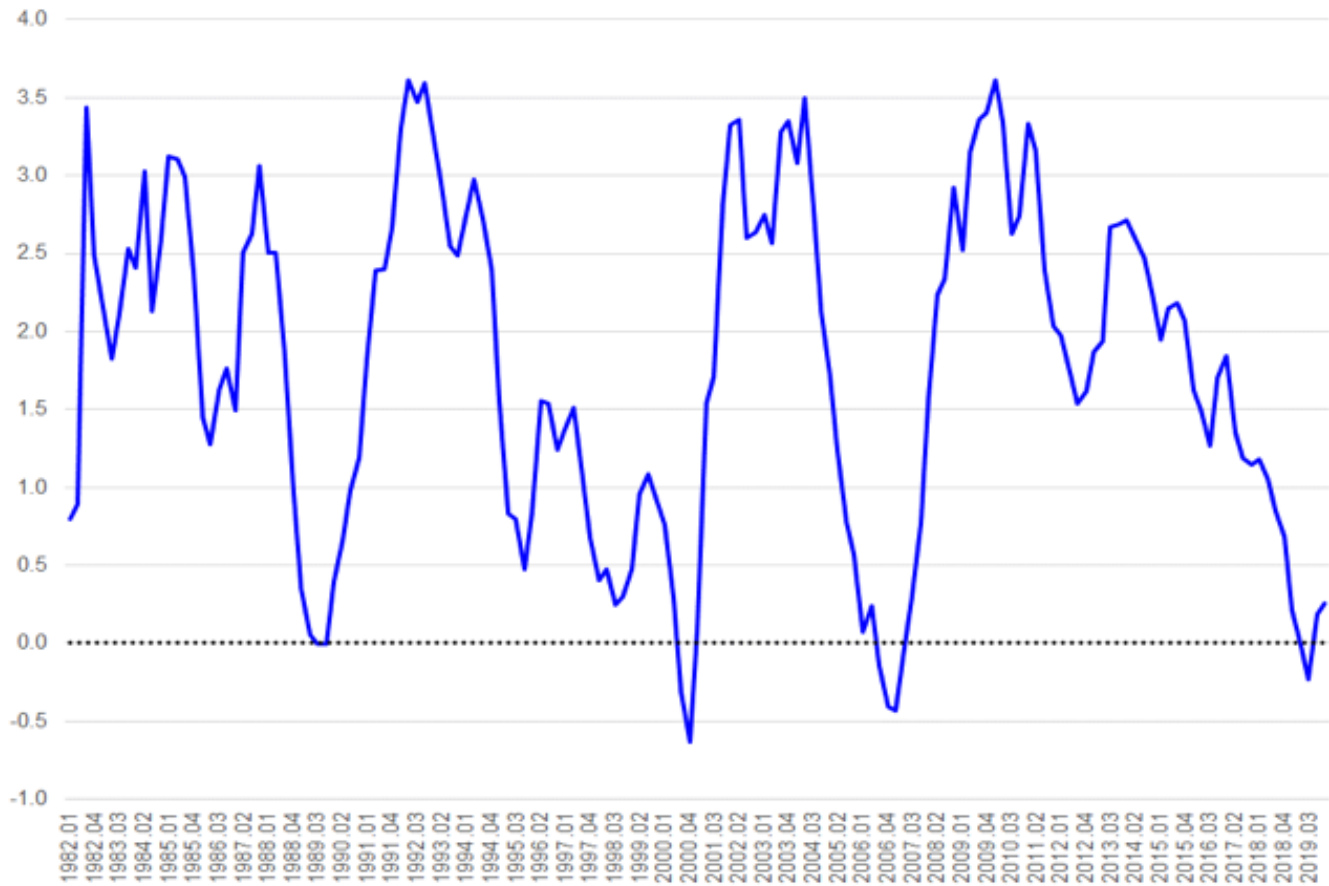
25 shows the standardized version of the 30+ day delinquency rate for hotels. Both exhibits reveal that the delinquency rate for hotels whose loans are securitized as part of CMBS deals are currently below their long-term average, although the standardized version of the hotel delinquency rate shows that the rate is reverting to its standardized average. The advantage of standardizing an indicator is that the mean is set equal to zero and the standard deviation is set equal to 1. If the indicator is above or below 1.645 (Z-score) then this indicates that the indicator has hit a statistically significant new high or low.

Cost of equity financing is now greater. The riskiness of hotels has risen relative to other types of commercial real estate. The cost of using equity financing for hotels as measured using the Capital Asset Pricing Model (CAPM) on hotel REIT returns (shown in Exhibit 26) has reversed

course and risen this quarter, making it costlier to borrow from equity markets. The cost of using equity funds in 2020Q1 stands at 7.75 percent, compared to 7 percent for 2019Q4 (and 6.9 percent for 2019Q3). In terms of *total risk* (systematic risk plus risk that is unique to hotel REITs), Exhibit 27 shows that the total risk of hotel REITs relative to the total risk of equity REITs rose 130 percent this quarter; on a year-over-year basis the increase was 96 percent.⁷ This indicates that the perceived default risk for hotels has widened relative to other types of commercial real estate consistent with our other hotel risk premium indicators. Expect borrowing costs for hotel loans to rise as the result of perceived riskier lending conditions. This trend is expected to persist in the short run.

⁷ We calculate the total risk for hotel REITs using a 12-month rolling window of monthly returns on hotel REITs.

U.S. Treasury 10-year versus 3-month spread



Sources: Cornell Center for Real Estate and Finance, St Louis Federal Reserve

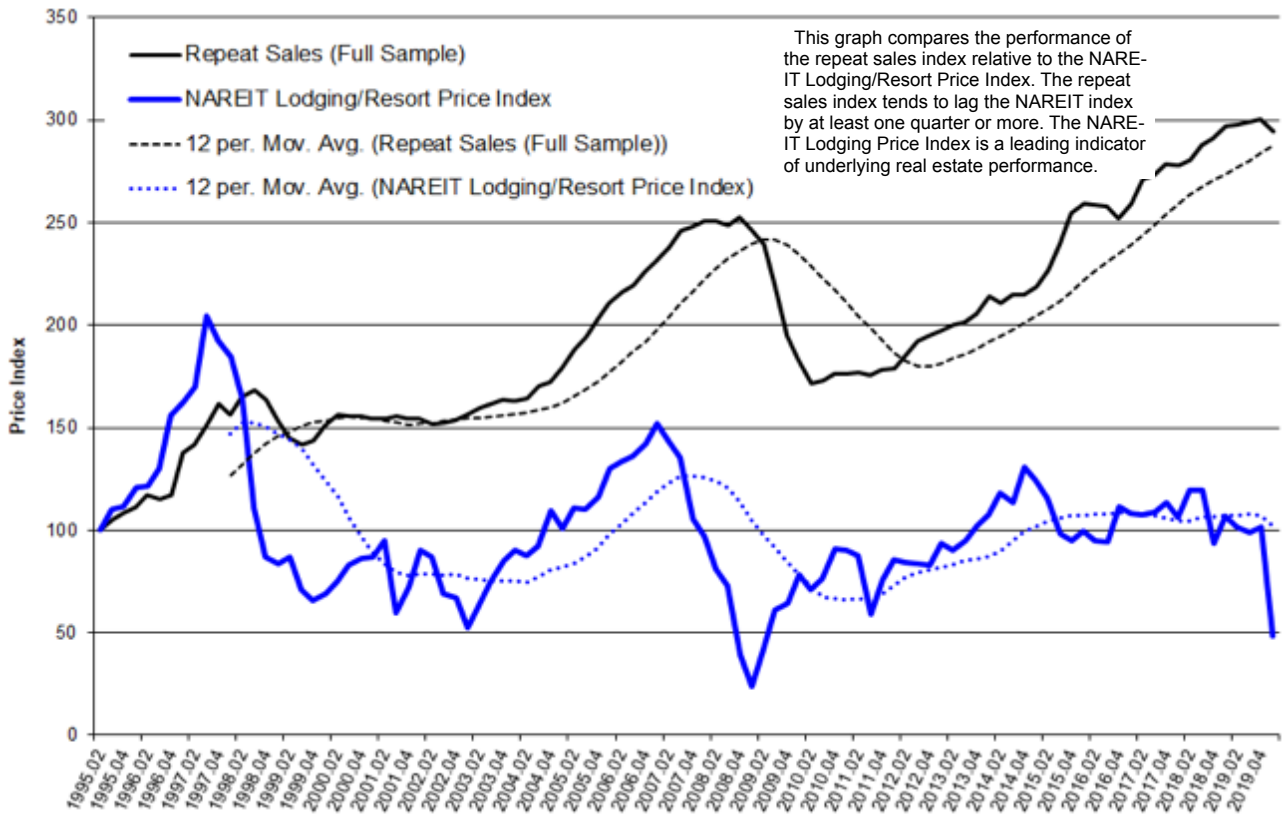
The spread between the 10-year Treasury and 3-month Treasury is flat this quarter and continues to be the Joker in the deck. The difference between the 10-year constant maturity treasury rate and the 3-month constant maturity treasury rate is widely used metric to study the yield curve. As the spread approaches zero, the yield curve flattens, while a negative spread has historically been a leading indicator of a recessionary period. Exhibit 28 shows that the positive spread has continued to rise. While this situation is a necessary condition for banks who borrow short and lend long, as well as the CMBS market that relies on an upward sloping yield curve for arbitrage, the current hemorrhaging of our economy as the result of Covid-19 generates uncertainty about market liquidity, which is critical to effective functioning of capital markets. If market liquidity improves, then expect interest rates to fall. This in turn depends on the extent to which the Federal Reserve embarks on an asset-buying spree, which includes buying

non-agency commercial mortgage backed securities (including mortgages on hotels). Whether the Fed will make non-agency CMBS purchases is unknown at this writing.

Our reading of the tea leaves suggests that the price of large hotels and small hotels should to continue to fall. Exhibit 29 compares the performance of the repeat sales index relative to the NAREIT Lodging/Resort Price Index. The repeat sales index tends to lag the NAREIT index by at least one quarter or more. This is consistent with prior academic studies which find that securitized real estate is a leading indicator of underlying real estate performance since the stock market is forward looking or efficient. Looking ahead, the NAREIT lodging index fell 52 percent this quarter, more than reversing a rise of 2.7 percent in the previous quarter. It also declined 54.5 percent year-over-year, compared to a rise of 8.8 percent in the previous year-over-year period.

EXHIBIT 29

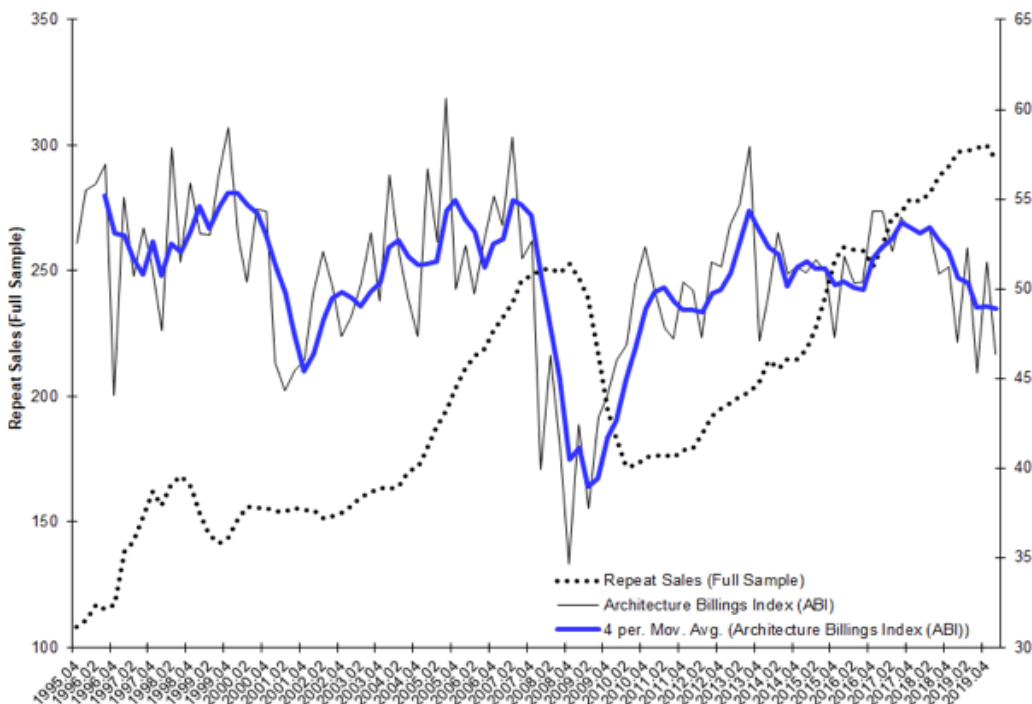
Repeat sales index versus NAREIT lodging/resort price index



Sources: Cornell Center for Real Estate and Finance, NAREIT

EXHIBIT 30

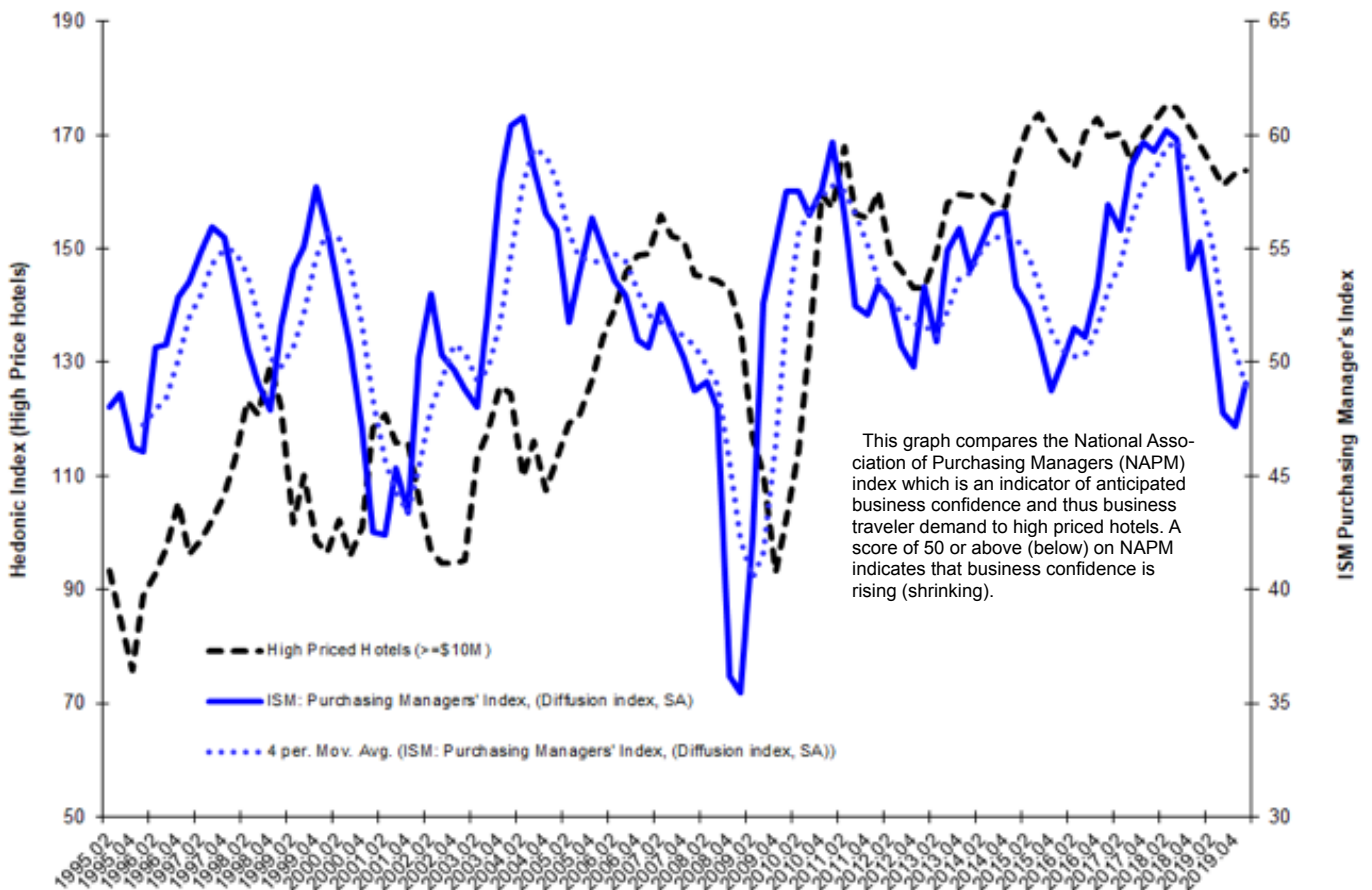
Repeat sales index versus the architecture billings index



This graph compares the architecture billings index (ABI) for commercial/ industrial property to the performance of the repeat sales index. *Ex ante*, the ABI is a forward-looking indicator of the performance of the repeat sales index. The ABI offers a 9-month to 1-year forward glimpse into the spending and demand for non-residential construction activity which includes hotels. A score of 50 and above indicates a rising level of construction in the non-residential sector.

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

Business confidence and high-price hotels



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

The architecture billings index (ABI) for commercial and industrial property,⁸ which represents another forward-looking metric, fell 10 percent this quarter from the previous quarter, as shown in Exhibit 30 (46.35 versus 51.5).⁹ Year over year, the ABI declined 1.4 percent in the

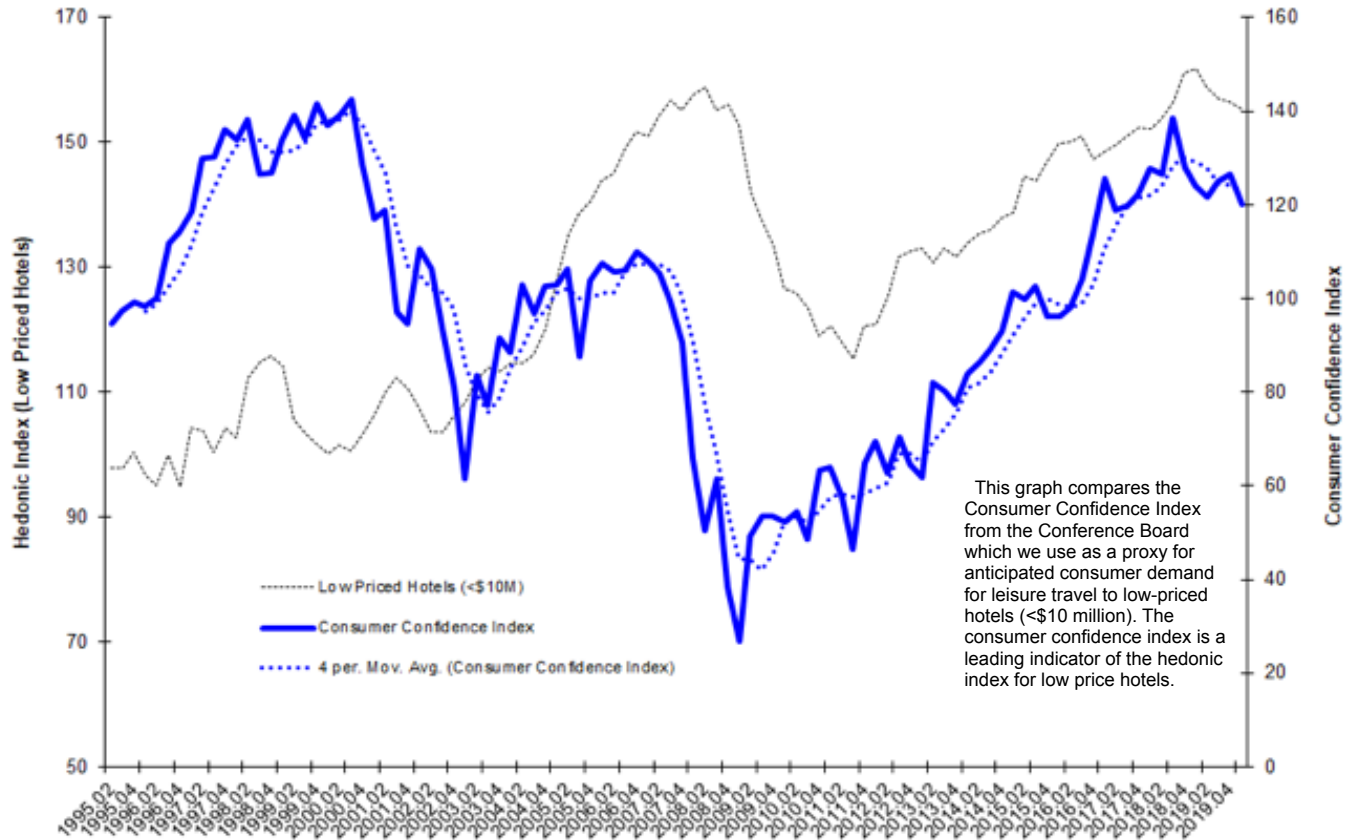
current period compared to a slight rise of .6 percent in the previous year-over-year period. Expect negative price momentum based on the year-over-year trend in ABI.

The National Association of Purchasing Managers (NAPM) index shown in Exhibit 31, which is an indicator of anticipated business confidence and thus business traveler demand, decreased 11.2 percent year over year (4 per-

⁸ <http://www.aia.org/practicing/economics/aiaas076265>

⁹ The 10% expected decline in the ABI is based on a special AIA Report issued in March 2020 entitled "Moving ahead, challenging times confront the design professions" <https://www.aia.org/pages/6282364-march-2020-special-report-moving-ahead-cha>

Consumer confidence and low-price hotels



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

cent on a quarter-over-quarter basis) compared to a drop of 12.8 percent in the prior year-over-year period (2019Q4-2018Q4). Based on this indicator, expect the price of large hotels to continue to decline on a year-over-year basis.

The Consumer Confidence Index from the Conference Board graphed in Exhibit 32, which we use as a proxy for anticipated consumer demand for leisure travel and a leading indicator of the hedonic index for low price hotels, lost 5.1 percent quarter-over-quarter, and also fell 3.3 percent year over year. Expect the price momentum for small hotels to fall in the next quarter. ■

**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. This is available for download from the [Scholarly Commons](#) or via our [CREF website](#).

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:

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

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

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

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

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