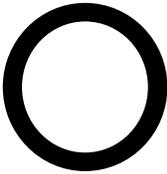


Third Quarter 2016:
Hotels Exhibit Positive Momentum

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

EXECUTIVE SUMMARY

 Our Standardized Unexpected Price (SUP) metric showed an uptick in the price of large hotels during the third quarter of 2016, with a continued decline in the price of small hotels. Although debt and equity financing for hotels were still relatively inexpensive during this quarter, we remain concerned that the increasing relative riskiness of hotels compared to other commercial real estate suggests that lenders will eventually start to tighten hotel lending standards if this trend continues. Our early warning indicators continue to suggest an eventual downward trend in large hotel prices. This is report number 20 of the index series.

ABOUT THE AUTHORS

Crocker H. Liu is a professor of real estate at the School of Hotel Administration at Cornell, where he is the Robert A. Beck Professor of Hospitality Financial Management. He previously taught at New York University's Stern School of Business (1988–2006) and at Arizona State University's W.P. Carey School of Business (2006–2009) where he held the McCord Chair. His research interests are focused on issues in real estate finance, particularly topics related to agency, corporate governance, organizational forms, market efficiency, and valuation. Liu's research has been published in 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*, *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 also 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*. 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 Graaskamp, and a Ph.D. in finance and real estate from the University of Texas under Dr. Vijay Bawa.



Adam D. Nowak is an assistant 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. Nowak taught an introduction to macroeconomics course and a survey of international economics at Arizona State. He was the research analyst in charge of constructing residential and commercial real estate indices for the Center for Real Estate Theory and Practice at Arizona State University. Nowak's research has been published in the *Journal of Urban Economics*, *Journal of Applied Econometrics*, and the *Journal of Real Estate Research*.



Robert M. White, Jr., CRE, is the founder and president of Real Capital Analytics Inc., an international research firm that publishes the Capital Trends Monthly. Real Capital Analytics provides real time data concerning the capital markets for commercial real estate and the values of commercial properties. 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, and his research has been published in the *Journal of Real Estate Finance and Economics*. 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, 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. 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 is also a member of numerous industry organizations and a supporter of academic studies. White is a graduate of the McIntire School of Commerce at the University of Virginia.



Acknowledgments

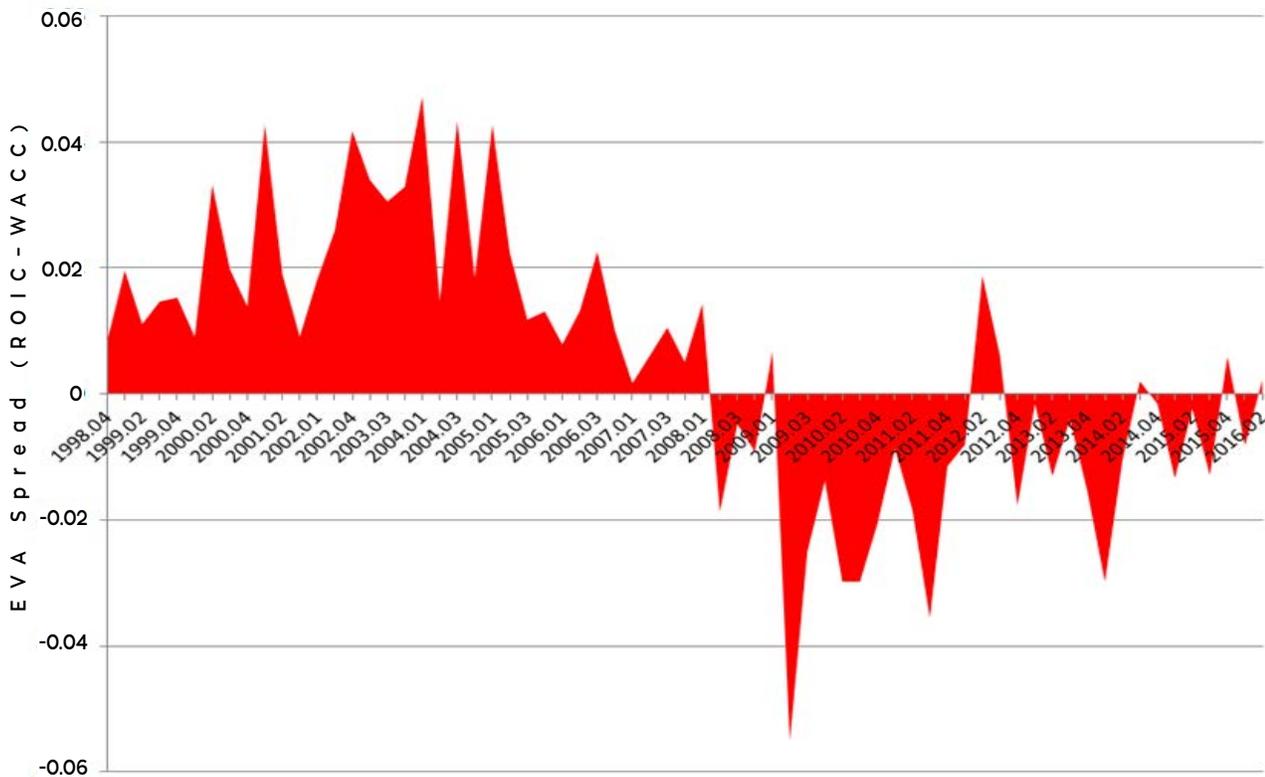
We wish to thank Glenn Withiam for copy editing this paper.

Disclaimer

The Cornell hotel indices are produced by The Center for Real Estate and Finance at the School of Hotel Administration at Cornell University and provided as a free service to academics and practitioners on an as-is, best-effort basis, with no warranties or claims regarding their usefulness.

EXHIBIT 1

Economic value added (EVA) for hotels

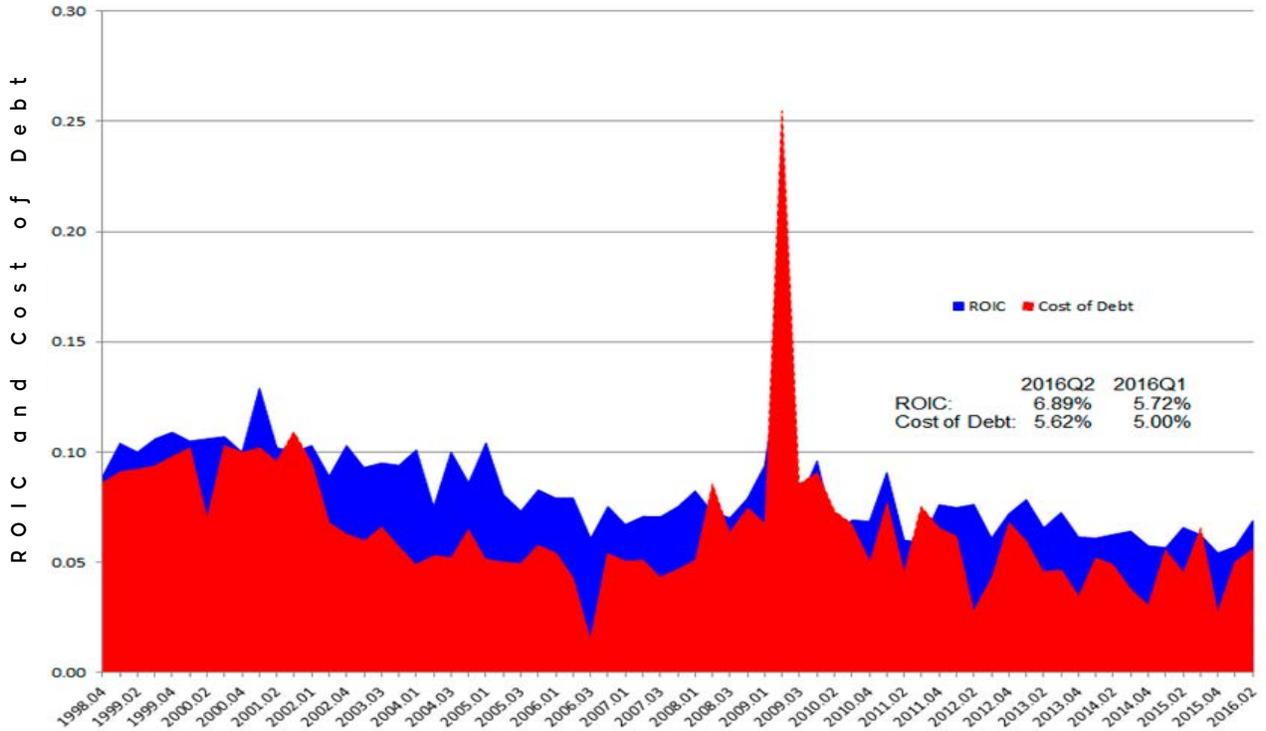


Sources: ACLI, Cornell Center for Real Estate and Finance, NAREIT, Federal Reserve

Analysis of Indices through Q3, 2016

Hotel investment based on operating performance is still in the black (essentially breakeven). Our Economic Value Added (EVA) indicator is at .002, as shown in Exhibit 1, although it has increased slightly from the previous quarter (2016Q1, when it stood at -.008). The EVA is currently at the same level that it was two years ago, back in 2014Q3. The cost of debt financing (5.62%) is 127 basis points lower than the hotel cap rate (6.89%), signalling that positive leverage continues to be the norm for hotel deals.

Return on investment capital versus cost of debt financing



About the Cornell Hotel Indices

In our inaugural issue of the Cornell Hotel Index series, we introduced three new quarterly metrics to monitor real estate activity in the hotel market. These are a large hotel index (hotel transactions of \$10 million or more), a small hotel index (hotels under \$10 million), and a repeat sales index (RSI) that tracks actual hotel transactions. These indices are constructed using the CoStar and Real Capital Analytics (RCA) commercial real estate databases. For the repeat-sale index, we compare the sales and resales of the same hotel over time. All three measures provide a more accurate representation of the current hotel real estate market conditions than does reporting 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 (CREF). In this fourth edition, we present updates and revisions to our three hotel indices along with commentary and supporting evidence from the real estate market.

The loosening of the spread of the cap rate over mortgage financing, as shown in Exhibit 2, suggests that the magnification of hotel property returns due to debt financing has increased. In summary, these two exhibits signal that the market is heading into positive territory.

Hotel transaction volume falls for both large and small hotels, with the median price of large hotels rising and that of small hotels remaining flat on a year-over-year basis. The total volume of 286 recorded transactions in the third quarter (both large hotels and small hotels combined), as reported in Exhibit 3B, was lower than the previous quarter (which saw 324 transactions). It is also the same level as the first quarter of 2007 (also at 286 transactions). On a year-over-year basis (2015Q3 to 2016Q3), both the volume of hotel transactions and the median price of hotels declined (volume dropped 4.7%, and median prices, 3.7%). Although the volume of transactions also declined year over year for both large (-6.9%) and small (-1.4%) hotel transactions, the median sale price increased for both sizes of property, with small hotels experiencing a 6.6-percent rise and large hotels having a 2.5-percent year-over-year increase.¹ On a quarter-over-quarter basis, however, larger hotels had a large price bump (60.7%),

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

Transaction volume (obs) and median sale price (part 1: 1995–2004)

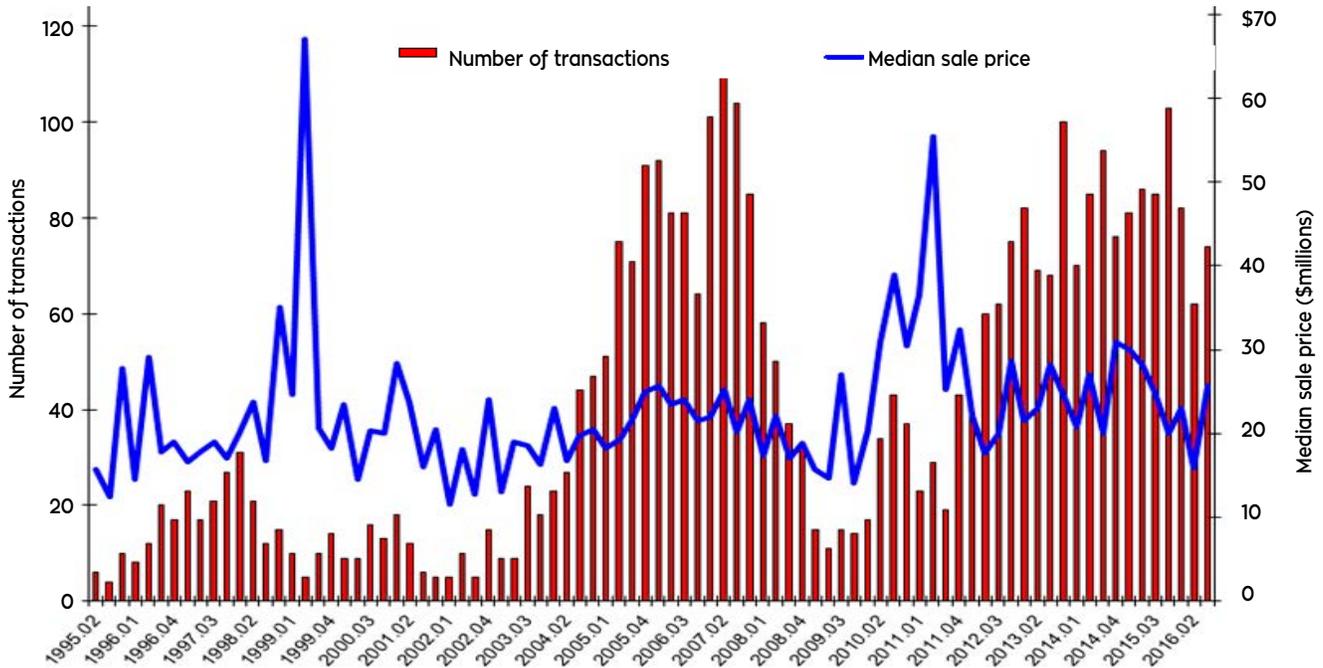
Year	Quarter	Full Sample		Big			Small		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
1995	1	\$2,357,500	20	.	.		\$2,357,500	20	
1995	2	\$3,150,000	29	\$15,712,500	6	20.69%	\$2,670,000	23	79.31%
1995	3	\$2,562,500	44	\$12,400,000	4	9.09%	\$2,378,000	40	90.91%
1995	4	\$3,400,000	41	\$27,750,000	10	24.39%	\$2,625,000	31	75.61%
1996	1	\$2,500,000	39	\$14,475,000	8	20.51%	\$1,700,000	31	79.49%
1996	2	\$2,925,000	43	\$29,150,000	12	27.91%	\$2,500,000	31	72.09%
1996	3	\$6,500,000	57	\$17,740,000	20	35.09%	\$3,000,000	37	64.91%
1996	4	\$2,735,000	58	\$19,000,000	17	29.31%	\$2,200,000	41	70.69%
1997	1	\$5,053,250	74	\$16,635,500	23	31.08%	\$3,500,000	51	68.92%
1997	2	\$2,862,500	72	\$17,750,000	17	23.61%	\$2,150,000	55	76.39%
1997	3	\$3,437,500	90	\$19,000,000	21	23.33%	\$2,400,000	69	76.67%
1997	4	\$4,330,950	78	\$17,000,000	27	34.62%	\$2,300,000	51	65.38%
1998	1	\$4,698,800	92	\$20,000,000	31	33.70%	\$3,100,000	61	66.30%
1998	2	\$3,630,000	96	\$23,765,000	21	21.88%	\$3,000,000	75	78.13%
1998	3	\$2,961,059	92	\$16,740,000	12	13.04%	\$2,690,550	80	86.96%
1998	4	\$2,550,000	84	\$35,000,000	15	17.86%	\$2,375,000	69	82.14%
1999	1	\$2,425,000	88	\$24,638,095	10	11.36%	\$2,125,000	78	88.64%
1999	2	\$2,100,000	95	\$67,000,000	5	5.26%	\$1,950,000	90	94.74%
1999	3	\$2,500,000	99	\$20,711,100	10	10.10%	\$2,130,000	89	89.90%
1999	4	\$2,440,000	87	\$18,190,000	14	16.09%	\$2,090,000	73	83.91%
2000	1	\$2,400,000	110	\$23,500,000	9	8.18%	\$2,300,000	101	91.82%
2000	2	\$2,450,000	88	\$14,500,000	9	10.23%	\$2,275,000	79	89.77%
2000	3	\$2,600,000	95	\$20,346,875	16	16.84%	\$2,250,000	79	83.16%
2000	4	\$2,475,000	101	\$20,000,000	13	12.87%	\$2,325,000	88	87.13%
2001	1	\$2,970,650	104	\$28,437,500	18	17.31%	\$2,422,500	86	82.69%
2001	2	\$2,800,000	110	\$23,795,000	12	10.91%	\$2,687,150	98	89.09%
2001	3	\$2,700,000	87	\$16,000,000	6	6.90%	\$2,500,000	81	93.10%
2001	4	\$2,400,000	73	\$20,500,000	5	6.85%	\$2,300,000	68	93.15%
2002	1	\$2,125,000	70	\$11,518,052	5	7.14%	\$2,000,000	65	92.86%
2002	2	\$2,400,000	106	\$18,125,000	10	9.43%	\$2,287,500	96	90.57%
2002	3	\$2,355,400	81	\$12,750,000	5	6.17%	\$2,237,500	76	93.83%
2002	4	\$2,907,500	100	\$24,000,000	15	15.00%	\$2,600,000	85	85.00%
2003	1	\$2,530,000	94	\$13,000,000	9	9.57%	\$2,425,000	85	90.43%
2003	2	\$2,750,000	110	\$19,000,000	9	8.18%	\$2,519,000	101	91.82%
2003	3	\$3,334,000	142	\$18,500,000	24	16.90%	\$2,637,500	118	83.10%
2003	4	\$2,600,000	149	\$16,375,000	18	12.08%	\$2,425,000	131	87.92%
2004	1	\$2,925,000	166	\$23,050,000	23	13.86%	\$2,550,000	143	86.14%
2004	2	\$2,700,000	195	\$16,700,000	27	13.85%	\$2,475,000	168	86.15%
2004	3	\$3,491,122	216	\$19,675,000	44	20.37%	\$2,630,000	172	79.63%
2004	4	\$4,000,000	177	\$20,475,000	47	26.55%	\$3,085,500	130	73.45%

Transaction volume (obs) and median sale price (part 2: 2005-2016)

Year	Quarter	Full Sample		Big			Small		
		Median Sale Price	Obs	Median Sale Price	Obs	% Total Sales	Median Sale Price	Obs	% Total Sales
2005	1	\$4,330,000	231	\$18,200,000	51	18.09%	\$3,350,000	180	81.91%
2005	2	\$4,566,250	316	\$19,316,925	75	19.18%	\$3,300,000	241	80.82%
2005	3	\$4,150,000	273	\$21,750,000	71	20.64%	\$3,100,000	202	79.36%
2005	4	\$4,425,000	300	\$25,000,000	91	23.27%	\$3,170,000	209	76.73%
2006	1	\$5,227,500	302	\$25,750,000	92	23.35%	\$3,825,000	210	76.65%
2006	2	\$4,675,000	314	\$23,500,000	81	20.51%	\$3,500,000	233	79.49%
2006	3	\$5,000,000	285	\$24,000,000	81	22.13%	\$3,657,500	204	77.87%
2006	4	\$4,587,500	248	\$21,600,000	64	20.51%	\$3,550,000	184	79.49%
2007	1	\$6,155,805	286	\$22,000,000	101	26.10%	\$3,789,500	185	73.90%
2007	2	\$5,650,000	385	\$25,250,000	119	23.61%	\$3,760,000	266	76.39%
2007	3	\$5,450,000	330	\$20,175,081	104	23.96%	\$3,911,750	226	76.04%
2007	4	\$4,680,000	249	\$24,000,000	85	25.45%	\$3,184,000	164	74.55%
2008	1	\$5,000,000	255	\$17,420,000	58	18.53%	\$4,000,000	197	81.47%
2008	2	\$5,062,900	228	\$22,150,000	50	17.99%	\$3,890,000	178	82.01%
2008	3	\$4,190,500	172	\$17,133,333	37	17.70%	\$3,350,000	135	82.30%
2008	4	\$4,050,000	159	\$18,850,000	32	16.75%	\$3,500,000	127	83.25%
2009	1	\$4,150,000	81	\$15,800,000	15	15.63%	\$3,600,000	66	84.38%
2009	2	\$3,090,231	86	\$14,722,500	11	11.34%	\$2,864,310	75	88.66%
2009	3	\$3,400,000	90	\$27,000,000	15	14.29%	\$3,000,000	75	85.71%
2009	4	\$3,562,500	84	\$14,100,000	14	14.29%	\$3,010,250	70	85.71%
2010	1	\$3,900,000	89	\$20,325,000	17	16.04%	\$2,912,500	72	83.96%
2010	2	\$3,700,000	138	\$30,833,449	34	19.77%	\$3,000,000	104	80.23%
2010	3	\$4,912,500	120	\$39,000,000	43	26.38%	\$2,850,000	77	73.62%
2010	4	\$3,988,800	100	\$30,500,000	37	27.01%	\$2,440,000	63	72.99%
2011	1	\$4,200,000	85	\$36,600,000	23	21.30%	\$2,797,750	62	78.70%
2011	2	\$4,150,000	97	\$55,500,000	29	23.02%	\$2,250,000	68	76.98%
2011	3	\$3,350,000	73	\$25,250,000	19	20.65%	\$2,800,000	54	79.35%
2011	4	\$5,000,000	157	\$32,400,000	43	21.50%	\$3,229,250	114	78.50%
2012	1	\$5,216,981	132	\$22,100,000	39	22.81%	\$3,275,000	93	77.19%
2012	2	\$4,000,000	209	\$17,600,000	60	22.30%	\$2,809,000	149	77.70%
2012	3	\$7,100,000	170	\$20,081,500	62	26.72%	\$3,202,000	108	73.28%
2012	4	\$5,700,000	209	\$28,600,000	75	26.41%	\$3,150,000	134	73.59%
2013	1	\$5,999,996	240	\$21,502,126	82	25.47%	\$3,000,000	158	74.53%
2013	2	\$4,700,000	217	\$23,000,000	69	24.13%	\$2,525,000	148	75.87%
2013	3	\$5,225,000	248	\$28,200,000	68	21.52%	\$3,600,000	180	78.48%
2013	4	\$4,735,000	318	\$24,000,000	99	23.74%	\$2,800,000	219	76.26%
2014	1	\$5,600,000	229	\$20,750,000	70	23.41%	\$3,250,000	159	76.59%
2014	2	\$4,300,000	322	\$27,000,000	85	20.88%	\$2,850,000	237	79.12%
2014	3	\$5,500,000	352	\$20,000,000	94	21.08%	\$3,475,000	258	78.92%
2014	4	\$4,500,000	313	\$30,920,684	76	19.54%	\$3,175,000	237	80.46%
2015	1	\$5,752,500	256	\$30,000,000	81	24.04%	\$3,162,100	175	75.96%
2015	2	\$6,300,000	269	\$28,250,000	86	24.23%	\$3,525,000	183	75.77%
2015	3	\$5,050,000	300	\$25,000,000	85	22.08%	\$3,025,000	215	77.92%
2015	4	\$6,700,000	293	\$19,750,000	102	25.82%	\$3,300,000	191	74.18%
2016	1	\$5,608,750	294	\$21,437,500	86	22.63%	\$3,415,000	208	77.37%
2016	2	\$4,100,000	324	\$15,950,000	62	16.06%	\$3,250,000	262	83.94%
2016	3	\$4,862,500	286	\$25,625,000	74	20.56%	\$3,225,000	212	79.44%

EXHIBIT 4

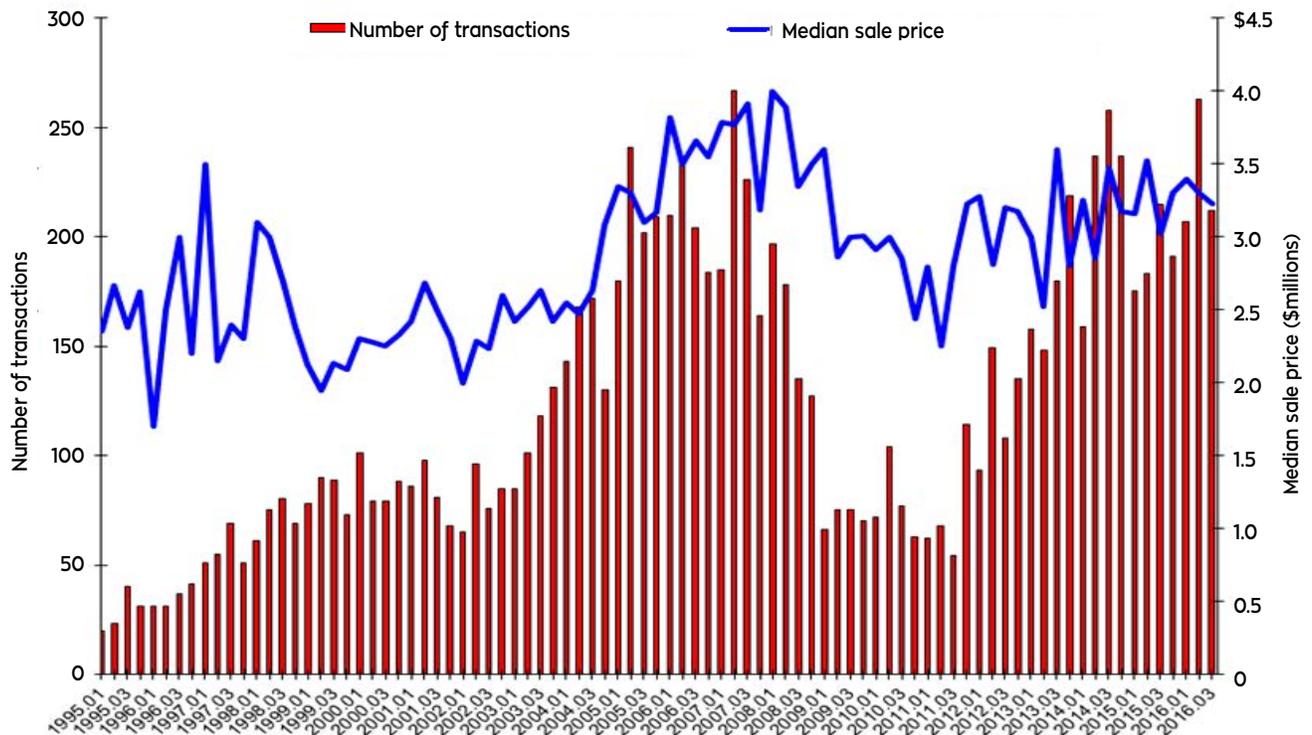
Median sale price and number of sales for high-price hotels (sale prices of \$10 million or more)



Sources: CoStar, Real Capital Analytics

EXHIBIT 5

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

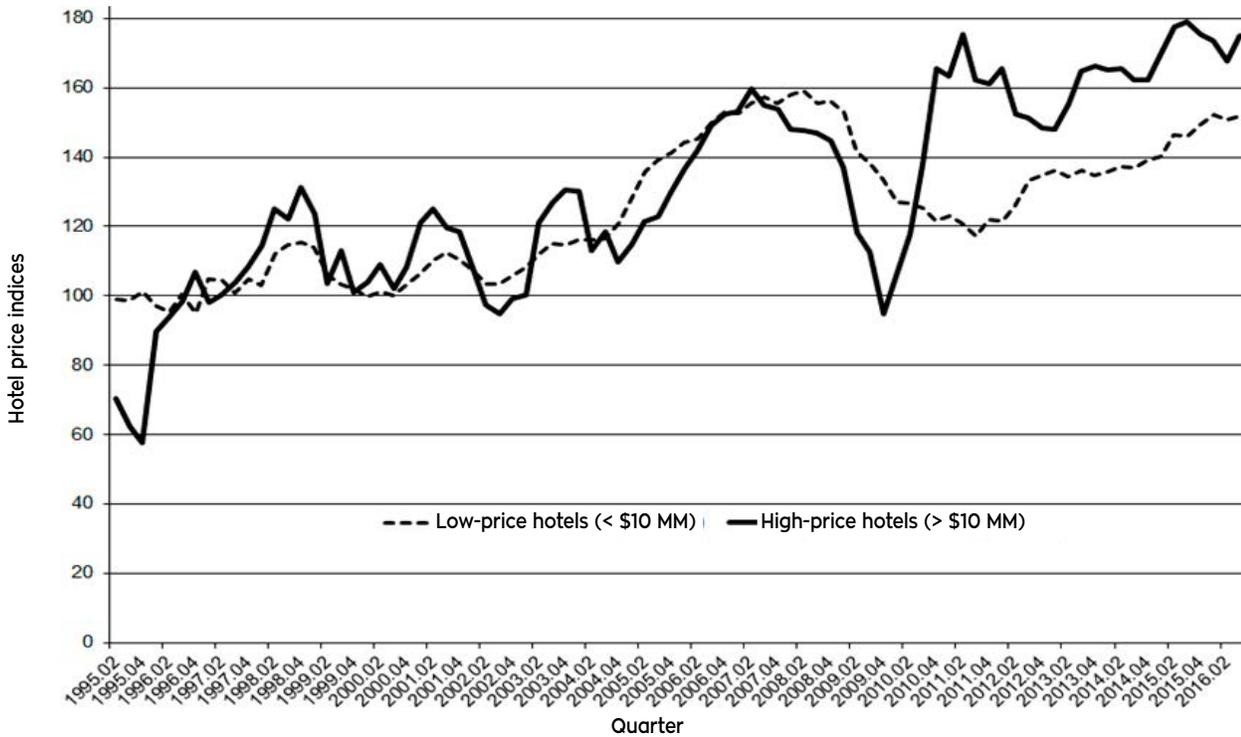


Sources: CoStar, Real Capital Analytics

Hotel indices through 2016, quarter 3

YrQtr	Index Value				YrQtr	Index Value			
	Hedonic	Hedonic	RSI	RSI		Hedonic	Hedonic	RSI	RSI
	Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Repeat Sales Index	Index Value Repeat Sales		Low Priced Hotels (<\$10M)	High Priced Hotels (>=\$10M)	Repeat Sales Index	Index Value Repeat Sales
1995.02	98.997285	70.362266	63.6096		2006.01	144.40327	136.93019	128.283	142.4748
1995.03	98.794833	62.469854	67.0357		2006.02	145.34144	142.05449	132.487	148.445
1995.04	101.20405	57.569826	68.4613		2006.03	150.1501	149.35211	133.835	148.349
1996.01	97.20758	89.643312	70.5949		2006.04	152.90374	152.37713	138.285	154.3294
1996.02	95.314557	93.911443	73.7527		2007.01	152.65447	153.35881	140.446	152.8638
1996.03	100.30806	98.323914	72.9498		2007.02	155.63009	159.84153	143.972	160.8199
1996.04	95.160949	106.84014	73.0258		2007.03	157.50094	155.14876	149.061	168.0232
1997.01	104.6869	98.042997	87.295		2007.04	155.62397	154.01984	147.54	159.8688
1997.02	104.36213	100.38803	89.5021		2008.01	158.08215	148.17867	148.341	175.8213
1997.03	100.82421	104.01297	95.8169		2008.02	159.24328	147.57252	147.866	165.0925
1997.04	104.6888	108.31888	100.398		2008.03	155.38755	146.82214	145.365	155.7545
1998.01	103.12753	114.63992	96.2484		2008.04	156.17921	144.97621	146.77	159.0682
1998.02	112.18769	125.27334	101.454		2009.01	152.89384	137.25993	141.596	140.2169
1998.03	114.78068	122.21686	102.897		2009.02	141.81138	118.1945	140.533	146.9465
1998.04	115.53155	131.32255	100.85		2009.03	137.89719	112.6663	127.346	97.0211
1999.01	113.99023	123.82464	93.7547		2009.04	133.56439	94.982123	115.9	105.9574
1999.02	105.86054	103.67465	88.6164		2010.01	127.28246	105.62941	112.488	117.9443
1999.03	103.44432	113.05743	86.3118		2010.02	126.69273	117.8008	103.276	109.5817
1999.04	101.79483	101.0771	88.5552		2010.03	125.25026	138.03508	104.684	106.3477
2000.01	99.828666	103.97762	94.4049	100	2010.04	121.61574	165.57685	110.089	127.0662
2000.02	101.35057	108.87965	97.9119	107.1998	2011.01	123.21401	163.37715	108.165	113.961
2000.03	100.27769	102.14491	97.4317	88.34621	2011.02	120.78258	175.46297	109.156	110.6031
2000.04	103.31946	108.30845	95.4645	93.64117	2011.03	117.39055	162.1947	109.297	104.8538
2001.01	106.36661	121.0131	93.8512	96.21031	2011.04	122.05902	161.07954	108.966	122.1409
2001.02	110.233	125.11964	92.9817	101.1551	2012.01	121.75472	165.40908	110.294	112.4508
2001.03	112.4643	119.62977	92.8284	95.11255	2012.02	126.10796	152.2902	111.962	132.145
2001.04	110.32972	118.54405	93.7364	95.99899	2012.03	133.44464	151.36517	116.747	121.6469
2002.01	107.3897	107.63181	92.3638	103.3095	2012.04	134.71175	148.6067	117.778	128.8904
2002.02	103.45808	97.209768	90.0199	85.42003	2013.01	136.25091	148.20147	120.698	124.4289
2002.03	103.42503	94.793371	91.1675	93.09077	2013.02	134.35976	155.19841	124.515	138.2567
2002.04	106.13137	99.186102	90.2585	97.95429	2013.03	136.05533	164.90647	127.051	139.4792
2003.01	108.27789	100.42714	93.7503	104.6973	2013.04	134.61737	166.40498	126.533	140.2
2003.02	112.16643	120.9749	96.27	107.2469	2014.01	135.78176	165.33001	132.973	161.0914
2003.03	115.20975	126.93717	97.8997	107.1142	2014.02	137.24842	165.50776	130.384	133.3601
2003.04	114.74965	130.54237	100.296	110.5546	2014.03	136.8861	162.25474	129.922	139.5406
2004.01	116.10531	130.14406	98.3139	104.2886	2014.04	138.97427	162.15365	133.343	144.3637
2004.02	116.0647	112.99552	98.9504	108.368	2015.01	140.24431	169.75659	135.642	162.5977
2004.03	116.36354	118.38151	102.889	124.6773	2015.02	146.55097	177.64	142.41	161.8608
2004.04	120.7452	109.82781	103.796	109.9217	2015.03	146.12794	179.01347	150.917	171.3855
2005.01	127.88451	114.78681	108.977	125.9975	2015.04	149.29991	175.49713	157.314	172.0821
2005.02	135.79792	121.33403	113.642	128.2777	2016.01	152.11324	173.61008	160.741	182.5619
2005.03	138.99116	122.78227	117.137	140.3942	2016.02	150.95985	167.87334	156.774	148.0293
2005.04	141.24419	129.70294	123.231	137.0765	2016.03	151.92559	174.97986	157.436	174.4346

Hedonic hotel indices for large and small hotel transactions

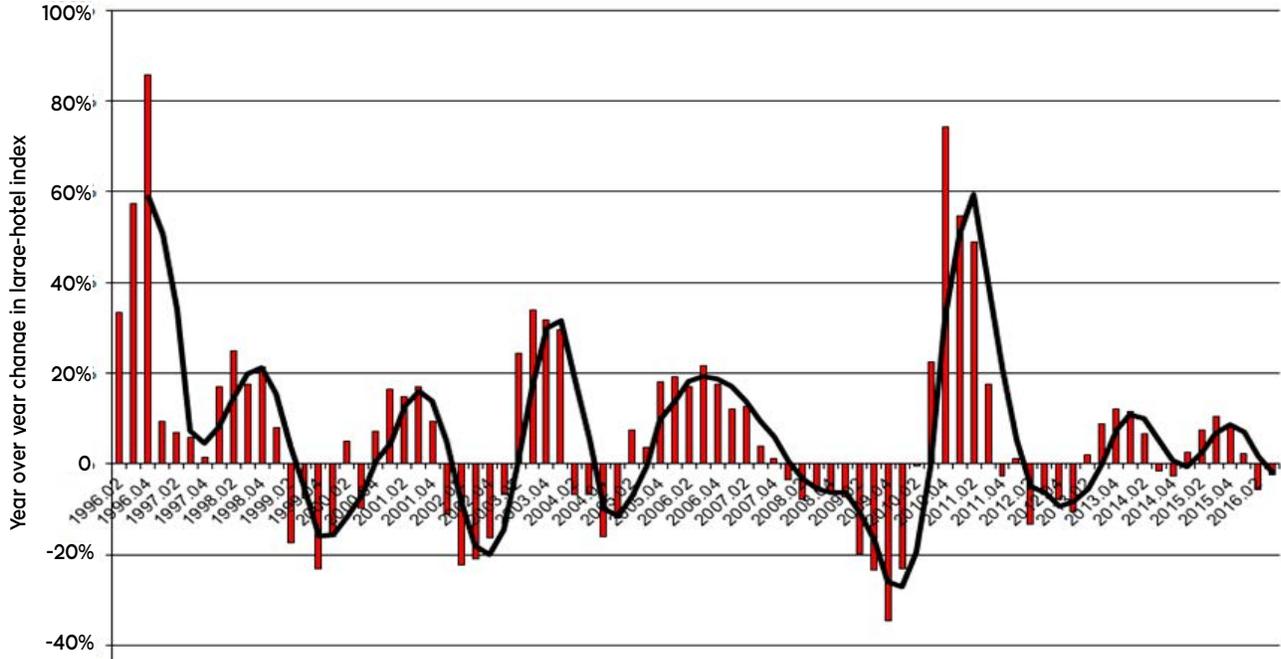


Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics

while the median price of smaller hotels remained essentially flat (-.8%). Exhibit 4 and Exhibit 5 show this year-over-year trend in the number of transactions for large hotels and small hotels.

Large hotels exhibit positive price momentum, while small hotels continue to revert to the mean, according to our Standardized Unexpected Price (SUP) metric. Exhibit 7, which graphs the prices reported in Exhibit 6, shows that the large-hotel price index increased 4.2 percent,

Year-over-year change in high-price (large) hotel index, with moving-average trendline



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

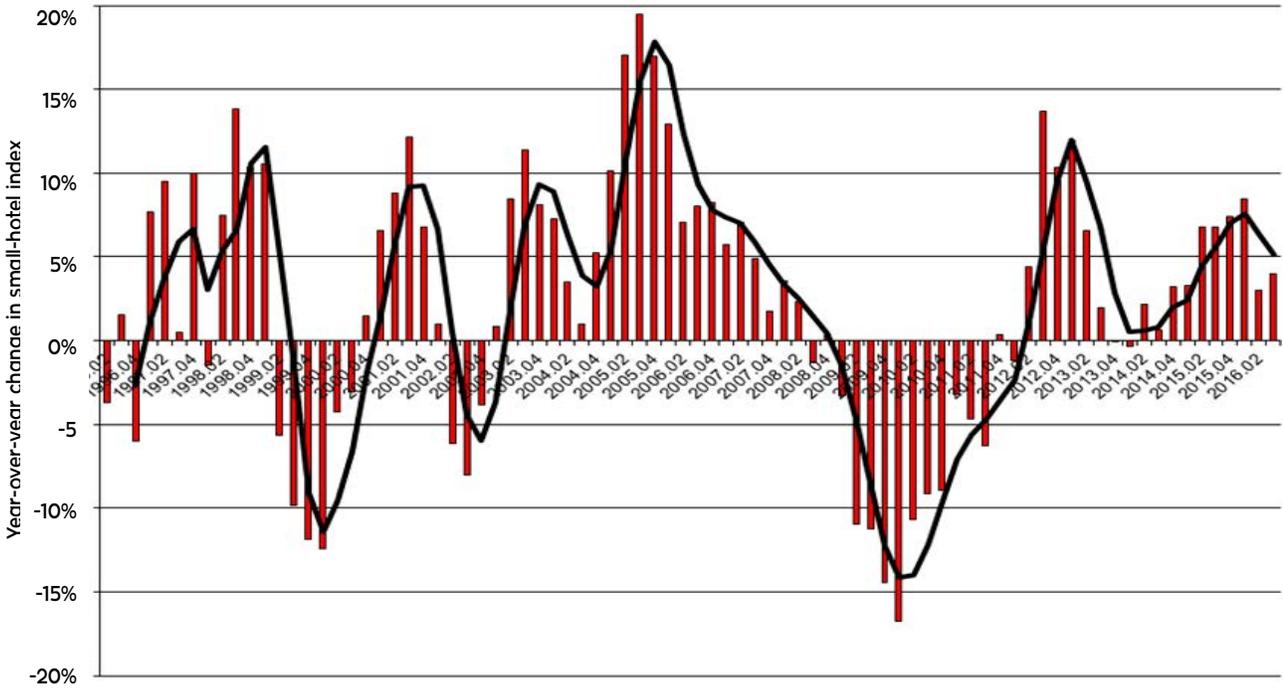
while the small-hotel price index remained relatively stationary at .6 percent on a quarter-over-quarter basis. Exhibit 8 and Exhibit 9 reveal that on a year-over-year basis, large hotels experienced a 2.3-percent decrease in price, while smaller hotels gained 4 percent. These two exhibits also reveal that the moving

average trend lines for the price of both large and small hotels continue to decline on a year-over-year basis.

Our SUP metric, displayed in Exhibit 10, shows that the price of large hotels, which was reverting to the standardized mean of zero, reversed direction this quarter, turning upwards.

EXHIBIT 9

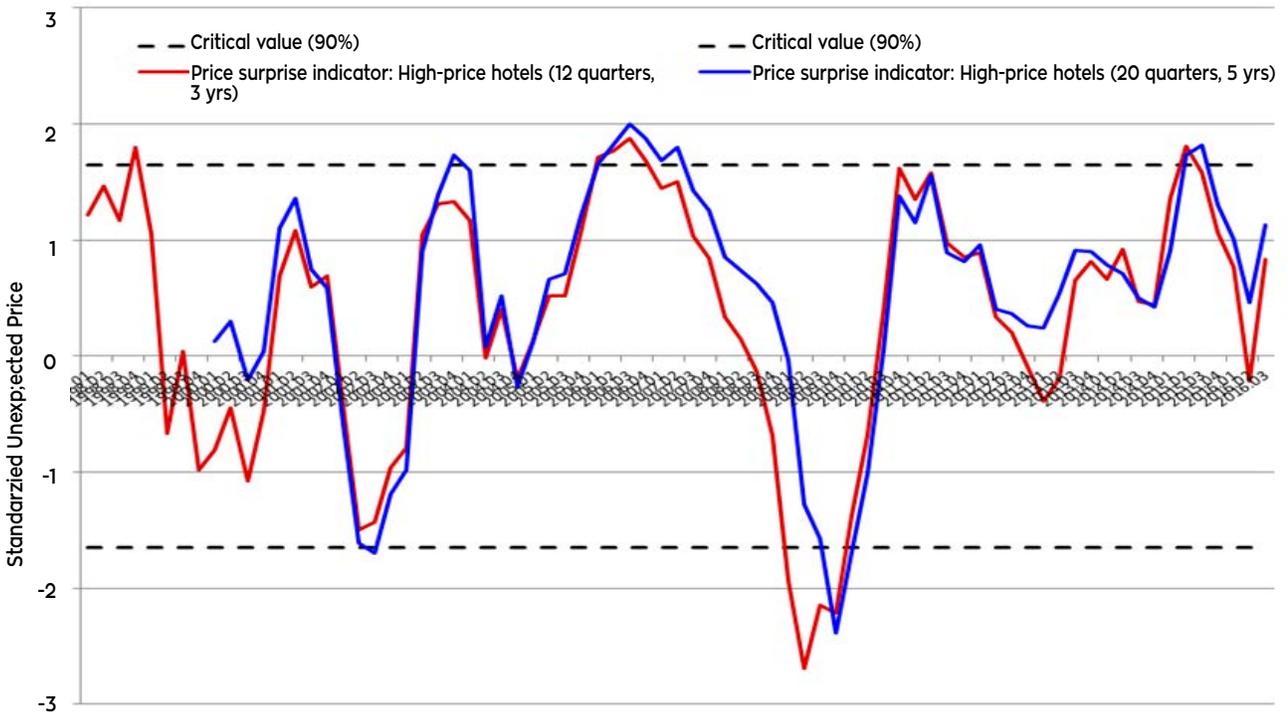
Year-over-year change in small-hotel index, with moving-average trendline



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

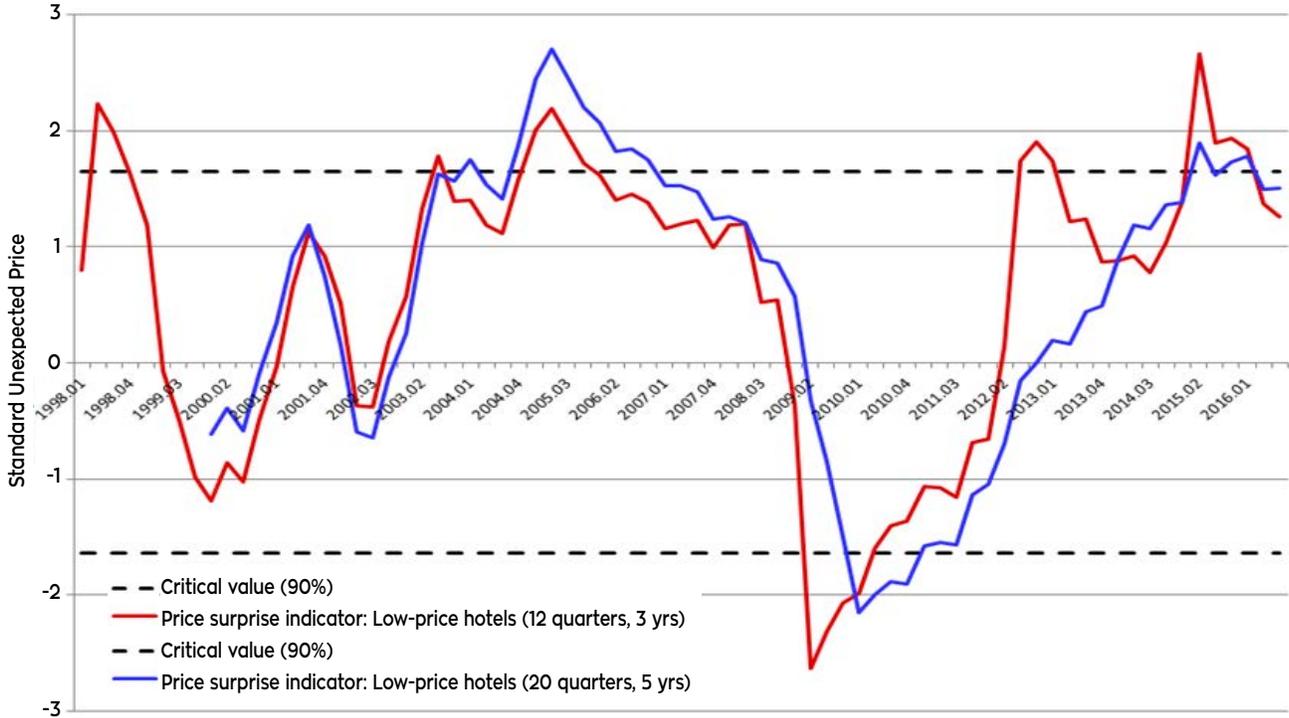
EXHIBIT 10

Standardized unexpected price (SUP) for high-price 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

This uptick, however, was not statistically significant. Exhibit 11 shows that the price for smaller hotels, in contrast, continued its decline, reverting to the standardized mean of zero.

Repeat sales are dropping at a decreasing rate on a year-over-year basis. Similar to the smaller hotels, both the three-year and five-year SUP indicator for repeat hotel sales in Exhibit 12 continued to decline toward the standardized mean of zero.² Exhibit 13 provides a confirmatory perspective

² We report two repeat-sale indices. The repeat sale full sample index uses all repeat-sale pairs, whereas the repeat-sale index with a base of 100 at 2000Q1 uses only those sales that occurred on or after the first quarter of 2000. The latter repeat sale index thus doesn't use information on sales prior to the first quarter of 2000. As such, if a hotel sold in 1995 and then sold again in 2012, it would be included in the full repeat sale index, but not the post-2000 index.

of the price momentum in the repeat sales. The moving average trend line continues to decline on a year-over-year basis. The year-over-year increase in this quarter of 4.3 percent (2015Q3 to 2016Q3) is lower than the year-over-year increases in the previous two periods: 10.1 percent from 2015Q2 to 2016Q2, and 18.5 percent from 2015Q1 to 2016Q1.

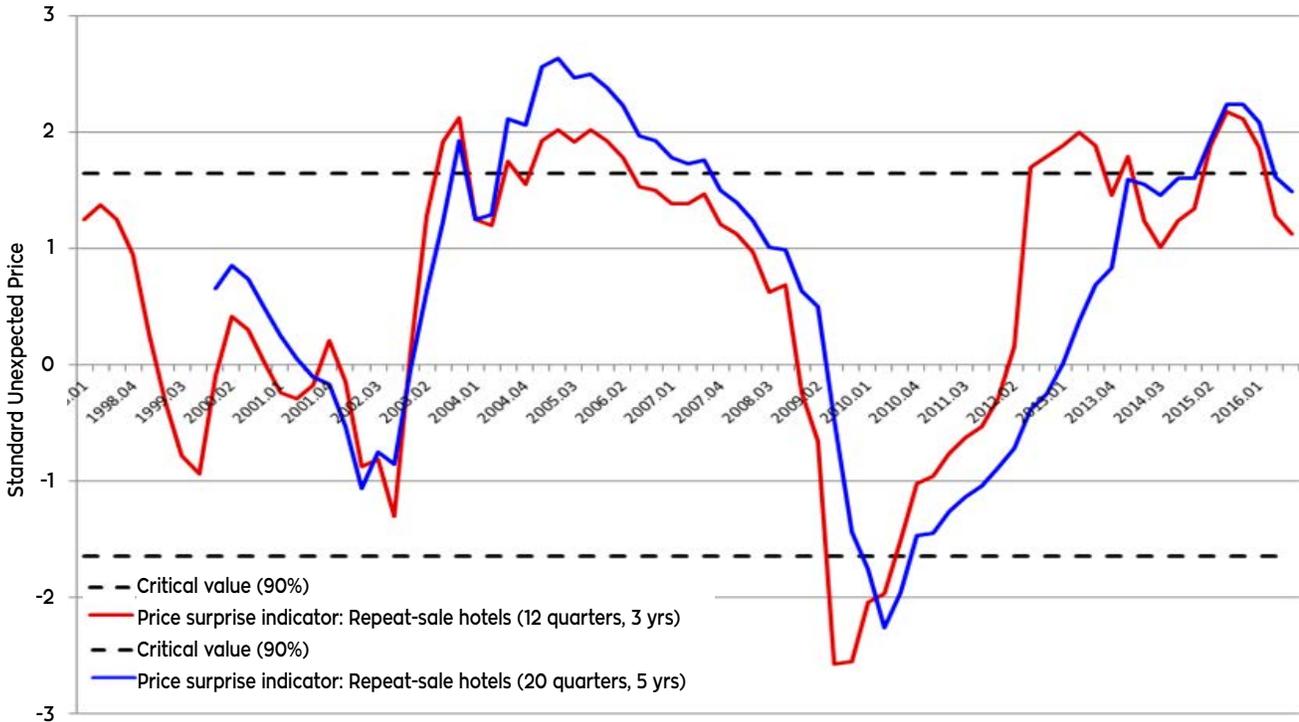
Mortgage financing volume declines on a year-over-year basis but has increased quarter over quarter.

Exhibit 14 shows that the mortgage origination volume for hotels as reported for 2016Q2 is about 11.5 percent lower than the previous year (2015Q2).³ This compares to a 2.8-percent year-over-year increase in the previous period (2016Q1 rela-

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

EXHIBIT 12

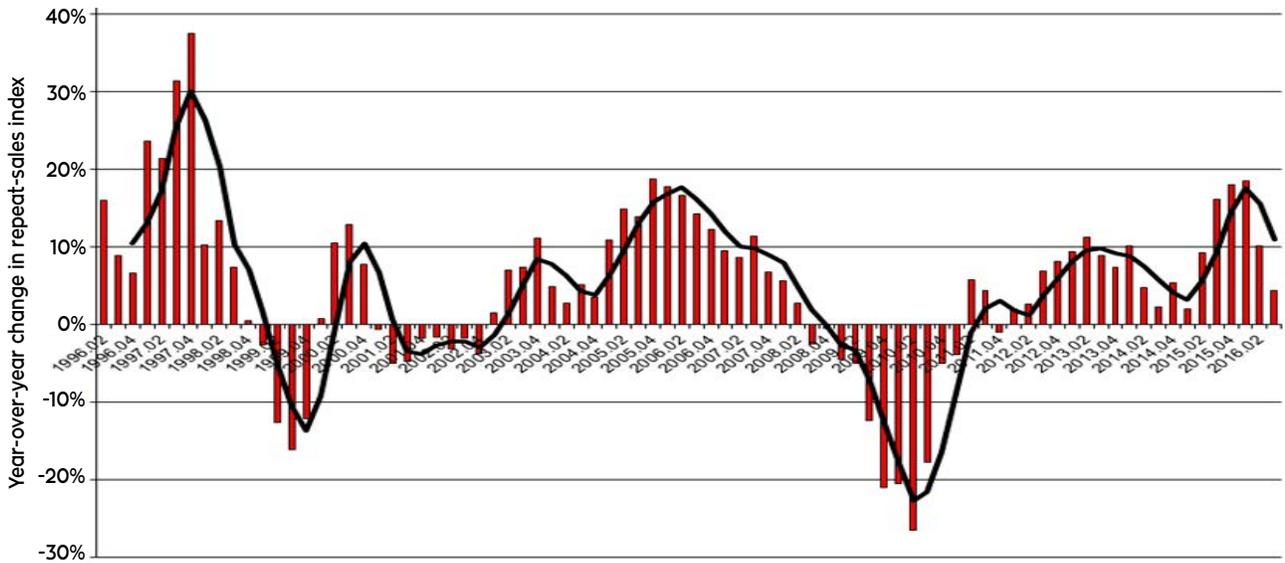
Standardized unexpected price (SUP) for repeat-sale hotels



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

EXHIBIT 13

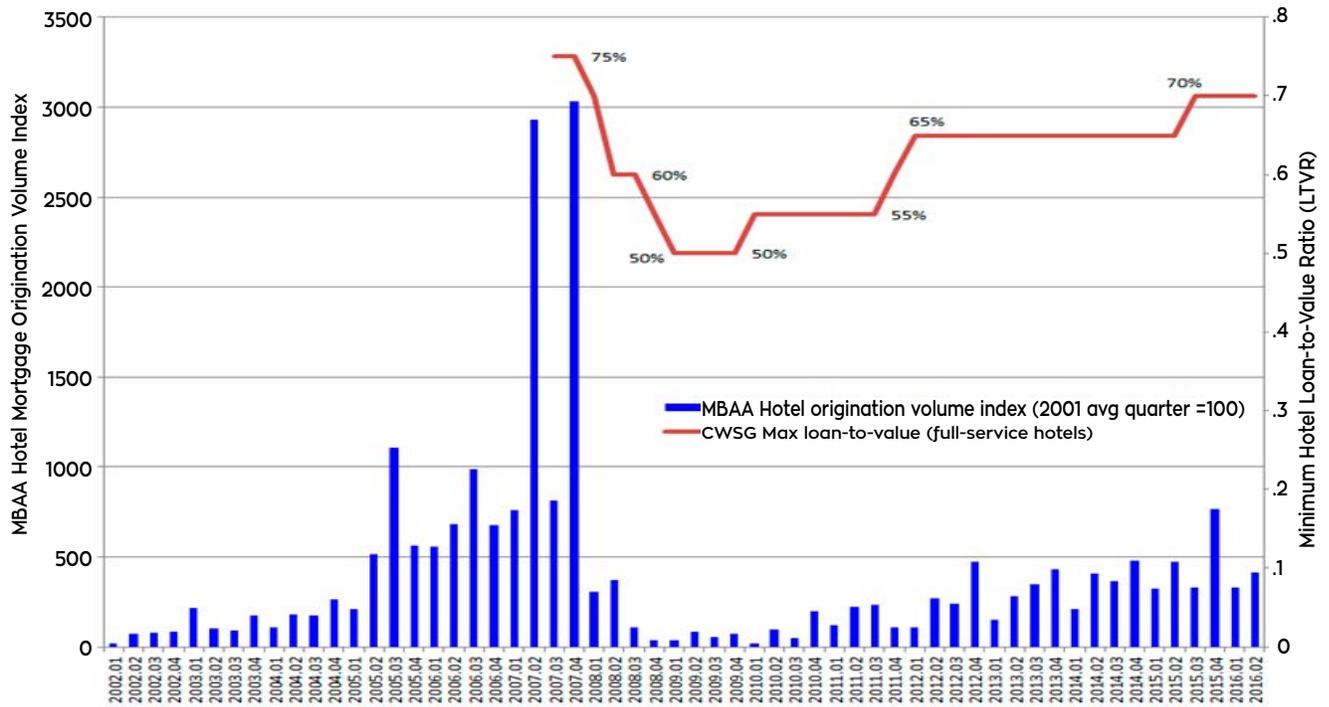
Year-over-year change in repeat-sale index, with moving-average trendline



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

EXHIBIT 14

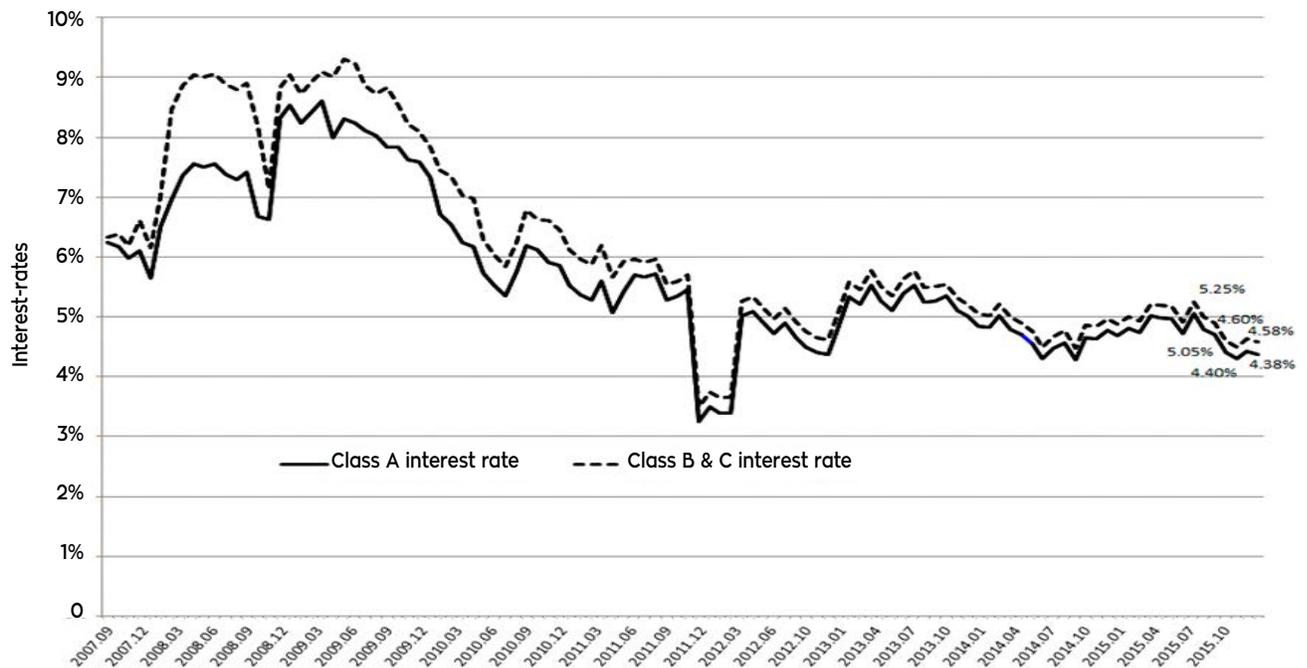
Mortgage origination volume versus loan-to-value ratio for hotels



Sources: Cornell Center for Real Estate and Finance, Mortgage Bankers Association

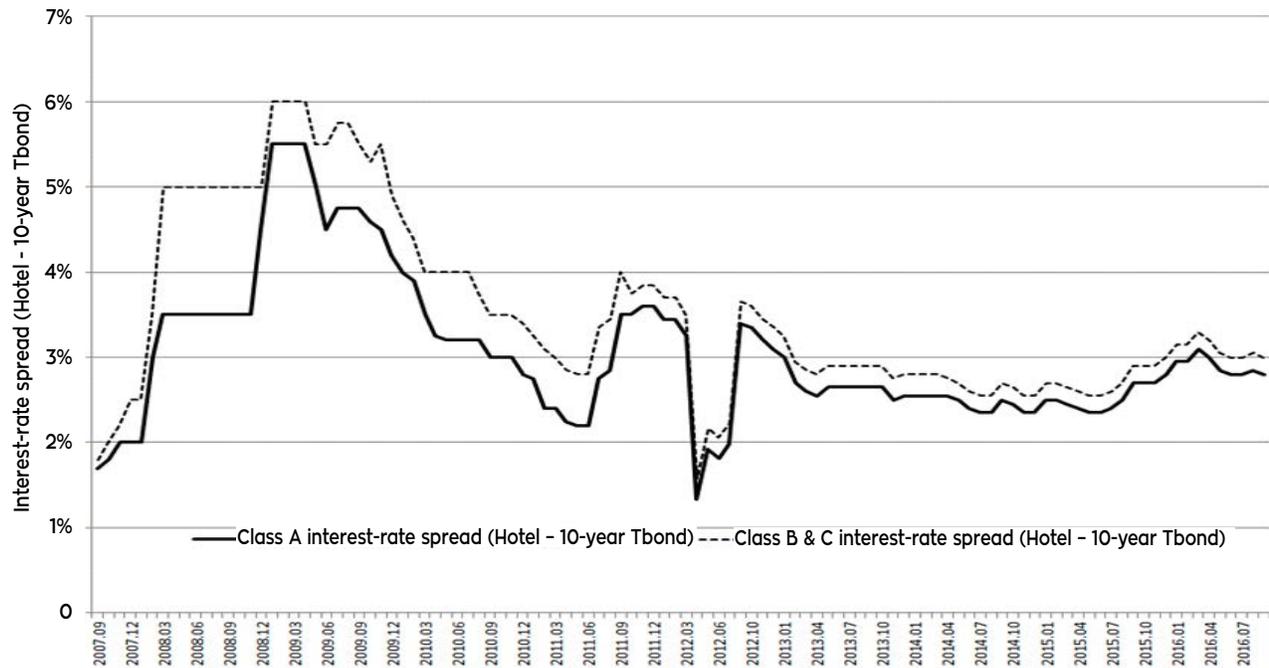
EXHIBIT 15

Interest rates on Class A hotels versus Class B & C properties



Sources: Cushman Wakefield Sonnenblick Goldman

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



Source: Cushman Wakefield Sonnenblick Goldman

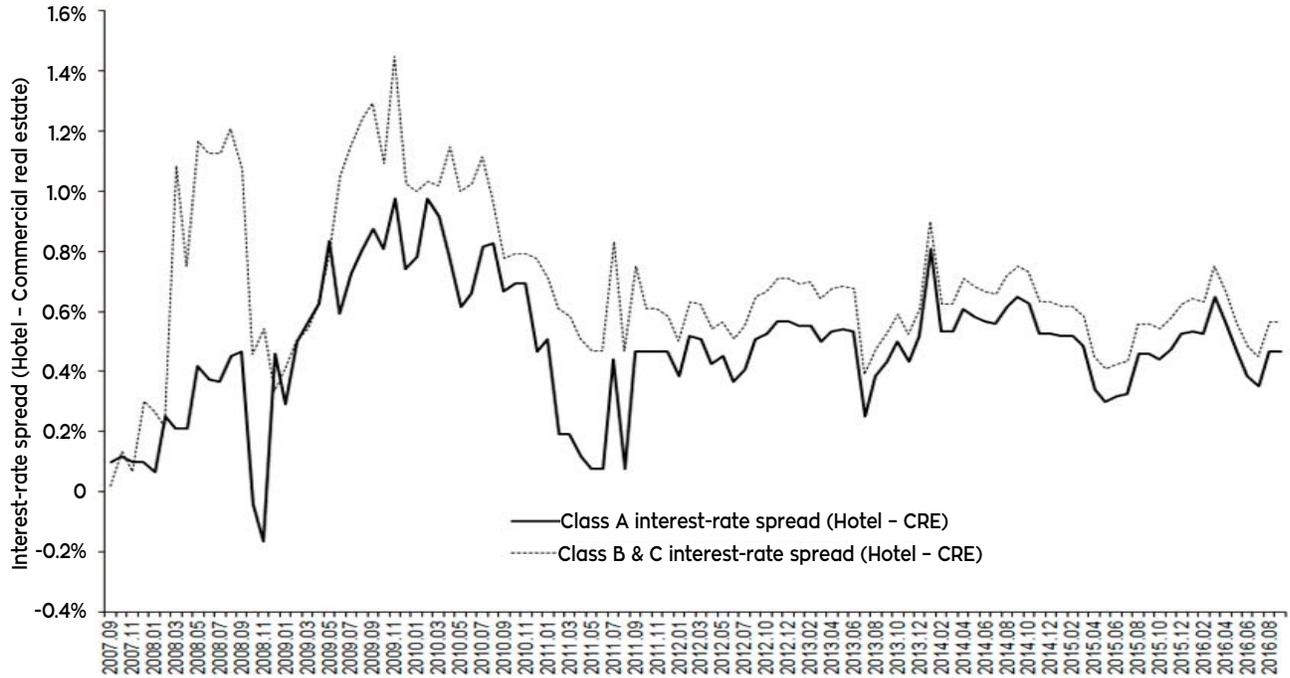
tive to 2015Q1). However, hotel loan originations are up 25.7 percent on a quarter-over-quarter basis (2016Q2 compared to 2016Q1). The loan-to-value (LTV) ratio for hotels continued to remain at 70 percent.

Although the cost of hotel debt financing hasn't changed, the relative risk premium for hotels has increased. The cost of obtaining hotel financing as reported by Cushman Wakefield Sonnenblick Goldman continued to decline slightly for both Class A and Class B&C Hotels. This decline in hotel interest rates partially accounts for the positive momentum in hotel prices. Exhibit 15 shows that at the beginning of September 2016, interest rates were at about 4.38 percent for Class A hotels (4.58% for B&C properties) compared to an interest rate of 4.4 percent for Class A properties (4.6% for B&C hotels)

in the previous quarter (June 2016).⁴ Exhibit 16 and Exhibit 17 depict interest rate spreads relative to different benchmarks. Exhibit 16 shows the spread between Class A (and B&C) interest rates on full-service hotels over the ten-year Treasury bond. On this metric, interest rate spreads have remained relative constant over the last five months (from May 2016 through September

⁴ 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 sized 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. The CWSG deals are not necessarily similar to deals that are reported by ACLI.

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



Source: Cushman Wakefield Sonnenblick Goldman

2016), indicating that lenders' compensation for risk associated with hotel loans has remained unchanged. Exhibit 17 shows the hotel real-estate premium, which is the spread between the interest rate on Class A (and B&C) full-service hotels over the interest rate corresponding to non-hotel commercial real estate.⁵ The hotel real estate premiums for both higher quality (Class A) and lower quality (Class B&C) hotels have once again reversed direction, turning upward again. The hotel real estate premium for Class A hotels is currently at .47% compared to .38% for 2016Q2 and .65% for 2016Q1. For Class B&C properties, the premium is now .57%, compared to .48% in the second quarter and .75% in the first quarter of 2016). The hotel risk premium for the third quarter of 2016 is similar to the premiums assessed in the 2015Q3 period. The increase in the premium in the most recent quarter is a signal that the perceived default risk for hotel

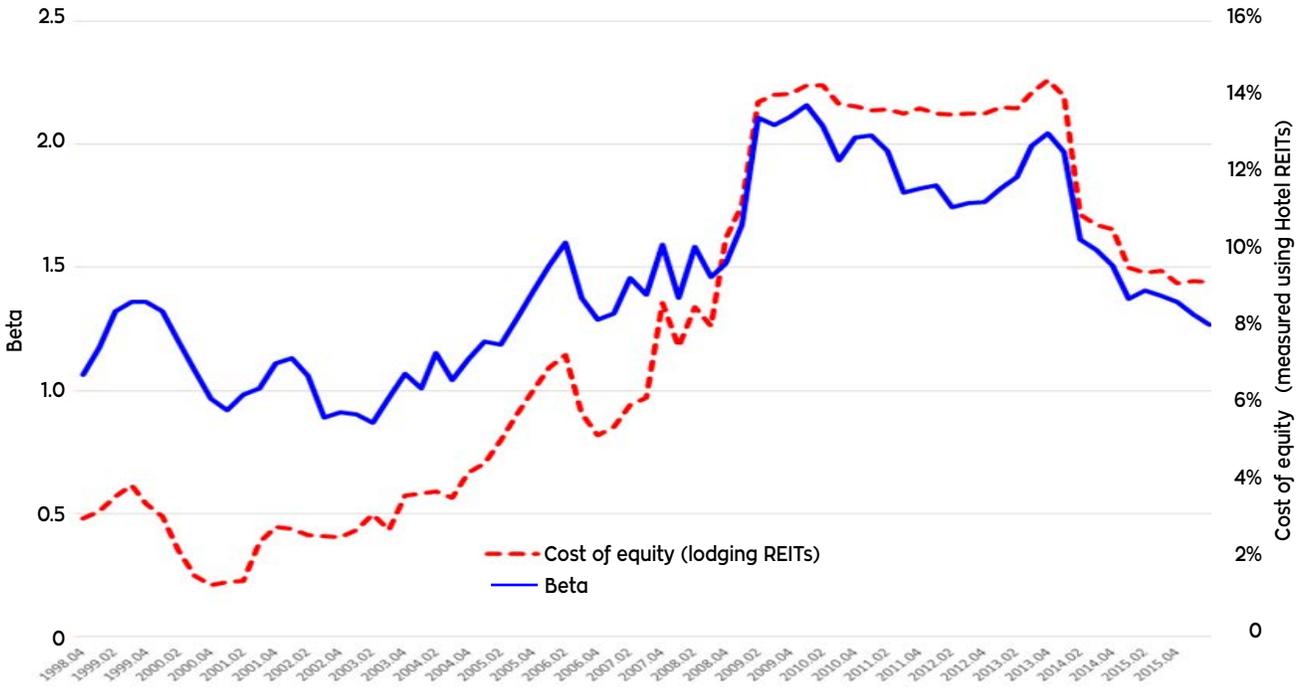
⁵ The interest rate on hotel properties is generally higher than that for apartment, industrial, office, and retail properties in part because hotels' cash flow is commonly more volatile than that of other commercial properties.

properties has widened relative to other commercial real estate, and hotels are viewed as having more risk than such properties as apartment buildings, offices, or warehouses.

Cost of equity financing continues to remain affordable; expect to see higher interest rates and tighter lending standards for hotel financing relative to other commercial real estate in the near future. The cost of using equity financing for hotels as measured using the Capital Asset Pricing Model (CAPM) on hotel REIT returns continues to decline, as shown in Exhibit 18. The cost of using equity funds is currently at 8.1 percent for 2016Q2, down from 8.4 percent for 2016Q1 and also down from 8.7 percent for 2015Q4. This lower cost is due to a reduction in the yield on the 10-year constant-maturity Treasury bond and a relatively stationary systematic risk (beta) of hotel REITs, which has remained relatively constant at 1.4 since the first quarter of 2015. However, the total risk of hotel REITs (systematic risk + risk that is unique to hotel REITs) continues to be greater than

EXHIBIT 18

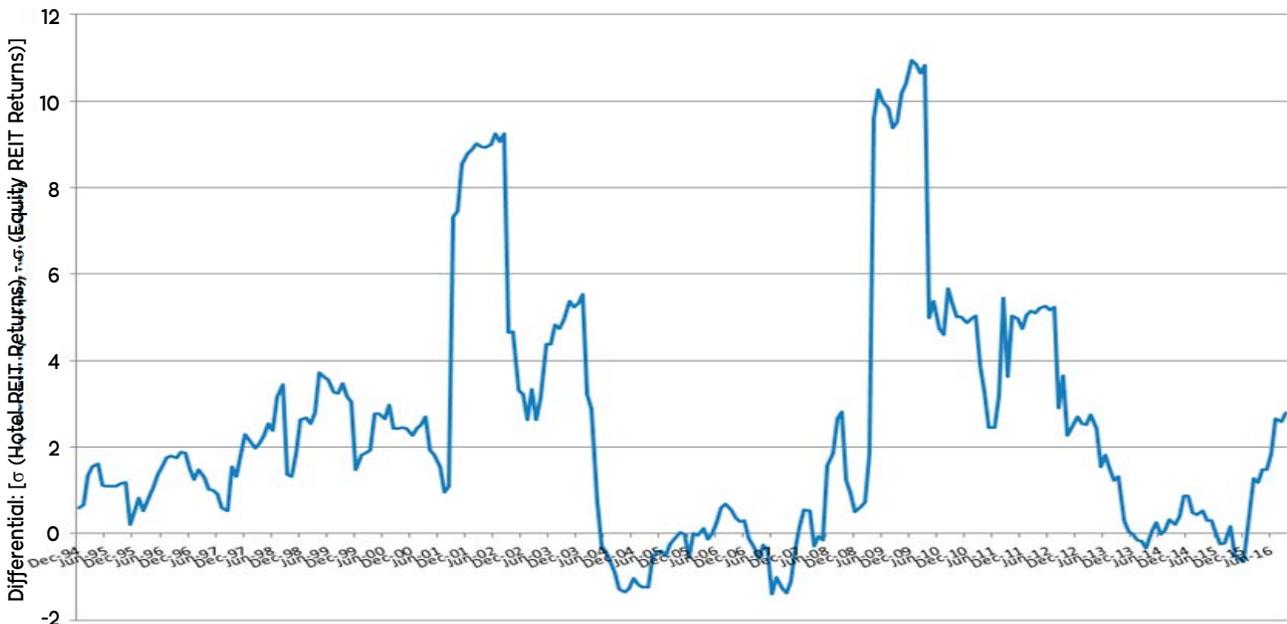
Cost of equity financing using the Capital Asset Pricing Model and hotel REITs



Source: Cornell Center for Real Estate and Finance, NAREIT

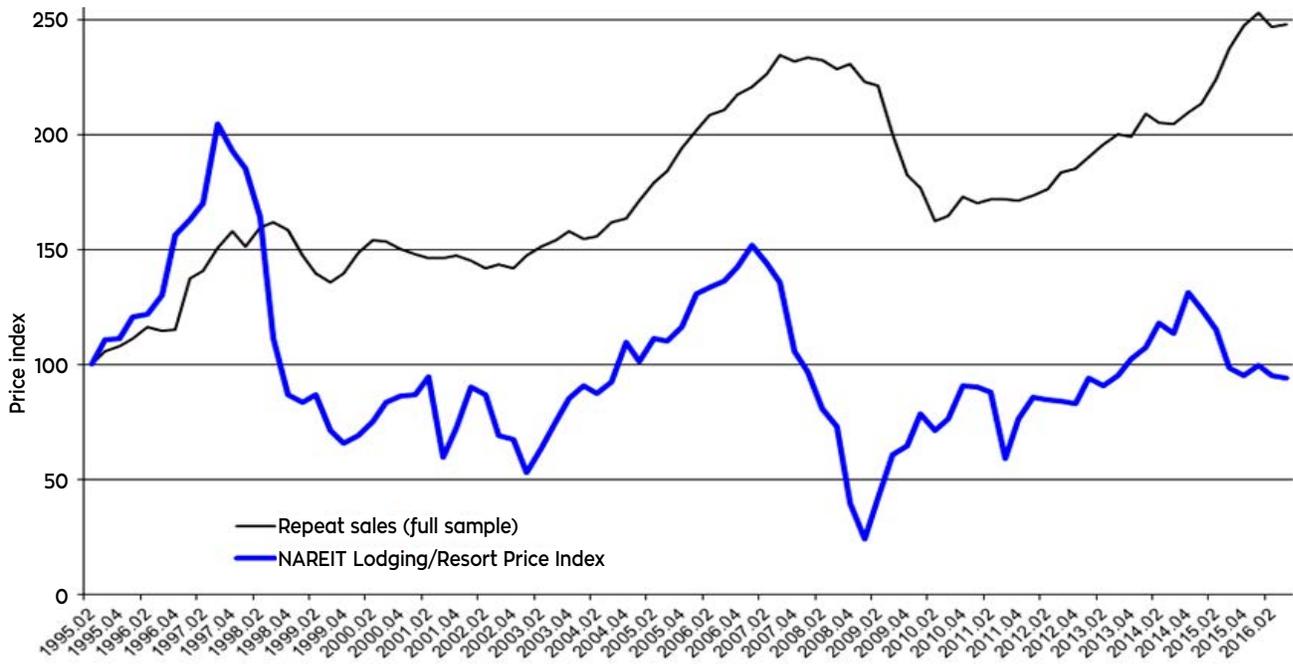
EXHIBIT 19

Risk differential between hotel REITs and equity REITs



Source: Cornell Center for Real Estate and Finance, NAREIT

Hotel repeat sales index versus NAREIT lodging/resort price index



Source: Cornell Center for Real Estate and Finance, NAREIT

the total risk of equity REITs as a whole (see Exhibit 19).⁶ This is consistent with Exhibit 17, which shows that the perceived default risk for hotels is currently increasing relative to other types of commercial real estate. This situation suggests that lenders will eventually start to tighten hotel lending standards if this trend towards higher risk continues.

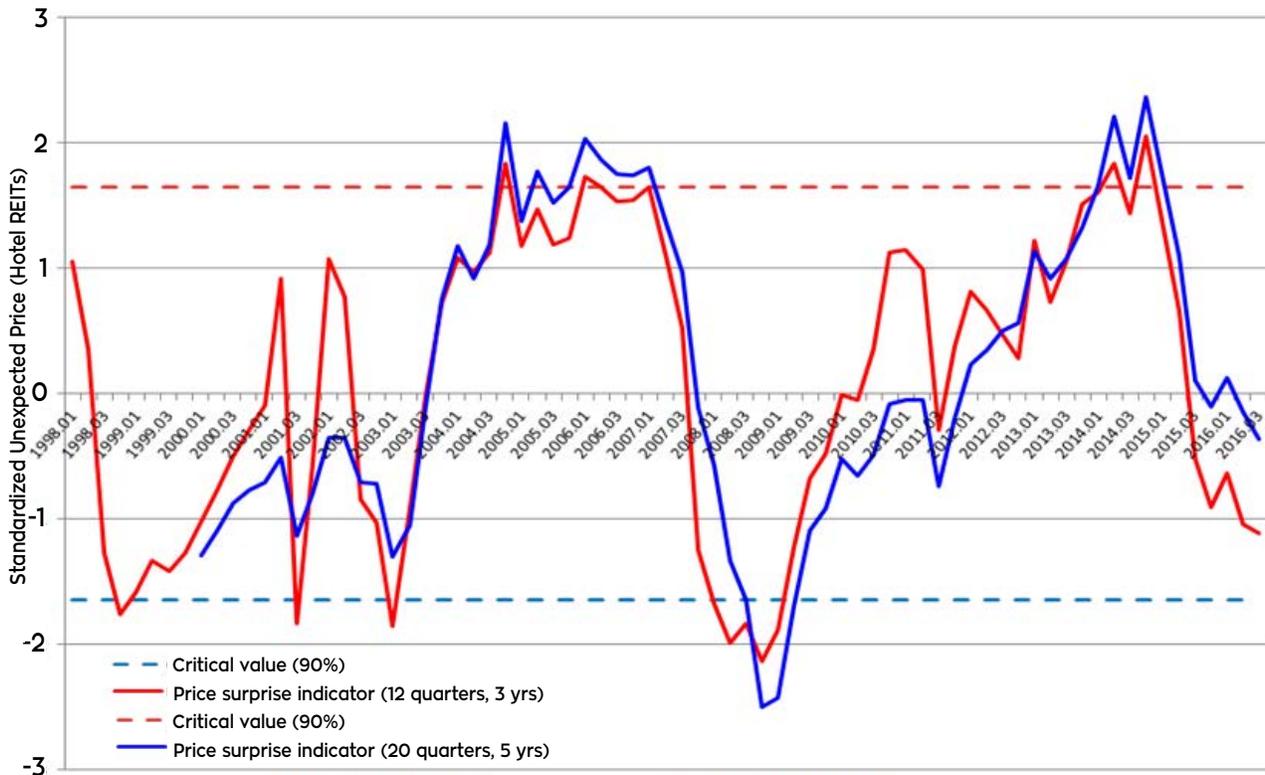
Negative signals continue to persist on the direction in the expected price of large hotels, while small hotels are expected to do better in the near term, according to the tea leaves. Exhibit 20 compares the performance of the repeat sales index relative to the NAREIT Lodging/Resort Price Index. The repeat sales index tends to lag the NAREIT index by at least one quarter or more. This is

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

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. Looking ahead, the NAREIT lodging index declined 1.2 percent in the third quarter compared to a decrease of 4.2 percent in the prior quarter. The NAREIT lodging index has been on a downward trend since the fourth quarter of 2014. Year over year, the NAREIT lodging index continues its downward trend, down 4.5 percent from 2015Q3 to 2016Q3, compared to a 17.5-percent drop in 2015Q2 to 2016Q2 and a 20-percent reduction in 2015Q1 to 2016Q1. In terms of the SUP for the NAREIT Hotel Index shown in Exhibit 21, which provides a complementary perspective, the hotel REIT index continues to decline below its standardized mean of zero. Consequently, expect hotel prices to fall in the future.

EXHIBIT 21

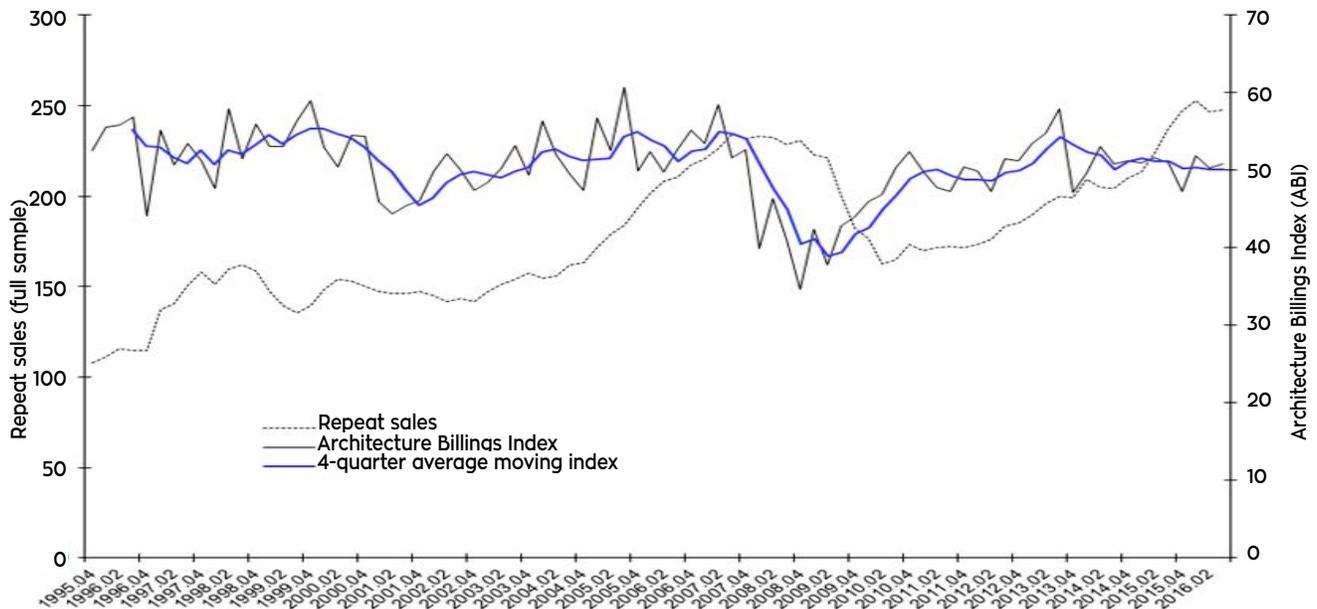
Standardized unexpected price (SUP) for NAREIT lodging/resort index



Source: Cornell Center for Real Estate and Finance, NAREIT

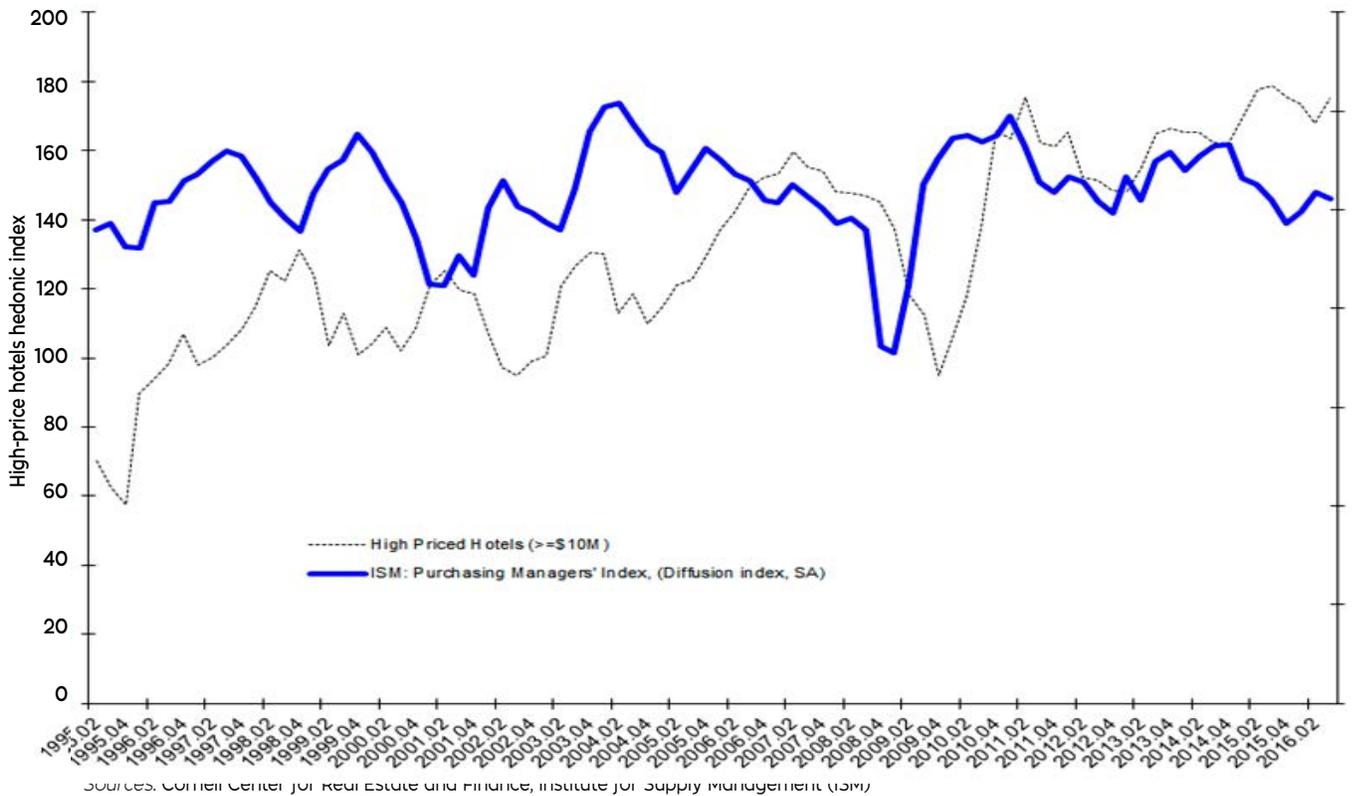
EXHIBIT 22

Hotel repeat sales index versus architecture billings index



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

Business confidence index (National Association of Purchasing Managers) and high-price hotel index

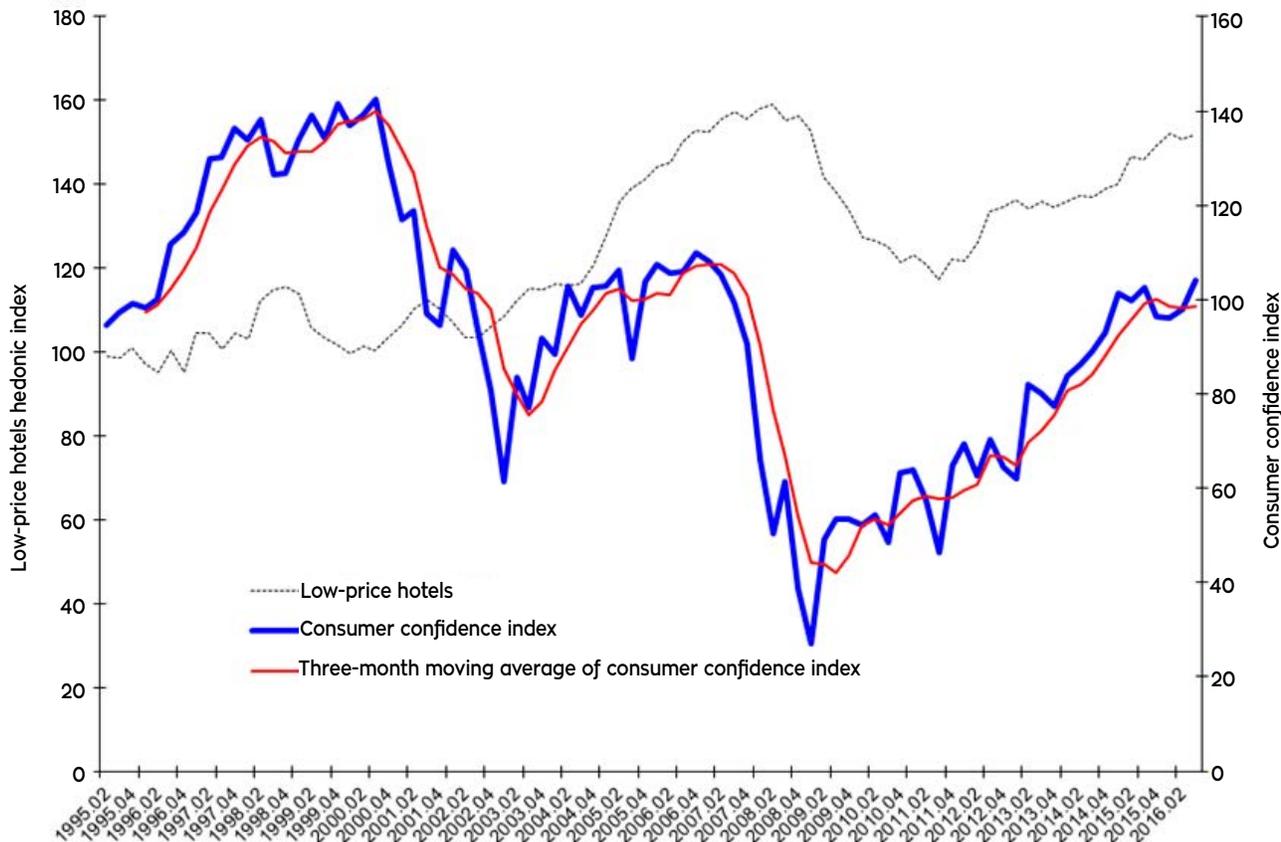


The architecture billings index (ABI) for commercial and industrial property, which represents another forward-looking metric, increased imperceptibly this quarter from the previous quarter, as shown in Exhibit 22 (50.8 versus 50.3).⁷ The four-quarter moving average of the ABI, shown in blue, indicates that the ABI has generally been flat for the last two quarters. The National Association of Purchasing Managers (NAPM) index shown in Exhibit 23, which is an indicator of anticipated business confidence and thus business traveler demand, also remained relatively stationary in September from the prior quarter (51.2 vs 51.8).⁸ Based on the NAPM index, we expect

⁷ As of September 21, 2016, see: www.aia.org/practicing/economics/aiaas076265

⁸ 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 in twenty-one industries covering all 50 states. It not only measures the health of the manufacturing sector but is a proxy for the overall economy. It is calculated by surveying purchasing managers for data about new orders, production, employment, deliveries, and inventory, in descending order of importance. A reading over 50 percent indicates that manufacturing is growing, while a reading below 50 percent means it is shrinking.

Consumer confidence index and low-price hotel index



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

the price of large hotels remain relatively constant for the next quarter.

The Consumer Confidence Index from the Conference Board, graphed in Exhibit 24, 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, rose about 6.2 percent in September (2016Q3) quarter over quarter. The index also rose approximately 1.5 percent on a year-over-year basis. Thus, we expect the price of small hotels to rise, based on the index’s four-quarter moving average. ■

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. HOTVAL is available for download from our [digital library](#).

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:

$$SUE_o = (A_o - m_o)/s_o$$

where SUE_o = quarter Q standardized unexpected earnings,

A_o = quarter Q actual earnings per share reported by the firm,

m_o = quarter Q consensus earnings per share forecasted by analysts in quarter Q-1, and

s_o = quarter Q standard deviation of earnings estimates.

From statistics, the SUE_o 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_o exceeds either ± 1.645 (90% significant) or ± 1.96 (95% significant). The earnings surprise is positive when $SUE_o > 1.645$, which is statistically significant at the 90% level assuming a two-tailed distribution. Similarly, if $SUE_o < -1.645$ 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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Center for Real Estate and Finance Reports,
Vol. 5 No. 4 (October 2016)

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The *CREF Report* series is produced for the
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