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Abstract
The borrowing cost of debt financing continues to remain stable while equity financing continues to remain relatively cheap. We expect prices for large hotel properties to remain flat, but prices for small hotel properties to rise in the first quarter of the new year. We hope that operating performance as measured by EVA will finally become positive vis-à-vis an increase in the cap rate, assuming that total borrowing cost remains stable or it becomes cheaper to borrow debt or equity money. We also introduce a new performance metric, the standard unexpected price (SUP). This is report number 13 of the index series.

Keywords
Cornell, standard unexpected price (SUP), hotel indices, interest rate spreads, hotel investments, HOTVaL

Disciplines
Real Estate

Comments
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Supplemental File:
Hotel Valuation Model (HOTVAL) We provide this user friendly hotel valuation model in an excel spreadsheet entitled HOTVAL Toolkit as a complement to this report which is available for download from http://scholarship.sha.cornell.edu/creftools/1/
EXECUTIVE SUMMARY

The borrowing cost of debt financing continues to remain stable while equity financing continues to remain relatively cheap. We expect prices for large hotel properties to remain flat, but prices for small hotel properties to rise in the first quarter of the new year. We hope that operating performance as measured by EVA will finally become positive vis-à-vis an increase in the cap rate, assuming that total borrowing cost remains stable or it becomes cheaper to borrow debt or equity money. We also introduce a new performance metric, the standard unexpected price (SUP). This is report number 13 of the index series.
Hotel investment based on operating performance continues to improve. Our Economic Value Added (EVA) indicator (shown in Exhibit 1) is now essentially in the black (at breakeven). It has continued to improve from -1.6% in 2014Q2 to effectively zero in 2014Q3 (-.002%). Looking under the hood, not only have hotel cap rates continued to rise from 6.3% (2014Q2) to 6.4% (2014Q3), but also the weighted average borrowing cost (the average debt financing and equity financing used on a hotel deal) has also declined from 7.9% (2014Q2) to 6.7% (2014Q3). If this trend continues into positive territory (i.e., EVA is positive), hotel investors will finally start to make money from hotel operations, in addition to the sale of the property.
**Exhibit 1**

Economic value added (EVA) for hotels

![Graph showing EVA Spread (ROIC - WACC) from 1995 to 2015]

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

**Exhibit 2**

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

![Graph showing median sale price and number of transactions from 1990 to 2015]

Sources: CoStar, Real Capital Analytics
Hotel transaction volume declines, but not necessarily median price. The total volume of all hotel transactions (both large hotels and small hotels combined) fell in the fourth quarter. Year over year, the hotel transaction volume declined 3.4% (2013Q4 to 2014Q4), compared to a 41.4% year-over-year increase in the previous quarter (that is, 2013Q3 to 2014Q3). A similar trend exists on a quarter-over-quarter basis, with total hotel volume falling 11.4% (2014Q3 to 2014Q4) in contrast to a 10% increase in the earlier period (2014Q2 to 2014Q3). With respect to large versus small hotels, the volume of large hotel transactions fell 19.1% while small hotel transaction volume fell 8.5% from the previous quarter.\(^1\) The transaction volume for large hotels fell 24.8% on a year-over-year basis, while the small hotel transaction volume, in contrast, experienced a gain with a year-over-year growth rate of 6.3%.

\(^1\) The number of transactions is limited to the sales that are included in the hedonic index, and should not be construed as being the total market activity.

In contrast to transaction volume, the median price for large hotels rose 28.8% on a year-over-year basis while the median price for small hotels rose 13.8% on a year-over-year basis. On a quarter-over-quarter basis, large hotels experienced a 54.6% gain while smaller hotels suffered a 8.3% loss. Exhibit 2 shows a negative trend in the number of transactions for large hotels, and Exhibit 3, for small hotels.

The bottom line is that hotel transaction volume has declined from both a year-over-year or quarter-over-quarter perspective. The median price for large hotels appears to have increased. The view is mixed for smaller hotels with a positive momentum in median price on a year-over-year basis but not on a quarter-over-quarter basis.

Déjà vu (again): History continues to repeat. Hotel prices continue to behave in a similar manner relative to the 2003Q1 to 2010Q2 cycle, based on repeat sales. Exhibit 4 provides the price index for the repeat hotel sales used to construct our RSI cycle analysis in Exhibit 5 together with the hedonic price indices for small and large hotels. Exhibit
### Exhibit 4

**Hotel indices through 2014, quarter 4**

<table>
<thead>
<tr>
<th>YrQtr</th>
<th>Hedonic Low Priced Hotels (&lt;$10M)</th>
<th>Hedonic High Priced Hotels (&gt;=$10M)</th>
<th>RSI Repeat Sales Index</th>
<th>RSI Repeat Sales Value</th>
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<tr>
<td>1995.02</td>
<td>99.584</td>
<td>70.595</td>
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<td>106.446</td>
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<td>2005.01</td>
<td>127.629</td>
<td>115.365</td>
<td>109.59</td>
<td>132.686</td>
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</tbody>
</table>
Exhibit 5

Comparison of hotel real estate cycles using repeat sales

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

Exhibit 6

Hedonic hotel indices for high-price and low-price hotel transactions

Sources: Cornell Center for Real Estate and Finance, CoStar, Real Capital Analytics
Exhibit 7

Standardized unexpected price (SUP) for high-price hotel index

Exhibit 8

Year-over-year change in high-price hotel index, with moving-average trendline
5 continues to confirm our prior calculations based on cycle analysis.

Prices of large and small hotels continue to move sideways, but our new Standardized Unexpected Price (SUP) metric shows this isn’t the entire story. Exhibit 6 shows that prices for the large-hotel and small-hotel indices continue to remain more or less flat in general. Although it might appear that the price of large and small hotels are co-moving in a parallel manner, our new Standardized Unexpected Price (SUP) metric, which is discussed in further detail in the Appendix (on page 23) tells a different story. Exhibit 7 shows the SUP indicator for large hotels along with the 90% confidence bands. If the SUP indicator crosses either above or below the dashed confidence band then this indicates that price for that period differs significantly (statistically) from its moving average. The graph shows that high price hotels turned down significantly in the first quarter of 2009 (2009Q1) and subsequently recovered from the financial crisis a year later, in the first quarter of 2010 (2010Q1). The graph also shows that the current price of high price hotels is converging towards its historical (moving) average, continuing an overall trend that started around the third quarter of 2013. Exhibit 8 provides further confirmation that the large-hotel index has declined on a year-over-year basis.

In contrast to large hotels, the SUP indicator for smaller hotels shown in Exhibit 9 appears to be diverging from both its three-year and five-year moving average, with price continuing to be above the moving averages. However, this divergence is not yet statistically significant (since it hasn’t crossed above the dashed 90% positive confidence band).
Exhibit 10 reveals that year-over-year growth in the price of small hotels has also increased.

Repeat sales continue to remain above the historical average but price momentum has declined on a year-over-year basis. The SUP indicator for repeat hotel sales in Exhibit 11 tells a similar story to that for smaller hotels, with the current repeat sale price continuing to increase faster than that of its (moving) average. In fact, relative to its five-year moving average, the current price on a standardized unexpected basis is statistically significant, although this is not the case with the three-year moving average. This is not necessarily surprising since the five-year SUP lags the three-year SUP. From the first quarter of 2013 (2013Q1) until the first quarter of 2014 (2014Q1), the repeat sale index was significantly higher than its historical average based on a three-year moving average. Exhibit 12 provides an alternative perspective of the price momentum in the repeat sales.

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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. In other words, 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 first repeat sale index e.g., repeat sale full sample index but it would not be included in the latter repeat sale index.
**Exhibit 11**

Standardized unexpected price (SUP) for repeat-sale hotels

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

**Exhibit 12**

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 13**

Decomposition of ACLI hotel capitalization rates into risk premium and risk-free rate

- Spread over 10-year treasury bond (Hotel cap rate - Tbond)
- 10-year treasury bond (constant maturity)

**Exhibit 14**

Mortgage origination volume for hotels

Sources: Cornell Center for Real Estate and Finance, Mortgage Bankers Association
Similar to large hotels, the index continues to decline on a year-over-year basis. In summary, downward price momentum is evident on a year-over-year basis.

**Cap rates continue to rise.** For the third quarter of 2014, the latest quarter for which ACLI reports data on hotel cap rates, cap rates have risen slightly, from 6.26% in 2014Q2 to 6.41% in 2014Q3. Exhibit 13 shows that although the rate on the 10-year Treasury bond (constant maturity) declined from 2.6% to 2.3%, the hotel cap rate spread over the 10-year Treasury continued to increase, from 3.66% to 4.13%. In the previous quarter, the hotel cap rate spread over the 10-year Treasury increased from 3.38% to 3.66%. Hotel investors appear to continue to demand increased compensation for greater perceived risk.

**Mortgage financing volume continues to remain relatively stable on a year-over-year basis.** Exhibit 14 shows that the mortgage origination volume for hotels as reported for 2014Q3 is 4.3% greater than the previous year (2013Q3). This compares to a 45.4% year-over-year increase (2013Q2 relative to 2014Q2) in the previous quarter.

**Cost of debt financing has remained relatively flat although the relative risk premium for hotels continues to increase.** The cost of obtaining hotel financing continues to remain relatively constant, as it has done since July 2013 (see Exhibit 15) when the interest rate was at 4.81% for Class A hotels and 5.06% for B&C hotels. As of December 2014, the interest rate on Class A hotels is 4.55% and, for Class B&C hotels, 4.75%. These rates are similar to those
**Exhibit 16**

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

Sources: Cushman Wakefield Sonnenblick Goldman

**Exhibit 17**

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

Source: Cushman Wakefield Sonnenblick Goldman
Exhibit 18

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Cost of Equity (measured using Hotel REITs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>16%</td>
</tr>
<tr>
<td>2002</td>
<td>14%</td>
</tr>
<tr>
<td>2004</td>
<td>12%</td>
</tr>
<tr>
<td>2006</td>
<td>10%</td>
</tr>
<tr>
<td>2008</td>
<td>8%</td>
</tr>
<tr>
<td>2010</td>
<td>6%</td>
</tr>
<tr>
<td>2012</td>
<td>4%</td>
</tr>
<tr>
<td>2014</td>
<td>2%</td>
</tr>
<tr>
<td>2016</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: Cornell Center for Real Estate and Finance, NAREIT

reported in March 2013. Exhibit 16 and Exhibit 17 depict interest rate spreads relative to different benchmarks. Exhibit 16 shows the spread between full service Class A hotel interest rates and those of B&C hotels over the 10-year Treasury bond. On this metric, interest rate spreads have remained relatively flat over the last two quarters, indicating that the lenders have not demanded additional compensation for risk associated with lending on hotels. Exhibit 17 shows the spread between the interest rate on Class A full service hotels and B&C hotels over the interest rate corresponding to non-hotel commercial real estate. This is known as the hotel real estate premium. The hotel real estate premiums for both higher quality hotels (.53%) and lower quality hotels (.63%) have declined relative to the previous two quarters (.65% (H)/.75% (L) for 2014Q3 and (.57% (H) /.67%(L) for 2014Q2. The fall in the premium in the most recent quarter in Exhibit 17 is a signal that the perceived default risk for hotel properties has narrowed relative other commercial real estate. The continued decline

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3 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.
in the 10-year treasury rate is reason why we have not seen an increase in the cost of borrowing.

Cost of equity financing continues to be cheap but expect to see interest rates for hotel financing increase more relative to other commercial real estate in the near future. The cost of using equity financing for hotels continues to become cheaper as measured using the Capital Asset Pricing Model (CAPM) on hotel REIT returns, as shown in Exhibit 18. The cost of using equity funds is currently at 11.21% for 2014Q3, slightly down from 11.59% in the previous quarter (2014Q2) and down from 14.01% in the previous year (2013Q3). This lower cost is due to a reduction in the systematic risk (beta) of hotel REITs. In terms of total risk (the sum of systematic risk + specific hotel REIT risk), Exhibit 19 depicts that the total risk of hotel REITs is becoming larger relative to the total risk of equity REITs in general.4 As the total risk of hotel REITs increases relative to the total risk for equity REITs, we expect to see interest rates

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4 We calculate the total risk for hotel REITs using a 12-month rolling window of monthly return on hotel REITs.
on hotel financing rise relative to other property types due to the increased likelihood of hotel defaults.\footnote{See: Jan A. deRoos, Crocker H. Liu, and Andrey D. Ukhov, “Relative Risk Premium: A New Canary for Hotel Mortgage Market Distress,” Cornell Hospitality Report, Vol. 14, No. 21 (December 2014), Cornell Center for Hospitality Research.}

Expect the price of large hotels to remain flat and the price of small hotels to rise 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 consistent with prior academic studies which find that securitized real estate is leading indicator of underlying real estate performance since the stock market is forward looking or efficient. Looking ahead, the NAREIT lodging index has regained its forward momentum, rising 15.5% in the fourth quarter after experiencing a 3.7% decline in the third quarter.
The architecture billings index (ABI) for commercial and industrial property, which represents another forward looking metric, remained relatively flat in the fourth quarter (2014Q4) after losing 4.3% in the third quarter (2014Q3), as shown in Exhibit 21. In contrast to these indicators, the Na-

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

7 We used the May ABI index as reported on June 19, 2013 since the June ABI index will be reported after the writing of this report. The ABI anticipates non-residential construction activity by approximately 9-12 months. According to material posted on their website, “The indexes are developed from the monthly Work-on-the-Boards survey panel where participants are asked whether their billings increased, decreased, or stayed the same in the month that just ended. According to the proportion of respondents choosing each option, a score is generated, which represents an index value for each month.”
The ISM: Purchasing Managers’ Index, (Diffusion index, SA) also known as the National Association of Purchasing Managers (NAPM) index is based on a survey of over 250 companies within twenty-one industries covering all 50 states. It not only measures the health of the manufacturing sector but is a proxy for the overall economy. It is calculated by surveying purchasing managers for data about new orders, production, employment, deliveries, and inventory, in descending order of importance. A reading over 50% indicates that manufacturing is growing, while a reading below 50% means it is shrinking.

8 The ISM: Purchasing Managers’ Index, (Diffusion index, SA) also known as the National Association of Purchasing Managers (NAPM) index shown in Exhibit 22, which is an indicator of anticipated business confidence and thus business traveler demand also remained relatively flat this quarter (.23%) compared to a 4.3% gain in the previous quarter. At 57.7 in the fourth quarter, the absolute level of the index has continued to stay above 50 since 2009Q3, indicating that the manufacturing sector continues to remain strong.
Hotel Valuation Model (HOTVAL) has been updated. We have updated our hotel valuation regression model to include the transaction data used to generate this report. We provide this user friendly hotel valuation model in an excel spreadsheet entitled HOTVAL Toolkit as a complement to this report which is available for download from our CREF website.

Finally, the Consumer Confidence Index from the Conference Board graphed in Exhibit 23, 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 in December (blue line) to 92.6, a 4% increase on a quarter-over-quarter basis, and 19% year over year. This suggests that we should expect the price of small hotels to continue to increase next quarter.
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:

\[ SUE_Q = \frac{(A_Q - \mu_Q)s_Q}{\sigma} \]

where \( SUE_Q \) = quarter Q standardized unexpected earnings,
\( A_Q \) = quarter Q actual earnings per share reported by the firm,
\( \mu_Q \) = 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 (~N(0,1)). This calculation shows an earnings surprise when earnings are statistically significant, when \( SUE_Q \) exceeds either \( \pm 1.645 \) (90% significant) or \( \pm 1.96 \) (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 (\( \mu \)). 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 \( \mu \), 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 \( \mu \) and the rolling three- or five-year standard deviation as our measure of \( \sigma \). Following is an example of how to calculate the SUP metric using high price hotels with regard to their three-year moving average.

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

\[
\text{Standard Deviation (}\sigma\text{)} = 18.99
\]

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