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# PUTTING THE PAST TO USE REDUX: EXPENSE ELASTICITY IN A DOWNTURN

**Erich Baum, CRE**  
*Senior Vice President*  
*HVS Boston*  
*83 Cambridge Street, Suite 3D*  
*Burlington, Massachusetts 01803*

*Reprising and updating a study from the last downturn, this article surveys operating expense elasticity in the industry's most recent period of acute revenue loss, 2008–2009, using data presented across a range of product types and quality levels. The study is intended to help industry participants build or evaluate a forecast in a context of economic decline and provides a forecasting tool for the same.*

Like restaurants and airlines, hotels offer experiential, temporal products that cannot be inventoried. The COVID-19 pandemic has temporarily reduced hotel demand to near zero; meanwhile, inventory continues to stream into the void unused. Thus, the hotel industry is experiencing unprecedented year-over-year hotel revenue losses. How long the direct impacts will continue remains to be seen, as does the collateral long-term impact; however, a significant RevPAR loss in 2020 is certain, and most experts expect post-pandemic results to remain below the pre-crisis benchmark year of 2019 for several years. In this environment, a central concern for hotel investors and operators is expense elasticity, representing the extent to which expenses can be reduced in proportion to revenue.

Using the HVS database, we identified 661 hotels (with an average of 210 rooms) that experienced material losses in revenue between 2008 and 2009. The following table summarizes the key metrics for this aggregate group and also provides a segregation by product type and quality level.

### Summary of Key Metrics

Category	No. of Hotels	Average No. of Rooms	RevPAR		Per Available Room				% Change			House Profit Loss Factor per \$1 Rev
			2008	2009	Total Revenue		House Profit		RevPAR	Total Revenue	House Profit	
					2008	2009	2008	2009				
<b>GRAND TOTAL</b>												
Total	661	210	\$121	\$98	\$64,814	\$52,758	\$23,511	\$16,795	(19.2) %	(18.6) %	(28.6) %	\$0.56
Profit Ratio							36%	32%				
<b>Limited-Service</b>												
First Tier	135	103	\$75	\$61	\$28,026	\$22,892	\$13,024	\$9,483	(18.3) %	(18.3) %	(27.1) %	\$0.69
Profit Ratio							46%	41%				
Second Tier	30	115	48	39	\$18,320	\$14,783	\$9,515	\$7,264	(19.3)	(19.3)	(23.7)	\$0.64
Profit Ratio							52%	49%				
<b>Extended-Stay</b>												
First Tier	111	122	\$92	\$77	\$35,012	\$29,140	\$16,889	\$12,942	(16.3) %	(16.7) %	(23.3) %	\$0.67
Profit Ratio							48%	44%				
Second Tier	21	105	63	54	\$23,281	\$19,929	\$12,024	\$9,548	(14.3)	(14.4)	(20.6)	\$0.74
Profit Ratio							52%	48%				
<b>Select-Service</b>												
Standard	94	151	\$94	\$78	\$39,320	\$32,770	\$17,738	\$13,408	(17.4) %	(16.7) %	(24.5) %	\$0.66
Profit Ratio							45%	41%				
<b>Full-Service</b>												
Standard	194	387	\$125	\$102	\$68,815	\$56,581	\$25,357	\$18,670	(18.5) %	(17.8) %	(26.4) %	\$0.55
Profit Ratio							37%	33%				
Lifestyle	12	261	184	152	\$107,310	\$91,593	\$30,730	\$23,991	(17.3)	(14.7)	(22.0)	\$0.43
Profit Ratio							29%	26%				
Luxury	36	335	234	177	\$153,062	\$117,849	\$41,320	\$24,410	(24.4)	(22.9)	(40.8)	\$0.48
Profit Ratio							27%	21%				
<b>Small Hotels</b>												
With F&B	10	41	\$313	\$255	\$247,786	\$207,207	\$93,089	\$30,975	(18.6) %	(15.6) %	(66.4) %	\$1.53
Profit Ratio							38%	15%				
No F&B	18	54	53	42	\$19,504	\$15,520	\$9,747	\$6,512	(20.6)	(19.9)	(32.7)	\$0.81
Profit Ratio							50%	42%				

Source: HVS

For all 661 hotels, the aggregate decline in RevPAR (revenue per available room: the product of occupancy and average daily rate) was 19.2%, roughly consistent with the industrywide decline in 2009. Total revenue fell by 18.6% and house profit declined by 28.6%.

The percentage decline factors have the benefit of being easily understood, but an additional calculation is available using the preceding data, resulting in a metric of greater benefit. The rightmost column presented above converts the figures into a loss factor, which is calculated by dividing the per-available-room loss in house profit by the per-available-room loss in total revenue. For the survey at large, house profit declined by \$0.56 for every \$1.00 decline in total RevPAR, calculated as follows.

### Calculation of House Profit Loss Factor

House Profit Per Available Room		
2008	\$23,511	
2009	\$16,795	
Difference		\$6,717
Divided by:		
Total Revenue Per Available Room		
2008	\$64,814	
2009	\$52,758	
Difference		\$12,056
<b>House Profit Loss Factor per \$1 of Total Revenue:</b>		<b>\$0.56</b>

Source: HVS

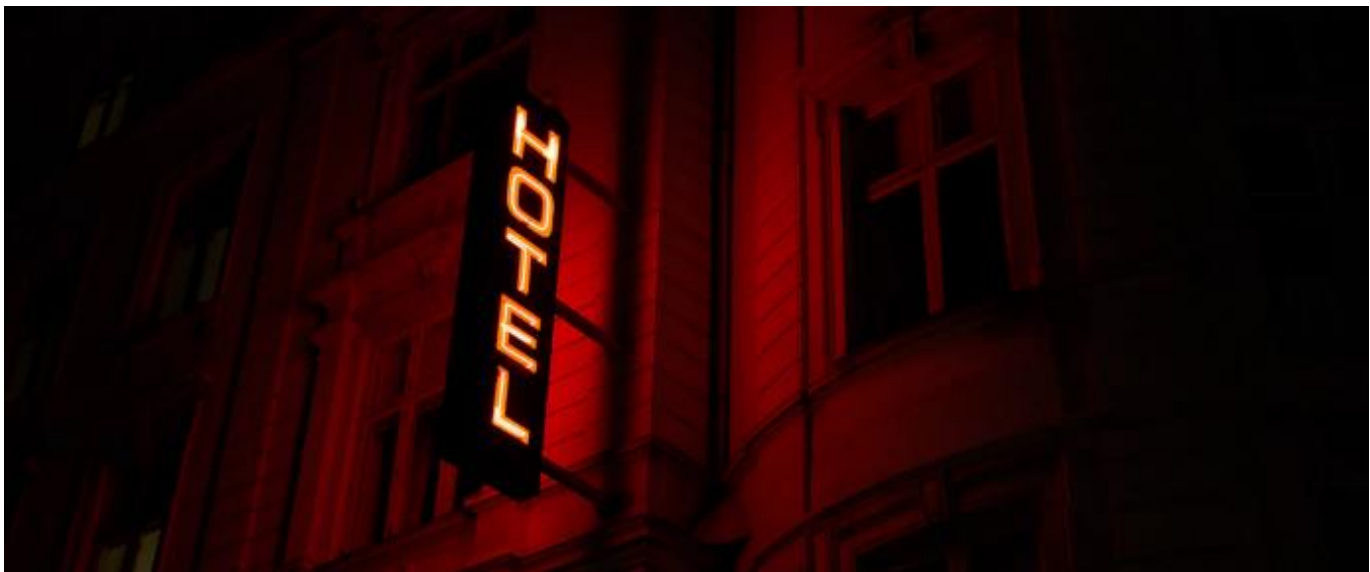
The higher the loss factor, the lower the degree of expense elasticity. The lower the loss factor, the higher the expense elasticity. Hotels with high expense elasticity have the greatest capacity for cost reductions. It stands to reason that larger hotels have the greatest expense elasticity because they have greater capacity for staffing reductions, as well as potential for temporary cuts to marketing and maintenance budgets. Thus, among the categories surveyed in Table 1, the full-service hotels have the lowest loss factors. The highest loss factors are indicated by the two categories of small hotels. Small hotels with food and beverage (F&B) are especially expense-inelastic, with each dollar of revenue lost resulting in a \$1.53 loss in house profit. The small hotels were filtered to include only properties with fewer than 70 rooms. The other categories are best described by identifying the brands included therein.



### Hotel Categories and Associated Brands

Category	Brands
Limited-Service - 1st Tier	Fairfield Inn, Hampton Inn, Holiday Inn Express, SpringHill Suites
Limited-Service - 2nd Tier	Baymont Inn, Best Western, Comfort Inn, Days Inn, La Quinta, Motel 6, Ramada, Red Roof Inn, Super 8
Extended-Stay - 1st Tier	Element, Homewood Suites, Hyatt House, Residence Inn, Staybridge Suites
Extended-Stay - 2nd Tier	Candlewood Suites, TownePlace Suites
Select-Service - Standard	Courtyard by Marriott, Four Points, Hilton Garden Inn, Holiday Inn, Hyatt Place
Full-Service - Standard	DoubleTree, Embassy Suites, Hilton, Hyatt Regency, JW Marriott, Le Meridien, Marriott, Renaissance, Sheraton, Westin
Full-Service - Lifestyle	Autograph Collection, Kimpton, W
Full-Service - Luxury	Conrad, Fairmont, Four Seasons, InterContinental, Park Hyatt, Ritz-Carlton, St. Regis
Small Hotels - With F&B	Various, less than 70 rooms
Small Hotels - No F&B	Various, less than 70 rooms

Source: HVS



### A Forecasting Tool: The Variability Index

For readers interested in adapting the preceding data into a forecasting tool, we herewith repeat the methodology originally presented in a February 2009 article entitled “Putting the Past to Use: A Hotel Forecasting Tool for the Current Downtown,” which performed this same study using the 2001–2003 recession as the premise.

In that report, we developed a metric called a “Variability Index” to be deployed as a benchmarking tool. The following tables detail the data used to calculate the variability indices. In the subsequent text, we will explain the mathematical basis for the indices and demonstrate their application.

### Raw Historical Data - 2008

	2008										GRAND TOTAL
	Limited-Service		Extended-Stay		Select-Service	Full-Service			Small Hotels		
	1st-Tier	2nd-Tier	1st-Tier	2nd-Tier		Standard	Lifestyle	Luxury	With F&B	No F&B	
<b>Number of Rooms:</b>	13,954	3,448	13,513	2,211	14,220	75,014	3,137	12,077	414	976	138,964
<b>No. of Hotels:</b>	135	30	111	21	94	194	12	36	10	18	661
<b>Average No. of Rooms</b>	103	115	122	105	151	387	261	335	41	54	210
<b>Occupied Rooms:</b>	3,578,034	859,552	3,690,410	544,850	3,834,727	19,877,812	851,989	2,956,636	101,679	240,960	36,536,649
<b>Days Open:</b>	365	365	365	365	365	365	365	365	365	365	365
<b>Occupancy:</b>	70.3%	68.3%	74.8%	67.5%	73.9%	72.6%	74.4%	67.1%	67.3%	67.6%	72.0%
<b>Average Rate:</b>	\$106.50	\$70.73	\$122.86	\$93.19	\$127.65	\$172.02	\$247.24	\$348.31	\$465.14	\$78.59	\$168.64
<b>RevPAR:</b>	\$74.82	\$48.31	\$91.93	\$62.91	\$94.31	\$124.89	\$183.97	\$233.62	\$312.99	\$53.16	\$121.48
<b>PER AVAILABLE ROOM</b>											
<b>REVENUE</b>											
Rooms	\$27,309	\$17,632	\$33,554	\$22,963	\$34,422	\$45,584	\$67,148	\$85,271	\$114,240	\$19,404	\$44,340
Food & Beverage	0	0	0	0	3,615	18,870	30,676	52,155	77,335	0	16,012
Other Op'd Departments	717	688	1,458	318	1,283	4,362	9,487	15,637	56,211	100	4,463
<b>Total</b>	<b>28,026</b>	<b>18,320</b>	<b>35,012</b>	<b>23,281</b>	<b>39,320</b>	<b>68,815</b>	<b>107,310</b>	<b>153,062</b>	<b>247,786</b>	<b>19,504</b>	<b>64,814</b>
<b>DEPARTMENTAL EXPENSES</b>											
Rooms	6,693	3,145	6,995	4,502	7,534	11,085	19,045	23,964	30,957	3,966	10,889
Food & Beverage	0	0	0	0	2,925	13,495	25,403	42,048	56,059	0	11,979
Other Op'd Departments	363	466	1,166	329	593	2,107	5,934	10,400	20,604	143	2,465
<b>Total</b>	<b>7,056</b>	<b>3,611</b>	<b>8,161</b>	<b>4,831</b>	<b>11,052</b>	<b>26,687</b>	<b>50,382</b>	<b>76,412</b>	<b>107,620</b>	<b>4,109</b>	<b>25,333</b>
<b>DEPARTMENTAL INCOME</b>	<b>20,970</b>	<b>14,709</b>	<b>26,851</b>	<b>18,450</b>	<b>28,268</b>	<b>42,129</b>	<b>56,929</b>	<b>76,650</b>	<b>140,166</b>	<b>15,395</b>	<b>39,482</b>
<b>OPERATING EXPENSES</b>											
Administrative & Gen'l	2,442	1,460	2,881	2,433	3,351	5,255	10,044	13,402	19,570	1,918	5,243
Marketing	1,123	545	1,748	688	1,948	4,116	7,257	9,170	9,734	480	3,722
Franchise Fee	1,902	1,052	1,998	1,323	1,966	1,669	430	18	307	1,122	1,555
Property Ops & Maint	1,206	831	1,668	1,036	1,673	2,965	4,823	6,862	10,907	1,033	2,837
Utilities	1,272	1,306	1,666	946	1,592	2,766	3,643	5,878	6,560	1,095	2,614
<b>Total</b>	<b>7,946</b>	<b>5,194</b>	<b>9,962</b>	<b>6,426</b>	<b>10,530</b>	<b>16,771</b>	<b>26,198</b>	<b>35,330</b>	<b>47,077</b>	<b>5,648</b>	<b>15,970</b>
<b>HOUSE PROFIT</b>	<b>\$13,024</b>	<b>\$9,515</b>	<b>\$16,889</b>	<b>\$12,024</b>	<b>\$17,738</b>	<b>\$25,357</b>	<b>\$30,730</b>	<b>\$41,320</b>	<b>\$93,089</b>	<b>\$9,747</b>	<b>\$23,511</b>
<b>2008 (% of Revenue)</b>											
<b>REVENUE</b>											
Rooms	97.4 %	96.2 %	95.8 %	98.6 %	87.5 %	66.2 %	62.6 %	55.7 %	46.1 %	99.5 %	68.4 %
Food & Beverage	0.0	0.0	0.0	0.0	9.2	27.4	28.6	34.1	31.2	0.0	24.7
Other Op'd Departments	2.6	3.8	4.2	1.4	3.3	6.3	8.8	10.2	22.7	0.5	6.9
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>DEPARTMENTAL EXPENSES*</b>											
Rooms	24.5	17.8	20.8	19.6	21.9	24.3	28.4	28.1	27.1	20.4	24.6
Food & Beverage	0.0	0.0	0.0	0.0	80.9	71.5	82.8	80.6	72.5	0.0	74.8
Other Op'd Departments	50.6	67.7	80.0	103.5	46.2	48.3	62.6	66.5	36.7	142.4	55.2
<b>Total</b>	<b>25.2</b>	<b>19.7</b>	<b>23.3</b>	<b>20.8</b>	<b>28.1</b>	<b>38.8</b>	<b>46.9</b>	<b>49.9</b>	<b>43.4</b>	<b>21.1</b>	<b>39.1</b>
<b>DEPARTMENTAL INCOME</b>	<b>74.8</b>	<b>80.3</b>	<b>76.7</b>	<b>79.2</b>	<b>71.9</b>	<b>61.2</b>	<b>53.1</b>	<b>50.1</b>	<b>56.6</b>	<b>78.9</b>	<b>60.9</b>
<b>OPERATING EXPENSES</b>											
Administrative & Gen'l	8.7	8.0	8.2	10.5	8.5	7.6	9.4	8.8	7.9	9.8	8.1
Marketing	4.0	3.0	5.0	3.0	5.0	6.0	6.8	6.0	3.9	2.5	5.7
Franchise Fee	6.8	5.7	5.7	5.7	5.0	2.4	0.4	0.0	0.1	5.8	2.4
Property Ops & Maint	4.3	4.5	4.8	4.4	4.3	4.3	4.5	4.5	4.4	5.3	4.4
Utilities	4.5	7.1	4.8	4.1	4.0	4.0	3.4	3.8	2.6	5.6	4.0
<b>Total</b>	<b>28.4</b>	<b>28.4</b>	<b>28.5</b>	<b>27.6</b>	<b>26.8</b>	<b>24.4</b>	<b>24.4</b>	<b>23.1</b>	<b>19.0</b>	<b>29.0</b>	<b>24.6</b>
<b>HOUSE PROFIT</b>	<b>46.5 %</b>	<b>51.9 %</b>	<b>48.2 %</b>	<b>51.6 %</b>	<b>45.1 %</b>	<b>36.8 %</b>	<b>28.6 %</b>	<b>27.0 %</b>	<b>37.6 %</b>	<b>50.0 %</b>	<b>36.3 %</b>

Source: HVS

\*Expressed as a ratio to departmental revenue

### Raw Historical Data - 2009

	2009										GRAND TOTAL
	Limited-Service		Extended-Stay		Select-Service	Standard	Full-Service		Small Hotels		
	1st-Tier	2nd-Tier	1st-Tier	2nd-Tier			Lifestyle	Luxury	With F&B	No F&B	
<b>Number of Rooms:</b>	<b>13,964</b>	<b>3,448</b>	<b>13,520</b>	<b>2,211</b>	<b>14,205</b>	<b>75,014</b>	<b>3,135</b>	<b>12,096</b>	<b>418</b>	<b>983</b>	<b>138,994</b>
<b>No. of Hotels:</b>	<b>135</b>	<b>30</b>	<b>111</b>	<b>21</b>	<b>94</b>	<b>194</b>	<b>12</b>	<b>36</b>	<b>10</b>	<b>18</b>	<b>661</b>
<b>Average No. of Rooms</b>	<b>103</b>	<b>115</b>	<b>122</b>	<b>105</b>	<b>151</b>	<b>387</b>	<b>261</b>	<b>336</b>	<b>42</b>	<b>55</b>	<b>1,677</b>
<b>Occupied Rooms:</b>	<b>3,221,954</b>	<b>758,932</b>	<b>3,407,446</b>	<b>533,817</b>	<b>3,600,497</b>	<b>18,504,946</b>	<b>817,664</b>	<b>2,682,614</b>	<b>92,631</b>	<b>205,562</b>	<b>33,826,063</b>
<b>Days Open:</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>	<b>365</b>
<b>Occupancy:</b>	<b>63.2%</b>	<b>60.3%</b>	<b>69.0%</b>	<b>66.1%</b>	<b>69.4%</b>	<b>67.6%</b>	<b>71.5%</b>	<b>60.8%</b>	<b>60.7%</b>	<b>57.3%</b>	<b>66.7%</b>
<b>Average Rate:</b>	<b>\$96.66</b>	<b>\$64.61</b>	<b>\$111.45</b>	<b>\$81.50</b>	<b>\$112.19</b>	<b>\$150.58</b>	<b>\$213.03</b>	<b>\$290.78</b>	<b>\$419.85</b>	<b>\$73.67</b>	<b>\$147.30</b>
<b>RevPAR:</b>	<b>\$61.10</b>	<b>\$38.96</b>	<b>\$76.96</b>	<b>\$53.91</b>	<b>\$77.91</b>	<b>\$101.77</b>	<b>\$152.22</b>	<b>\$176.68</b>	<b>\$254.91</b>	<b>\$42.21</b>	<b>\$98.21</b>
<b>PER AVAILABLE ROOM</b>											
<b>REVENUE</b>											
Rooms	\$22,303	\$14,221	\$28,090	\$19,677	\$28,437	\$37,146	\$55,562	\$64,489	\$93,041	\$15,405	\$35,846
Food & Beverage	0	0	0	0	3,178	15,510	26,566	39,676	67,234	0	12,950
Other Op'd Departments	589	562	1,050	252	1,155	3,925	9,465	13,684	46,932	115	3,962
<b>Total</b>	<b>22,892</b>	<b>14,783</b>	<b>29,140</b>	<b>19,929</b>	<b>32,770</b>	<b>56,581</b>	<b>91,593</b>	<b>117,849</b>	<b>207,207</b>	<b>15,520</b>	<b>52,758</b>
<b>DEPARTMENTAL EXPENSES</b>											
Rooms	6,027	2,582	6,472	4,051	6,729	9,896	17,489	20,331	29,371	3,832	9,671
Food & Beverage	0	0	0	0	2,623	11,388	21,533	33,870	58,435	0	10,023
Other Op'd Departments	319	361	758	306	539	1,892	5,470	8,848	34,851	116	2,195
<b>Total</b>	<b>6,346</b>	<b>2,943</b>	<b>7,230</b>	<b>4,357</b>	<b>9,892</b>	<b>23,176</b>	<b>44,492</b>	<b>63,050</b>	<b>122,658</b>	<b>3,948</b>	<b>21,889</b>
<b>DEPARTMENTAL INCOME</b>	<b>16,546</b>	<b>11,840</b>	<b>21,910</b>	<b>15,572</b>	<b>22,878</b>	<b>33,405</b>	<b>47,101</b>	<b>54,799</b>	<b>84,549</b>	<b>11,572</b>	<b>30,869</b>
<b>OPERATING EXPENSES</b>											
Administrative & Gen'l	2,194	1,240	2,608	2,168	3,006	4,575	8,566	11,276	23,024	1,772	4,572
Marketing	1,011	473	1,586	716	1,799	3,647	6,267	7,842	11,978	536	3,294
Franchise Fee	1,617	918	1,684	1,278	1,636	1,352	353	13	211	953	1,283
Property Ops & Maint	1,073	710	1,521	943	1,535	2,719	4,370	6,247	11,464	869	2,596
Utilities	1,168	1,235	1,568	919	1,493	2,442	3,554	5,010	6,897	930	2,329
<b>Total</b>	<b>7,063</b>	<b>4,576</b>	<b>8,967</b>	<b>6,024</b>	<b>9,469</b>	<b>14,735</b>	<b>23,110</b>	<b>30,389</b>	<b>53,574</b>	<b>5,060</b>	<b>14,074</b>
<b>HOUSE PROFIT</b>	<b>\$9,483</b>	<b>\$7,264</b>	<b>\$12,942</b>	<b>\$9,548</b>	<b>\$13,408</b>	<b>\$18,670</b>	<b>\$23,991</b>	<b>\$24,410</b>	<b>\$30,975</b>	<b>\$6,512</b>	<b>\$16,795</b>
<b>2009 (% of Revenue)</b>											
<b>REVENUE</b>											
Rooms	97.4 %	96.2 %	96.4 %	98.7 %	86.8 %	65.7 %	60.7 %	54.7 %	44.9 %	99.3 %	67.9 %
Food & Beverage	0.0	0.0	0.0	0.0	9.7	27.4	29.0	33.7	32.4	0.0	24.5
Other Op'd Departments	2.6	3.8	3.6	1.3	3.5	6.9	10.3	11.6	22.6	0.7	7.5
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
<b>DEPARTMENTAL EXPENSES*</b>											
Rooms	27.0	18.2	23.0	20.6	23.7	26.6	31.5	31.5	31.6	24.9	27.0
Food & Beverage	0.0	0.0	0.0	0.0	82.6	73.4	81.1	85.4	86.9	0.0	77.4
Other Op'd Departments	54.2	64.2	72.2	121.2	46.7	48.2	57.8	64.7	74.3	100.9	55.4
<b>Total</b>	<b>27.7</b>	<b>19.9</b>	<b>24.8</b>	<b>21.9</b>	<b>30.2</b>	<b>41.0</b>	<b>48.6</b>	<b>53.5</b>	<b>59.2</b>	<b>25.4</b>	<b>41.5</b>
<b>DEPARTMENTAL INCOME</b>	<b>72.3</b>	<b>80.1</b>	<b>75.2</b>	<b>78.1</b>	<b>69.8</b>	<b>59.0</b>	<b>51.4</b>	<b>46.5</b>	<b>40.8</b>	<b>74.6</b>	<b>58.5</b>
<b>OPERATING EXPENSES</b>											
Administrative & Gen'l	9.6	8.4	9.0	10.9	9.2	8.1	9.4	9.6	11.1	11.4	8.7
Marketing	4.4	3.2	5.4	3.6	5.5	6.4	6.8	6.7	5.8	3.5	6.2
Franchise Fee	7.1	6.2	5.8	6.4	5.0	2.4	0.4	0.0	0.1	6.1	2.4
Property Ops & Maint	4.7	4.8	5.2	4.7	4.7	4.8	4.8	5.3	5.5	5.6	4.9
Utilities	5.1	8.4	5.4	4.6	4.6	4.3	3.9	4.3	3.3	6.0	4.4
<b>Total</b>	<b>30.9</b>	<b>31.0</b>	<b>30.8</b>	<b>30.2</b>	<b>28.9</b>	<b>26.0</b>	<b>25.2</b>	<b>25.8</b>	<b>25.9</b>	<b>32.6</b>	<b>26.7</b>
<b>HOUSE PROFIT</b>	<b>41.4 %</b>	<b>49.1 %</b>	<b>44.4 %</b>	<b>47.9 %</b>	<b>40.9 %</b>	<b>33.0 %</b>	<b>26.2 %</b>	<b>20.7 %</b>	<b>14.9 %</b>	<b>42.0 %</b>	<b>31.8 %</b>

Source: HVS

\*Expressed as a ratio to departmental revenue

### Percentage Change – 2008 to 2009

	Percentage Change: 2008 to 2009										GRAND TOTAL
	Limited-Service		Extended-Stay		Select-Service	Full-Service			Small Hotels		
	1st-Tier	2nd-Tier	1st-Tier	2nd-Tier		Standard	Lifestyle	Luxury	With F&B	No F&B	
<b>Occupied Rooms:</b>	(10.0) %	(11.7) %	(7.7) %	(2.0) %	(6.1) %	(6.9) %	(4.0) %	(9.3) %	(8.9) %	(14.7) %	(7.4) %
<b>Occupancy:</b>	(10.0)	(11.7)	(7.7)	(2.0)	(6.0)	(6.9)	(4.0)	(9.4)	(9.8)	(15.3)	(7.4)
<b>Average Rate:</b>	(9.2)	(8.7)	(9.3)	(12.5)	(12.1)	(12.5)	(13.8)	(16.5)	(9.7)	(6.3)	(12.7)
<b>RevPAR:</b>	(18.3)	(19.3)	(16.3)	(14.3)	(17.4)	(18.5)	(17.3)	(24.4)	(18.6)	(20.6)	(19.2)
<b>REVENUE</b>											
Rooms	(18.3)	(19.3)	(16.3)	(14.3)	(17.5)	(18.5)	(17.3)	(24.3)	(17.8)	(20.0)	(19.1)
Food & Beverage	---	---	---	---	(12.2)	(17.8)	(13.5)	(23.8)	(12.2)	---	(19.1)
Other Op'd Departments	(17.8)	(18.4)	(28.0)	(20.6)	(10.0)	(10.0)	(0.3)	(12.4)	(15.7)	15.3	(11.2)
Total	(18.3)	(19.3)	(16.8)	(14.4)	(16.7)	(17.8)	(14.7)	(22.9)	(15.6)	(19.9)	(18.6)
<b>DEPARTMENTAL EXPENSES</b>											
Rooms	(10.0)	(17.9)	(7.5)	(10.0)	(10.8)	(10.7)	(8.2)	(15.0)	(4.2)	(2.7)	(11.2)
Food & Beverage	---	---	---	---	(10.4)	(15.6)	(15.3)	(19.3)	5.2	---	(16.3)
Other Op'd Departments	(12.0)	(22.6)	(35.0)	(7.0)	(9.1)	(10.2)	(7.9)	(14.8)	70.8	(18.3)	(10.9)
Total	(10.1)	(18.5)	(11.4)	(9.8)	(10.6)	(13.2)	(11.7)	(17.4)	15.1	(3.2)	(13.6)
<b>DEPARTMENTAL INCOME</b>											
	(21.1)	(19.5)	(18.4)	(15.6)	(19.2)	(20.7)	(17.3)	(28.4)	(39.1)	(24.3)	(21.8)
<b>OPERATING EXPENSES</b>											
Administrative & Gen'l	(10.2)	(15.1)	(9.5)	(10.9)	(10.4)	(12.9)	(14.8)	(15.7)	18.8	(6.9)	(12.8)
Marketing	(10.0)	(13.2)	(9.3)	4.1	(7.7)	(11.4)	(13.7)	(14.3)	24.3	12.4	(11.5)
Franchise Fee	(15.0)	(12.7)	(15.7)	(3.5)	(16.9)	(19.0)	(17.9)	(26.6)	(30.7)	(14.4)	(17.5)
Property Ops & Maint	(11.0)	(14.6)	(8.8)	(9.0)	(8.3)	(8.3)	(9.4)	(8.8)	6.1	(15.3)	(8.5)
Utilities	(8.2)	(5.4)	(5.9)	(2.8)	(6.4)	(11.7)	(2.5)	(14.6)	6.2	(14.5)	(10.9)
Total	(11.1)	(11.9)	(10.0)	(6.3)	(10.2)	(12.1)	(11.8)	(13.8)	14.9	(9.8)	(11.9)
<b>HOUSE PROFIT</b>	(27.2) %	(23.7) %	(23.4) %	(20.6) %	(24.5) %	(26.4) %	(22.0) %	(40.8) %	(66.4) %	(32.7) %	(28.6) %

Source: HVS

### Variability Indices

	Variability Indices										GRAND TOTAL
	Limited-Service		Extended-Stay		Select-Service	Full-Service			Small Hotels		
	1st-Tier	2nd-Tier	1st-Tier	2nd-Tier		Standard	Lifestyle	Luxury	With F&B	No F&B	
<b>Relative to % Change in Rooms Revenue</b>											
Rooms Revenue	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
F&B Revenue	---	---	---	---	70	96	78	98	69	---	100
Other Op'd Depart Revenue	97	95	172	144	57	54	2	51	88	(76)	59
Total Revenue	100	100	103	101	96	96	85	94	88	99	97
Rooms Expense	54	93	46	70	62	58	48	62	24	13	58
House Profit	148	122	144	144	140	142	127	168	374	163	149
<b>Relative to % Change in F&amp;B Revenue</b>											
F&B Expense	---	---	---	---	85 %	88 %	114 %	81 %	(43) %	---	85 %
<b>Relative to % Change in Other Operated Departments Revenue</b>											
Other Op'd Depart Expense	67 %	123 %	125 %	34 %	91 %	102 %	2,746 %	120 %	(451) %	(120) %	98 %
<b>Relative to % Change in Total Revenue</b>											
Administrative & Gen'l	55 %	78 %	57 %	76 %	62 %	73 %	101 %	69 %	(121) %	35 %	69 %
Marketing	55	68	55	(29)	46	64	93	63	(156)	(62)	62
Franchise Fee	82	66	94	24	101	107	122	116	197	73	94
Property Ops & Maint	60	76	53	62	50	47	64	39	(39)	77	46
Utilities	45	28	35	19	38	66	17	64	(40)	73	59
House Profit	148	123	139	143	146	148	150	178	427	165	154

Source: HVS

The variability indices are calculated by dividing the two rates of change indicated for some defined pair of (at least partially dependent) revenue and/or expense line items, where the denominator is the base point of reference and the numerator is the dependent.

For example, in Table 6, for the Select-Service hotel category, rooms revenue declined by 17.5%, while F&B revenue in the same category declined by 12.2%. Dividing the F&B rate of decline by the rooms revenue rate of decline indicates a ratio of 70%. Expressed another way, F&B revenue was 70% variable with rooms revenue.

In the same category (select-service hotels), other operated departments' revenue was 57% variable with rooms revenue. The higher the index, the higher the degree of variability (or elasticity) with rooms revenue. The lower the index, the larger the fixed component. In cases where the index is negative (see most of the undistributed operating expenses in the Small Hotels with F&B category), the expense continued to grow in real terms despite the revenue loss.

From the standpoint of optimizing net income during a downturn, an operator hopes to see lower variability in revenue items and higher variability in expense categories. Utilities and maintenance expenses tend to have the lowest levels of elasticity.

Note that the line items studied here are restricted to those with a mix of fixed and variable expense components. Expenses that are totally variable are excluded (e.g., management fees and replacement reserves), as are fixed property-specific expenses, such as property taxes and insurance. The items reviewed here are hybrids, and the question of how much is directly variable with declining revenue is at the heart of this study. In addition, note that, in the interim between the previous economic downturn and today, the Uniform System of Accounts for the Lodging Industry (USALI) was revised to create a new category called Information & Telecommunications Systems, which captures expenses previously categorized as Other Operated Departments and Administrative & General expenses. In the absence of historical data for this new item, we advise using the Administrative & General variability index.

## A Case Study

Assume you are the asset manager of a 151-room, select-service hotel, where the actual 2019 performance results reflect the following:

### Actual 2019 Results – Hypothetical 151-Room, Select-Service Hotel

Year	2019 Actual	
<b>Number of Rooms:</b>	<b>151</b>	
<b>Days Open:</b>	<b>365</b>	
<b>Occupancy:</b>	<b>73.9%</b>	
<b>Occupied Rooms:</b>	<b>40,795</b>	
<b>Average Rate:</b>	<b>\$127.65</b>	
<b>RevPAR:</b>	<b>\$94.31</b>	
<b>REVENUE</b>		
Rooms	\$5,207,000	87.5 %
Food & Beverage	547,000	9.2
Other Operated Departments	194,000	3.3
Total	5,948,000	100.0
<b>DEPARTMENTAL EXPENSES</b>		
Rooms	1,140,000	21.9 *
Food & Beverage	443,000	80.9 *
Other Operated Departments	90,000	46.2 *
Total	1,673,000	28.1
<b>DEPARTMENTAL INCOME</b>	4,275,000	71.9
<b>OPERATING EXPENSES</b>		
Administrative & General	507,000	8.5
Marketing	295,000	5.0
Franchise Fee	297,000	5.0
Property Operations & Maintenance	253,000	4.3
Utilities	241,000	4.0
Total	1,593,000	26.8
<b>HOUSE PROFIT</b>	<b>\$2,682,000</b>	<b>45.1 %</b>

Source: HVS

\*Expressed as a ratio to departmental revenue

Given current events, hotel management is projecting 2021 occupancy of 69.4% at an average rate (ADR) of \$112.19, for a RevPAR of \$77.91, a 17.4% decrease from 2019. Using this change rate as the basis, the following other change rates can be calculated using the relevant variability indices.



### Rate of Change Projections – 2021

	Variability Index				Projected % Change
<b>Projected Change in Rooms Revenue:</b>					<b>(17.4) %</b>
Corresponding Change in					
Rooms Revenue	100 %	x	(17.4) %	=	(17.4) %
F&B Revenue	70	x	(17.4)	=	(12.1)
Other Operated Depts Revenue	57	x	(17.4)	=	(10.0)
Rooms Expense	62	x	(17.4)	=	(10.7)
<b>Projected Change in F&amp;B Revenue:</b>					<b>(12.2) %</b>
Corresponding Change in					
F&B Expense	85 %	x	(12.2) %	=	(10.4) %
<b>Projected Change in Other Operated Depts Revenue:</b>					<b>(10.0) %</b>
Corresponding Change in					
Other Operated Depts Expense	91 %	x	(10.0) %	=	(9.1) %
<b>Projected Change in Total Revenue:</b>					<b>(16.7) %</b>
Corresponding Change in					
Administrative & General	62 %	x	(16.7) %	=	(10.4) %
Marketing	46	x	(16.7)	=	(7.7)
Franchise Fees	101	x	(16.7)	=	(16.9)
Property Operations & Maintenance	50	x	(16.7)	=	(8.3)
Utilities	38	x	(16.7)	=	(6.4)

Source: HVS

By applying the preceding change rates, the property's 2021 results are projected as follows.

### Forecasted Results - 2021

Year	2019 Actual			2021 Forecast		
<b>Number of Rooms:</b>	<b>151</b>			<b>151</b>		
<b>Days Open:</b>	<b>365</b>			<b>365</b>		
<b>Occupancy:</b>	<b>73.9%</b>			<b>69.4%</b>		
<b>Occupied Rooms:</b>	<b>40,795</b>			<b>38,344</b>		
<b>Average Rate:</b>	<b>\$127.65</b>		<b>Projected</b>	<b>\$112.19</b>		
<b>RevPAR:</b>	<b>\$94.31</b>		<b>% Change</b>	<b>\$77.91</b>		
<b>REVENUE</b>						
Rooms	\$5,207,000	87.5 %	(17.4) calc'd	\$4,302,000	86.8 %	
Food & Beverage	547,000	9.2	(12.1)	481,000	9.7	
Other Operated Departments	194,000	3.3	(10.0)	175,000	3.5	
Total	5,948,000	100.0	(16.6) calc'd	4,958,000	100.0	
<b>DEPARTMENTAL EXPENSES</b>						
Rooms	1,140,000	21.9 *	(10.7)	1,018,000	23.7 *	
Food & Beverage	443,000	81.0 *	(10.4)	397,000	82.5 *	
Other Operated Departments	90,000	46.4 *	(9.1)	82,000	46.9 *	
Total	1,673,000	28.1	(10.5) calc'd	1,497,000	30.2	
<b>DEPARTMENTAL INCOME</b>	<b>4,275,000</b>	<b>71.9</b>	<b>(19.0) calc'd</b>	<b>3,461,000</b>	<b>69.8</b>	
<b>OPERATING EXPENSES</b>						
Administrative & General	507,000	8.5	(10.4)	454,000	9.2	
Marketing	295,000	5.0	(7.7)	272,000	5.5	
Franchise Fee	297,000	5.0	(16.9)	247,000	5.0	
Property Operations & Maintenance	253,000	4.3	(8.3)	232,000	4.7	
Utilities	241,000	4.1	(6.4)	226,000	4.6	
Total	1,593,000	26.8	(10.2) calc'd	1,431,000	28.9	
<b>HOUSE PROFIT</b>	<b>\$2,682,000</b>	<b>45.1 %</b>	<b>(24.3) calc'd</b>	<b>\$2,030,000</b>	<b>40.9 %</b>	

Source: HVS

\*Expressed as a ratio to departmental revenue

We used the aggregate 2008 occupancy, ADR, and income and expense ratios for the Select-Service category (presented in Table 4) as the basis for the 2019 actual data in this case study. We then used this same category's 2009 occupancy and ADR results as the basis for the 2021 forecast. Because the case study's 2021 projected

results match the actual 2009 income and expense ratios, the preceding case example also works as a mathematical proof of the tool.

### **Conclusion**

The variability indices developed here provide hotel investors and operators a market-derived forecasting tool. Segregated over ten hotel categories, the indices allow an analyst with a given rate of rooms revenue loss to either build a ground-up forecast or confirm that an existing forecast is reasonable.





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## About the Author



Erich Baum, CRE, is a Senior Vice President with HVS New York and Boston who performs appraisal and consulting assignments for hotels and resorts throughout North America. Erich co-authored the 2001 edition of the Appraisal Institute's hotel valuation

textbook, has written numerous articles on issues related to hotel valuation and consulting, and regularly serves as an expert witness. Erich is a state-certified appraiser, a member of the Counselors of Real Estate, and a graduate of Cornell's School of Hotel Administration.

Contact Erich at +1 (603) 502-6625, or [ebaum@hvs.com](mailto:ebaum@hvs.com).

HVS Boston  
83 Cambridge Street, Suite 3D  
Burlington, Massachusetts, 01803