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University Lodging Demand: An analysis of its stability and guidance for estimating its growth potential at the market level

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Structured Abstract

This translational research study analyzes university-related lodging demand over a 24-year period through 2013. In so doing, this research project focuses on 27 university towns in an attempt to best isolate the dynamics of lodging supply and demand related to universities. Also, the study compares the supply and demand in university towns to U.S. averages and to similarly-sized cities that are not dominated by a university. This study finds that lodging demand in university towns is more stable than both U.S. averages and to similarly-sized small cities. This study also evaluates factors that hotel developers and analysts should consider when studying proposed lodging development or acquisition in markets dominated by a university. Significant predictors of lodging demand include city employment and population trends, as would be expected. Interestingly, university grant funding and graduate student populations are also strong predictors of lodging demand. Among the primary implications and recommendations of this study are that hotel feasibility analysts should evaluate both grant funding and graduate student population trends when studying individual markets. The results of this study may be useful to lodging feasibility analysts and developers evaluating university-related lodging demand in a variety of markets, not only small towns dominated by a major university.

University Lodging Demand: An analysis of its stability and guidance for estimating its growth potential at the market level

Introduction

A recent *Wall Street Journal* article[1] announced a new hotel brand named "Graduate Hotels" which will target university markets and has plans to develop 20 hotels over the next five years. The new brand is a $500 million collaboration between Chicago-based AJ Capital and Hong Kong-based Gaw Capital Partners.[2] In recent years, discussions among hospitality practitioners at hotel investment conferences and articles in business newspapers and the hotel trade press have promoted the benefits of hotel development and acquisition in university towns because while business travel suffers noticeable declines during economic recessions, universities are reported to provide relatively more stable and dependable sources of lodging demand and they generate guests for a broad variety of reasons.[3, 4] In particular, universities tend to generate lodging demand both on weekdays and weekends.[5] As a result, hotel development and acquisition proximate to universities has been reported to be relatively less risky than in non-university locations.[6] While universities are not completely immune to economic downturns, and may lay off employees, they continue to operate over the long term.[7] Universities may create economic resilience and equilibrium. Previous research suggested that urban factors creating such resilience have included high tech industry through the 1990s[8] and universities through 2009.[9]

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[1] Karmin, C. (2014, August 26). Hotel chain gives it the old college try. *Wall Street Journal* B1.

[2] Karmin, 2014.

[3] Nessler, D. (2010, September 7-20). Tertiary markets may represent best growth opportunities: College towns, state capitals offer stability. *Hotel Business* 2-41.

[4] Esposito, L. (2009, September 7-20). University markets help steady hotels in recession. *Hotel Business* 9-72.

[5] Esposito, 2009.

[6] Esposito, 2009.

[7] Esposito, 2009.

[8] Simmie, J. and Martin, R. (2010). The economic resilience of regions: Towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society* 3: 27-43.

[9] O'Neill, J.W. (2013). Improving the quality of hotel feasibility studies: Evaluating potential opportunities for hotel development and acquisition in university towns. *Journal of Quality Assurance in Hospitality & Tourism* 14: 391-411.

The subject research is intended to assist lodging feasibility analysts and developers who may be tasked with evaluating university-related lodging demand in a variety of markets, not only the small towns dominated by a major university which are the focus of this study.[10] Lodging demand, in this case, is measured in terms of hotel occupancy, and is usually evaluated on an annual basis.

Hotel operators have reported that their properties located nearby colleges and universities, and particularly state universities, fared better than similar hotels located elsewhere during the previous recession,[11] and there has been a resultant increase in the development of lodging facilities proximate to colleges and universities in recent years.[12] Other operators have emphasized that in university towns, the university is usually, by far, the primary lodging demand generator, so operational success is generally driven based on having a location as proximate to the university campus as possible.[13] A lodging demand generator is an organization or other factor in a market that results in group and/or transient visitation to the area. Although it is often assumed that a risk involved in developing or acquiring a hotel in a university town is that university lodging demand is seasonal, that is largely a misconception because universities tend to generate significant summer visitation as well as fall, winter, and spring demand.[14]

Background

Since universities are unique, evaluating lodging demand generated by them deserves special attention. Unlike many areas where the majority of employment growth has been in relatively small businesses, one significant employer that generates the majority of lodging demand in the city dominates university towns. However, even though a university may be a single major employer, it is composed of a diversity of parts and activities.

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[10] A feasibility study is generally defined as a market analysis/study and presentation of the historical supply and demand for a certain type of real estate in a specific geographic location that expands the market study by prognosticating future performance for a specific project in a specific location to determine whether it is feasible to develop or acquire that proposed property (Rushmore et al, 2012).

[11] Esposito, 2009.

[12] Arrants, M. (2013, April). News for the hospitality executive. *Hotel Online*.

[13] Esposito, 2009.

[14] Esposito, 2009.

Notably, undergraduates and graduates are all students, but their behavior and many of their related activities may be quite different. While undergraduate and graduate students may both generate lodging demand due to such activities as campus visits and graduation ceremonies, the volume of such lodging demand would be far greater from undergraduate students. At the same time, graduate students may be much more actively involved in research activities which generate visitation for entirely different reasons. Previous literature regarding hotel development in university towns has suggested analysts should focus on trends in overall student population, rather than consider trends in both undergraduate and graduate student populations separately as done in the subject study.

While previous literature has indicated that analysts should consider area employment trends, this study considers both the city and the university's employment trends which may be related to very different sorts of activities. Finally, this study considers trends in each university's grant funding which has become a significant activity at major research universities around the world. These issues raise a question regarding whether such factors should be included in an analysis of lodging demand pertaining to a potential hotel development project or acquisition opportunity in a university town or a marketplace dominated by a university, and the subject study endeavors to provide guidance to hotel feasibility analysts tasked with making such information gathering decisions.

Larger cities, which may have major universities, were excluded from this study due to the inherent difficulty in isolating university-related demand in such areas. For example, proposed hotel developments or acquisitions in Greenwich Village (New York) or Brentwood (Los Angeles) probably would be influenced by the sites' proximity to NYU and UCLA, but it would be infeasible to isolate the local lodging demand generated by each of those universities due to the sites' and competitive markets' proximity to other significant lodging demand generators located in those major metropolitan areas. On the other hand, analysts studying potential hotel acquisition or development in such local markets of major metropolitan areas would certainly want to evaluate the nature of lodging demand of such important generators as the nearby universities, and may require guidance regarding the factors about those universities that should be investigated. This study endeavors to reveal not only the dynamics

of lodging demand in relatively small university cities, but also to assist hoteliers and analysts with evaluating demand trends of universities, in general.

Smaller colleges were excluded for the same reason – because of their tendency not to function as the primary demand generator in their communities. Furthermore, in small towns with small colleges, the data needed for an empirical study such as this one are generally unavailable, as will be discussed in greater detail later. As a result, the sample was restricted to cities which all had populations between 10,000 and 150,000; and the universities were all research-oriented institutions with student populations over 10,000, over 2,000 employees, and over $50,000,000 in annual grant funding. Universities in all of the major NCAA conferences plus the Ivy League were considered.

Consistent with previous literature suggesting that university-related demand is generally accommodated relatively close to the university campus, data for all variables represented city level figures, as opposed to county or MSA data, because the intent of this study was to isolate as much as possible the effects on the communities of the universities, and to minimize the effects of outside factors. The cities represented all regions of the U.S., and in all of these cities, the major university operated as the largest employer.

Research Methodology

This translational research project employed data garnered via primary research through comparable methodology used by hotel feasibility analysts, including contacting the staff at a number of American universities to obtain information regarding annual research grant funding, university employment, undergraduate student population and graduate student population. In addition, data pertaining to hotel performance were graciously provided by STR. Data regarding municipal employment were obtained from the U.S. Bureau of Labor Statistics, and population data were obtained from the U.S. Census Bureau, using both on-line sources and interviews with Bureau of Labor Statistics and Census Bureau representatives when necessary. It was found that reliable and complete data could be obtained for a 24-year period of 1990 through 2013.

Specifically, hotel performance data, including annual city occupancy, average daily rate (ADR), room revenue per available room (RevPAR), supply of guest rooms, guest room demand (annual occupied room nights), and room revenues, were requested from STR (formerly Smith Travel Research) for 30 university towns for the 24-year period of 1990 through 2013. STR operates with strict limitations regarding the hotel performance data they will provide to researchers. Specifically, in this instance, hotel performance data could not be provided for three of the cities for which they were requested because the inventory of guest rooms was too small to maintain STR's confidentiality standards. Those cities were Iowa City, IA (University of Iowa), Pullman, WA (Washington State University), and Storrs, CT (University of Connecticut), leaving a total of 27 cities/universities for analysis. A listing of the universities and cities studied is presented in Table 1.

Table 1: Universities and Cities

University	*City*	*State*
Iowa State University	Ames	Iowa
University of Michigan	Ann Arbor	Michigan
University of Georgia	Athens	Georgia
Auburn University	Auburn	Alabama
Virginia Tech University	Blacksburg	Virginia
Indiana University	Bloomington	Indiana
Montana State University	Bozeman	Montana
University of Illinois	Champaign	Illinois
University of Virginia	Charlottesville	Virginia
Clemson University	Clemson	South Carolina
Texas A&M University	College Station	Texas
University of Missouri	Columbia	Missouri
Oregon State University	Corvallis	Oregon
Colorado State University	Fort Collins	Colorado
University of Florida	Gainesville	Florida
Cornell University	Ithaca	New York
University of Wyoming	Laramie	Wyoming
University of Kansas	Lawrence	Kansas
Kansas State University	Manhattan	Kansas
University of Montana	Missoula	Montana
West Virginia University	Morgantown	West Virginia
University of Mississippi	Oxford	Mississippi
University of Notre Dame	South Bend	Indiana
Mississippi State University	Starkville	Mississippi

Pennsylvania State University	State College	Pennsylvania
Oklahoma State University	Stillwater	Oklahoma
University of Alabama	Tuscaloosa	Alabama

Table 2 presents a summary of hotel operating data for each of the 27 cites included in the study. The cities had between 548 and 4,126 (1,985 mean) available hotel rooms. Citywide occupancy ranged between 51.54 and 69.44 percent (59.05% mean), ADR was between $77.11 and $144.00 ($93.65 mean), and RevPAR was between $40.46 and $85.21 ($55.51 mean) for 2013. The sample contained a total of 707 hotels with 57,388 guest rooms. Mean hotel size was 81 guest rooms.

Table 2: Hotel Operating Data

University	*City*	*Guest Rooms*	*Occ*	*ADR*	*RevPAR*
Iowa State University	Ames	1,367	60.29%	$87.23	$52.59
University of Michigan	Ann Arbor	3,815	67.35%	$98.95	$66.64
University of Georgia	Athens	2,218	57.33%	$87.84	$50.36
Auburn University	Auburn	1,118	56.89%	$92.75	$52.77
Virginia Tech University	Blacksburg	867	60.20%	$104.86	$63.13
Indiana University	Bloomington	1,856	60.71%	$104.93	$63.70
Montana State University	Bozeman	2,101	64.35%	$95.07	$61.17
University of Illinois	Champaign	1,966	63.22%	$81.72	$51.66
University of Virginia	Charlottesville	3,177	69.44%	$110.88	$77.00
Clemson University	Clemson	794	58.25%	$89.58	$52.17
Texas A&M University	College Station	2,896	64.48%	$101.75	$65.61
University of Missouri	Columbia	3,655	58.52%	$77.11	$45.12
Oregon State University	Corvallis	800	56.33%	$98.83	$55.67
Colorado State University	Fort Collins	2,535	64.62%	$89.60	$57.90
University of Florida	Gainesville	4,126	63.18%	$90.12	$56.94
Cornell University	Ithaca	1,593	59.17%	$144.00	$85.21
University of Wyoming	Laramie	1,493	51.75%	$78.20	$40.46
University of Kansas	Lawrence	1,259	51.54%	$84.94	$43.78
Kansas State University	Manhattan	1,249	56.34%	$89.38	$50.36
University of Montana	Missoula	3,114	57.41%	$85.32	$48.98
West Virginia University	Morgantown	2,068	65.95%	$91.34	$60.24
University of Mississippi	Oxford	548	60.17%	$107.46	$64.66
University of Notre Dame	South Bend	2,993	50.93%	$94.90	$48.33
Mississippi State University	Starkville	779	55.28%	$89.05	$49.23
Pennsylvania State University	State College	2,813	59.25%	$107.50	$63.70
Oklahoma State University	Stillwater	1,203	69.18%	$82.35	$56.98

| University of Alabama | Tuscaloosa | 2,846 | 61.16% | $81.95 | $50.12 |

Note: Data represent 2013 figures.
Source: STR

      Hotel density was calculated as the number of hotel rooms in the city divided by city population for each of the 27-cities/university areas. It was found that hotel density ranged from 0.014 to 0.075 in each of the cities. Mean hotel density was 0.035. In other words, there were an average of 0.035 hotel rooms per resident in each of the cities studied. It is likely that the variances in hotel density by city may be attributed to other factors in addition to population, and particularly in these cities, the size and scope of the local university.

Findings and Solutions

      Historical performance of hotels in the university markets was compared to the overall performance of U.S. hotels since 1990 to evaluate the relative stability of the university town lodging markets. A summary of relevant data is presented as Table 3. University town occupancies and ADRs have historically been below U.S. averages. Specifically, university town occupancies have consistently ranged between 91.8 and 98.7 percent of U.S. averages. University town ADRs have shown relatively greater discounts compared to U.S. averages, ranging between 76.4 and 87.3 percent of U.S figures.

Table 3: University Town Lodging Performance Compared to United States

Year	University Towns				United States				University Towns/ United States	
	Occ	Change	ADR	Change	Occ	Change	ADR	Change	Occ	ADR
1990	58.9%		$48.63		63.2%		$58.22		93.3%	83.5%
1991	58.2%	-1.3%	$49.57	1.9%	61.8%	-2.2%	$58.07	-0.3%	94.2%	85.4%
1992	58.7%	0.9%	$50.01	0.9%	62.6%	1.3%	$58.90	1.4%	93.8%	84.9%
1993	61.1%	4.2%	$51.23	2.5%	63.5%	1.4%	$60.52	2.8%	96.3%	84.7%
1994	63.1%	3.2%	$53.13	3.7%	64.7%	1.9%	$62.83	3.8%	97.5%	84.6%
1995	62.5%	-1.0%	$54.22	2.1%	65.0%	0.5%	$65.80	4.7%	96.1%	82.4%
1996	60.5%	-3.2%	$56.80	4.8%	65.1%	0.2%	$69.91	6.2%	92.9%	81.2%
1997	59.2%	-2.1%	$58.59	3.1%	64.5%	-0.9%	$75.31	7.7%	91.8%	77.8%
1998	59.0%	-0.3%	$61.25	4.6%	64.0%	-0.8%	$78.62	4.4%	92.2%	77.9%
1999	59.4%	0.7%	$62.84	2.6%	63.3%	-1.1%	$81.82	4.1%	93.9%	76.8%
2000	59.8%	0.6%	$65.03	3.5%	63.2%	-0.2%	$85.10	4.0%	94.6%	76.4%
2001	57.9%	-3.2%	$66.07	1.6%	59.7%	-5.5%	$83.90	-1.4%	96.9%	78.7%
2002	58.2%	0.6%	$66.93	1.3%	59.0%	-1.2%	$82.68	-1.5%	98.7%	80.9%
2003	57.9%	-0.5%	$67.58	1.0%	59.2%	0.3%	$82.79	0.1%	97.9%	81.6%
2004	59.4%	2.5%	$69.52	2.9%	61.3%	3.5%	$86.25	4.2%	96.9%	80.6%
2005	60.2%	1.3%	$73.65	5.9%	63.0%	2.8%	$91.05	5.6%	95.5%	80.9%
2006	59.9%	-0.4%	$78.93	7.2%	63.2%	0.3%	$97.96	7.6%	94.8%	80.6%
2007	60.2%	0.4%	$83.97	6.4%	62.8%	-0.6%	$104.23	6.4%	95.8%	80.6%
2008	57.6%	-4.4%	$86.87	3.5%	59.9%	-4.6%	$107.18	2.8%	96.1%	81.0%
2009	52.4%	-8.9%	$85.44	-1.6%	54.7%	-8.7%	$97.87	-8.7%	95.8%	87.3%
2010	55.4%	5.7%	$85.56	0.1%	57.5%	5.1%	$98.24	0.4%	96.3%	87.1%
2011	57.7%	4.2%	$88.38	3.3%	59.9%	4.2%	$101.97	3.8%	96.3%	86.7%
2012	58.8%	1.9%	$91.19	3.2%	61.3%	2.3%	$106.25	4.2%	95.9%	85.8%
2013	60.9%	3.6%	$94.10	3.2%	62.3%	1.6%	$110.35	3.9%	97.8%	85.3%
AAGR	0.1%		4.1%		-0.1%		3.9%			
CAGR	0.1%		2.9%		-0.1%		2.8%			

Notes: AAGR = average annual growth rate

CAGR = compound annual growth rate

Source: STR

Table 3: University Town Lodging Performance Compared to United States

	University Towns				United States				University Towns/ United States	
Year	Occ	Change	ADR	Change	Occ	Change	ADR	Change	Occ	ADR
1990	58.94%		$48.63		63.2%		$58.22		93.3%	83.5%
1991	58.19%	-1.3%	$49.57	1.9%	61.8%	-2.2%	$58.07	-0.3%	94.2%	85.4%
1992	58.70%	0.9%	$50.01	0.9%	62.6%	1.3%	$58.90	1.4%	93.8%	84.9%
1993	61.15%	4.2%	$51.23	2.5%	63.5%	1.4%	$60.52	2.8%	96.3%	84.7%
1994	63.10%	3.2%	$53.13	3.7%	64.7%	1.9%	$62.83	3.8%	97.5%	84.6%
1995	62.48%	-1.0%	$54.22	2.1%	65.0%	0.5%	$65.80	4.7%	96.1%	82.4%
1996	60.48%	-3.2%	$56.80	4.8%	65.1%	0.2%	$69.91	6.2%	92.9%	81.2%
1997	59.18%	-2.1%	$58.59	3.1%	64.5%	-0.9%	$75.31	7.7%	91.8%	77.8%
1998	59.00%	-0.3%	$61.25	4.6%	64.0%	-0.8%	$78.62	4.4%	92.2%	77.9%
1999	59.42%	0.7%	$62.84	2.6%	63.3%	-1.1%	$81.82	4.1%	93.9%	76.8%
2000	59.79%	0.6%	$65.03	3.5%	63.2%	-0.2%	$85.10	4.0%	94.6%	76.4%
2001	57.87%	-3.2%	$66.07	1.6%	59.7%	-5.5%	$83.90	-1.4%	96.9%	78.7%
2002	58.21%	0.6%	$66.93	1.3%	59.0%	-1.2%	$82.68	-1.5%	98.7%	80.9%
2003	57.94%	-0.5%	$67.58	1.0%	59.2%	0.3%	$82.79	0.1%	97.9%	81.6%
2004	59.39%	2.5%	$69.52	2.9%	61.3%	3.5%	$86.25	4.2%	96.9%	80.6%
2005	60.17%	1.3%	$73.65	5.9%	63.0%	2.8%	$91.05	5.6%	95.5%	80.9%
2006	59.93%	-0.4%	$78.93	7.2%	63.2%	0.3%	$97.96	7.6%	94.8%	80.6%
2007	60.19%	0.4%	$83.97	6.4%	62.8%	-0.6%	$104.23	6.4%	95.8%	80.6%
2008	57.55%	-4.4%	$86.87	3.5%	59.9%	-4.6%	$107.18	2.8%	96.1%	81.0%
2009	52.41%	-8.9%	$85.44	-1.6%	54.7%	-8.7%	$97.87	-8.7%	95.8%	87.3%
2010	55.40%	5.7%	$85.56	0.1%	57.5%	5.1%	$98.24	0.4%	96.3%	87.1%
2011	57.70%	4.2%	$88.38	3.3%	59.9%	4.2%	$101.97	3.8%	96.3%	86.7%
2012	58.80%	1.9%	$91.19	3.2%	61.3%	2.3%	$106.25	4.2%	95.9%	85.8%
2013	60.90%	3.6%	$94.10	3.2%	62.3%	1.6%	$110.35	3.9%	97.8%	85.3%
	59.04%		$68.73		61.86%		$83.58	5	96.4%	
								3	96.7%	
AAGR	0.1%		4.1%		-0.1%		3.9%			
CAGR	0.1%		2.9%		-0.1%		2.8%			
	0.02167				0.02567		17.079			
Notes: AAGR = average annual growth rate	3.67%				4.15%		20.44%			
CAGR = compound annual growth rate										
Source: STR										

Given the relatively tight range of university town occupancies relative to (divided by) the U.S. figures, of 91.8 to 98.7 percent, it appears that university towns operate with more stable occupancies than the U.S. overall. Notably, since 1990, university town occupancy rate increased by an average annual rate of 0.1 percent (compound annual rate of 0.1%, as well), while U.S. occupancy rate declined by an average annual rate of 0.1 percent (compound annual rate of 0.1% too). On the other hand, during the recessionary period of 2001 to 2003, the gap between university town and U.S. occupancies narrowed as university town occupancies averaged a relatively high 97.8 percent of U.S. figures. Similarly, during the last three years of analysis (2011 to 2013), university town occupancies averaged a relatively high 96.7 percent of U.S. figures, compared to the first three years of analysis (1990 to 1992) when university town occupancies averaged a relatively lower 93.8 percent of U.S. figures. These trends suggest that, albeit slight, there may be a long-term narrowing of the gap between university town and U.S. occupancy rates.

Hotel performance in university towns was also compared to performance in 30 similarly-sized U.S. cities. Since the university towns had a mean population of approximately 64,000 and a population range of about 13,000 to 139,000, STR randomly selected 30 small U.S. towns representing all U.S. regions, and with approximately the same mean population and population range as the university towns, i.e., the two sets of cities each had the same mean population and population range to the nearest 1,000 residents. These 30 small towns had a total of 631 hotels with 53,520 guest rooms and an average size of 85 guest rooms each. Thus, these small U.S. towns were not only comparable to the university towns in size, but also comparable in the overall number of hotels and size of hotels (university towns had a total of 707 hotels with 57,388 guest rooms and a mean hotel size of 81 guest rooms).

Table 4: University Town Lodging Performance Compared to Small Towns

Year	Occ	Change	ADR	Change	Occ	Change	ADR	Change	Occ	ADR
		University Towns				*Small Towns*			*University Towns/ Small Towns*	
1990	58.9%		$48.63		63.5%		$51.34		92.8%	94.7%
1991	58.2%	-1.3%	$49.57	1.9%	61.4%	-3.3%	$50.69	-1.3%	94.7%	97.8%
1992	58.7%	0.9%	$50.01	0.9%	63.7%	3.7%	$51.01	0.6%	92.2%	98.0%
1993	61.1%	4.2%	$51.23	2.5%	64.2%	0.8%	$52.53	3.0%	95.2%	97.5%
1994	63.1%	3.2%	$53.13	3.7%	65.0%	1.3%	$54.99	4.7%	97.0%	96.6%
1995	62.5%	-1.0%	$54.22	2.1%	66.0%	1.5%	$57.58	4.7%	94.7%	94.2%
1996	60.5%	-3.2%	$56.80	4.8%	65.7%	-0.4%	$60.88	5.7%	92.0%	93.3%
1997	59.2%	-2.1%	$58.59	3.1%	65.2%	-0.8%	$64.59	6.1%	90.8%	90.7%
1998	59.0%	-0.3%	$61.25	4.6%	64.8%	-0.5%	$67.67	4.8%	91.0%	90.5%
1999	59.4%	0.7%	$62.84	2.6%	64.7%	-0.3%	$70.10	3.6%	91.9%	89.6%
2000	59.8%	0.6%	$65.03	3.5%	64.5%	-0.3%	$73.17	4.4%	92.7%	88.9%
2001	57.9%	-3.2%	$66.07	1.6%	60.9%	-5.6%	$73.27	0.1%	95.1%	90.2%
2002	58.2%	0.6%	$66.93	1.3%	59.5%	-2.3%	$74.19	1.3%	97.8%	90.2%
2003	57.9%	-0.5%	$67.58	1.0%	59.9%	0.7%	$74.75	0.8%	96.7%	90.4%
2004	59.4%	2.5%	$69.52	2.9%	63.8%	6.4%	$77.53	3.7%	93.1%	89.7%
2005	60.2%	1.3%	$73.65	5.9%	65.0%	2.0%	$82.59	6.5%	92.5%	89.2%
2006	59.9%	-0.4%	$78.93	7.2%	64.7%	-0.5%	$89.22	8.0%	92.6%	88.5%
2007	60.2%	0.4%	$83.97	6.4%	63.9%	-1.2%	$94.71	6.2%	94.2%	88.7%
2008	57.6%	-4.4%	$86.87	3.5%	60.4%	-5.5%	$96.77	2.2%	95.2%	89.8%
2009	52.4%	-8.9%	$85.44	-1.6%	56.5%	-6.5%	$88.16	-8.9%	92.8%	96.9%
2010	55.4%	5.7%	$85.56	0.1%	61.4%	8.7%	$86.28	-2.1%	90.2%	99.2%
2011	57.7%	4.2%	$88.38	3.3%	62.5%	1.8%	$89.41	3.6%	92.3%	98.8%
2012	58.8%	1.9%	$91.19	3.2%	63.4%	1.4%	$93.30	4.4%	92.7%	97.7%
2013	60.9%	3.6%	$94.10	3.2%	63.4%	0.0%	$95.61	2.5%	96.1%	98.4%
			$68.73		63.09%		$73.76			
AAGR	0.1%		4.1%		0.0%		3.7%			
CAGR	0.1%		2.9%		0.0%		2.7%			
	0.021666		14.47667		0.023338		15.72546			

Notes: AAGR = average annual growth rate   21.06%   3.70%   21.32%

CAGR = compound annual growth rate

Source: STR

Since 1990, small town occupancy rate changed insignificantly, compared to university towns where occupancy increased slightly. However, mean university town occupancies were lower than small town occupancies, ranging from 90.8 to 97.8 percent of average small town occupancies. Thus, other than that university town occupancy was lower than average small town occupancy, the overall occupancy trends of university towns were somewhat similar to those of average small towns.

Table 4: University Town Lodging Performance Compared to Small Towns

|	University Towns				Small Towns				University Towns/ Small Towns	
Year	_Occ_	_Change_	_ADR_	_Change_	_Occ_	_Change_	_ADR_	_Change_	_Occ_	_ADR_
1990	58.9%		$48.63		63.5%		$51.34		92.8%	94.7%
1991	58.2%	-1.3%	$49.57	1.9%	61.4%	-3.3%	$50.69	-1.3%	94.7%	97.8%
1992	58.7%	0.9%	$50.01	0.9%	63.7%	3.7%	$51.01	0.6%	92.2%	98.0%
1993	61.1%	4.2%	$51.23	2.5%	64.2%	0.8%	$52.53	3.0%	95.2%	97.5%
1994	63.1%	3.2%	$53.13	3.7%	65.0%	1.3%	$54.99	4.7%	97.0%	96.6%
1995	62.5%	-1.0%	$54.22	2.1%	66.0%	1.5%	$57.58	4.7%	94.7%	94.2%
1996	60.5%	-3.2%	$56.80	4.8%	65.7%	-0.4%	$60.88	5.7%	92.0%	93.3%
1997	59.2%	-2.1%	$58.59	3.1%	65.2%	-0.8%	$64.59	6.1%	90.8%	90.7%
1998	59.0%	-0.3%	$61.25	4.6%	64.8%	-0.5%	$67.67	4.8%	91.0%	90.5%
1999	59.4%	0.7%	$62.84	2.6%	64.7%	-0.3%	$70.10	3.6%	91.9%	89.6%
2000	59.8%	0.6%	$65.03	3.5%	64.5%	-0.3%	$73.17	4.4%	92.7%	88.9%
2001	57.9%	-3.2%	$66.07	1.6%	60.9%	-5.6%	$73.27	0.1%	95.1%	90.2%
2002	58.2%	0.6%	$66.93	1.3%	59.5%	-2.3%	$74.19	1.3%	97.8%	90.2%
2003	57.9%	-0.5%	$67.58	1.0%	59.9%	0.7%	$74.75	0.8%	96.7%	90.4%
2004	59.4%	2.5%	$69.52	2.9%	63.8%	6.4%	$77.53	3.7%	93.1%	89.7%
2005	60.2%	1.3%	$73.65	5.9%	65.0%	2.0%	$82.59	6.5%	92.5%	89.2%
2006	59.9%	-0.4%	$78.93	7.2%	64.7%	-0.5%	$89.22	8.0%	92.6%	88.5%
2007	60.2%	0.4%	$83.97	6.4%	63.9%	-1.2%	$94.71	6.2%	94.2%	88.7%
2008	57.6%	-4.4%	$86.87	3.5%	60.4%	-5.5%	$96.77	2.2%	95.2%	89.8%
2009	52.4%	-8.9%	$85.44	-1.6%	56.5%	-6.5%	$88.16	-8.9%	92.8%	96.9%
2010	55.4%	5.7%	$85.56	0.1%	61.4%	8.7%	$86.28	-2.1%	90.2%	99.2%
2011	57.7%	4.2%	$88.38	3.3%	62.5%	1.8%	$89.41	3.6%	92.3%	98.8%
2012	58.8%	1.9%	$91.19	3.2%	63.4%	1.4%	$93.30	4.4%	92.7%	97.7%
2013	60.9%	3.6%	$94.10	3.2%	63.4%	0.0%	$95.61	2.5%	96.1%	98.4%
AAGR	0.1%		4.1%		0.0%		3.7%			
CAGR	0.1%		2.9%		0.0%		2.7%			

Notes: AAGR = average annual growth rate
       CAGR = compound annual growth rate
Source: STR

To test the relative volatility of university town occupancies, the means, standard deviations and volatility indices were analyzed. Between 1990 and 2013, university town occupancy had a mean of 59.05 percent, with a standard deviation of 2.17 occupancy points and a volatility index of 3.67 percent. A volatility index is a type of coefficient of variation which is a relative measure of dispersion that measures the scatter in the data relative to the mean and is expressed as a percentage.[15] During the same time period, U.S. occupancy had a mean of 61.86 percent with a standard deviation of 2.57 occupancy points and a volatility index of 4.15 percent. Since university town occupancy had a lower standard deviation and volatility index than U.S. occupancy, it suggests that university town occupancy is less volatile and more stable than the overall U.S. Between 1990 and 2013, small town occupancy had a mean of 63.09 percent, with a standard deviation of 2.33 occupancy points and a volatility index of 3.69 percent. Thus, university town occupancy is less volatile than average small town occupancy, as well. A comparison of university town, small town, and overall U.S. occupancies is presented as Exhibit 1.

Exhibit 1: Occupancy Trends - University Towns vs. Overall U.S. and Small Towns
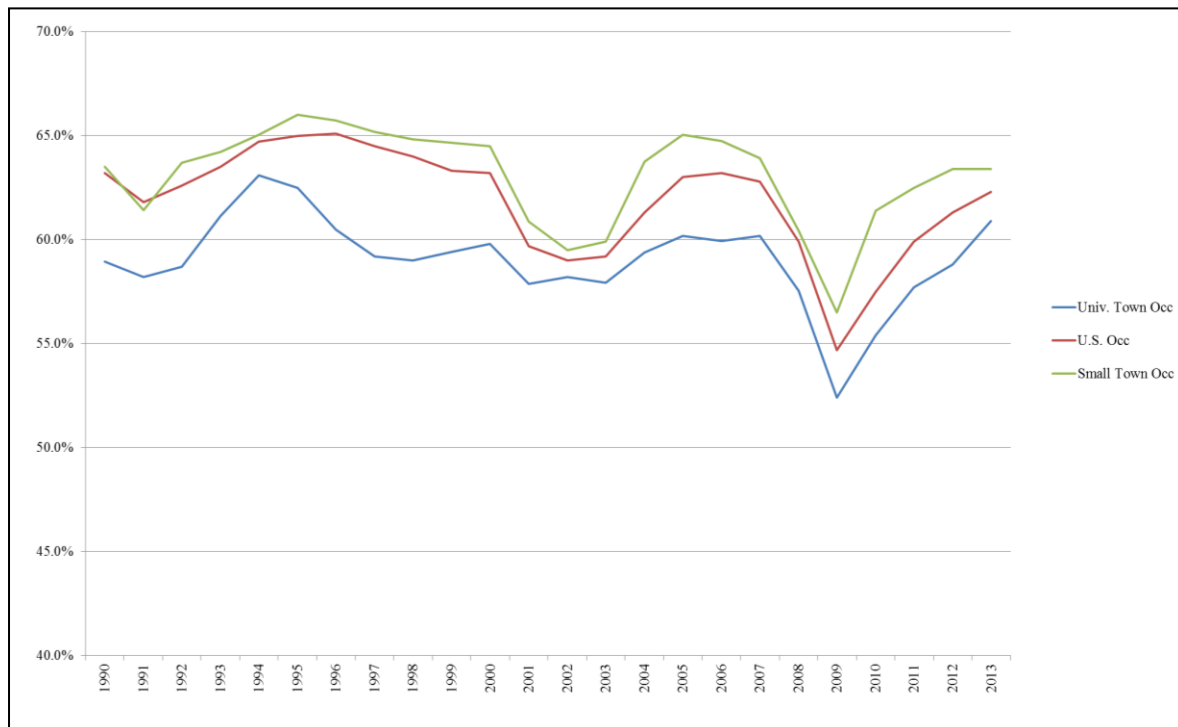
[15] Volatility index is calculated as the standard deviation divided by the mean, and as a relative measure, a volatility index is particularly useful for comparing the variability of two or more batches of data (Berenson and Levine, 1993).

Compared to occupancy, university town ADR exhibits greater disparity relative to the overall U.S. figures, representing between 76.4 and 87.3 percent of U.S. numbers between 1990 and 2013. That discount is not surprising considering the relatively remote locations and small sizes of the towns that fit the criteria for this study of being dominated by a major university. Simply put, none of the towns are near major metropolitan areas, and, all other things being equal, smaller cities operate with relatively lower ADRs than larger ones. At the same time, university town ADR appears to exhibit greater stability than U.S. ADR. Notably, since 1990, university town ADR increased by an average annual rate of 4.1 percent (compound annual rate of 2.9%), while U.S. ADR increased by a lower average annual rate of 3.9 percent (compound annual rate of 2.8%). Specifically, university town ADR has increased every year since 1990, except for 2009 when it decreased by 1.6 percent versus an 8.7 percent decline in the U.S. In addition, university town ADR continued to increase every year during the recessionary period between 2001 and 2003.

Since 1990, small town ADR increased by an average annual rate of 3.7 percent (compound annual rate of 2.7%), less than university towns. However, mean university town ADRs were lower than small town ADRs, ranging from 88.5 to 99.2 percent of average small town ADRs. Since the university towns selected for this study were by definition in remote locations (to isolate university-related demand as much as possible, as previously discussed), and the similarly sized small towns were not necessarily in remote locations, the relatively lower ADR of university towns is not surprising. Other than that university town ADRs were lower than average small town occupancies, the overall ADR trends of university towns were similar to those of average small towns, except that in 2009, small town ADR declined by 8.9 percent while university town ADR declined by only 1.6 percent (the only year of ADR decline in university towns). Similarly, in 1991, while small town ADR declined 1.3 percent, university town ADR actually increased 1.9 percent.

ADR volatility was tested in a similar fashion as occupancy volatility. Between 1990 and 2013, university town ADR had a mean of $68.73, with a standard deviation of $13.48 and a volatility index of 19.6 percent. During the same time period, U.S. ADR had a mean of $83.58 with a standard deviation of $17.08 and a volatility index of 20.4 percent. Since university town

ADR had a lower standard deviation and volatility index than U.S. ADR, it suggests that university town ADR is relatively less volatile and more stable than the overall U.S. Between 1990 and 2013, small town ADR had a mean of $73.76, with a standard deviation of $15.73 and a volatility index of 21.3 percent. Thus, university town ADR is less volatile than average small town ADR, as well.

A comparison between university town, small town, and overall U.S. ADR is presented as Exhibit 2. In summary, university town occupancy rates and ADRs are lower but more stable than similarly-sized small towns and the overall U.S.

Exhibit 2: ADR Trends - University Towns vs. Overall U.S. and Small Towns
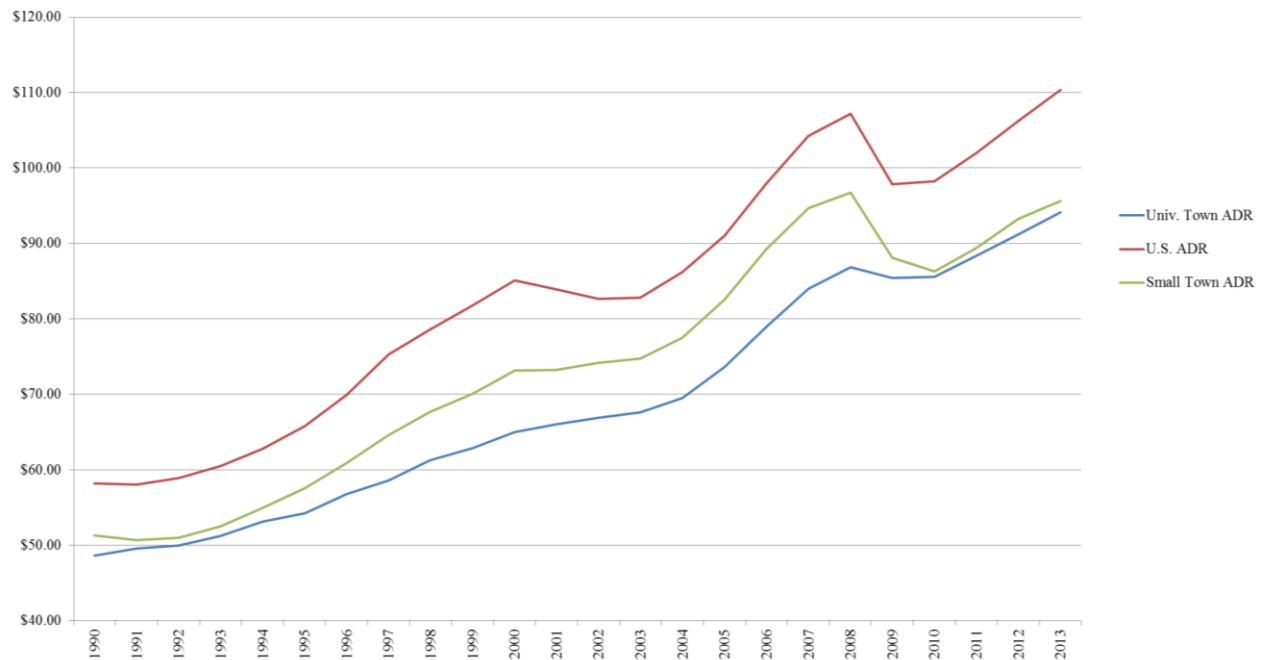
Implications for Practice

Regression analyses were conducted using all of the data from 1990 through 2013 for the predictor (independent) variables of city population, city employment, university employment, number of undergraduate students, number of graduate students, total students, and grant funding, and the response (dependent) variable of lodging demand expressed as number of occupied room nights in the city per year. All variables were found to be significant

predictors of lodging demand.[16] Overall, city employment was found to be the strongest predictor of lodging demand.[17] Changes in city employment predicted a very high 97.8 percent of changes in lodging demand. This high regression coefficient is not necessarily surprising, however, because city employment is well known as a strong indicator of area commerce. Specifically, each person employed in a university town was associated with approximately 10.5 occupied room nights in the regression equation derived from this study.

Surprisingly, perhaps, grant funding was also found to be strong predictor of lodging demand.[18] Specifically, each $1,000 in grant funding was associated with 14.4 additional occupied room nights. Grant funding appears to be a good indicator of commerce generated by universities themselves. In particular, grant funding includes research dollars captured by university faculty and staff from such sources as foundations, associations, corporations and state and federal agencies. Grant funds may be used for research, training, and outreach. Grant funding typically results in visitation to campus from foundation, association, corporate and governmental representatives, as well as research project collaborators. In addition, grants often result in the development of campus symposia, conferences, and training sessions, which can generate significant visitation and room night demand.

Interestingly, the number of graduate students was also a strong predictor of lodging demand.[19] Specifically, each graduate student was associated with 68.1 occupied room nights. Similar to grant funding, the graduate student population appears to be an indicator of university-related commerce, though in the case of graduate students, it would be activities primarily related to research activities at the universities included in the sample in this study. At such universities, graduate students generally work on research projects, and larger, more complex projects require more graduate student support. While university graduate students in such areas as the sciences and humanities are often involved in research activities, graduate students in other areas, such as business, may not. Thus, the high regression coefficient related to graduate students probably captures more than merely research activities (and resultant

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[16] $(p<.001)$

[17] 0.978 (F [1, 18] = 367, p<.001)

[18] 0.953 (F [1, 18] = 357, p<.001)

[19] 0.931 (F [1, 18] = 121, p<.001)

travel to campus by grant funders, collaborators and conference/symposia attendees), and may also capture lodging demand related to other graduate-student-related activities such as campus visits by prospective students and by employment recruiters.

Trends in the city population, number of undergraduate students, and university employment were also found to be significant predictors of lodging demand.[20] Of the variables studied in this project, the total student population by year was found to be the relatively weakest predictor of lodging demand growth. That finding is particularly interesting considering that a proprietary consulting report recommended consideration of trends in total student population when projecting future lodging demand in university towns.[21] The findings of this study suggest that the separation of student population into graduate and undergraduate students provides greater analytical precision for evaluation and forecasting purposes. Though undergraduate student population trends are not irrelevant, they are a weaker predictor of lodging demand than graduate student population trends, possibly because undergraduate student population is relatively more stable. Further, this study suggests that other university-related factors such as grant funding, and other city factors such as employment trends, possess superior predictive capacity related to lodging demand. Among the primary implications and recommendations of this study are that hotel feasibility analysts should evaluate both grant funding and graduate student population trends when studying individual markets.

Since hotel feasibility studies[22] are usually conducted at the market level, each predictor variable was evaluated for each city for the period 1990 through 2013. These analyses revealed grant funding to be the strongest predictor of lodging demand growth in more cities than any other predictor variable studied in this project. The nine cities where grant funding served as the best predictor of lodging demand were Ames, IA, Bozeman, MT, Charlottesville, VA, College Station, TX, Laramie, WY, Lawrence, KS, Missoula, MT, Oxford, MS, and Starkville, MS. These cities represent many northern, southern, eastern, and western regions of the U.S. City

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[20] Regression coefficients were 0.930, 0.914, and 0.894, respectively, p<.001 for all three regression coefficients.

[21] Suzuki, A. (2008). Ten considerations when developing an on-campus or college hotel. Pinnacle Perspective (proprietary consulting report).

[22] Such documents prepared by public accounting firms, and/or for transactions regulated by the Securities and Exchange Commission, may be referred to as "market studies with prospective financial analyses."

employment was the strongest predictor of lodging demand growth in seven cities, and city population was the best predictor in four cities. The number of graduate students and undergraduate students were the strongest predictors in three cities each. University employment was found to be the strongest predictor in one city while total student population was not the strongest predictor in any of the cities. As with the aggregated analyses, separating student population into graduate and undergraduate students would be advisable for analytical purposes.

Limitations

This study identified factors that have high correlation with lodging demand in university towns. However, correlation does not necessarily indicate causation. Causation cannot be completely proven in a study such as this one. Further, since the regression coefficients are below 100 percent (i.e., 1.000), there are other factors that are not included in this study which generate or contribute to lodging demand. Certainly, one of those factors would be macroeconomic indicators such as trends in gross domestic product (GDP) as measured in larger geographic areas than the small towns which are the focus of this particular study. It is important to note that this study focused on local economic factors that typically would be collected by hotel developers and analysts conducting hotel feasibility studies or acquisition studies for particular sites. It is also important to note that there are multiple factors that could determine the feasibility of a proposed hotel on a specific site. The demand drivers evaluated in the subject study would be among those factors, but would not be all of the factors.

Other local factors that could influence lodging demand in a university town could include athletic demand. Athletic demand was not evaluated in the present study because, unlike the factors included herein, research revealed there exists no metric allowing reasonable comparison between one university and another. For example, while all local hotel rooms are sold out for virtually all men's football games in cities such as South Bend and Blacksburg, there is no single sport generating significant visitation for all of the cities included, making infeasible such a comparison among different cities. Sports such as men's football and basketball are consistent generators of lodging demand in many university towns (but not all of the cities

included in this study), and in some cases, fluctuations in attendance may result in fluctuations in lodging demand. However, in cases such as football demand in many cities such as South Bend and Blacksburg, virtually every football stadium seat and every hotel room has been sold out during home football events throughout the 24-year period of analysis used in this study resulting in a low level of variance and poor predictive capacity for such sporting event attendance, even in cities where a single sport is a significant generator of lodging demand. In theory, total annual attendance at university sporting events could be studied in a project such as this one; however, it is inconsistently tracked from university to university because, among other reasons, not all such attendance is paid. In short, it was found that university sporting event attendance was not a viable predictor of lodging demand across markets, unlike the other predictors evaluated herein.

In addition, it is not possible from this study to discern the specific factors that may drive lodging demand within each of the predictor variables studied. For example, though research grant funding trends have been shown in this study to be related to lodging demand patterns, it is not possible to know for certain whether or to what extent such lodging demand is driven by conferences and symposia generated by those research grants, visits by grant funders, visits by grant collaborators and/or other factors. However, this study is not a feasibility study for an individual market, and ultimately, an analyst engaged to conduct a feasibility study for an individual market would need to drill down into each of the relevant variables to be able to understand and explain market behavior related to the specific components of each of the variables in that market including not only grant funding, but factors such sporting events which may have greater variability and/or relevance in a given marketplace. Further, future market-based case research could include updated information to provide greater color and context regarding individual markets as has been done in the past.

Another limitation of this study is that not all of the lodging demand in each of the cities is university-generated. Even though much of the commercial lodging demand in the subject cities is derived from companies with research roots in the local university, such as Accuweather from Penn State's meteorology department, or ACSI LLC (formerly American Consumer Sentiment Index) from Michigan's business school, some amount of commercial and

other lodging demand accommodated in each city is not university-related, and that amount may vary by city. Every reasonable attempt was made to control for this limitation by applying the previously discussed strict criteria for inclusion of cities resulting in a sample of cities where the local university is at least the primary lodging demand generator to assist developers and analysts not only with evaluating hotel feasibility and lodging demand in university towns, but possibly with evaluating university-related lodging demand in other markets, as well.

Conclusions

This study found support for the practical hypothesis raised at hotel investment conferences and in trade journals that lodging demand in university towns is more stable than other market areas, and this study found that condition to be the case with both occupancy rate and ADR. This situation is particularly notable regarding ADR, not only because university town ADR varies less than U.S. ADR and ADR in other similarly-sized cites, but also because unlike other small cities and the overall U.S., university town ADR decreased in only one year between 1990 and 2013 (in 2009).

The relative stability of hotel performance in university towns may be due to the fundamental underlying factors that are drivers of hotel demand. Factors that lodging analysts should consider when evaluating a proposed hotel development project in a university town certainly include city employment and population trends. That finding of this study confirms the conclusion of earlier work,[23] and may be applicable to analysts studying lodging demand in cities without a major university, as well.

Additionally, grant funding is a factor that has not been evaluated in previous research, and should be considered by analysts because of its strong predictive capability. Similarly, trends in graduate student population should be considered, as well, because they appear to have similar predictive abilities as grant funding trends.

Undergraduate student population trends are also worthy of consideration by analysts studying potential hotel development in university towns. However, it is important to note that this study found undergraduate student population trends should not only be considered separately from the number of graduate students, but these trends should be evaluated separately from the total student population, as well. These conclusions should be beneficial in providing guidance to hotel developers and analysts considering university town hotel development or acquisition, and they may be generalizable to evaluating university-related lodging demand, in general. The results of this study suggest that, based on historical performance over a 24-year period, hotels developed or acquired that are proximate to major

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[23] Rushmore, S. and Baum, E. (2001). *Hotels & Motels: Valuations and Market Studies.* Chicago: Appraisal Institute.

universities may be expected to exhibit relatively strong occupancy and ADR growth and stable operating performance.

Appendix

Changes in lodging demand are a function of changes in both the local and general economy (Crogel, 2005). Macroeconomic factors in the general economy such as tremors in the oil markets or currency restrictions can simultaneously affect lodging demand in multiple local hotel markets, or even entire countries (Witt and Witt, 1990). This research project analyzes the veracity of recent sentiment regarding hotel performance in university towns on a local level because there is a lack of real, empirical research regarding the topic. Furthermore, previous research has not evaluated how to project lodging demand in small cities, or how to evaluate lodging demand generated by universities, though previous research has evaluated lodging demand in major metropolitan markets (Canina and Carvell, 2005), and has evaluated lodging demand and performance relative to variables at the hotel unit level, such as age of the hotel (O'Neill, 2011) and whether the hotel is a branded or independent property (O'Neill & Carlback, 2011).

One proprietary consulting report indicated that factors to consider in evaluating the feasibility of lodging development in a university town include the size of the university in terms of total student population, the quantity of existing lodging supply in the municipality, and the quantity of additional lodging supply under construction or under consideration (Suzuki, 2008). The subject study analyzes other factors which do not appear to have been considered in earlier research.

Literature has suggested that, in general, factors that should be considered in evaluating the feasibility of hotel development in a given market include population trends (Rushmore et al, 2012; Rushmore and Baum, 2001; Witt and Witt, 1990) and employment trends (Rushmore et al, 2012; Rushmore and Baum, 2001; Hiemstra and Ismail, 1993). Early research studying lodging demand modeled the hotel industry cycle as a function of the general economic cycle and focused on the timing of the cycles, but not on the fundamental factors causing changes in demand (Choi, Olsen, Kwansa and Tse, 1999). Other early research evaluated hotel room rates as a predictor of lodging demand but concluded that analyzing room rates as an independent variable creates a simultaneity problem (Wheaton and Rossoff, 1998). Hiemstra and Ismail (1990) considered hotel room rates as predictors of lodging demand, but specifically in the

context of the effects of hotel room taxes on demand. Palakurthi and Parks (2000) considered macro-level, socio-demographic factors as influencers of lodging demand.

Recent research has indicated that macro factors influencing lodging demand include gross domestic product (PricewaterhouseCoopers, 2011), personal income, corporate income, and consumer confidence, as well as hotel average daily rates (ADRs), although ADR has been particularly found to be an influencing factor in lodging elasticity of demand where demand that can be captured by one hotel tends to be a function of prices (ADRs) of alternative lodging choices (Canina and Carvell, 2005), although fluctuations in hotel ADRs do not generally result in fluctuations in lodging demand on a market level (Enz, Canina and Lomanno, 2009). Furthermore, recent research indicates that on a macro level, lodging demand tends to be a predictor of ADR rather than the other way around. For example, as the U.S. economy slipped into recession in 2008, hoteliers resisted discounting, but by 2009, as demand continued to weaken, ADR declined over nine percent (Smith, 2009). Other recent research concluded that when projecting quarterly lodging demand on a macro level, time-series forecasting techniques, including neural networks, may be optimal methods (Cho, 2003). In other words, when using the quarterly data that are available for macro analyses, the strongest predictor of lodging demand in one quarter is lodging demand in the prior quarter.

Other research has found that different types of markets have different sensitivities to the determinants of demand (Domke-Damonte and Morse, 1998). Research has indicated that the costs of traveling to a given lodging market can influence lodging demand in that market (Witt and Witt, 1990; Witt and Martin, 1987; Summary, 1987). These studies suggest it may be advisable for researchers conducting studies regarding lodging demand to evaluate relatively homogeneous markets. This research project focuses on evaluating local economic factors as predictors of local lodging demand, specifically in the context of relatively homogeneous markets dominated by a major university.

The intent of this study is to investigate the nature of lodging demand (annual occupied room nights) generated by universities by considering trends in cities dominated a major university serving as the primary lodging demand generator. Since it would be infeasible in a study such as this one to quantify the precise amount of demand generated by a university in

any given city, small cities with relatively large universities were investigated, because in such areas, there was a reasonable level of confidence that the university served as the primary lodging demand generator. This approach allowed relative isolation of university demand to the extent feasible. Thus, the conclusions of this study may be generalizable to other market areas or neighborhoods that hotel developers or analysts believe are dominated by the presence of a university.

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