

APPLICATIONS OF REVENUE MANAGEMENT IN APARTMENT RENTAL INDUSTRY



UNIVERSITY OF TEXAS AT DALLAS

SCHOOL OF MANAGEMENT



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1 Objective

The objective of this report is to look into the apartment rental industry focusing on the DFW area and see the role of revenue management associated with the market. Various aspects of Revenue Management, (RM) such as demand, price, segmentation of market, and competition which are related to this industry have been explored and explained through this report. We also closely looked at the constraints and issues regarding these important RM decisions.

As Revenue management is a new addition to apartment industry, we explored the various aspects of the industry, such as demand trend for apartments, pricing strategy and rent amount for various apartments. We looked at how prices are set for apartment complexes by choosing three different apartments in the DFW area. We chose two apartments in different locations from the same company, which are Camden Buckingham and Camden Legacy. Lincoln Crossing Apartment was our third apartment complex of study. We gathered price/rent data for these three locations for various lease terms, unit types and analyzed how the price/rent varied for these three locations. Also through these data we tried to generate a demand price relation for the apartment market and point out the factors that might affect demand or price for this industry which might be a possibility for further research. At the end we gave our input/views on the apartment industry of DFW and tried to explain the advantage of having or using revenue management for apartment pricing.

2 Introduction

Revenue management is becoming more and more important in the apartment rental industry and gaining a lot of popularity. After years of research over the accuracy of market data, yield or revenue management software entered the apartment industry. At first, only large apartment companies invested in the technology because it is very costly, but currently medium and smaller sized companies are also embracing technology in the form of revenue management systems.

The changing economy has facilitated demand for apartment rentals and improved overall industry revenue. “Because of the dwindling homeownership levels and a high unemployment rate, a more favorable renter's market has been created. The rental housing is a major force in the US economy. Research shows that 30.6 percent of U.S. households are renter occupied households, annually generating over \$260 billion dollars in rental revenues” [1]. “Of these renter occupied households, 22.5 million households represent multifamily (structures with two or more units) rental units that house 48.3 million residents, generating over \$195 billion dollars in rental revenues which accounts for about 2 percent of Gross Domestic Product (GDP), placing it on par with industries such as transportation and utility” [2].

For this project, we focused our attention to the Dallas apartment market. According to the Dallas news, demand for DFW apartments boomed in the first quarter of 2010 which is a positive sign of an economy [3]. During the last three months, local net apartment occupancy jumped by 6,520 units which is the strongest performance in more than two years, according to statistics by MPF Research Inc. The research indicated that a stabilizing local economy has allowed local apartment demand to pick up again. The net apartment leasing in the DFW area has increased almost 10,000 units in the last year [3]. The **Table 1** below gives a good indication about the present apartment rental situation in the DFW area.

Table 1 Statistics for Dallas apartment rental market
(SOURCE: MPF Research Inc.)

<u>First quarter 2010 statistics for apartment rental</u>	
Completions	7,895 units
Net leasing	6,520 units
Avg. monthly rent	\$739
Avg. occupancy	89.30%
Under construction	9,009 units

The **Table 1** taken from MPF research Inc. indicates the current scenario of DFW apartment market. The average occupancy rate in this city is almost close to 90% which is quite high for a city where housing price usually is low compared to other cities in the east or west coast. This indicates that demand for an apartment is high in Dallas.

Revenue management which in a simple form looks into setting price based on market condition is a popular but a comparatively new concept in the apartment rental industry. As we all know, pricing or rent in an apartment very much depends on the move in date and lease term, unit type and area of the unit. With so many factors ,permutations and combinations, it is a very stressful task to calculate prices for every combination. But through software, apartment complexes are offering various combinations of these factors which provide flexibility and seem to be appealing to prospective tenants.

“Dallas apartments are being rented swiftly, as more and more residents forgo purchasing properties. To get a better idea of how many renters are entering the marketplace, consider that renters leasing twice as many apartments as developers added to the market in the third quarter of 2010.The increase in leases for Dallas apartments led to an increase in rents by more than one percent, which is the first gain the Dallas apartments market has seen in over a year” [4]. Because of this sudden boom in apartment rental industry, apartment owners felt the need to introduce and embrace revenue management system into their environment to observe the increase trend better and to understand the demand price relation to better serve the needs of people.

3 Research Methodology

To understand the concept of revenue management in the apartment industry better, we looked at various revenue management concepts such as apartment rental demand, the demand drivers, pricing of the industry, factors influencing the pricing, market segmentation of this industry and focused on demand price relation that exists in the apartment industry. To explore the demand price relation we looked into three different apartment complexes in the DFW area. Two of the apartments that were chosen were of the same company, Camden apartments but in two different locations. We looked at Camden Buckingham in Richardson area and Camden Legacy from Plano area. Our third apartment was Lincoln Crossing apartments in the Dallas area. Information used to calculate average prices by floor plan is also collected from renters' disclosure of monthly rental rates on [www. ApartmentRatings.com](http://www.ApartmentRatings.com).

Camden Buckingham and Camden Legacy Park

To observe the rents for these two locations, we went through their website and filled in the apartment search criteria. We plugged in the move in date or date the apartment was needed along with apartment type (1Bedroom, 1Bathroom (1/1), 2Bedroom, 2Bathroom (2/2)) and lease term. The maximum lease term that could be entered was 15 months. Price range and floor level was not mandatory information for the search. After all the data was plugged in, a list of all apartments available for that specific move in date was shown which matched all other criteria as well. After an apartment was selected from the list, the best price for that apartment (based on lease term) was shown along with apartment floor plan which can be seen in figure1. The same method was conducted for both Camden apartments.

Figure 1 and **Figure 2** show how Camden apartment offers flexible lease options for the available apartments, and thus try to point out the cheapest deal as the "Best price". In figure 2, Camden shows the ranges within which the rent prices lie for any lease term requirements.



Camden Legacy Park

6600 Preston Rd Plano, TX 75024

(972) 491-5000 (Phone) (972) 491-5100 (Fax)

Go to Search

Overview

Floorplans & Availability

Why Camden



Review details

Apartment 0626

"B3" floor plan

Summary

Square feet	1070
Bedrooms	2
Bathrooms	2
Max Occupants	4
Floor	2
Available	Now
Date Needed	12/1/2010
Deposit *	\$0

Monthly charges

Valet Waste	\$30.00
Rent	\$956.00
Total	\$986.00
/month	

[Return to apartment list](#)



Click to enlarge

[Click to see apartment features](#)

Choose a lease term

Best prices for a move-in date of **Wednesday, December 01, 2010**

\$1052 for a 9 month lease

\$992 for a 10 month lease

\$985 for a 11 month lease

\$956 for a 12 month lease

This is the price you chose

\$1034 for a 13 month lease

\$954 for a 14 month lease

\$943 for a 15 month lease

This is the best price for this apartment

Start application

To secure your apartment home, simply complete our Rental Application and submit an Application Fee and an Administrative Fee of \$250.00.

Start Application

Still thinking about it?


Save Price

Prices change daily! You can lock in this price for 3 days. We can't guarantee the apartment will be available, but if it is, and your application is approved, we will lease it to you for this price. There is no charge to lock a price.

Figure 1 Camden apartment prices based on lease term

(Source: www.camdenliving.com)

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Leasing your apartment online is easy as 1-2-3!

1 Choose an apartment

Browse through our list of available apartments to find your next new home.

2 Get approved

Find out in seconds if you qualify for the apartment you want.

3 Sign your lease

Once approved, you can sign your lease documents online, print a receipt, and pick up your keys on move-in day!

That's it! Enjoy your new home...

Welcome to Camden's online Leasing. We're glad that you have chosen to explore the apartment home options available to you at Camden Legacy Park, one of our nearly 200 communities located across the United States.

By providing just a little information, you can:

- ◆ Discover what's available, its features and receive a guaranteed monthly rent quote.
- ◆ Lease your favorite apartment home online!

So go ahead...Check out Camden Legacy Park. You'll be glad you did.

Choose an apartment

To choose an apartment, click 'Select' next to the apartment you would like to lease. To see a brochure, click the apartment floor plan name.

Apt #	Avail.	Floor plan	Sq.Ft.	Beds/baths	Rent	Deposit	Floor	
0626	Now	B3	1070	2 / 2	\$943-\$1,094	\$0	2	Featured Apartments Select
1026	Now	B3	1070	2 / 2	\$968-\$1,122	\$0	2	Featured Apartments Select
1121	Now	C1	1372	3 / 2	\$1,455-\$1,796	\$0	2	Featured Apartments Select
1524	Now	B3	1070	2 / 2	\$968-\$1,122	\$0	2	Featured Apartments Select

Search for an apartment

Date needed *

Apartment type *

Price range

Lease term *

Floor

Search

Figure 2 Available apartment details for Camden

(Source: www.camdenliving.com)

We monitored the apartment rents 4 times a week for 2 weeks in November. We gathered information for 1/1 and 2/2 unit types in all the different floor plans that were available.

For Lincoln crossing apartment, we went to the apartment office and they mentioned that a set price is usually used for renting their apartments. A brochure of the property was given to us explaining the price range, amenities, floor plans etc. The property offered rebates and discounts for renewals or first time renters.

After all the prices were gathered, pricing based on lease term was analyzed to observe if there was any common pattern. We tried to understand if the prices for these apartments followed any demand pattern, to explore the occupancy vs. price relation and tried to compare the small sample data to the industry statistics/pattern that was present for apartment rental industry.

4 Revenue Management Decisions

Revenue Management (RM) has been successfully adopted by diverse industries like airlines, hotels, apartment rental industry to utilize data ,to forecast demand -supply to price products in order maximize revenues. But, for the apartment industry it remains a comparatively new field. “The apartment industry shares many characteristics with the hotel industry, but presents new challenges such as extremely long lengths of stay (lease term) and relatively small transactions (monthly rent)” [5].

“We can easily compare apartment rents to hotel stays because both offer rooms to customers to stay in for a certain amount of time. For hotels, this is like days but for apartments, this can be months, years. The rooms or ‘product’ is perishable in a way that till the room is occupied a certain amount of money is flowing in (price /night for hotel, rent for apartment) but then when the room is vacant, it becomes worthless till it is occupied again” [5].

In apartment rental industry, the apartment owners have a fixed capacity of apartments for each size. The capacity can be increased but it requires lot of time, planning, it involves lot of management decisions and it cannot be done overnight. So since they have a fixed capacity, and if the demand from market is more, it is a good time for them to increase their rental prices. They may do it by increasing the prices, thus only targeting higher willingness to pay customers [5].

A revenue management system for an apartment complex need to take few things into account. The first thing is the length of stay renters. “An apartment RM system has to take into account the diverse likelihoods of customer behavior, such as early termination of leases, due to its longer-length-of-stay characteristic. In contrast to the hotel industry, an apartment has fewer transactions. For every hundred transactions that an apartment has, a hotel may have thousands. So estimation of demand pattern, or forecasting is less accurate for an apartment RM system because less data will be available” [5]. Another feature of apartment rental is that no repeat customers are seen in this industry which is very much different for a cruise line, hotel industry or airline industry. “Pricing is

very important in apartment rentals as the initial lease price influences the subsequent rate and probability of a renewal” [5].

In apartment rental industry, existing tenants may renew their lease or else if they don't want to renew their lease, they shift to some other apartment complex. The possibility of repeat customers (Here repeat customers are not those who renew their leases) is less in this industry. This is the reason why “Customer Relationship Management” factor is not as important in apartment rental revenue management system as compared to a hotel industry[5] .The RM system for every industry differs according to certain characteristics of that industry. Another important feature of apartment rental is lease renewal. Normally, as the existing lease term of any tenant approaches its expiry date, the apartment owners offer them a lease renewal option. In order to attract existing tenants to continue the lease, rent prices more or less equal to initial rent prices are offered. Thus, pricing becomes a major RM decision. These prices help tenants to calculate a tradeoff between continuing in the same apartment, or shifting to a new one considering the extra transportation, shifting expenses, manual efforts,time etc.

RM also involves deciding about rebates, discounts to be offered to prospective tenants. “In terms of discounts and rebates, apartment rentals often have “concessions” as incentives to attract and retain customers. Typically, there are two kinds of concessions: upfront and recurring. Upfront concessions are offered when the customers sign new leases, such as free rent for the first month. Recurring concessions are sometime common if there is like a discount every month” [5]. Another important RM decision is overbooking, which is very commonly adopted in the Airline industry. In apartment rental industry, “For the term of the tenancy, the rights and obligations defined in the tenant lease agreement cannot change until the term expires or upon the tenant's agreement in writing. When the lease expires, the parties may create a new lease; the landlord may decline to renew the lease, or if the tenant remains in the rental unit, the tenancy automatically becomes a month-to-month agreement” [6]. Thus, overbooking is not practiced in apartment rental industry. No-shows generally don't occur since the rent for the first month of the lease is already paid in full.

Since Apartment Rental industry is a service industry, the chances for arbitration do not exist. Cannibalization, as we know happens when higher willingness to pay customers see a low cost alternative and go for it. In this apartment rental industry, 1Bed-Bath, 2 bed-bath are two different products. We can assume that cannibalization has occurred when a family looking for a big 2bed-2bath apartment discovers another low cost option of 982 sq feet apartment with similar features and goes for it.

5 Demand drivers and trends

The first demand driver for housing/apartment industry is population, which is more specifically population growth, population movement, and population characteristics. As the young generation starts working, they prefer staying separate on their own and they look for apartments. If people are moving to a new city, even if as a temporary stay, apartments are the first choice that comes to mind. Again there are people who love the city life or the cosmopolitan lifestyle and prefer to stay in an apartment rather than a house. Immigrants, who cannot afford a house right after coming to a new city, tend to prefer an apartment to stay in and share the rent with their colleagues.

The second driver in this industry is economics - affordability, employment prospects, and consumer sentiment. "Over the last two years, owners of commercial real estate properties, including apartment communities, have taken a hit from pressure on rental rates and occupancy levels due to a weak economy" [7]. "However, it is expected that the balance between supply and demand will turn in the favor of apartment owners in late 2010 and throughout 2011" [7].

"The U.S. housing market is highly fragmented, and is characterized broadly by two types of housing units, multi-family, and single-family. At the end of 2009, the U.S. Census Bureau estimated that there were 130.59 million housing units in the country, an increase of 0.9% from 2008. Partially due to the high fragmentation, and the fact that residents have the option of either being owners, or tenants (renters), the housing market is highly competitive. It is estimated that 1.2 million new households will be formed in 2010, up from 0.5 million in 2009. With apartment tenants on relatively short leases compared to those of commercial and industrial properties, apartment renters are generally more sensitive to changes in market conditions than other property categories. Trends in home price affordability also affect both rent levels and the level of new construction, since the relative price attractiveness of owning versus renting is an important factor in consumer decision making" [7].

Unit type also plays an important role as a demand driver. Actually the apartment market can be segmented on the basis of unit type. “As Edelstein (1997) points out, with regard to residential apartments, constraints on the functionality of apartments by unit type (such as 1/1, 2/1, and 2/2) are postulated to be sufficient to appeal to distinct demand segments in the apartment market. Segmentation of demand by unit type also influences apartment price like floor area, location, and the impact of economic change captured by temporal trends in apartment rent” [8].

As a result, the population of potential renters has become more heterogeneous, and different unit configurations are therefore expected to be more preferred or less preferred by segments of the aggregate demand pool. For example, two-bedroom apartment units provide more utility to renters who choose to share living expenses with a roommate or to couples having one or more children. These units are also attractive to childless couples who require, and can afford, an extra room for a study or guest bedroom. Furthermore, while a 2/1 unit may satisfy a childless couple, 2/2 units are likely to be preferred by households with children or by those who choose to share an apartment with a roommate. Even there are people who just prefer to stay in apartments, such as people who want the city life and like to stay close to attractions/downtown, workplace, thus enjoy a cosmopolitan lifestyle [8].

Relatively small 1/1 units are more expensive to build on a cost-per-square-foot basis because certain elements of an apartment building or apartment unit do not vary in direct proportion to the size of the dwelling unit. These are the fixed costs which remain same for any level. Like for example, the cost of building a kitchen is same irrespective of the size of apartment. Higher construction costs for relatively small 1/ 1 units are passed along to renters who are willing and able to pay higher per square foot rents in exchange for a more convenient location and privacy [8].

“Because the demographic makeup of apartment demanders such as the mix of students, young workers, and families can be expected to vary by neighborhood, it is reasonable to expect demand for different unit types to vary also by neighborhood” [8].

6 Pricing Structure

Being one of the four major elements of the Marketing mix, Pricing plays a very important role in the apartment rental industry. Pricing decisions include setting rents for all possible product combinations being offered to current and prospective tenants. An apartment acts as a “product” in this case.

In this Internet era, people surf the internet to search for apartments where they would like to rent. One can just surf the websites of the apartments in their preferred area, compare the prices and obtain a fair idea about average rental rate in that area. Obtaining the average rental rate for your area of interest has become very much easier and this requires apartment owners to be competitive in order to survive. They need to be aware of rental demand-supply relationship and the fact that internet has made information flow easily available to all.

Rent depends on the amenities provided to tenants, apartment area, garage, floor, pet friendly, apartment features, washer-dryer facility, location, dishwasher facility, public transport availability, safety, neighborhood, proximity to places like companies, shopping malls, schools, colleges, malls, trash pickup services, pool, spa etc.

Pricing plays a very important role in apartment rentals and it has to be in line with the area's average rental rates where it is located. The **Figure 3** shows average rental rates for Dallas for various sized apartments.

Dallas Rental Rates

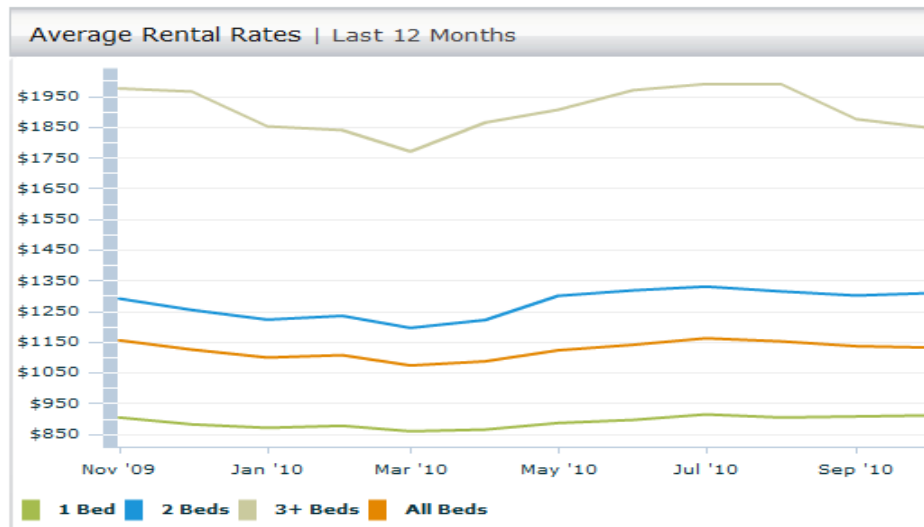


Figure 3 Average rental rates of Dallas for last 12 months

(Source: www.dallasnews.com)

6.1 Comparative Pricing

In apartment industry, pricing is largely affected by competition in the market. In this section, we have put light on how our 3 sample apartments and the way they carry out pricing.

6.1.1 Lincoln Apartments

Lincoln Crossing uses weekly market surveys of their closest competitors to help determine prices for their apartments.

They also take into consideration the market trends. They try to obtain this information from monthly newsletters from different research groups and thus it helps to know what is going on in the housing/apartment market in various areas of the USA. They also obtain information about the yearly/monthly trends. Monthly trends are useful as seasonality plays an important role since there are months that are generally slower/busier than others.

They also consider the current numbers, occupancy, leased and prospective percentages. Then there is the owner who may or may not want increases on a specific unit type. Holly, who is working at Lincoln Crossing Apartment leasing office, has been figuring, calculating and helping set rental prices for about 6 years at Lincoln Crossing as well as other LPC communities. The basics are what apt. can get per month for this space without pricing the community beyond that of the neighborhood. The neighborhood and area and surrounding communities are what Lincoln considers most. In this way it takes care of the competition.

6.1.1.1 Pocket/ List Price

A list price is what a leasing office “wants” for the rent, and may or may not accurately represent what the prospective tenant will bear. For Lincoln apartments, they provide discounts depending on apartment selections, season, etc. Apartment advertisements will present the discount with no further details, which appeals customers to visit apartments to get more information. For some good apartments, visiting the real apartment is the best advertisement. Discounts help to get business quickly. This was also what we have ourselves experienced.

Table 2 below shows the list prices of Lincoln Apt. Considered the discount and referral fee, the pocket price is lower. For a 5-month time length renting, a \$250 discount will be deducted from the first month rent, which means the average rent is deducted by \$50/month.

**Table 2 List price for Lincoln Crossing Apartment
(Source: Brochure received from Lincoln Crossing Apt.)**

Pricing							
Style	Beds	Ba	1/2	SqFt	Price	Term	Deposit
<u>Apartment</u>	1	1	0	542	\$510-520	Per Month	\$200
<u>Apartment</u>	1	1	0	636	\$585-610	Per Month	\$200
Apartment	1	1	0	729	\$630-715	Per Month	\$200
<u>Apartment</u>	1	1	0	751	\$625-650	Per Month	\$200
<u>Apartment</u>	2	2	0	933	\$799-825	Per Month	\$275
<u>Apartment</u>	2	2	0	979	\$825-850	Per Month	\$275
Apartment	2	2	0	1045	\$899-925	Per Month	\$275
Apartment	2	2	0	1091	\$925-1050	Per Month	\$275

6.1.1.2 Price follower

According to the information above, the neighborhood, area and surrounding communities are what Lincoln considers most while determining prices. Thus, we can say that Lincoln Crossing is a price follower.

6.1.2 Pricing of Camden Apartments at two locations

As mentioned earlier, rent of an apartment complex is one major factor that affects a person’s decision on leasing that particular apartment complex. At Camden, through the software Realpage’s Yieldstar™, rent is set for various units for various lease terms for first time renters. Renewal prices may be set by the software or the managers may have a say in that. The **Figure 4** below shows the average monthly rent for Camden at Buckingham location for 4 different lease periods and for 5 different sq ft plans (2 different unit types). We can see that for month 3, the rents are the highest because

usually for a shorted period of time, apartments do charge more. Between the 1/1 unit types (719 and 799 sq ft) the bigger 1/1 unit was priced more. But for the 2/2 unit type, the biggest floor plan was charged less compared to the small 2/2 units (in green and purple color). For a 12 month lease, all the rent prices were low as expected and the bigger floor plans for both unit types were charged more.

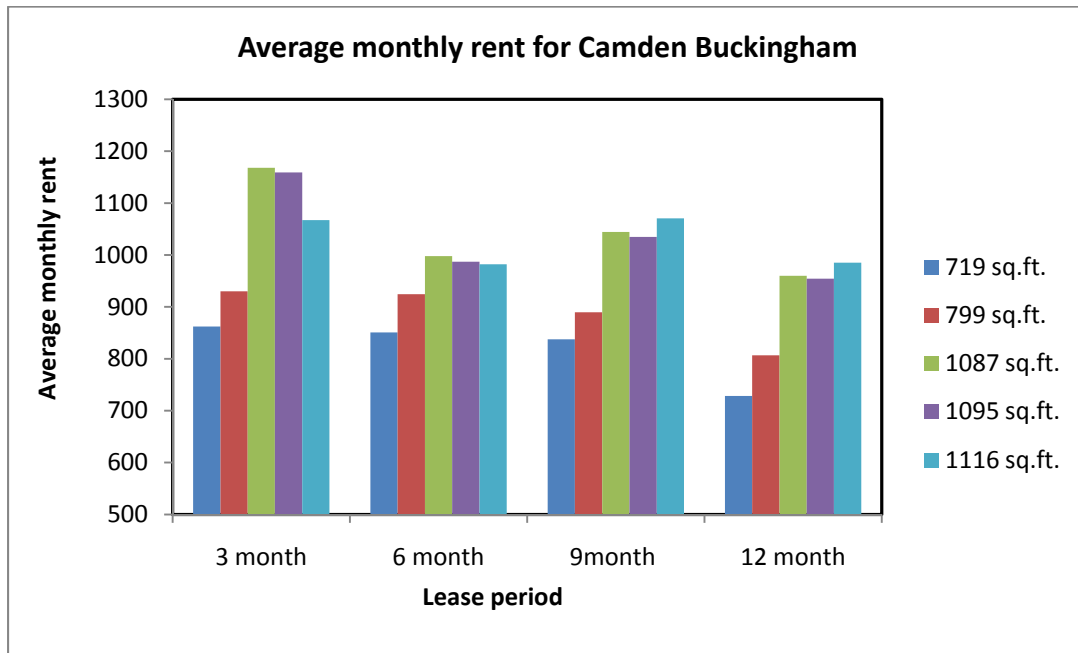


Figure 4 Average rent for Camden at Buckingham
 (Source: www.camdenliving.com)

The Average rent for Camden Legacy Park is shown in **Figure 5** . Among all the lease periods, 3 month leasing terms have the highest rents. This apartment complex has more 1-1 apartments and price is also higher which suggests that there is large demand for 1-1 apartments. We also observed that rates keep on changing daily and sometimes, even bigger apartments are available at a lower rate. This might be the case when demand for them is low.

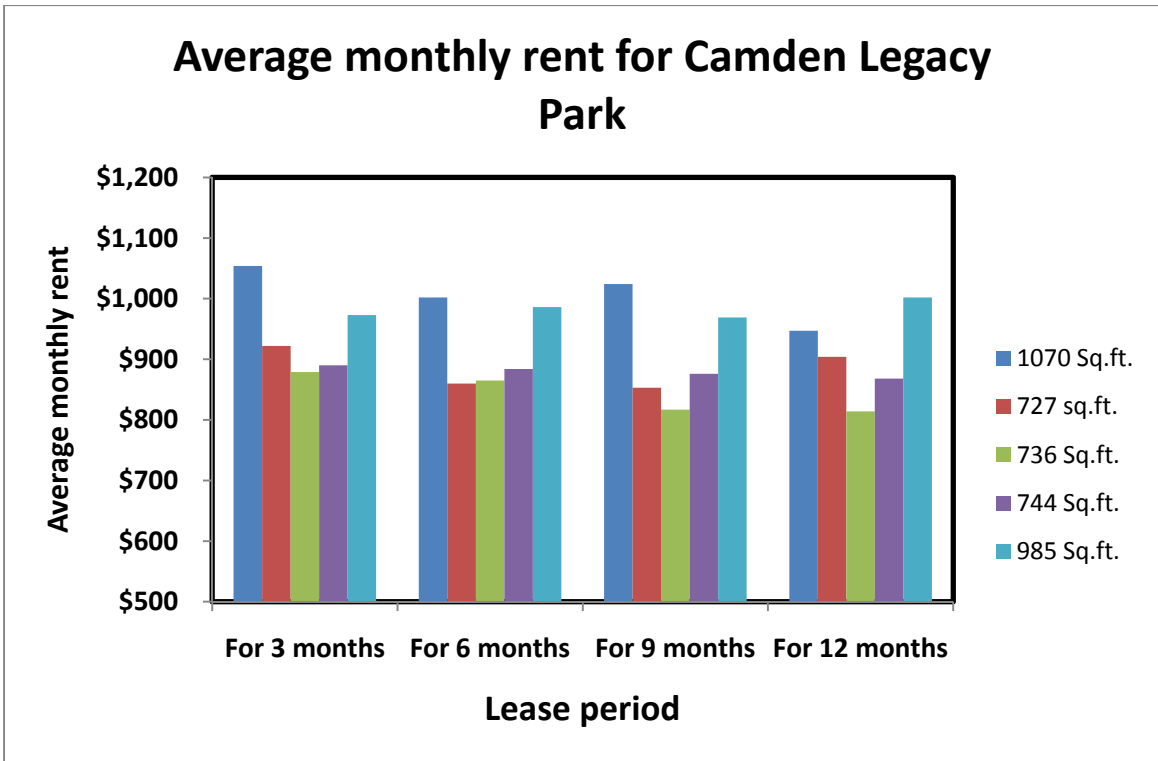


Figure 5 Average rent for Camden at Legacy Park
 (Source: www.camdenliving.com)

7 Demand Price relationship

7.1 Price change by Unit Type

As of November 2010, the average rents in Dallas area are generated using 5604 applicable apartment listings that were posted throughout this month. The **Figure 6** below shows the rent for different unit types in Dallas. The average price of a studio apartment in Dallas is \$548. A one bedroom apartment has an average list price of \$823, a two bedroom rental will cost around \$1,187. Average rent for a three bedroom apartment is \$1,422.



Figure 6 Rent/Price for different Unit types in Dallas
(Source: myapartmentmap.com)

7.2 Price change by Time

Seasonality does have an effect on demand for apartments which leads to changes in prices. "According to rental history data as shown in **Figure 7**, as of November 2010, any changes to the average rental rates for Dallas, Texas, from June to November are reflected in the following averages. These average rates were generated using 16164 apartment listings that were posted throughout the past six months in Dallas. Knowledge about cost changes over time and other trends really proves useful to

understand how prices change overtime. The average rental rate in June was \$943, as compared to one-month later during July, which was \$958. In August, the average rental rate was \$1,058 while in September the average rental price was \$970. Most recently, in October and November, the average rental prices were \$1,110 and \$1,187, respectively". [9]



Figure 7 Rent/price change in Dallas apartments over time

(Source: www.myapartmentmap.com)

Typically, the peak season for the rental industry extends from April to August. Estimated demand can also be generated by the visits or tracks made to the websites in order to get information. In fact, Apartments.com (website) recorded 5.1 million visits in March 2010, making it the second most visited month in the Web site's 12 year history. Previous research on high traffic and lead months have occurred during the traditional peak rental season months of June and July.

It is observed that many people prefer to re-locate in summer season, provided they have a liberty to choose their relocation time. Summer provides various favorable conditions over winter for example longer daylight hours, vacation period for students,

better climate etc. In winter, people generally avoid relocating because of extreme cold weather, shorter day hours. This is what demand for rental apartments is more in summer than in winter [10].

7.3 Demand Change

“A microeconomic law states that, all other factors being equal, as the price of a good or service increases, consumer demand for the good or service will decrease and vice versa” [11]. In case of apartment rental industry, demand can be assumed to be equal to apartment absorption rate of the market. As stated in study of economics, economic growth is represented by rising purchasing power of consumers. But, as researched and stated on Investopedia.com, “A rising economy may have opposite effects on demand for rental apartments. On one hand, it allows renters, to move to homeownership, but on the other hand it allows young singles living with their parents to move out of the family home and rent their own apartment for rental unit” [12]. Thus, economic growth affects demand for apartments.

“The average monthly rent for Dallas apartment is up to \$762, as per the third quarter of the year 2010. Many of the Dallas apartments being leased are newly completed, thereby providing a general upturn in the industry” [13].

“The local economy has no doubt spurred the latest surge in apartment leases, thereby providing more proof that the Dallas market is heading back into positive territory. In fact, about 30,000 jobs have been added in North Texas this year. That is enough job growth to warrant the development of a mid-sized city. If a city needs 3 jobs to support every 5 people, 27,300 new jobs justifies a population increase of 45,500 people. Kids and retired people don't work but they need places to live. Assuming 2.5 people per household, 45,500 new people need 18,200 additional housing units” [13].

“The Dallas-Fort Worth area saw renters leasing 7,800 apartments during the third quarter of 2010, which brings the total leases this year to 22,970. Economists note that the activity in the Dallas apartment market has been stronger in just the last nine months than the previous four years combined” [13].

7.4 Occupancy-Price Relationship

“Occupancy rate is the ratio of rentable units to total rentable units”[15]. There appears to be a negative relationship between apartment rent and occupancy rates.

“Dallas/Fort Worth apartment market occupancy increased 0.34% points in September 2010 to 90.11%, and is up 1.46 points from last year’s level. Rents per square foot increased \$0.001 over the month to \$0.890. Over the year, per square foot averages are up \$0.002. Rental rates per unit increased \$0.32 over the month to \$761.56, while increasing \$3.82 over the last twelve months. Absorption in September was positive 1,949 units, while annual absorption stands at positive 14,174 units” [16].

“The areas that saw some of the biggest improvements this year when it comes to Dallas apartments include the Frisco area, which experienced a 14-point increase in occupancy this year, and central Dallas, which experienced a 7-point increase [17]. Other areas, such as North Fort Worth and Frisco have seen apartment rate jump by as much as six percent”.

Dallas/Ft. Worth Apartment Market Key Metrics	
Occupancy	90.11%
Monthly Change	+ 0.34%
Annual Change	+ 1.46%
Rent / Unit	\$761.56
Monthly Change	+ \$0.32
Annual Change	+ \$3.82
Rent / SF	\$0.890
Monthly Change	+ \$0.001
Annual Change	+ \$0.002
Monthly Absorption	+ 1,949
Annual Absorption	+ 14,174
Units U/C	4,687
Units Planned	7,142

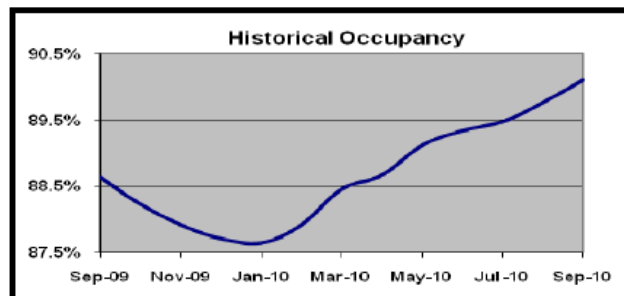
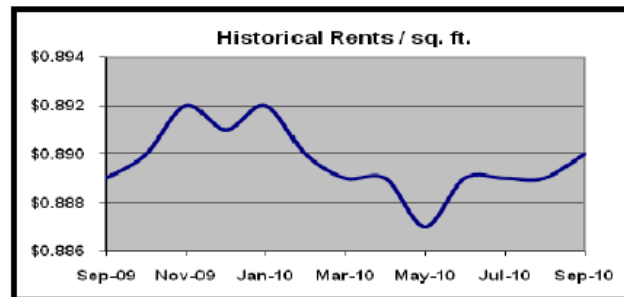


Figure 8 Statistical data showing Dallas apartment metrics

(Source: www.poconnor.com)

The **Figure 8** shows the apartment key metrics for Dallas market and rents and occupancy level for a year ending September 2010. Let's assume all the demand has been satisfied in DFW area. We use historical occupancy as demand and historical rents/sq.ft. as price to plot the following graph, which reflects a linear trend with negative slope. This matches the common principle that with higher rents, the demand decreases.

Also, we need to consider occupancy is not the demand. Actually, demand is much more than the occupancy rate as we mentioned above, because of the increasing job market. We can still observe a general trend of this relationship as shown in **Figure 9**.

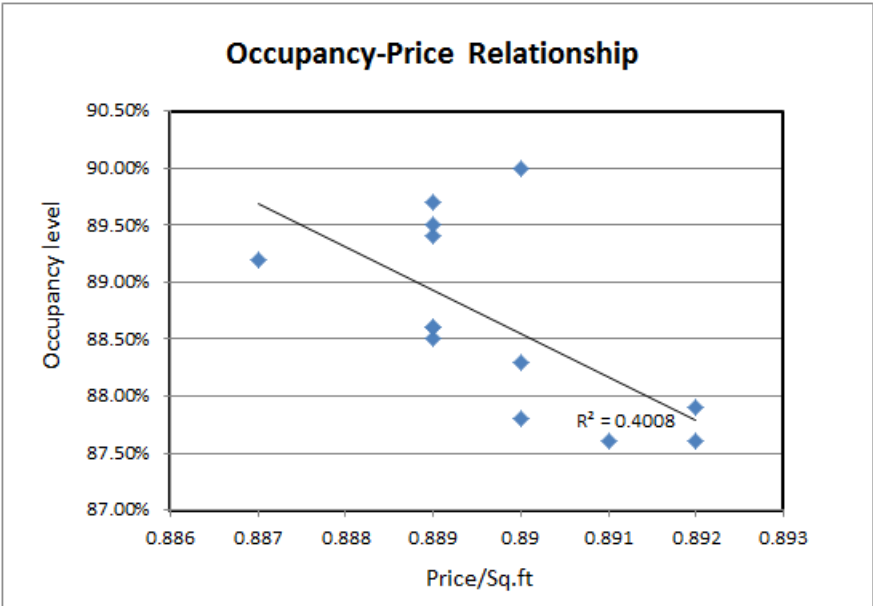


Figure 9 Occupancy vs. Price relationship

8 Price Optimization

As we have already seen in pricing section, setting optimal rent for apartments (for a new customer as well as for lease renewals) remains the most important decision to be made by the property owners or apartment managers.

Pricing in apartment rental market depends is affected by cost and competition in the market. “Leasing apartments is a high fixed-cost business with time-based transactions, where the value of a given product (such as a two-bedroom apartment with a pool view) changes over time, depending on what is happening in the surrounding market, such as mass layoffs, condo conversions, or the arrival of a new corporation and new jobs in town and many more factors” [18].

Here, since the value changes overtime, the optimal rent amount also changes. The amount of rent optimal for a particular apartment in December may not be optimal for the same apartment in May. The products offered by apartment owners like Camden are way too much. So deciding rent for every product is a very tedious time-consuming job which requires lot of research, analysis and understanding.

Thus, Apartment owners have started using software to set rents. The software are pricing optimization systems which remove the responsibility of price setting from community managers. We will elaborate on Camden’s pricing software, Price Optimizer by M/PF Yieldstar™, and its biggest competitor in this section.

“Lease/rent optimization systems see the multifamily industry in terms of hot and cold markets and adjust prices accordingly. When markets are hot, they may call for higher rents and faster rent hikes; when a market is cold, they may recommend keeping rents high at first and then lowering them gradually to spread out revenue reductions” [19].

Legal factors: In US, some states have enacted Rent control laws that set price controls on the renting of residential housing. They function as a price ceiling [20]. So, in such states, these ceilings are considered before setting arriving at the optimal rent price.

8.1 Camden's Revenue management system- Price Optimizer by M/PF Yieldstar™

Camden Living Apartments first replaced their DOS system with Real Page's Web-based system, and joined revenue management revolution in 2005 by adopting a data-driven rent pricing model Price Optimizer by M/PF Yieldstar™ [21].

“Price Optimizer by M/PF Yieldstar™ is a market-based and data-driven revenue management system, which can analyze supply and demand to determine the best balance between yield and occupancy. This automated pricing system presents flexible lease terms and move-in options which are highly appreciated by prospects” [21].

Yield star price optimizer is a product of Texas-based Real Page Inc. YieldStar™ is the pricing solutions designed specifically for the multifamily industry and has a working similar as described below:

YieldStar™ uses certain property-specific statistics to systematically forecast supply and demand for a particular unit, and prices it accordingly. These statistics include the numbers of Camden units currently vacant, current and anticipated future demand, competitive property rents, and marketplace factors such as number of apartment permits and job growth. The database is updated each night, providing on-site staff with a matrix of rents for new leases and renewals by move-in week and lease term for each apartment [21].

Camden establishes a percentage threshold for price variance which helps Camden to set rentals within the threshold, in spite of daily fluctuating prices. If a price falls outside the threshold, the company's central pricing authority personnel double-checks the accuracy of the price. Camden then gives prospects a quoted price and will honor the quote for only three days to create a sense of urgency [21].

Benefits of YieldStar™

- Drawing on unsurpassed market data, and weighing unit availability, competitor pricing, local market trends, and other key variables, Price Optimizer helps Camden to achieve its target goals for optimal occupancy at the highest rent price [22].
- Price Optimizer also improves apartment owners' leasing flexibility and customer service by making it easy to offer prospective renters a wide array of alternatives in pricing based on move-in date, length of the lease, selected amenities, and other variables [22].
- It is built around a "glass box" approach. All of the key variables used to arrive at the recommended price are displayed: your available inventory, your leasing velocity, your recently achieved rental rates, your market position and more [24].
- Price Optimizer uses history from the property and its submarket to set an expectation, but the system responds as soon as current experience deviates from those expectations and price is immediately adjusted to capitalize on the conditions that exist at the site and in its submarket today [23].

8.2 YieldStar™'s biggest competitor - Rainmaker Group Inc's LRO software.

This system crunches market conditions and historical performance, and then recommends pricing for any move-in date, unit or lease term [25].

The software diminishes the human guesswork of the rate-setting process, and permits a company to raise or lower rates more precisely and gradually than it had in the past. In the traditional process, apartment management's personal preference or emotional attachment toward certain tenants can give way to objectivity [25].

In order to make an accurate assessment of pricing tolerance in a given market, demand must be considered using all customer visits, even if a unit is not leased. This provides a forecast of unconstrained demand, which is an estimate of your property's

true demand while accounting for historical price and availability constraints. LRO tracks all customer visits and provides a forecast of unconstrained demand [26].

The **Table 3** shows the companies which have adopted revenue management software.

The two software companies,

The Rainmaker Group- Product is LRO

Price Optimizer by M|PF YieldStar™

They are the leading software players in Revenue Management software in Apartment Rental industry.

Table 3 List of apartments using revenue management software

(Source: <http://www.multifamilyrevenue.com>)

Companies using LRO software	Companies using Price Optimizer
Alliance Residential	Archon Group
Allison-Shelton Real Estate Services	Berkshire Property Advisors
Altman Management Companies	Camden property Trust
Apogee Residential, LLC	CWS Apartment Homes
Archstone	E&S Ring Management corporation
AvalonBay Communities	Essex Property Trust
Babcock Brown Residential	Grand Peaks Property Management
Carmel Partners	Griffis /Blessing Inc
Centennial Holding Company, LLC	JPI
Colonial Properties Trust (LRO by The Rainmaker Group)	Mission residential
ConAm Management Company	Morgan Group
Continental Properties Company	Pinnacle
Equity Residential	Prometheus Real Estate Group, Inc.
First Communities	Sares Ragis
General Investment & Development	Steven D. Bell & Company
First Choice Management Group, Inc	Shea Company
Hirschfeld Properties, LLC	UDR Inc

Home Properties	
IMT Residential	
Julian LeCraw Company (LRO by The Rainmaker Group)	
Jupiter Communities	
The Kamson Corporation	
Korman Residential	

9 Price Differentiation

Price Differentiation is charging different prices for products or services to different willingness-to-pay customers. This is done to make the the product attractive to specific target market .As in the case of restaurant industry, different prices are charged for Buffet and Ala-carte. But in apartment industry, at least for Camden apartment, “customers cannot be explicitly segmented or differentiated at the time their requests are being processed” [5] since prices that appear on their website camdenliving.com are charged to all. But, “Apartment customers can be differentiated by their purchase behavior such as their desired time for move in or lease period” [5].

Apartments have a fixed capacity. So, an important Revenue Management decision can be “adjusting the demand”. When demand is on a higher side, market segmentation can prove a good strategy in such a way that charging higher rents can attract only higher willingness-to-pay customers [5].

10 Competition

Competition always exists in an industry and the apartment industry is nothing different. It is always taken into consideration before setting the rent prices. The revenue management pricing software, Yieldstar™ also takes inputs on prevailing competition in the market. Usually in this industry an apartment owner will have the knowledge about rent amounts for other properties in that area and will set his or her property price accordingly. For example, Camden at Buckingham has its main competitor, Arboretum Estates right opposite their property. The **Table 4** below shows a price range for both properties for a 1 Bedroom 1 Bathroom unit.

Table 4 Price difference between Camden & Arboretum apartment

Apartment complex	Unit	Sq ft	Price range	Deposit
Camden at Buckingham	1B/1B	719	\$657-\$827	Not Applicable
Arboretum Estates	1B/1B	718	\$674-\$694	\$150.00

(Source: www.camdenliving.com, www.arboretumestates.com)

Just looking at this table, for a similar apartment unit, these two complexes have quite a difference. Even though Camden doesn't have a deposit, but maybe the rent itself includes the deposit amount but it just doesn't print it out to attract customers. When a customer visits these two locations, seeing one has deposit and other doesn't might be the factor for them in choosing Camden over Arboretum. So this might be a way how Camden rents or takes into account their competition. As any other industry, competitors in apartment industry are monitored to see what kind of incentives, discounts are being offered.

As mentioned before, Lincoln Crossing uses weekly market surveys of their closest competitors to help determine prices. It mainly considers its local competitors. So competition in the neighborhood is very closely monitored to set prices for Lincoln Crossing apartments

11 Observations and Conclusions

- More and more apartment owners are applying technology for rent-setting process since it enables them to act in modernization and helps to increase revenue. “It also helps in achieving company-wide transparency and a single source of rents, forecasts and demand information” [27].
- “Apartment owners can track incoming customer leads and leases and consistently by price range, source and by time in order to understand patterns of demand. Similarly, they can track lease expirations graphically to better understand when supply will be maximized” [27]. Thus, a demand-supply relationship can be obtained.
- Revenue Management helps to determine the trade-off between occupancy and profitability. For an apartment community, having an occupancy rate of more than 97% probably means its rents are too low and there lies a scope for increasing rent prices.
- Before investing time and resources in any new technology, it is essential to understand the details of the system and its conduct its feasibility study .Thus, testing new software on small scale is a wise decision before deploying it to the entire portfolio. The results can be obtained for a pilot project which can provide inputs for further deployment. In our case, Camden conducted an extensive research and planning for 4 years and then started deployed YieldStar™ for 5 properties. The results turned out very well so extended the software to whole of its portfolio.
- Though Camden has outsourced to YieldStar™, at times it applies its operational expertise in order to evaluate the best suggested solutions by YieldStar™. Sometimes, it is possible, that some things are better noticed,predicted and logically analyzed by a human being than the software, so in such cases the results of the software are first evaluated and then implemented.

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