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Entering the short-term rentals market for Watershed: how profitable?

Capstone Project

Excel to MySQL:
Analytic Techniques for Business

Coursera Specialization

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The Business Problem

In this project, I performed data analysis to recommend how Watershed Property Management, Inc can increase profits. Watershed is responsible for managing thousands of residential rental properties throughout the United States. My job was to persuade Watershed's management team to pursue a new strategy of short-term renting that will increase the company's profits.

To do this, I have done the following:

- Elicited information about important variables relevant to your analysis;
- Extracted relevant data from a real estate MySQL database;
- Implemented data analysis in Excel to identify the best opportunities for Watershed to increase revenue and maximize profits, while managing any new risks;
- Created a Tableau dashboard to show Watershed executive the results of a sensitivity analysis;
- Gave a presentation to Watershed executives with my recommendations.

Presentation Speech

Here's the link to my Tableau dashboard upon which this presentation is based:

https://public.tableau.com/profile/katerina.bosko#!/vizhome/Bosko_dashboardforWatershedproperties/FinalDashboard

Intro

The recent technological advances and the move to a sharing economy allowed such companies as Airbnb to reap high profits from renting properties on a nightly basis. One of our clients asked us to evaluate this opportunity for her. Based on the solid data analysis, which results I will present now, I highly recommend entering the short-term rental market under following conditions.

Conditions

The safest way to enter is to start with 15 most profitable properties that would still be profitable even the assumptions harshly change, which I will later demonstrate. The main **reason** for my recommendation is the financial constraint that Watershed faces – namely $ 500,000 in cash and unwillingness to take on additional loans to finance the project. The profits in this case are not the highest and we can maximize them at a later stage, after the conversion of the first fifteen is completed and more financial resources become available.

Let's see now what properties I recommend and what are the numbers.

The 15 chosen properties are predominantly houses. They have lucrative locations in **California, Texas, Florida and the New York City.** All properties would make profits after conversion year of at least $25,000 yearly. You can find the full list in the handout.

Profits & Costs

If Watershed converts all 15 properties, its forecasted profits will go up to about $ 850,000 in the first conversion year and will be about $ 765,000 annually afterwards. All cash flows are positive, also during the conversion year. And the good thing is the forecasted capital expenditure stay, as I said, within limits. It will cost us about $ 450,000 to convert the mentioned above properties. The numbers are based on the assumptions elicited during interviews with our financial and marketing departments. You can find the details in the White Paper distributed to you.

Results of Sensitivity Analysis

Now you might want to know: how robust are these predictions? Well, given the uncertainty at the market, especially our dependency on external agents like local governments and rental platform providers, I conducted a sensitivity analysis by changing simultaneously the underlying considerations by plus or minus 20%.

In the worst-case scenario, the profits after conversion year is over will drop by almost 40% compared to baseline scenario - to almost 480,000 $. In the best case, we might earn additional profits of almost 1000,000$. In either case, all numbers are positive, while the cash to finance the conversions stay within reasonable range – 540,000 $ in the worst-case scenario or $360,000 in the best case.

Conclusion

To conclude, Watershed will only profit from entering the race of short-term rentals. The 15 properties I highlighted here form the firm basis for this conclusion. They are highly profitable under different conditions, so there is hardly any risk associated with this recommendation. Also, Watershed won't need to make additional debts to test the new market and may start converting other properties at the later stage in order to maximize profits.

That's all from my side. Thank you for you attention! All additional information, including the predictive modeling details I included in the White Paper that is distributed to you. If you have any further questions, please don't hesitate to ask me.

White Paper

Technical Details of Recommendation to Enter the Short-Term Rental Market

I recommend that Watershed should definitely entry the short-term rentals market. Given the financing constraints ($0.5 million), Watershed should start with 15 properties, predominantly houses, that have lucrative locations in California, Texas, the New York City and Florida. All properties would make profits after conversion year of at least $25,000 yearly.

The analysis that serves as the basis of my recommendation indicates that Watershed and its client would benefit from $ 0.85 millions of increased profits during the first year, and yearly profits of $0.76 millions every year thereafter if my recommendation is enacted. The initial capital investment needed to implement my recommendation would be $ 0.45 millions. This analysis is based on financial assumptions that were confirmed by company and industry experts, but sensitivity analyses indicate that Watershed should enter the short-term rental market with their client, even if these initial assumptions need to be revised. Below, I describe the analyses I used to arrive at my conclusion, and report the results of my sensitivity analysis that assesses how expected profits and needed capital expenditure would change if my assumptions are modified.

Analysis Summary

I modeled the relationship between nightly rental price and occupancy rate for short-term rental properties using data from current short-term rentals managed by other companies and owners. I used this model to predict the short-term rental price that would maximize profits from each of Watershed's client's properties if it were managed as a short-term rental property. The metrics I report are based on the sum of the forecasted profits that would be gained and the forecasted capital investment that would be needed if my recommendation is followed, after the following are taken into account: (1) initial furnishing costs, (2) upkeep costs, (3) internet service fees, (4) regulatory fees, (5) hospitality charges (including key service and cleaning), (6) typical duration of stay, and (7) utilities. The details of the assumptions I used are provided below (Table 1), followed by a description of the results of my sensitivity analysis.

Analysis Assumptions and Sensitivity Analysis Ranges

Table 1

Consideration	Assumed Value	Source of Original Assumed Value	Minimum Value Tested	Maximum Value Tested	Rationale for Range of Values Tested
Additional profit needed for a property to be considered "more profitable as a short-term rental"	$6,000	Watershed Financial Department	$4,800	$7,200	+/- 20% of assumed value elicited during interviews
Cost to convert property to short-term rental (includes furnishing and decorating)	$30,000	Watershed Marketing Department	$24,000	$36,000	+/- 20% of assumed value elicited during interviews
Years to depreciate capital expenditures	5	Watershed Financial Department	4	6	+/- 20% of assumed value elicited during interviews
Yearly upkeep	$6,000	Watershed Marketing Department	$4,800	$7,200	+/- 20% of assumed value elicited during interviews
Service fees to short-term stay website (e.g. Airbnb)	20%	Watershed Marketing Department	16%	24%	+/- 20% of assumed value elicited during interviews
Regulatory fees (taxes and potential legal fees)	10%	Watershed Financial Department	8%	12%	+/- 20% of assumed value elicited during interviews
Hospitality charges (key service, cleaning, re-stocking)	$100	Watershed Financial Department	$80	$120	+/- 20% of assumed value elicited during interviews
Typical stay duration (days)	3	Watershed Marketing Department	2	4	+/- 20% of assumed value

					elicited during interviews
Monthly utilities per property	$300	Watershed Financial Department	$240	$360	+/- 20% of assumed value elicited during interviews

As agreed upon at the beginning of the project, some issues were NOT incorporated into the analysis, but could be incorporated in the future to help optimize short-term rental rates or to further refine projected profits (Table 2):

Table 2

Factor not included in analysis	**Reason for exclusion from analysis**
Weekly or seasonal changes in rental prices/occupancy rates	Instructions from Project Manager
Promotions, coupons, or special events	Instructions from Project Manager
Loss in rental income while property is converted	Instructions from Project Manager
Differences in utility rates across properties	Instructions from Watershed Financial Department

I have created a dashboard that illustrates the effects of changing these assumptions on predicted profits and required capital investment that is available to anybody on the team by request. **The minimum additional profits Watershed could earn when the assumptions were modified within the ranges described above was $ 0.51 million**, if all the properties that are "more profitable" as a short-term rental are converted. **The maximum additional profits Watershed could earn when the assumptions were modified within the ranges described above was $ 2.4 million**, if all the properties that are "more profitable" as a short-term rental are converted. The modified set of parameters associated with this minimum and maximum value are provided below (Table 3). Overall, the parameter that affected profits most was the transaction fee charged by sites like Airbnb.

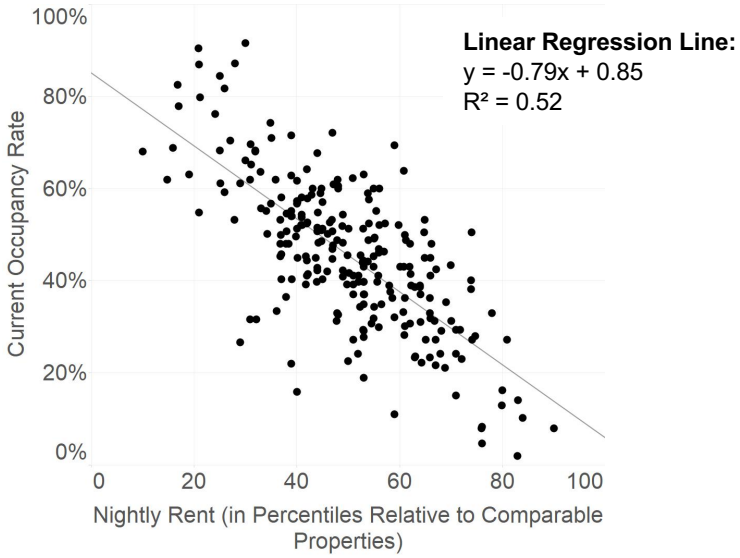
Table 3

Consideration	**Value in Assumption Set that led to Minimum Profits**	**Value in Assumption Set that led to Maximum Profits**
Additional profit needed for a property to be considered "more profitable as a short-term rental"	$7200	$4800
Cost to convert property to short-term rental (includes furnishing and decorating)	$36000	$24000
Years to depreciate capital expenditures	4	6
Yearly upkeep	$7200	$4800

Service fees to short-term stay website (e.g. Airbnb)	24%	16%
Regulatory fees (taxes and potential legal fees)	12%	8%
Hospitality charges (key service, cleaning, re-stocking)	120	80
Typical stay duration (days)	2	4
Monthly utilities	360	240

Predictive Modeling Details

I was provided with four types of information about short-term rentals of the same type (number of bedrooms, apartment or house, kitchen availability, unshared property) and in the same location as Watershed's client's 244 properties: a typical short-term nightly rental rate, the corresponding occupancy rate for the property with that rental rate, the 10th percentile nightly rental rate, and the 90th percentile nightly rental rate. When the typical rental prices were expressed in terms of percentiles relative to properties of the same type and in the same location—but not when they



were analyzed as raw dollar values—they correlated linearly with occupancy rates:

I used the parameters of the regression line and Excel's Solver optimization function to find the rental price and occupancy rate that would maximize the profits expected from each of Watershed's client's 244 properties. Any optimized price below the 10th percentile rate was replaced with the 10th percentile rate, and any optimized price above the 90th percentile rate was replaced with the 90th percentile rate, in order to account for lack of data outside of these ranges in the linear model. These optimized rental rates were entered into a financial cash flow and profit model that computed the expected revenue from each property based on its projected occupancy rate, and the expected costs according to the financial assumptions described above.