

Modeling and Assessment of Seasonal Factors of Influence on the Activities of Recreational Enterprises*

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Abstract. The article examines seasonality as one of the most important problems of the recreational sphere, which manifests itself in the indicators of business activity of enterprises in this sphere. The current state of recreational enterprises is characterized by a high level of under loading of infrastructure during the off-season and increased demand during a period of high activity, which as a result is reflected in the high prices and costs of recreational services. To increase efficiency, enterprises of the recreational sphere are required to find ways to optimize resources following their business activity or to increase the volume of activity during the off-season. The obtained seasonality coefficients can be used in calculating the need for personnel, its training, and determining the necessary minimum, which will be the object of investment in human capital (22%), as well as the minimum size of all working capital.

Keywords: Entrepreneurial Activity; Recreational Area; Seasonality, influencing factors, optimization, data analysis, planning, modeling, forecast

1 Introduction

Please note that the first paragraph of a section or subsection is not indented. The first paragraphs that follow a table, figure, equation, etc. do not have an indent, either.

Among the most significant problems of using the recreational and tourist complex of Big Yalta, seasonal dependence can be called. In the region, most of the enterprises of the complex can operate year-round, almost all of them operate in a seasonal mode, from May to October, and this significantly reduces the return on work of recreational enterprises of the sub-region.

Seasonality should be understood as constantly repeating fluctuations in business activity associated with the intensity of the action of recreational factors over several years.

The low season is the period of the New Year and May holidays, which are present throughout the year and amount to a month. The period of the “dead” season is an

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almost complete absence of tourists for five months. Thus, favorable months are five months, and unfavorable seven.

2 Analysis of recreational services

The main profiles of spa treatment: pulmonary, cardiological, neurological, musculo-skeletal. SPA salons have been created based on modern sanatoriums, which includes Russian, Finnish, Turkish baths, infrared saunas, and solariums, pools with a complex of hydromassage installations.

Recreational services are mainly related to the recreation sector, which can be grouped into four main groups:

1. Accommodation (main) - luxury room and high comfort rooms;
2. Food - various types of food are offered: breakfast (half board), full board (if necessary, a menu can be developed on a contractual basis); complex (individual) menu, diet dishes, room service, banquets;
3. Sports and recreational facilities - the recreation center is represented by massage rooms, a Sharko-shower, and hot tubs;
4. Entertaining - on the beaches of sanatoriums and hotels, you can use boats, yachts, pedal boats, jet skis, hang gliders, rental points for beach and water sports equipment.

The management mechanism of enterprises in the recreational sector should take into account its peculiarity, which manifests itself in different levels of seasonal activity throughout the year, fluctuations, the presence of which, in turn, causes underloading and insufficient loading of fixed assets, labor, and financial resources. Such seasonality accounting will allow more efficient use of fixed assets of the enterprise and current assets of the enterprise by creating a more efficient management system, increasing sales volumes, optimizing receivables and payables [1; 2; 3].

Theoretical developments and recommendations of a scientific and practical nature regarding overcoming the negative effects of seasonality factors are pragmatic valuable for financial managers, owners, potential investors who work in the recreational field and comprehensively contribute to improving the management of financial resources of business entities [3; 4; 5].

Thus, the seasonal loading of the sanatorium of Ai-Petri Sanatorium JSC shows that the potential of the enterprise has not been fully realized (Table 1).

In the table 1, one can observe how the value of actual profit during the off-season in some months has a negative value, which is paid off during a period of high activity, which ultimately brings profit for the entire period of 51425.39 thousand rubles. In the sales column, without a discount, the same actual sales volumes are presented, but without a discount, so that it is possible to determine the seasonal workload of the organization and build the dependence of costs on the volume of activities.

Numerous scientific studies are designed to find ways to improve the performance of organizations, which is reflected in an increase in absolute and relative profitability indicators. It happens that the financial result is not profit, but loss, and then you need to develop a set of serious measures to eliminate the current situation and take measures

to increase profitability and reduce the costs of the financial and economic activities of the organization. The correct distribution of profits is also important, as this is a private resource for further activities [1; 2; 3; 4; 5].

Table 1. Performance Indicators of the Company Ai-Petri Sanatorium JSC for 2017, Taking into Account Potential Implementation.

Months	Actual implementation	Actual Costs	Actual profit	Income without discount	Seasonal discounts	Potential sales without discounts	Potential sales with discounts
February	5363,37	13520,48	-8157,11	7151,16	0,3	78873,13	55211,19
March	12619,70	15594,24	-2974,54	15774,63	0,25	78873,13	59154,84
April	23346,45	27383,37	-4036,93	29183,06	0,25	78873,13	59154,84
May	32811,22	30338,58	2472,64	41014,03	0,2	78873,13	63098,50
June	59943,58	37084,17	22859,41	70521,85	0,15	78873,13	67042,16
July	78873,13	52034,58	26838,55	78873,13	0	78873,13	78873,13
August	69092,86	48526,87	20565,99	76769,84	0,05	78873,13	74929,47
September	35145,24	24108,87	11036,37	41347,34	0,1	78873,13	70985,81
October	21953,49	27978,33	-6024,84	27441,86	0,2	78873,13	63098,50
November	16090,12	22249,46	-6159,34	20112,65	0,25	78873,13	59154,84
December	14828,15	13885,69	942,46	18535,18	0,3	78873,13	55211,19
January	8518,30	14455,55	-5937,25	11357,73	0,3	78873,13	55211,19
Total	378591	327102,62	51425,39	438082,45		946477,50	761125,66

The linear correlation coefficient, the regression equation, and the random variable will be used as the main tools for analyzing the activities of the enterprise under seasonal conditions. For a quantitative description of the relationships, the variables presented will be defined as [7; 8]:

a) the need to establish the dependence of costs on the implementation of X_i (load in thousand rubles without a discount) and Y_i (costs in thousand rubles) to determine the impact on the result of fixed costs and orientation to variables as the limit for the discount;

b) the need to establish the dependence of sales on the sequence of months of the year X_i (months) and Y_i (load in thousand rubles) to assess the seasonality coefficient.

A model of the form, where Y_i is a dependent variable (productive attribute); X_i is an independent, or explanatory, variable (attribute-factor).

The correlation coefficient of X and Y (r) indicates the presence or absence of a linear relationship between the variables:

To find the linear correlation coefficient, we use the formula 1.

$$r = \frac{Cov(x_i, y_i)}{\sqrt{Dx_i * Dy_i}}, \quad (1)$$

where, $Cov(x_i, y_i)$ – is the covariance of the values;

Dx_i, Dy_i – the variance of the same value.

To calculate the theoretical frequencies of the values of the dependent variables (y), we use the regression equation.

The regression equation is an equation that reflects the change in the average value of one attribute (y) depending on the second (x).

$$y = kx + b, \quad (2)$$

where, y – is the resulting feature;

x – is a factor sign;

k and b are the numerical parameters of the equation; the coefficient k in the regression equation is called the regression coefficient.

In almost every individual case, the quantity (y) is composed of two terms:

a) In table. 2 shows indicators of possible implementation at maximum load, taking into account discounts. It is also worth noting that the implementation of all the possibilities of the sanatorium, excluding discounts, will be 895,589.06 thousand rubles. This value will be used to predict the costs of the sanatorium at maximum load, as well as the adjusted monthly value for seasonal discounts to determine the maximum profit (Table 2).

Table 2. The Financial Result of the Sanatorium with the Maximum Load of Ai-Petri Sanatorium JSC for 2017.

Months	Potential sales without discounts	Potential sales with discounts	Kx Costs (variables)	Marginal income	Cost b (permanent)	Expenses Kx + b (general)	Potential profit
February	78873,13	55211,19	39830,93	15380,26	8744,46	48575,39	6635,80
March	78873,13	59154,84	39830,93	19323,92	8744,46	48575,39	10579,46
April	78873,13	59154,84	39830,93	19323,92	8744,46	48575,39	10579,46
May	78873,13	63098,50	39830,93	23267,57	8744,46	48575,39	14523,11
June	78873,13	67042,16	39830,93	27211,23	8744,46	48575,39	18466,77
July	78873,13	78873,13	39830,93	39042,20	8744,46	48575,39	30297,74
August	78873,13	74929,47	39830,93	35098,54	8744,46	48575,39	26354,08
September	78873,13	70985,81	39830,93	31154,89	8744,46	48575,39	22410,43
October	78873,13	63098,50	39830,93	23267,57	8744,46	48575,39	14523,11
November	78873,13	59154,84	39830,93	19323,92	8744,46	48575,39	10579,46
December	78873,13	55211,19	39830,93	15380,26	8744,46	48575,39	6635,80
January	78873,13	55211,19	39830,93	15380,26	8744,46	48575,39	6635,80
Total	946477,50	761125,66	477971,13	283154,53	104933,52	582904,64	178221,01

b) To understand the changing needs of the enterprise in resource provision at different periods of business activity, we determine the seasonal factors for months and the general indicator of seasonality. For this, methods of correlation and regression analysis will be used to identify the theoretical values of the load, which characterize

uniformity. By comparing the theoretical values with the actual values, we determine the seasonal factors of each month for 2017 (Table 3).

Table 3. Calculation of theoretical and actual revenue values for the months of Ai-Petri Sanatorium JSC for 2017.

Xi	Yi	x*y	x2	y2	YT
1	7662,0	7662,0	1,0	58705642,0	39504,8
2	16826,3	33652,5	4,0	283123249,9	38989,6
3	31128,6	93385,8	9,0	968989322,9	38474,4
4	41014,0	164056,1	16,0	1682150246,7	37959,2
5	70521,9	352609,3	25,0	4973331742,3	37443,9
6	78873,1	473238,8	36,0	6220969847,3	36928,7
7	72729,3	509105,3	49,0	5289554523,6	36413,5
8	39050,3	312402,1	64,0	1524922892,8	35898,2
9	27441,9	246976,8	81,0	753055817,5	35383,0
10	21453,5	214534,9	100,0	460252233,2	34867,8
11	21183,1	233013,7	121,0	448722363,8	34352,5
12	12169,0	146028,0	144,0	148084474,1	33837,3
78	440052,8	2786665,1	650,0	22811862356,0	440052,8

The resulting calculations will be placed in Table 4.

Table 4. The Financial Result of the Sanatorium with the Maximum Load of Ai-Petri Sanatorium JSC for 2017.

Xi	YT - Yi	(YT - Yi) 2	Seasonal activity (Sa)	Coefficient underload (Cu)
1	-31842,9	1013969457,3	0,19	$(1-Sa)^2=0,65$
2	-22163,3	491214020,0	0,43	0,32
3	-7345,8	53960621,3	0,81	0,04
4	3054,9	9332260,4	1,08	0,01
5	33077,9	1094149806,9	1,88	0,78
6	41944,4	1759336043,2	2,14	1,29
7	36315,9	1318842500,2	2,00	0,99
8	3152,0	9935363,5	1,09	0,01
9	-7941,1	63061464,6	0,78	0,05
10	-13414,3	179942501,4	0,62	0,15
11	-13169,5	173434530,3	0,62	0,15
12	-21668,3	469514935,4	0,36	0,41
78	0	6636693504,6	12	$4,48/12=0,40$

The business activity of the enterprise for the months of 2017 is characterized by seasonality indicators, where the highest values can be observed between May and October. The situation at the enterprise is such that the minimum need, for example, in labor resources is $(1 - Cu.) / (1 + Cu.) = 0,22$.

The correlation coefficient of x and y (r) has a negative value $(-0,08)$. The coefficient is greater than $(-0,30)$, which indicates a weak connection. $- (-6139,85)$; $- 11,92$ and $556221244,96$ respectively.

The regression equation has the form $y = -515,23x + 40020,08$ where the coefficients k is $(-515,23)$ and b is $40020,08$.

To increase the efficiency of enterprises in the recreational sector, it is necessary to search for ways to optimize resources following their business activity or to increase the volume of activities during the off-season. The obtained seasonality factors can be used to calculate the need for personnel, their training and determine the required minimum, which will be the object of investment in human capital (20%), as well as the minimum size of all working capital.

The above models show that it is necessary to provide some measures to improve the level of service through investment in human capital. It should be borne in mind that personnel at recreational enterprises are unevenly distributed both in terms of employment and goals, which means that activities should differ significantly for different groups of workers (Fig. 1).

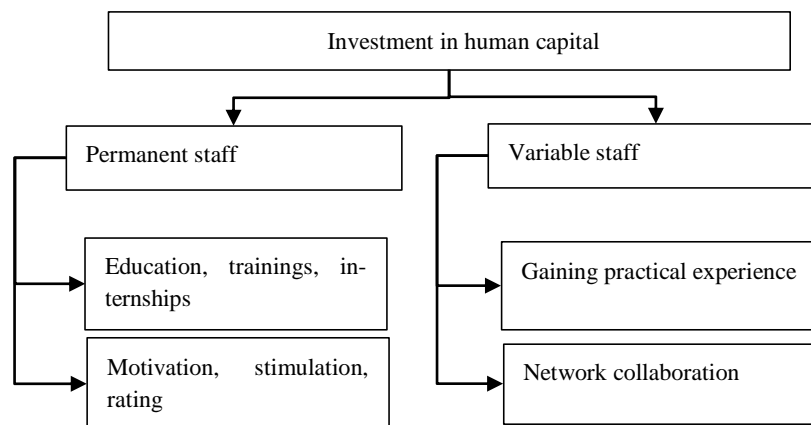


Fig. 1. Enterprise personnel management

3 Conclusions

Comparison of theoretical values with actual values allows us to conclude business activity in each month, and thereby establish the unrealized economic potential of the enterprise. An enterprise, as well as the others in its field, needs to look for ways to optimize resources according to sales during seasonal periods, which will improve the efficiency of using equity.

Seasonality factors must be used in calculating staffing requirements and training. So, it can be recommended to maintain a stable part of the staff not lower than 22% according to the minimum need - the costs of which can be directly attributed to variable costs. The presented methodology for assessing the minimum needs can be applied to all enterprises in this field of activity since seasonality is a common factor influencing sales and resource utilization, which ultimately affects the efficiency of enterprises.

The seasonal nature of capacity utilization is an essential factor holding back the movement towards the economic well-being of the enterprise. An overall seasonality coefficient for the year is obtained, which is 36%, which can be expressed as a difference in resource requirements of 64% during the year.

Based on the assessment of seasonal activity, more attention should be paid to issues of planning and forecasting the needs of enterprises in personnel and fixed assets, as well as in sales promotion based on the obtained seasonal factors [10; 11].

When planning the increase in the company's revenue and profit growth, an analysis of the variable costs of the enterprise is necessary, which was presented in the calculations when implementing the economic opportunities of enterprises.

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