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Full Length Research Paper

Measuring the marketing performances of state forest enterprises in Turkey

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Today, any enterprise has to consider marketing as important as production. Production and marketing are two complementary activities in enterprises. The increase in marketing effectiveness is achieved through measuring the activity outcomes that can be described as marketing performance. Because marketing is a social science and, therefore, determining the marketing performance system concretely, examining it and determining its principles may not be possible, a need for a new model was felt to represent the real system, and, consequently, a multi dimensional purpose-system model was developed. This model was applied in the eighty-nine state forest enterprises in Turkey which are branches of the General Directorate of Forestry and which are run on the principles of business enterprise. This study covers a limited period of time (1999 - 2003), and 41 variables were developed in order to measure the marketing performances of these enterprises. As a result of the statistical analyses, the total production area (TPA), total production costs (TPC), total number of the personnel working in the management unit (TNPWM), total growing stock (TGS), total investment amount (TIA), number of the assistant personnel separated from the management unit (NAPSM), distance to city center (DCC), total marketing/sale expenditure (TME), total management unit area (TMUA), total sales (TS), total forest area (TFA), total personnel expenditures (TPE), total production amount (TPAM) and total market priced product income (TMPPI) were found to be the most important marketing variables in the state forest enterprises. It was also found that the marketing performance could be explained 77.328% with the 14 variables that were used in this model.

Key words: Marketing performance, performance measurement, state forest enterprises.

INTRODUCTION

In today's world, marketing is one of the most complex practices used in management of enterprises. A major contributing factor to this complexity is the diverse perception of the notion of marketing by different management and business personnel. Following the developments in 1970's, it was argued whether marketing principles could be applicable for institutions other than for profit organizations; and the general applicability of the marketing discipline in management of enterprises was established (Kotler, 1979).

It is necessary to emphasize marketing operations at least as much as production operations, in order to foster the growth of economy and therefore increase the quality of life of the people. One of the responsibilities of the enterprise management is to deliver the products and services to their target consumers. Consequently, we

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Abbreviations: TPA, Total production area; **TPC**, total production costs; **TNPWM,** total number of the personnel working in the management unit; **TGS**, total growing stock; **TIA,** total investment amount; **NAPSM**, number of the assistant personnel separated from the management unit; **DCC,** distance to city center; **TME,** total marketing/sale expenditure; **TMUA,** total management unit area; **TS,** total sales; **TFA,** total forest area; **TPE,** total personnel expenditures; **TPAM,** total production amount; **TMPPI,** total market priced product income; **SFEs,** state forest enterprises; **GDF,** general directorate of forestry.

need to acknowledge that the production and marketing operations are fundamentally of equal importance in management of enterprises. No matter how big the demand is for its products and services, even if it is a monopoly in the market, an enterprise should regard marketing as valuable as production.

In addition to the ever increasing competition in the international markets, integration and conservation movements are affecting the enterprises, small and large alike. In this regard, conflicts within the business world could be viewed as clashes between marketing strategies. Therefore, it is easier for enterprises that have an edge on marketing to gain competitive advantage.

If we view production and marketing as activities that lead to economic profit, the importance of marketing performance becomes more pronounced. In this perspective, marketing is a profit making activity, just like production. The increasing importance given by enterprises to their marketing performance, complementary to their efforts in production performance, is an inescapable necessity.

It is misleading to evaluate an enterprise's performance via one-sided analyses. Especially, profitability should not be the single factor used in assessing the strength of an enterprise. Enterprise performance should be analyzed and evaluated through measurement systems that involve various factors and are based on fundamental efficiency metrics (Kaya, 1992).

Several methods have been developed in the literature for studying various aspects of performance (Buzzell and Chussil, 1985; Daşdemir, 1996; Bolak, 1987; Yolalan, 1996; Gülen, 1994). In summary, major techniques include ratio analysis and parametric as well as non-parametric mathematical programming techniques used in micro-economy. Many methods and models exist for measuring and monitoring enterprise performance (Bonoma and Clark, 1992; Torlak, 1991; Gross, 1984). In selecting the methods and models to use in a particular application, the scope and the aim of the application, as well as the availability and attainability of the required input data are among the main decisive factors.

Marketing and sales activities in enterprises are too numerous to enumerate. There are many internal and external factors that directly and indirectly impact these activities (Bucklin, 1978; Hulbert and Toy, 1977; Beik and Buzby, 1973; Kirpalani and Shapiro, 1973). We refer to these factors as variables. It is an invaluable asset for any manager or analyst to know which of these variables are effective in which directions and among many variables, which ones impact the marketing operations the most. Certain models are often used to characterize the relationships between these variables and reduce them to a smaller set. In other words, these models are used to reveal the correlations among the variables and filter them down to a more fundamental set.

In evaluating marketing performance, there are numerous advantages to using a model that can handle large number of variables and clearly expose all inter-variable relationships, compared to using a model that supports only a few variables. Most importantly, such effective models would reduce the time spent by managers and analysts for decision making and would improve the effectiveness of their decisions (Mossman et al., 1974; Dunne and Wolk, 1977; Sharma and Achabal, 1982; Jaworski, 1988).

In Turkey, where 99.9 % of the forests belong to the state and almost all of the forestry activities are carried out by the state through State Forest Enterprises (SFEs), the marketing performance of SFEs is deemed an important topic of study. In general, since they are under public ownership, SFEs perform activities in accordance with the structural properties as well as main goals and strategies of the national economy, sector, and geographic region in which they operate. Thus, we can view the goals of these enterprises as derivatives of the macro-economic and sector-wide goals, in light of regional characteristics. In this regard, considering the importance of marketing activities in enterprise management, and the existence of such activities in forest enterprises, there is a strong need for determining the performance levels of marketing activities in SFEs. Marketing performance of SFEs could be measured by establishing to what degree results from their activities match the aforementioned goals. Since each forest enterprise has a different combination of goals, various and numerous activities take place and hence many different benefits and outcomes are possible. In summary, the elimination of bottlenecks and dysfunctional elements within the forestry sector, and making it an overall successful sector, is first and foremost dependent on identifying a clear cut performance metric. Much benefit is expected from identifying such a metric for performance and utilizing it for evaluating enterprise performance.

Turkey, because of its natural, biological, socio-economic, political, etc. structure and parallel to this, due to the unique forestry organization structure, are living a series of bottlenecks in organizational structure, motivation, coordination and control (Geray, 1989, 1990). The most important reason for this is the definition for lack of success in forestry organizations, not established competition between enterprises and administrative environment and the lack of willpower for the necessary improvements according to the marketing performance measurement in this direction (Daşdemir, 1996).

Looking to the development of marketing concept in forest enterprises in Turkey, it is known that the marketing concept in forest enterprises has not yet completed the first phase of the evolutionary development known as production-oriented management (İlter and Ok, 2004).

Defining, evaluating and rewarding successful managers in several ways will bear competitive environment between businesses and managers in the marketing performance

of forestry businesses. This competition will provide effective usage of the allocated resources in the direction of forestry purposes, alternative development and multi-criteria decision making of the managers, process requests to the advanced planning, economics, marketing and forestry techniques and the development of contemporary understanding of forestry.

Marketing in forest enterprises is similar to marketing of agricultural and industrial products, and even to marketing of trade products, to some degree. Despite these similarities, there are various differences and many unique problems relating to marketing in the context of SFEs, since in Turkey all forests and associated marketing operations are carried out by the state. Consequently, marketing of forestry products in Turkey has so far been performed without following common marketing principles, due to socio-cultural and legal responsibilities of SFEs that prevent them from acting solely based on maximizing economic profit (Daşdemir, 1996).

Currently, in SFEs, profit or loss do not have administrative significance and the activities that govern the sales of forestry products, including marketing operations, are directed by the high level management. Given more freedom in their operations, SFEs could in fact increase their competitiveness, reduce production losses, improve customer relationships, and thus better satisfy customer demand through products that are targeted toward customer needs. Furthermore, autonomous SFEs could avoid employing excessive number of personnel, reduce their expenses, and as a result offer forestry products for less. In forest enterprises, determining economic, technical, administrative, and socio-economic variables that impact marketing performance at the micro and macro levels, and utilizing the understanding from the analysis of these variable to guide the decision making process to sustain an effective marketing performance is a major goal.

In this work, we employ the general marketing performance evaluation model that has been commonly utilized in the literature. The model in question has been specialized for the SFEs affiliated with the main office of forestry; and the variables that directly or indirectly impact marketing and sales operations in forest enterprises are established by means of a questionnaire.

Finding out the marketing performance variables is an important topic, and forms the basis of this study. For this purpose, a questionnaire was prepared, bearing in mind the following principles to determine the right set of marketing performance variables:

1. We developed a variety of general and technical variables, which have socio-economical properties, are marketing and sales oriented, suitable for multidimensional performance analysis, and expected to impact marketing performance.
2. We measured marketing operations of forest enterprises in reference to the main goals and strategies of the sector.
3. We measured some parts of the marketing operations using numerical variables and some other parts using variables that take the form of ratios.
4. We determined not only an effective set of variables, but also a set that includes variables that could be measured in a straightforward manner.

MATERIALS AND METHODS

In order to measure the marketing performance levels of SFEs, we prepared a questionnaire that has 27 questions (with 41 variables) and covers a 5 year period. The variables that directly or indirectly impact the marketing and sales performance of forest enterprises are determined with the help of this questionnaire. In this research, the questionnaires were distributed and the results were collected by mail.

At the time of this questionnaire, there were 217 Forest Enterprise Offices in Turkey. Among these, 89 of them completed the questionnaire in full, with a response rate of 41% (89/217). The model was put in its present form by applying it in the state forest enterprises operated by the General Directorate of Forestry (GDF), and, to do this, variables affecting the marketing and sales activities directly or indirectly were determined through a questionnaire. The questionnaire was administered to 62 of the 80 technical personnel working in the 89 state forest directorates in Turkey included in the study; 14 of the other related personnel, and to 4 academicians related to the topic, for a total of 80.

The names, the units of measurement, and the acronyms of the 41 marketing performance variables, which were determined to serve the aims of this study are shown in Table 1.

A multi-dimensional measurement model was used in this study in order to analyze simultaneously the many variables, which affect the marketing performance. In order to determine the most important performance variables and to measure the marketing performance as a single scale value, the following were taken into consideration:

1. The model consists of variables that represent the many performance dimensions of marketing activities of the enterprise (Bonoma and Clark, 1992; Eccles, 1991). In other words, special importance was given to using a lower internal correlation among the variables to be included in the model, and, therefore, it was ensured that each variable reflects a different aspect of marketing activities of the enterprise.
2. Special importance was given to include and weighting of consistent and easily quantified variables.
3. It was assumed that there was a linear correlation between the increasing levels of the variables and the marketing performance, and that the variables showed a normal distribution.
4. The model was developed so that it would enable the measurement of marketing performance with a value between 0 and 100.

The multi-dimensional purpose-system model (Bolak, 1987; Daşdemir, 1996; Ayyıldız, 2000), which was developed, to serve and to be suitable for the above-mentioned aims can be summarized as:

$$MP = a_1X_1 + \dots a_jX_j + \dots a_nX_n = \sum_{J=1} a_jX_j$$

Where, MP = marketing performance of enterprise (dependent variable); a_j = variable coefficients; X_j = independent variables in

Table 1. Marketing performance variables used in the study.

Number	Description	Units	Variable name
1	Distance to city center	Km	DCC
2	Establishment date	Year	ED
3	Number of management unit	Number	NMU
4	Distance of the depots to the market	Km	DDM
5	Total management unit area	Ha.	TMUA
6	Population of the management unit area	Number	PMUA
7	Population amount of forest villages in the management directorate	Number	PFVMD
8	Total production area	Ha.	TPA
9	Productive forest area	Ha.	PFA
10	Unproductive forest area	Ha.	UFA
11	Total forest area	Ha.	TFA
12	Productive growing stock	Ha.	PGS
13	Unproductive forest growing stock	Ha.	UFGS
14	Total growing stock	Ha.	TGS
15	Total annual allowable cut	m^3	TAAC
16	Total production amount	m^3	TPAM
17	Product amount, sold with market prices	m^3	PASMP
18	Product amount, sold out of the market prices	m^3	PASOMP
19	Planned production amount	m^3	PPA
20	Number of the technical personnel working in the management unit	Number	NTPWM
21		Number	NAPWM
22	Number of the assistant personnel working in the management unit	Number	TNPWM
23		Number	NTPSM
24	Total number of the personnel working in the management unit	Number	NAPSM
25		Number	TNPSM
26	Number of the technical personnel separated from the management unit	TL	TPC
27		m^3	ACSA
28	Number of the assistant personnel separated from the management unit	TL	TS
29	Total number of the personnel separated from the management unit	TL	TMPPI
30		TL	TOMPI
31	Total production costs	TL	AE
32	Average cycled stock amount	TL	TME
33	Total sales	TL	TMC
34	Total market priced product income	TL	TMR
35	Total out of market priced income	TL	TSR
36	Annually expenditures	TL	TIA
37	Total marketing/sale expenditure	TL	TPE
38	Total management capital	TL	BC
39	Total management richness	Number	NM
40	Total stationary richness	Number	ADC
41	Total investment amount	Number	NPT
	Total personnel expenditures		
	Benefit/cost		
	Number of the machines		
	Amounts of the development cooperatives		
	Number of the professional trainings		

the model; n = number of variables.

In order for the marketing performance (MP) to be measured as a value between 0 – 100: i) The variable values must be between (X_j), $0 \leq X_j \leq 100$; ii) the variable weightings must be between (a_j), $0 \leq a_j \leq 1$; iii) the sum of all variable weightings in the model must be 1. The need to measure the marketing performance between 0 - 100 requires the independent variables in the model to have the same characteristics. Therefore, the variables, which are measured by different units (TL, ha, %, m^2, etc) and in different intervals must be converted into new values varying between 0 - 100 before they are used in this model. Furthermore, the variables used in the model need to be suitably weighted. Then, step-by-step, answers are needed to the following questions:

(1) Which independent variables will be used in the model?
(2) How will the conversion of the variable values be done?
(3) How will the variable weights be calculated?

Once these questions are answered, the marketing performance measurement model in this study can be shown as:

$$MP = \sum_{j=1}^{n} a_j CX_j$$

Where, CX_j = Converted (normalized) variables.

In order to determine the levels and directions of the correlation among the 41 variables, and to check the significance of the correlation between the variables to be used in the MP model, correlation analyses were conducted and significance of the calculated correlation coefficients were checked using a t-test:

$$t_p = r \sqrt{N-2}/\sqrt{(1-r)^2}$$

Where, N is the sample size, p is the level of significance and N-2 is the *df* (Kalıpsız, 1981). For the calculation of critical correlation coefficients at a given level of significance, the following formula was used:

$$r = \sqrt{(t_p)^2}/(tp)^2 + (N-2).$$

For all the statistical analysis, SPSS, Release 9.0.0 was used. The critical r value was found to be 0.20765 at .95 level (0.27 at .99 level) of significance and df = 10 ($t_{0.05:87}$ = 1.98). Therefore, the correlation coefficients, which are higher than the critical r-value, are significant and meaningful. Correlation coefficients were evaluated together with the results of factor analyses, and therefore, the variable groups that will be represented by the most important variables to be used in the MP model were determined, and the correlations among variables were also evaluated.

Factor analyses were carried out to determine the most important performance variables to be used in the MP model. In doing so, it was decided to measure the same dimension of the enterprise with the most important variable instead of with more than one variable (Mucuk, 1978; Bennet and Bowers, 1977).

Finally, the model was applied to test the hypothesis of whether the marketing performances of state forest enterprises differ in terms of the variables chosen. The analyses were made in terms of 5 years' (1999 - 2003) average values in order to eliminate the possible effects of any given year on the choice of the variables to be used in the model.

RESULTS

Correlation analysis was performed to determine the pair-wise correlations among the 41 variables and to evaluate the strength of the correlations among the variables that will be used in the PP model. Since correlation analysis by itself is not sufficient to explain the relationships among the variables in full, the results from the correlation analysis were evaluated together with the results from the factor analysis. The variable groups represented by the variables to be used in the PP model were determined and the lack of strong correlations among the model variables was verified to ensure the success of the model. As a result, we find it useful to describe the results from factor analysis here.

Since in order to reduce the variables in the factor analysis variables were standardized, the variance of each variable is equal to 1 and the total variance is equal to 41, the number of variables. First fourteen factors, whose Eigen values are higher than 1, were taken as the basic factors by considering the contribution of each basic factor to the total variance.

According to the unconverted factor matrix, the first factor defines 14.07% of the total variance, the remaining thirteen other factors define 11.646, 8.081, 7.372, 6.445, 4.763, 4.055, 4.031, 3.062, 2.976, 2.856, 2.772, 2.645 and 2.554% of the total variance, respectively. 77.328% of the variance in MP is defined by the fourteen factors. Because there was both an excessive accumulation in the first factor and each value showed significant correlation with more than one factor (for example, the total production area (TPA), UFA and PASOMP variables have significant correlation with factors 1 and 2), the varimax method of orthogonal rotation was performed. The results obtained from the varimax rotation are presented in Table 2. Based on the results of the rotated factor analysis, variables chosen to represent each factor are shown in Table 3.

Whichever solution set (varimax, quartimax, etc) can be used to measure the marketing performance, because the level of effect or weight of each variable on the performance is not the same, it is necessary to determine these weights according to the aims of the enterprises. State forest enterprises in Turkey were established for several reasons. However, the importance and priorities of these reasons are yet to be determined. That the importance and priorities of these reasons have not been determined and weighted are important obstacles in measuring the performances of the enterprises. Therefore, the aims and priorities of the enterprises need to be determined. For this purpose, an additional questionnaire was administered to 80 people working within these enterprises.

Based on questionnaire results, the marketing sale-oriented objectives of the state forest enterprises were determined with regards to the percentage of preference according to order of importance. 1) Soil productivity; 2) nature protection; 3) cost minimization; 4) profitability; 5) employment; 6) collective service production.

Table 2. Factor-loading matrix after orthogonal rotation using varimax.

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11	Factor 12	Factor 13	Factor 14
DCC	-0.052	0.062	-0.206	-0.031	-0.060	0.078	0.727	-0.085	0.111	0.039	-0.078	-0.153	-0.096	-0.016
ED	0.205	-0.097	-0.329	-0.004	0.391	-0.082	0.202	-0.033	-0.200	0.477	0.232	-0.035	0.118	0.092
NMU	0.010	0.511	0.427	0.062	0.132	0.255	-0.149	0.127	0.360	-0.039	-0.005	0.133	0.111	-0.197
DDM	0.010	-0.024	0.176	-0.035	-0.049	-0.107	0.620	0.009	-0.130	-0.067	0.329	0.044	-0.104	0.187
TMUA	-0.010	0.015	-0.079	-0.026	0.003	-0.033	0.192	-0.066	0.727	-0.084	-0.035	-0.008	0.012	0.040
PMUA	0.132	-0.137	0.518	-0.031	-0.029	0.121	-0.117	-0.003	0.361	0.481	-0.146	0.093	-0.139	0.050
PFVMD	-0.039	-0.033	0.372	0.047	-0.011	0.139	-0.300	0.074	0.625	0.123	0.158	0.013	-0.049	0.022
TPA	0.997	-0.021	-0.031	-0.001	0.007	-0.017	-0.013	-0.002	-0.013	0.008	-0.003	-0.005	-0.011	-0.003
PFA	0.990	-0.025	-0.013	0.002	0.014	-0.026	-0.012	0.007	0.009	0.007	-0.003	0.001	0.002	0.002
UFA	0.997	-0.044	-0.030	-0.002	0.006	-0.014	-0.013	-0.006	-0.001	0.008	-0.001	-0.011	-0.006	0.003
TFA	0.006	0.109	-0.029	-0.018	-0.052	-0.032	-0.125	-0.040	-0.037	-0.093	-0.630	-0.042	-0.023	0.070
PGS	-0.002	-0.021	-0.024	0.998	-0.017	-0.028	-0.019	-0.001	0.001	-0.002	0.010	-0.008	-0.004	0.005
UFGS	-0.002	-0.020	-0.026	0.997	0.003	-0.030	-0.025	0.006	0.001	-0.012	-0.004	-0.012	-0.009	-0.004
TGS	-0.002	-0.012	-0.027	0.998	-0.015	-0.028	-0.022	-0.001	-0.002	-0.005	-0.002	-0.009	-0.005	0.005
TAAC	-0.086	0.583	0.132	-0.031	0.058	0.034	0.563	0.064	0.125	-0.085	0.172	-0.064	0.191	-0.083
TPAM	-0.015	0.115	-0.031	-0.024	-0.067	-0.094	-0.157	-0.046	-0.037	0.068	0.097	-0.054	0.801	0.021
PASMP	0.997	-0.009	-0.033	-0.002	0.004	-0.022	-0.010	-0.013	-0.012	0.011	0.003	-0.011	0.004	-0.002
PASOM	0.997	-0.020	-0.038	-0.002	0.002	-0.017	-0.014	-0.011	-0.011	0.012	0.005	-0.009	0.001	0.000
PPA	0.040	0.792	0.112	-0.062	0.074	0.015	0.367	0.066	0.060	0.045	-0.090	0.095	0.111	-0.073
NTPW	-0.023	0.091	0.622	-0.039	0.065	-0.016	0.007	-0.067	-0.131	-0.293	0.001	-0.082	0.020	0.002
NAPW	-0.065	0.091	0.840	-0.020	-0.002	0.277	0.019	0.005	0.080	0.068	0.042	0.013	-0.023	-0.010
TNPW	-0.073	0.077	0.858	-0.050	-0.002	0.193	0.021	0.015	0.074	0.074	0.068	-0.017	-0.014	-0.004
NTPSM	0.014	0.114	0.252	-0.058	0.099	0.850	-0.074	-0.031	0.012	0.014	-0.008	0.231	-0.014	0.085
NAPSM	-0.044	-0.030	0.046	-0.020	0.003	0.933	0.043	0.006	-0.009	-0.031	-0.031	-0.043	-0.014	-0.027
TNPSM	-0.054	0.079	0.250	-0.023	0.009	0.874	0.035	-0.087	0.066	0.036	0.031	-0.026	-0.027	-0.011
TPC	-0.026	0.814	0.013	0.013	0.078	-0.037	-0.013	0.072	-0.020	0.036	-0.111	0.050	-0.310	0.004
ACSA	-0.016	0.332	-0.067	-0.022	-0.106	-0.143	-0.239	-0.123	-0.065	0.079	0.342	-0.137	-0.497	-0.022
TS	-0.023	0.105	0.034	-0.015	-0.044	-0.009	-0.035	0.000	-0.029	0.695	0.069	-0.044	0.026	-0.016
TMPPI	-0.030	0.082	-0.152	-0.032	0.111	0.000	-0.083	-0.037	0.023	0.013	-0.029	-0.192	0.007	0.758
TOMPI	-0.079	0.807	0.029	-0.008	0.158	0.128	-0.065	-0.030	-0.041	-0.015	-0.011	-0.061	0.097	0.228

However, because the objectives do not have the same importance and weight, the variables to be used in the MP model will not have the same importance and weight. For this reason, the variables to be used in the MP model should be weighted.

At this stage, in order to determine the aims, which are served by the fourteen variables, further information was needed. The necessary information was obtained from technical personnel working in state forest enterprises. The following conclusions were made: TPA incorporates soil productivity

Table 2. Contd.

Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11	Factor 12	Factor 13	Factor 14
AE	-0.073	0.698	0.433	-0.028	0.025	0.081	0.009	0.156	-0.101	0.198	-0.181	0.133	-0.027	-0.021
TME	-0.008	0.093	-0.036	0.033	0.185	-0.030	-0.042	0.888	0.019	0.013	-0.009	-0.027	0.002	-0.048
TMC	-0.013	0.021	-0.005	-0.028	-0.070	-0.055	-0.008	0.903	-0.043	-0.022	0.027	0.000	-0.013	0.030
TMR	0.017	0.172	0.213	-0.005	0.841	0.012	-0.025	0.069	0.044	-0.030	-0.004	-0.018	-0.008	-0.093
TSR	-0.007	0.017	-0.032	-0.028	0.907	0.053	-0.058	0.031	-0.009	-0.039	-0.088	-0.047	-0.040	0.140
TIA	0.001	0.067	-0.066	0.005	0.954	0.031	0.004	0.020	-0.010	0.035	0.081	0.003	0.000	0.025
TPE	-0.034	0.008	-0.062	-0.026	0.016	-0.029	-0.037	-0.063	0.006	0.038	-0.079	0.763	-0.027	-0.090
BC	-0.037	0.008	-0.183	-0.049	0.032	-0.036	-0.216	-0.027	-0.035	0.000	0.047	-0.249	-0.028	-0.544
NM	-0.011	0.242	0.520	0.058	0.052	0.118	-0.035	-0.121	-0.020	0.342	-0.370	0.208	0.155	0.048
ADC	0.018	0.575	-0.105	-0.022	-0.142	-0.033	-0.143	-0.164	-0.023	-0.026	0.467	-0.053	0.160	0.045
NPT	0.002	0.138	0.112	-0.006	-0.152	0.281	-0.139	0.087	0.011	-0.141	0.241	0.593	0.025	0.163

and profitability; total production costs (TPC) incorporates profitability and cost minimization; total number of the personnel working in the management unit (TNPWM) incorporates profitability, employment and collective service production; total growing stock (TGS) incorporates profitability, soil productivity and nature protection; total investment amount (TIA) incorporates profitability and cost minimization; number of the assistant personnel separated from the management unit (NAPSM) incorporates cost minimization and employment; distance to city center (DCC) incorporates profitability and cost minimization; total marketing/sale expenditure (TME) incurporates cost minimization and profitability; total management unit area (TMUA) incorporates soil productivity and profitability; total sales (TS) incorporates soil productivity, cost minimization and profitability; total forest area (TFA) incurporates soil productivity, nature protection, collective service production and profitability; total personnel expenditures (TPE) incorporates cost minimization, profitability and employment; total production amount (TPAM) incorporates soil productivity and profitability and total market priced product income (TMPPI) incorporates only profitability.

The fourteen variables, which would be used in the MP model, are required to have the same scale, such that the marketing performance of the different enterprises could be measured in a scale between 0 - 100. Therefore, variables measured in different enterprises by using different scales and units required conversion derived by a linear normalization procedure.

The weighting of the variables were made with a logical method in terms of the characteristics of the study and in parallel to project objectives. First, the aims assigned to the fourteen variables were listed in order of importance (1 - 6). Second, the ordered aims were graded in descending value (6 - 1) (Table 4).

For statistical validity, the total of weights must equal to 1. In this context, the least important aim becomes 0.04762 (1/21 = 0.04762), as a result of the weighting of the above-mentioned aims out of 1. According to this calculation, the weighting of other aims are as follows: Soil productivity, 0.28570; nature protection, 0.23810; cost minimization, 0.19048; profitability, 0.14286; employment, 0.09524; collective service production, 0.04762. Upon the completion of the weighting of the aims in this way, the number of repetitions of each aim in each line is counted carefully. The point of each aim is divided by the number of repetitions and therefore, the amount of weight of each line is determined; and these amounts in each line are added to determine the weights of each variable.

For example, soil productivity is counted in 6 places. If 0.28570, the point of soil productivity, divided by 6, 0.047616 is obtained. Similarly, for nature protection this value is 0.2381/2 = 0.11905. For profitability this value is 0.14286/13 = 0.010989. As the whole aims to which the TGS variable serves are calculated, the weight of TGS variable becomes 0.177655 (0.047616 + 0.11905 + 0.010989). Similar calculations were made for the other variables and the variable weights (variable coefficients) obtained out of 1 were found to be as

Table 3. The chosen variables concerning each solution in the MP model.

Factors	Varimax
Factor 1	TPA
Factor 2	TPC
Factor 3	TNPWM
Factor 4	TGS
Factor 5	TIA
Factor 6	NAPSM
Factor 7	DCC
Factor 8	TME
Factor 9	TMUA
Factor 10	TS
Factor 11	TFA
Factor 12	TPE
Factor 13	TPAM
Factor 14	TMPPI

follows:

TPA =0.047616 + 0.010989 = 0.058605; TPC = 0.0272 + 0.010989 = 0.038189; TNPWM = 0.010989 + 0.031746 + 0.02381 = 0.066545; TGS = 0.047616 + 0.11905 + 0.010989 = 0.177655; TIA = 0.0272 + 0.010989 = 0.038189; NAPSM = 0.0272 + 0.031746 = 0.058946; DCC = 0.0272 + 0.010989 = 0.038189; TME = 0.0272 + 0.010989 = 0.038189; TMUA = 0.047616 + 0.010989 = 0.058605; TS = 0.047616 + 0.0272 + 0.010989 = 0.085805; TFA = 0.047616 + 0.11905 + 0.02381 + 0.010989 = 0.201465; TPE = 0.0272 + 0.010989 + 0.031746 = 0.069935; TPAM = 0.047616 + 0.010989 = 0.058605; TMPPI = 0.010989 = 0.010989.

Based on these calculations, the MP model can be formed as follows:

MP = 0.058605*TPA + 0.038189*TPC + 0.066545*TNPWM + 0.177655*TGS + 0.038189*TIA + 0.058946*NAPSM + 0.038189*DCC + 0.038189*TME + 0.058605*TMUA + 0.085805*TS + 0.201465*TFA + 0.069935*TPE + 0.058605*TPAM + 0.010989*TMPPI

If the normalized variable values are placed in the formula, the marketing performance of, for example, the state forest enterprise in the city of Pozantı can be calculated as follows:

$MP_{Pozantı}$ = 0.058605*TPA + 0.038189*TPC + 0.066545*TNPWM + 0.177655*TGS + 0.038189*TIA + 0.058946*NAPSM + 0.038189*DCC + 0.038189*TME + 0.058605*TMUA + 0.085805*TS + 0.201465*TFA + 0.069935*TPE + 0.058605*TPAM + 0.010989*TMPPI
Where, $MP_{Pozantı}$ = 28.79.

Table 4. The weighting of variables according to objectives.

Aim order no.	Name of aim	Points
1	Soil productivity	6
2	Nature protection	5
3	Cost minimization	4
4	Profitability	3
5	Employment	2
6	Collective service production	1
Total		21

Similar calculations were made for the enterprises in the other cities, and the levels of marketing performances out of 100 were found to be as shown in Table 5.

The MP model aims to measure the marketing performance of an enterprise on a scale between 0 - 100. This allows us to compare the enterprises in the same time period, to see how good or bad a condition an enterprise is in comparison with others, to know how far one enterprise is from the ideal level of marketing performance (100), and to observe the development of each enterprise over time.

A sensitivity analysis was carried out to test the results, and it was found that the ordering of aims determined for the state forest enterprises has an effect on the marketing performances of the state forest enterprises.

DISCUSSION

Being in the public ownership, the state forest enterprises activate in terms of the structural characteristics of their national economy, sector, and region and in terms of their main aim and strategies. In this context, the state forest enterprise operates on the basis of commercial principles, that is, enterprises that produce goods for sale and carry out marketing activities. Considering the importance of marketing for the enterprises, it is obvious that the determination of the performance levels of these activities is necessary. On the other hand, performance can be determined by measuring how many of the specified aims have been realized based on the figures obtained within an enterprise. This study, determines the marketing performance levels of several state forest enterprises in Turkey. The marketing performance measurements were made based on an understanding of a multi dimensional system and by considering the country-sector-region-enterprise aims. Through utilization of correlation and factor analysis techniques, the most important variables were determined from among the 41 variables that were determined by the technical personnel in the state forest enterprises studied, and then by weighting these variables in terms of country-sector-region-enterprise aims, their marketing performance levels were measured by using

Table 5. The levels of marketing performances of state forest enterprises in terms of Varimax.

S/N	Name of enterprise	Level of marketing performance	No	Name of enterprise	Level of marketing performance	No	Name of enterprise	Level of marketing performance (in order)	No	Name of enterprise	Level of marketing performance (in order)
1	Pozantı	28.79	46	Akkuş	27.95	1	Köyceğiz	50.73	46	Tosya	29.43
2	Saimbeyli	33.69	47	Dereli	28.26	2	Geyve	47.12	47	Mut	29.39
3	Yahyalı	33.92	48	Mesudiye	30.03	3	Sivas	38.8	48	Korkuteli	29.38
4	Geyve	47.12	49	Burdur	28.13	4	Hakkari	38.36	49	Kavaklıdere	29.36
5	Hendek	30.44	50	Çatalca	25.75	5	Tarsus	36.95	50	İnegöl	29.33
6	Karasu	28.58	51	Demirköy	26.92	6	Diyarbakır	36.26	51	Karadere	29.32
7	Gölcük	31.37	52	İstanbul	31.70	7	Yılanlı	36.21	52	Oltu	29.27
8	Bafra	30.60	53	Vize	31.91	8	Yahyalı	33.92	53	Aladağ	29.27
9	Kargı	31.38	54	İzmir	25.60	9	Saimbeyli	33.69	54	Mengen	29.26
10	Tokat	30.19	55	Kilis	29.71	10	Sındırgı	32.95	55	Cide	29.2
11	Sivas	38.80	56	Adıyaman	25.32	11	Göynük	32.62	56	Daday	29.2
12	Ilgaz	29.49	57	Araç	26.40	12	Gündoğmuş	32.6	57	Kastamonu	29.2
13	Nallıhan	31.17	58	Azdavay	29.43	13	Ünye	32.27	58	Maçka	29.13
14	Elmalı	30.13	59	Cide	29.20	14	Finike	32.18	59	Yusufeli	29.09
15	Finike	32.18	60	Daday	29.20	15	Bandırma	32.16	60	Bozkurt	29.01
16	Gazipaşa	30.78	61	Kastamonu	29.20	16	Vize	31.91	61	Keles	28.99
17	Gündoğmuş	32.60	62	Çatalzeytin	29.69	17	Akçakoca	31.87	62	Anamur	28.79
18	Korkuteli	29.38	63	İhsangazi	29.46	18	İstanbul	31.7	63	Pozantı	28.79
19	Manavgat	26.44	64	İnebolu	30.09	19	Ş. karahisar	31.38	64	Ayancık	28.65
20	Taşağıl	29.51	65	Küre	29.69	20	Kargı	31.38	65	Düzce	28.62
21	Yusufeli	29.09	66	Tosya	29.43	21	Gölcük	31.37	66	Karasu	28.58
22	Bandırma	32.16	67	Samatlar	30.35	22	Nallıhan	31.17	67	Pınarbaşı	28.47
23	Dursunbey	27.83	68	Pınarbaşı	28.47	23	Rize	30.87	68	Bayramiç	28.43
24	Edremit	29.44	69	Bozkurt	29.01	24	Pazar	30.83	69	Dereli	28.26
25	Sındırgı	32.95	70	Karadere	29.32	25	Gazipaşa	30.78	70	Ordu	28.14

the multi dimensional system model (the MP model).

In order to eliminate the possible effects of data of any given year, the average values of the variables in five years (1999 - 2003) were used. By using factor analysis and rotation techniques, the TPA, TPC, TNPWM, TGS, TIA, NAPSM, DCC, TME, TMUA, TS, TFA, TPE, TPAM and TMPPI were found to be the most important marketing performance variables, which could represent more than one variable. The 41 variables can be represented by the 14 variables above with a loss of data of as little as 22.672%.

The marketing selling-oriented aims of the state forest enterprises which were considered in the scope of national and sectoral aims and of the general and socio-economic characteristics of the region were determined in terms of order of importance as follows: 1) Soil productivity, 2) nature protection, 3) cost minimization, 4) profitability, 5) employment and 6) collective service production.

Table 5. The levels of marketing performances of state forest enterprises in terms of Varimax.

S/N	Name of enterprise	Level of marketing performance	No	Name of enterprise	Level of marketing performance	No	Name of enterprise	Level of marketing performance (in order)	No	Name of enterprise	Level of marketing performance (in order)
1	Pozantı	28.79	46	Akkuş	27.95	1	Köyceğiz	50.73	46	Tosya	29.43
2	Saimbeyli	33.69	47	Dereli	28.26	2	Geyve	47.12	47	Mut	29.39
3	Yahyalı	33.92	48	Mesudiye	30.03	3	Sivas	38.8	48	Korkuteli	29.38
4	Geyve	47.12	49	Burdur	28.13	4	Hakkari	38.36	49	Kavaklıdere	29.36
5	Hendek	30.44	50	Çatalca	25.75	5	Tarsus	36.95	50	İnegöl	29.33
6	Karasu	28.58	51	Demirköy	26.92	6	Diyarbakır	36.26	51	Karadere	29.32
7	Gölcük	31.37	52	İstanbul	31.70	7	Yılanlı	36.21	52	Oltu	29.27
8	Bafra	30.60	53	Vize	31.91	8	Yahyalı	33.92	53	Aladağ	29.27
9	Kargı	31.38	54	İzmir	25.60	9	Saimbeyli	33.69	54	Mengen	29.26
10	Tokat	30.19	55	Kilis	29.71	10	Sındırgı	32.95	55	Cide	29.2
11	Sivas	38.80	56	Adıyaman	25.32	11	Göynük	32.62	56	Daday	29.2
12	Ilgaz	29.49	57	Araç	26.40	12	Gündoğmuş	32.6	57	Kastamonu	29.2
13	Nallıhan	31.17	58	Azdavay	29.43	13	Ünye	32.27	58	Maçka	29.13
14	Elmalı	30.13	59	Cide	29.20	14	Finike	32.18	59	Yusufeli	29.09
15	Finike	32.18	60	Daday	29.20	15	Bandırma	32.16	60	Bozkurt	29.01
16	Gazipaşa	30.78	61	Kastamonu	29.20	16	Vize	31.91	61	Keles	28.99
17	Gündoğmuş	32.60	62	Çatalzeytin	29.69	17	Akçakoca	31.87	62	Anamur	28.79
18	Korkuteli	29.38	63	İhsangazi	29.46	18	İstanbul	31.7	63	Pozantı	28.79
19	Manavgat	26.44	64	İnebolu	30.09	19	Ş. karahisar	31.38	64	Ayancık	28.65
20	Taşağıl	29.51	65	Küre	29.69	20	Kargı	31.38	65	Düzce	28.62
21	Yusufeli	29.09	66	Tosya	29.43	21	Gölcük	31.37	66	Karasu	28.58
22	Bandırma	32.16	67	Samatlar	30.35	22	Nallıhan	31.17	67	Pınarbaşı	28.47
23	Dursunbey	27.83	68	Pınarbaşı	28.47	23	Rize	30.87	68	Bayramiç	28.43
24	Edremit	29.44	69	Bozkurt	29.01	24	Pazar	30.83	69	Dereli	28.26
25	Sındırgı	32.95	70	Karadere	29.32	25	Gazipaşa	30.78	70	Ordu	28.14

The aims to which the variables, which were reduced to 14 by using correlation and factor analysis, were determined with the help of the technical personnel in the state forest enterprises as follows: TPA involves the aims of soil productivity and profitability; TPC involves the aims of profitability and cost minimization; TNPWM involves the aims of profitability, employment and collective service production; TGS involves the aims of profitability, soil productivity and nature protection; TIA involves the aims of profitability and cost minimization; NAPSM involves the aims of cost minimization and employment; DCC involves the aims of profitability and cost minimi-zation; TME involves the aims of cost minimization and profit-ability; TMUA involves the aims of soil productivity and profitability; TS involves the aims of soil productivity, cost minimization and profitability; TFA involves the aims of soil productivity, nature protection, collective service production and profit-ability; TPE involves the aims of cost minimization,

profitability and employment; TPAM involves the aims of soil productivity and profitability and TMPPI involves only the aim of profitability.

In order to measure the marketing performance of the enterprise on a 0-100 scale by using the MP model, the variables which were based on ha, m^2, %, TL etc. had to be converted into the same scale. In order to do this, the linear normalization method was used. This allows us to compare the enterprises in the same time period, to see how good or bad a condition an enterprise is in comparison with others, to know how far one enterprise is from the ideal level of marketing performance (100), and to observe the development of each enterprise over time.

According to the results obtained through Varimax method and based on the data above, the enterprises were listed from the highest to the lowest in terms of their levels of marketing performance as follows: Köyceğiz (50.73), Geyve (47.12), Sivas (38.8), Hakkari (38.36), Tarsus (36.95), Diyarbakır (36.26), Yılanlı (36.21), Yahyalı (33.92), Saimbeyli (33.69), Sındırgı (32.95), Göynük (32.62), Gündoğmuş (32.6), Ünye (32.27), Finike (32.18), Bandırma (32.16), Vize (31.91), Akçakoca (31.87), İstanbul (31.7), Şebinkarahisar (31.38), Kargı (31.38), Gölcük (31.37), Nallıhan (31.17), Rize (30.87), Pazar (30.83), Gazipaşa (30.78), Bafra (30.6), Emet (30.57), Hendek (30.44), Samatlar (30.35), Tokat (30.19), Çatacık (30.17), Elmalı (30.13), Seben (30.11), İnebolu (30.09), Mesudiye (30.03), Sürmene (29.73), Kilis (29.71), Çatalzeytin (29.69), Küre (29.69), Fethiye (29.68), Taşağıl (29.51), Ilgaz (29.49), İhsangazi (29.46), Edremit (29.44), Azdavay (29.43), Tosya (29.43), Mut (29.39), Korkuteli (29.38), Kavaklıdere (29.36), İnegöl (29.33), Karadere (29.32), Oltu (29.27), Aladağ (29.27), Mengen (29.26), Cide (29.2), Daday (29.2), Kastamonu (29.2), Maçka (29.13), Yusufeli (29.09), Bozkurt (29.01), Keles (28.99), Anamur (28.79), Pozantı (28.79), Ayancık (28.65), Düzce (28.62), Karasu (28.58), Pınarbaşı (28.47), Bayramiç (28.43), Dereli (28.26), Ordu (28.14), Burdur (28.13), Sinop (28.11), Karadenizereğli (28.03), Trabzon (28), Akkuş (27.95), Dursunbey (27.83), Tirebolu (27.67), Eskere (27.56), Türkeli (27.48), Demirköy (26.92), Bozyazı (26.58), Manavgat (26.44), Araç (26.4), Çatalca (25.75), İzmir (25.6), Adıyaman (25.32), Çanakkale (24.51), Denizli (23.24) and Gediz (22.75). If we consider that enterprises which have a performance level of 50 and above have a high level of performance, there is only one enterprise whose marketing performance can be considered high which is Köyceğiz (50.73). Other enterprises have been considered unsuccessful.

In order to test the results, a sensitivity analysis was made and the results of the sensitivity analysis showed that the ordering of aims that were determined for the state forest enterprises has been effective on the marketing performances of the state forest enterprises. Therefore, in the enterprises where ordering of aims have not been made, the aims and order of the aims should be determined very carefully when determining, ordering the aims and when measuring the performance. Obtaining a lower performance indicates that the enterprises do not operate according to their main aims and strategies. This indicates that the enterprises have no productive marketing activities, and that it has a negative effect on the interests of the enterprises and interest groups and of the public.

The main goal of this work was to put the management behavior of private entrepreneurs into the state forest managements (that is, the ownership and management condition of the state) measured by the marketing performances. Motivation is the key point of this contribution. Identifying the forest enterprises according to the specifications within their location and country, determination of the most important performance variables, comparison of the forest enterprises according to the level of business performance, creation of a positive competition between managers and businesses by performance evaluation, providing autonomy to the forest enterprises and the establishment of working system with contributions, etc. are also studied in this work.

These results show that the marketing performance of the State Forest enterprises administration is low and very few managers are working willingly, fully, efficiently and economically. The reason for this is thought to be the un-premium working and this could be solved with a fair premium working system. The enterprises and managers will compete with each other in making their businesses successful and to gain premium in the premium working system. To be the successful business manager, it is important to eliminate the preventing factors by using the modern business requirements like autonomy. In summary, marketing performance measurement, premium work and autonomy are very important for Turkish forestry success.

Definition and assessment deficiencies of marketing performance of the state forest enterprises will cause competition failure between and within the enterprises and their personnel. This kind of competition failure obstructs the advanced planning, development of the modern forestry understandings, request to the operational, economic and alternative forestry techniques and the effective usage of the allocated sources which are given to the enterprises in the frame of macroeconomic targets, sectoral and regional goals.

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