

Full Length Research Paper

Investigation of the efficiency of the furniture industry in Turkey

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The development of a country depends on the efficiency of the production in each sector. The efficiency in the sector is brought about mostly by the use of modern technology and effective management techniques. Prior to the establishment of an organization, it is necessary to know whether it will be economically viable, the cost of the facilities and the goods to be produced, and possibility of making profit from the sales. The companies manufacturing woodworks and furniture maintain their activities under the restrictions imposed by the price, quality, time, production capacity, raw materials. Therefore, before starting production activities, it is necessary to determine where and how production will be carried out and what will be produced, the amount of the goods to be produced, and the time of production. For this purpose, the managements of the organizations manufacturing woodworks and furniture should make production planning in advance, and make effective and efficient use of the resources. It is of great importance to determine the performances of the organizations manufacturing woodworks-furniture for both the management of the organization and investors. However, it is not possible to evaluate the performance of the organization based on a single criterion. Organizations have various functions and objectives concerning different time periods and different managerial levels and hence, having different input and output combinations. An organization having a wonderful short-term performance may exhibit a bad performance in the long-term due to erroneous marketing strategies. Therefore, efficiency measurements are of vital importance for the organization. The study aims is to investigate the ways of bringing these factors together by using appropriate methods in a timely manner and using them in an effective way.

Key words: Furniture production, efficiency, regression, correlation, turnover.

INTRODUCTION

Production is a human activity resulting from the nature's being inadequate in meeting the needs of people. The societies where little production occurs are generally primitive societies and they are mostly satisfied with the blessings of the nature and their needs develop very slowly (Ilhan, 1989:6).

The production is usually made in a physical plant called factory. A factory is an investment unity where a huge amount of capital and labor are turned into long-term continuous production (Aklin et al., 2003:141). For an investment to be economical and long-term, the planned objectives should be realized. And this is only possible if the factory is efficient, productive, and equipped with appropriate technology that will not be obsolete for a long time. All of these objectives can be

attained through the gains of modern production planning (Alpar, 2003:83).

For organizations, production is the basic function and of vital importance. Organizations serve the function of producing services or goods from certain raw materials to satisfy various needs of people. This is the main purpose of production. On the other hand, organizations bring many benefits to the society by opening new job opportunities and reducing the inflation. In this way, they make great contributions to the well-being of the society (Aktepe, 2004: 106). When the production is considered as the outputs to meet human needs, then production factors come into being (Can et.al., 1994:15).

As the objective of organizations is to make long-term profits, the main reason behind the establishment of the

organization is to profit. However, making profit can not be the only factor for deciding to establish an organization. In addition to this, one or more of the following reasons can be influential in investors' deciding to set up an organization (Alpugan et al., 1990:84, 85).

The entrepreneurs having the idea of establishing an organization will first need to conduct some research to determine where the plant will be established and what it will produce. Regardless of the type of the organization, either being small or large-scale, there are some works to be done in the process of establishment (Cemalciler et al., 1976: 10-14).

Though establishing an organization in a certain sector may seem to be profitable at first, after the establishment processes are completed, it becomes very difficult to retreat and the entrepreneur should take the risk of all the expenditures (Alpugan et al., 1990:84). But, if the necessary research is conducted before investments are made, it is possible to retreat with less loss of time and money. In this way, limited resources can also be used more efficiently and better service is given to the society (Aktepe, 2004: 132).

Organizations should be able to predict the demand for their goods. Therefore, demand predictions should be available to make the planning of the production activities. Production planning is impossible without having information about what, how and how much will be produced. Hence, systematic market research should be performed first to determine the amount to be produced, required raw materials, arrange all the production-related factors and in this way, to provide goods with good price and quality (Aktepe, 2004: 132).

MATERIALS AND METHODS

The literature review revealed that there is paucity of research dealing with the efficiency of the existing furniture companies. The relationship between the input and output in the furniture industry has not been evaluated so far. Therefore, the present study aims to investigate the efficiency of the furniture organizations and sector with a survey to be administered to small-, medium- and large-scale furniture organizations. The principal aim of the present study is to determine the factors affecting the profitability and export performance of the furniture industry.

Materials

Though the small-scale, workshop type organizations dominate the furniture sector, rapid increase has been observed in the number of the medium- and large-scale organizations in the last 1 - 20 years. In Turkey, the cities where furniture production activities are intense, there are Istanbul, Ankara, Bursa, Izmir, Kayseri, Bolu, Eskisehir, Sakarya, Zonguldak, Balikesir, Trabzon, Antalya and Adana.

According to Turkish Statistical Institute's 2003 general census of industrial and business organizations, the number of the officially registered organizations is 29,346. The number of the retail sellers is 32,382. When the organizations registered, the chambers of industry and commerce are included, the number of the registered organizations reach 65,000. Only 100 of these organizations are

large-scale factories.

The reasons for the selection organizations operating in the furniture sector as the survey area of the present study are listed below:

- (ii) The importance of furniture industry has increased in this century and it is expected to increase more in the future,
- (i) Furniture industry realized the 1% of all the export in the year 2007; that is, 850 million dollars of the total 85 billion dollars and its contribution is expected to increase in the future,
- (iii) Furniture sector has positive contributions to the development of other related sectors,
- (iv) Firms operating in furniture sector believe that such studies will be great contribution to the sector.
- (v) As there is no study looking at the activities taking place in this sector, the findings of the present study are believed to provide some guidance to the related firms and individuals.

Method

In the study, as a data collection tool "survey method" was used. In the questionnaire, there are questions concerning the inputs (raw materials, semi-processed and processed materials, labor, amount of the investment in machinery, the capital of the organization etc.), the production planning, machine and instruments used in the production and their compliance with the current technology, opinions of the organizations about the importance attached to quality and the outputs (the amount of the furniture produced, total revenue, profit, export, etc.).

The data collected concern the 2008 operations of the organizations. The administration of the questionnaire was not limited to one city to have a high level of objectivity and to get more generalizable results. The questionnaire was administered to 1028 organizations in 68 cities. 93% of the 1028 organizations are large-scale organizations and this means a representation ratio of 93% for the large-scale organizations. While the sampling of the study was determined, first large-scale organizations were included and the rest of the sampling was randomly assigned.

The questionnaire was administered through face-to-face interview method in 1000 of the organizations. 50 organizations participated in the study through questionnaires sent via e-mail, but only 28 of them were returned. One questionnaire was administered to each organization and filled in by managers or supervisors. Two types of analyses were used in the present study, one being regression analysis and the other correlation analysis.

Evaluation of the results of regression and correlation analyses

Regression analysis allows making predictions for the future based on the present evidence. Regression analysis enables us to develop prediction equality by using the relationship between the dependent and independent variables and linear curve concept. After the relations have been determined, as the score for independent variable(s) is (are) known, the score for the dependent variable can be predicted (Kose, 2008:2). Regression analysis, the most widely known parametric activity measurement method, aims to determine the causal structure of the relationship between the dependent and independent variables which are known to have cause and affect relationships (Hays, 1973:676).

Today, the term of regression is used to explain the statistical relations between the variables. Regression is a functional expression of the average relationship between the dependent and independent variables. The purpose of the regression analysis is to determine the relationship between the dependent and independent variables by revealing the equation that will best represent this

Table 1. Correlation among the annual financial turnover, mean capacity, total annual wages of the employees, closed area of the organization, open area of the organization, amount of investment in machinery, raw materials used annually, and cost of semi- processed and processed materials, capital of the organization.

	Y ₁	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇
Y ₁	1							
X ₁	0.313 ^{***}	1						
X ₂	0.967 [*]	0.329 ^{***}	1					
X ₃	0.851 [*]	0.316 ^{***}	0.844 [*]	1				
X ₄	0.484 ^{***}	0.162 ^{***}	0.454 ^{***}	0.717 ^{**}	1			
X ₅	0.882 [*]	0.347 ^{***}	0.905 [*]	0.827 [*]	0.470 ^{***}	1		
X ₆	0.997 [*]	0.305 ^{***}	0.956 [*]	0.848 [*]	0.485 ^{***}	0.870 [*]	1	
X ₇	0.974 [*]	0.316 ^{***}	0.994 [*]	0.835 [*]	0.461 ^{***}	0.896 [*]	0.964 [*]	1

***Weak correlation **Medium correlation *Strong correlation.

relationship. Mathematical function formed to show the relationship between the variables not only shows the functional form of the relationship but also allows making predictions (Ayhan, 2006: 5). The method used to determine the degree, direction and significance of the correlative relationship between two or more variables is called correlation (Ozdamar, 2004: 527).

Coefficient of determination is the best measurement of goodness of fit of the linear model. This coefficient shows to what extent the change taking place in the dependent variable is accounted for by independent variable or variables. This is a good indication of the explanatory power of the regression model (Akgul, 2003: 22). Correlation coefficient (R) is the measurement of the relationship between two variables and ranges between -1 and +1 (Kose, 2008: 1). The following definitions are given for the power of correlation coefficient (Alpar, 2003):

- (i) 0.00 – 0.49 Weak correlation,
- (ii) 0.50 – 0.74 Medium correlation,
- (ii) 0.75 – 1.00 Strong correlation.

In this section, findings derived from the data collected from the furniture producing companies for the sub-problems of the present study, the table showing the results of regression and correlation analyses in line with the order of sub-problems, and their interpretations are presented.

The coefficient of determination between the annual financial turnover and the other independent variables (mean capacity, total annual wages of the employees, closed area of the organization, open area of the organization, amount of investment in machinery, cost of annually used raw materials, semi- processed and processed materials, capital of the organization) is R²=0.996. Nearly 99.6% of the annual financial turnover varies depending on seven independent variables. As the significance level is 0, there is a significant relationship among them. Regression Equation is;

$$y_1 = -166927 + 2063.77x_1 + 0.662x_2 - 5.000x_3 + 1.043x_4 + 0.397x_5 + 1.642x_6 + 8264.283x_7.$$

Where,

- Dependent variable (y₁) : Annual financial turnover,
- Independent variable (x₁) : Capacity utilization ratio,
- Independent variable (x₂) : Total annual wages of the employees,
- Independent variable (x₃) : Closed area of the organization (m²),
- Independent variable (x₄) : Open area of the organization (m²),
- Independent variable (x₅) : Amount of investment in machinery,
- Independent variable (x₆) : Cost of materials used annually,
- Independent variable (x₇) : Capital of the organization.

In order to obtain information about the direction and power of the relationship found between the dependent and independent variables with regression analysis, correlation analysis was carried out in Table 1.

The coefficient of determination among cost of annually used raw materials, semi-processed and processed inputs, annual profit, annual financial turnover, annual expenditures for research and development, total annual wages of employees, capacity utilization ratio, amount of investment in machinery, credit used by the organization and operating period was found to be R²=0.997. Nearly 99.7% of the annual cost of raw materials, semi-processed and processed inputs varies depending on eight variables. Regression Equation is;

$$y_2 = 62413.48 - 0.239x_1 + 0.570x_2 - 0.534x_3 - 0.162x_4 - 1196.52x_5 - 0.300x_6 + 0.707x_7 - 2856.98x_8$$

Where,

- Dependent variable (y₂) : Cost of annually used materials input
- Independent variable (x₁) : Annual profit
- Independent variable (x₂) : Annual financial turnover
- Independent variable (x₃) : Annual expenditure for research and development
- Independent variable (x₄) : Total annual wages of the employees
- Independent variable (x₅) : Capacity utilization ratio
- Independent variable (x₆) : Investment in machinery
- Independent variable (x₇) : Credit used by the organization
- Independent variable (x₈) : Operating period of the organization.

When Table 2 is examined, it is seen that the correlation between the annual expenditure for research and development and operating period of the organization is R = -0.016 and the correlation between the credit used by the organization and operating period of the organization is R = -0.005 and there is reverse correlation between them.

The coefficient of determination between the annual financial turnover and education level of the workers is R²=0.951. Nearly, 95.1% of the annual financial turnover varies depending on the education level of the workers. The regression equation is;

$$y_1 = -239383 + 165118.5x_1 + 35397.37x_2 + 68576.84x_3 + 88107.73x_4 + 79424.9x_5 + 74481.54x_6.$$

Where,

- Dependent variable (y₁) : Annual financial turnover
- Independent variable (x₁) : The number of university graduates

Table 2. The correlation between the costs of annually used raw materials, semi-processed and processed materials input and eight independent variables.

	Y ₂	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈
Y ₂	1								
X ₁	0.973 [*]	1							
X ₂	0.997 [*]	0.983 [*]	1						
X ₃	0.363 ^{***}	0.369 ^{***}	0.372 ^{***}	1					
X ₄	0.956 [*]	0.970 [*]	0.967 [*]	0.444 ^{***}	1				
X ₅	0.305 ^{***}	0.305 ^{***}	0.313 ^{***}	0.125 ^{***}	0.329 ^{***}	1			
X ₆	0.870 [*]	0.892 [*]	0.882 [*]	0.334 ^{***}	0.905 [*]	0.347 ^{***}	1		
X ₇	0.437 ^{***}	0.327 ^{***}	0.394 ^{***}	0.086 ^{***}	0.328 ^{***}	0.105 ^{***}	0.373 ^{***}	1	
X ₈	0.034 ^{***}	0.039 ^{***}	0.037 ^{***}	-0.016	0.038 ^{***}	0.025 ^{***}	0.049 ^{***}	-0.004	1

Independent variable (x₂) : The number of two-year degree program graduates

Independent variable (x₃) : The number of vocational high school graduates

Independent variable (x₄) : The number of high school graduates

Independent variable (x₅) : The number of apprenticeship education graduates

Independent variable (x₆) : The number of primary school graduates.

The correlation between the annual financial turnover and education level of the workers is given in Table 3.

The coefficient of determination between the annual financial turnover and the number of engineers, technicians, foremen, workers and seasonal workers and others working in the organization is R² = 0.950. Nearly 95.1% of the annual financial turnover varies depending on the titles of the employees of the organization. The Regression Equation is;

$$y_1 = -159268 + 108276.4x_1 + 64425.97x_2 + 43003.98x_3 + 78111.36x_4 + 60681.28x_5 + 112615x_6.$$

Where,

Dependent variable (y₁) : Annual financial turnover

Independent variable (x₁) : The number of the engineers

Independent variable (x₂) : The number of technicians

Independent variable (x₃) : The number of foremen

Independent variable (x₄) : The number of workers

Independent variable (x₅) : The number of seasonal workers

Independent variable (x₆) : The number of others

The correlation between the annual financial turnover and the number of workers with different titles is given in Table 4.

The coefficient of determination between the annual expert revenue of the organization and the other independent variables is R² = 0.858. Nearly, 85.8% of the annual export revenues change depending on four independent variables. The significance level of the correlation between them is 0,039. The regression Equation is;

$$y_3 = -100586 + 0.913x_1 + 34866.77x_2 + 2802.32x_3 - 1.240x_4 - 2.718x_5 + 0.130x_6 - 15606x_7 + 0.012x_8 - 3.703x_9 + 2.138x_{10} - 0.329x_{11} + 0.117x_{12} - 0.132x_{13} + 1.002x_{14}.$$

The correlation is given in Table 5.

Where,

Dependent variable (y₃) : Annual export revenues

Independent variable (x₁) : Annual profit

Independent variable (x₂) : The number of the engineers

Independent variable (x₃) : Total number of the employees

Independent variable (x₄) : Total annual wages of the employees

Independent variable (x₅) : Closed area of the organization (m²)

Independent variable (x₆) : Capital of the organization

Independent variable (x₇) : The number of the people working in quality control

Independent variable (x₈) : Cost of annual materials input

Independent variable (x₉) : Annual tax paid

Independent variable (x₁₀) : Annual expenditures for research and development

Independent variable (x₁₁) : The amount of credit used by the organization

Independent variable (x₁₂) : Annual financial turnover

Independent variable (x₁₃) : Total area of the organization (m²)

Independent variable (x₁₄) : Investment in machinery

As the variables used in the correlation and regression analyses presented in the following tables include non-numerical values, different correlation methods are employed. The correlation between the annual financial turnover and the education level of the company owners is given in Table 6.

When or whether there is a significant correlation between the annual financial turnover of the organizations of the education level of their owners is examined via Somer'd correlation coefficient statistics, the correlation concerning the change of annual financial turnover depending on the education level of the owners and is found to be -0.311, and the correlation concerning the education level of the owner depending on the annual financial turnover is -0.232, hence, there is a reverse correlation between them. The significance level of the correlation is 0.05, with the increasing education level, the annual financial turnover drops, or with increasing annual financial turnover, education level decreases.

The correlation between the ownership structure of the organization and annual financial turnover is given in Table 7. When or whether there is a significant correlation between the ownership structure of the organizations and their annual financial turnover is investigated through Eta correlation coefficient statistics, it is seen that the correlation concerning the change of annual financial turnover depending on the ownership structure is 0.228, and the correlation concerning the annual financial turnover depending on the ownership structure is 0.806. Hence, the significant correlation between the annual financial turnover and ownership structure is in the form of annual financial turnover being the independent variable affecting the ownership structures of the organizations.

The correlation between whether the company owners consider making new investments and managerial structures of the organizations is given in Table 8. Contingency correlation coefficient was used to calculate the correlation as both variables include non-numerical values. When the correlation between the tendency for making new investments and managerial structure of the organizations was evaluated with Contingency coefficient, it was found to be 0.186 and this indicates that though it is a directly proportional

Table 3. Correlation between the annual financial turnover and education level of the workers.

	Y ₁	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆
Y ₁	1						
X ₁	0.720 ^{**}	1					
X ₂	0.523 ^{**}	0.814 [*]	1				
X ₃	0.823 [*]	0.657 ^{**}	0.568 ^{**}	1			
X ₄	0.791 [*]	0.456 ^{***}	0.331 ^{***}	0.758 [*]	1		
X ₅	0.542 ^{**}	0.294 ^{***}	0.096 ^{***}	0.337 ^{***}	0.309 ^{***}	1	
X ₆	0.802 [*]	0.518 ^{**}	0.257 ^{***}	0.505 ^{**}	0.445 ^{***}	0.521 ^{**}	1

Table 4. Correlation between the annual financial turnover and the employees.

	Y ₁	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆
Y ₁	1						
X ₁	0.840 [*]	1					
X ₂	0.637 ^{**}	0.759 [*]	1				
X ₃	0.848 [*]	0.854 [*]	0.750 [*]	1			
X ₄	0.965 [*]	0.814 [*]	0.580 ^{**}	0.843 [*]	1		
X ₅	0.103 ^{***}	0.117 ^{***}	0.030 ^{***}	0.028 ^{***}	0.067 ^{***}	1	
X ₆	0.449 ^{***}	0.346 ^{***}	0.092 ^{***}	0.231 ^{***}	0.399 ^{***}	0.223 ^{***}	1

and weak correlation, it is statistically significant ($p < 0.05$).

The correlation between whether the company owners having a tendency to make a new investment and managerial structure and capacity utilization ratio is given in Table 9. While calculating the correlation, Eta correlation coefficient was employed as one of the variables include a numerical value and the other non-numerical one. When the capacity utilization ratio is considered to be the independent variable affecting the tendency to make investment, the correlation calculated with Eta correlation coefficient is 0.165, and when the tendency to make a new investment is considered to be independent variable affecting the capacity utilization ratio, then, the correlation between the two variables is 0.131. When the managerial structure is considered to be the independent variable affecting the capacity utilization ratio, then, the correlation calculated with Eta correlation coefficient is 0.335, and when the capacity utilization ratio is considered to be the independent variable affecting the managerial structure, then, the correlation between them is 0.320; hence, there is a directly proportional and weak correlation between them. The correlation between the quality control and export is given in Table 10. The correlation found according to Contingency correlation coefficient statistics is 0.432 and as the p value is smaller than 0.05, the correlation is significant. The Correlation between the managerial structure and the annual financial turnover and capacity utilization ratio is given in Table 11. As the findings reveal that correlation concerning the annual financial turnover depending on the managerial style is 0.860, there is a directly proportional and strong correlation between them ($p < 0.05$). A professional managers with an annual turnover of enterprises, and capacity utilization rates and a significant difference was found between. When the capacity utilization ratio is considered to be the independent variable, the correlation is 0.320, when the managerial style is considered to the independent variable affecting the annual financial turnover, then the correlation is 0.423, when the managerial structure is considered to be the independent variable affecting the capacity utilization ratio, then, correlation is 0.335, when the correlation between the capacity utilization ratio and annual financial turnover is calculated with Pearson correlation

coefficient, the correlation is 0.312; hence, there is a directly proportional and weak correlation between them.

RESULTS AND DISCUSSION

According to 2003 general census of industrial and business organizations, the number of the officially registered furniture organizations is 29,346. Only 100 of these organizations are large-scale organizations. The sampling of the study represents the 3.6% of all the organizations and 93% of all the large-scale organizations.

The number of the people working in the production and marketing operations of the registered furniture organizations is 258,123. The number of the people working in the organizations participating in the present study is 37,771. So, the representation ratio of the sampling is 14.63%. The operating period of 75% of the organizations participating in the study is 9 years or more.

This shows that the organizations participating in the study are generally well-established. 174 of the participating organizations make exports and the total of the participating organizations have a great proportion in the total export revenue of the furniture industry (571 million dollars out of 850 million dollars, which represents 67.17% of the total amount). 80.09% of the organizations work with a capacity utilization ratio higher than 50%, and only 17% of these organizations work with full capacity. Larger-scale organizations usually work with full capacity. Annual sales of 44.06% of the organizations are more than 1 million TL. 19.27% of the 499 organizations

Table 5. Correlation between the annual export revenues and fourteen independent variables.

	Y ₃	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄
Y ₃	1														
X ₁	0.843 [*]	1													
X ₂	0.972 [*]	0.867 [*]	1												
X ₃	0.970 [*]	0.889 [*]	0.994 [*]	1											
X ₄	0.856 [*]	0.771 [*]	0.835 [*]	0.844 [*]	1										
X ₅	0.852 [*]	0.771 [*]	0.837 [*]	0.845 [*]	0.854 [*]	1									
X ₆	0.857 [*]	0.814 [*]	0.855 [*]	0.868 [*]	0.888 [*]	0.794 [*]	1								
X ₇	0.973 [*]	0.823 [*]	0.964 [*]	0.956 [*]	0.848 [*]	0.885 [*]	0.846 [*]	1							
X ₈	0.999 [*]	0.844 [*]	0.973 [*]	0.969 [*]	0.853 [*]	0.846 [*]	0.856 [*]	0.973 [*]	1						
X ₉	0.694 ^{**}	0.679 ^{**}	0.713 ^{**}	0.715 ^{**}	0.650 ^{**}	0.620 ^{**}	0.673 ^{**}	0.689 ^{**}	0.694 ^{**}	1					
X ₁₀	0.327 ^{***}	0.306 ^{***}	0.307 ^{***}	0.328 ^{***}	0.375 ^{***}	0.604 ^{**}	0.310 ^{***}	0.437 ^{***}	0.306 ^{***}	0.196 ^{***}	1				
X ₁₁	0.983 ^{**}	0.840 ^{**}	0.974 ^{**}	0.967 ^{**}	0.851 ^{**}	0.877 ^{**}	0.857 ^{**}	0.997 ^{**}	0.984 ^{**}	0.700 ^{**}	0.394 ^{***}	1			
X ₁₂	0.603 ^{**}	0.501 ^{**}	0.575 ^{**}	0.572 ^{**}	0.818 [*]	0.656 ^{**}	0.712 ^{**}	0.596 ^{**}	0.603 ^{**}	0.469 ^{**}	0.310 ^{***}	0.596 ^{**}	1		
X ₁₃	0.892 [*]	0.809 [*]	0.896 [*]	0.905 [*]	0.827 [*]	0.854 [*]	0.816 [*]	0.870 [*]	0.887 [*]	0.630 ^{**}	0.373 ^{***}	0.882 [*]	0.579 ^{**}	1	
X ₁₄	0.896 [*]	0.782 [*]	0.882 [*]	0.878 [*]	0.800 [*]	0.845 [*]	0.787 [*]	0.903 [*]	0.894 [*]	0.666 ^{**}	0.383 ^{***}	0.907 [*]	0.563 ^{**}	0.871 [*]	1

conducting research and development works spend more than 10,000 TL for research and development works.

There is a positive correlation between the capacity utilization ratio and the profitability. The main reasons behind the lower capacity utilization ratios are inadequate functioning of old-fashioned technologies, lack of knowledge about time-management. 82.9% of the organizations are in need of qualified personnel. The need for the qualified personnel in large-scale organization is not very high as they perform machinery-intense production.

In this study, for the first time, a comprehensive questionnaire was administered to 1028 furniture organizations with the present study. As a result of the literature review, it can be argued that for the first time, regression and correlation analyses were used in the furniture industry. Moreover, the use of regression and correlation techniques will

be a great asset for manufacturers to predict their profit because besides financial criteria, non-financial ones can be taken into consideration.

Conclusion

The organizations should be able to decrease the cost of one unit of outcome; that is, they need to produce more quality products with less input to compete with the rivals. This is only possible with improvement in efficiency. The problems leading to decrease in capacity utilization ratio and efficiency can be grouped under three headings. First, problems concerning the qualitative and quantitative provision of the basic inputs of the industry. These problems are referred to as provision problem. Second, problems concerning the demand and marketing of the products. Third, problems stemming from the shortages and short-

comings encountered during the production and leading to qualitatively and quantitatively low production and they are called production problems. In the furniture industry, production problems result in lower capacity utilization, efficiency, profit, and higher production cost.

The countries, prominent consumers of furniture, are main determinants of the demand in furniture and they are affected in their preferences from the cultures of other nations. As in the every field of life, the furniture sector is getting more and more globalize and this may lead to increase in the use of styles resulting from west-east synthesis; hence, manufacturers need to pay attention to the desires of the international market, with university-industry cooperation, new developments in the field of technology and science should be incorporated into the sector. Furniture manufacturers should pay attention to the likes and dislikes of the consumers, their spending

Table 6. Correlation between the annual financial turnover and education level of the company owners.

	Somers' d	P
Turnover (Dependent variable)	-0.311	0.000
Education level of the company owner (Independent variable)	-0.232	0.000

Table 7. Correlation between the ownership structure of the organization and annual financial turnover.

	Eta
Turnover (Dependent)	0.228
Ownership structure (Dependent)	0.806

Table 8. Correlation between the tendency for making new investments and managerial structure.

Contingency correlation coefficient	Tendency for making new investment
Managerial structure	0.186 p<0.05

Table 9. Correlation between the tendency to make a new investment and managerial structure and capacity utilization ratio.

Eta correlation coefficient	Tendency to make a new investment (Dependent)	Capacity utilization ratio (Dependent)	Managerial structure (Dependent)
Capacity utilization ratio (Independent)	0.165		0.320
Tendency to make a new investment (Independent)		0.131	
Managerial structure (Independent)		0.335	

Table 10. Correlation between the quality control and export.

Contingency coefficient	Quality control
Export	0.432 p=0.000

Table 11. Correlation between the managerial structure and annual financial turnover and capacity utilization ratio.

Eta correlation statistics	Managerial structure (Independent)	Turnover (Independent)	Capacity utilization ratio (Independent)
Managerial structure (Dependent)	1	0.860	0.320
Turnover (Dependent)	0.423		
Capacity utilization ratio (Dependent)	0.335		

power and the quality and appearance they want while producing their goods. The furniture organizations should be encouraged to take part in fairs to promote their products.

During and after production, great attention should be

paid to the quality control and laboratories should be established to check the compliance of the features of the products with the standards. Regardless of being small- or large-scale, every organization should conduct market research to determine the desires of the consumers.

REFERENCES

- Akgul A (2003). Statistical Analysis Techniques in Medical Research "SPSS Applications", Ankara: Emek Ofset, 386 p.
- Aktepe E (2004). Administrative Knowledge, Ankara: Gazi Bookstore, 247 p.
- Alkin E, Yildirim K, Ozer M (2003). Introduction to the economics, Eskisehir: Anadolu University Web-Ofset, Anadolu University Publishing No: pp. 785-493.
- Alpar R (2003). Introduction to Applied Multi-variables Statistical Methods 1, Ankara: Nobel, 412 p.
- Alpugan O, Demir H, Oktav M, Uner N (1990). Organizational Economy and Management, Istanbul: Beta Publishing, 488 p.
- Alpugan O, Demir H, Oktav M, Uner N (1990). Organizational Economy and Management, Istanbul: Beta Publishing, 488 p.
- Ayhan S (2006). "Determination of the Factors Affecting the Nurses' Intention to Give up by means of Serial Logistics Regression Analysis in Turkey", (Published Master's Thesis), Osmangazi University Institute of Natural Sciences Department of Statistics, 86 p.
- Can H, Dogan T, Dogan YA (1994). General Information about Administration, Ankara: Political Bookshop, 308 p.
- Cemalciler I, Bayar D, Inan C, Ozalp S (1976). Administrative Knowledge, Eskisehir: Commercial and Trade Academy Publishing, No: 122.
- Hays WL (1973). Statistics for The Social Sciences Holt, Newyork: Rinehart and Winston Inc., s.18, 676.
- Ilhan R (1989). Production Planning II, Ankara: Hacettepe University, Vocational School of Technology Publishing, 236 p.
- Kose K (2008). "Correlation and Regression analyses", www.toraks.org.tr/msc-ptt-pdf/kenanKOSE3pdf.
- Ozdamar K (2004). Statistical Data Analysis with Program Packages, Volume: 1, Eskisehir: Kaan Bookstore, 649 p.