

## Study and recognition of the relationship between productivity pragmatics and quality of working life in Wood industry in Golestan province

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### ABSTRACT

This study was aimed to investigate and identify components of productivity and its relationship with quality of working life in the particle board industry in Golestan province. This research was performed as descriptive, surveying and correlational. After studying research literature and background, components and factors affecting productivity and quality of working life in chipboard industry were extracted and then chipboard industry was provided using the interview and documents of based on preliminary framework of the components extracted from the theoretical foundations. Statistical community of this study included all employees of particle board industry which were 360. Sample included employees of particle board industry in which sample size was determined using Kristy - Morgan table.

**Keyword:**

*Labor productivity, total productivity, quality of working life, time.*

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**Introduction:**

Happiness and prosperity of each nation depends on work and attempts of all segments of society and productivity is a criterion to evaluate performance of these activities and efforts and various socioeconomic sectors. Productivity is expressed through the ratio of resulting desirability (outputs) to the sources and what is spent to achieve results (data).

Effort to improve and effective and efficient use of various resources such as labor, capital, materials, energy and information is the goal of all managers of economic organizations and manufacturer industrial units and service institutions. Existence of an appropriate organizational structure, efficient administrative procedures, healthy working equipment and tools, balanced work environment and most importantly, qualified and competent human resource are of the requirements which should be considered by managers to achieve the desired productivity. Staff participation in their conscious and deliberate affairs and efforts along with work discipline can affect its improvement and productivity level, especially in a turbulent environment associated with insecurity [8].

Those organizations which have realized the importance of role of human resource in productivity improvement, they value the power of committed and diligent labor. Therefore, they spend important resources and great amount of energy of management building an environment where employees would be able to contribute to performance improvement. Such efforts are typically known as "quality of working life" [6]

**Background:**

Definition of productivity

Organization for Europe Economic Co-operation (OEEC) presented a more formal definition in 1950 as follows. Productivity is the quotient obtained from dividing the output by one of the productive factors [13] Productivity is the relationship between output and data used in production of such amount of output [2] It is possible to maximize labor productivity through several ways:

- Continuous training of employees at all levels and for lifetime service of the staff.
- Continually improving and organizing proportionate to updated upheaval conditions and making it effective.
- Proper leadership and direction of human resources permanently and perpetually [7]
- Productivity includes effectiveness and efficiency and is also a set of results of products with highest level of performance [11]
- Productivity means to be more efficient or to use potential and actual facilities optimally, or to enjoy maximum use of facilities in minimum time with minimum cost, or in another words, desirable use of resources and intelligent thought on all affairs for better use of time, lifetime, materials, energy, capital and other factors [1]

Productivity measurement indices:  
Productivity is expressed in one of the common forms below:

- Partial productivity is ratio of product or output to a class of inputs, such as labor productivity, capital productivity and materials productivity. Labor productivity is the most

common productivity index which is obtained from dividing the product value or added-value by the number of individuals employed in the production department or by entire people per working hour allocated to each production department.

- Factor total productivity: the net ratio of product or added value to total value of used inputs of labor and capital is called factor overall productivity. Factor overall productivity index is calculated by following formula:

In which:  
VA indicates= produced Value Added, W = wage level, L = number of labor, k = used capital and r = capital revenue

$$TFP = \frac{VA}{(L.W)+(K.r)}$$

- Multi-factor productivity results from fraction of the product value or overall value-added by a number of inputs
- Comprehensive productivity results from multiplication of overall productivity index by index of intangible factors [14]

Definition of quality of working life:  
During the past two decades, the term "quality of working life" has been used in prestigious magazines and publications [12]

There is no standard and agreed definition for quality of working life in academic and professional literature [10] In fact, quality of working life represents an organizational culture or management style based on which employees feel responsible and self-esteem [5]

Quality of working life is the ability level of employees to satisfy their important personal needs using the experience they have gained in the organization. In this definition, emphasis has been strongly put on creating an environment that will lead to meeting people's needs [9]

Quality of working life is also considered as a set including: autonomous work groups, job enrichment, large partnerships aimed at improving satisfaction and productivity of employees [3]

Quality of work life is a comprehensive plan to improve satisfaction of employees. Many studies have found high correlation between job satisfaction and quality of working life [4]

It is hard to separate working life from private life in an increasingly competitive environment. Today, employees tend to make balance among their work, family life and recreational activities [11]

So many researchers have identified the structures forming quality of working life and its key indicators [3]

Quality of working life can be defined in two concepts:  
1-The objective definition of quality of working life is simply a set of actual conditions of work and work environment in an organization, such as the level of wages and benefits, facilities, health and safety, participation in decision-making, supervision democracy, diversity and richness of jobs and...

2- The subjective definition of quality of life is simply people's thought and attitudes towards quality of life in particular, in other words, quality of life for every individual or group of people with similar culture and attitudes, has its

own particular characteristics [4]

Overall productivity indicators include (X):  
 X1) value of production / production total costs  
 X2) value of production / the number of staff  
 X3) value of production / labor total costs  
 X4) value of production / manufacturing labor costs  
 X5) value of production / cost of raw materials  
 Labor productivity indices include (Z):  
 Z1) value of production / the number of staff  
 Z2) value of production / labor total costs  
 Indicators of employees' quality of working life include (P):  
 P1) Total number of employees / number of staff's complaints  
 P2) Total number of employees / total hours of training  
 P3) Total number of employees / service compensation costs  
 P4) Total number of employees / total benefits of employees  
 The main question we are following in this research is simply whether there is a relationship between total productivity, labor productivity and quality of working life of employees in Particle board Industries in Golestan province. In order to respond more accurately and more completely to the above question, different conditions will be estimated and tested to study the relationship between total productivity, labor productivity and quality of working

life by multiple regression statistics in Eviews software [9]  
 Methodology:

In term of purpose, this study is applied type and in term of nature and methodology, it is a correlational research. Interview and documents of particle board companies in Golestan province have been used in order to collect data and information. Main purpose of this research was to study the relationship between total productivity, labor productivity and quality of working life employees of particle board industry of the province.

The final presented model in this study is introduced as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + v_i$$

Overall Productivity = F (Labor pro, Qwl, Time)  
 Overall Productivity: Overall Productivity  
 Labor pro: labor productivity  
 Qwl: quality of working life  
 Time: Time

Results:

H0: There is no significant relationship between productivity and quality of working life  
 H1: There is a significant relationship between productivity and quality of working life

The table of estimation model variables

Variables Entered/Removedb

Model	Variables Entered	Variables Removed	Method
1	Time, Labor.Pro, QWLa	.	Enter

- a. All requested variables entered.
- b. Dependent Variable: Over.Pro

The above table represents the model variables including three independent variables of Labor.Pro, QWL, and Time and the dependent variable is called Over.Pro.

Table of correlation coefficient determination, adjusted determination coefficient, standard deviation of determination coefficient and Durbin-Watson coefficient between independent and dependent variables in model

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. Change	
1	.96a	.922	.771	11.47561	.828	14.467	3	9	.001	1.989

- a. Predictors: (Constant), Time, Labor.Pro, QWL
- b. Dependent Variable: Over.Pro

The above table indicates the amount of correlation coefficient, determination coefficient, adjusted determination coefficient, standard deviation of

determination coefficient and Durbin-Watson coefficient between independent and dependent variables in model, as it can be seen in the table above, in the estimation model, the correlation between independent and dependent variable (overall productivity in particle board industry in Golestan

province) is 0.96, on the other hand, determination coefficient (R square) indicates that 92 percent of the changes caused by dependent variable i.e. overall productivity in particle board industry of the province results from changes of independent variables; this amount is very desirable and the other 8 percent related to other factors affecting overall productivity which are not ANOVAb

mentioned in the model. On the other hand, the amount of 1.989 for Durbin-Watson statistic indicates lack of correlation in the estimation model, which is desirable.

ANOVA table indicates sum of squares of freedom degree, mean squares

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5715.447	3	1905.148	14.467	.001a
Residual	1185.206	9	131.690		
Total	6900.653	12			

ANOVA table indicates sum of squares of freedom degree, mean squares, and Fisher statistics and significance level of estimated regression, as it can be seen, (sig) value of given

regression is 0.001, according to this hypothesis, regression is not significant: H0 will be rejected with confidence higher than 0.999.

Table of coefficients of estimated parameters

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.329	10.119		2.713	.011
	Labor.Pro	.861	.140	.868	6.173	.023
	QWL	.342	.188	.122	3.753	.011
	Time	-.161	1.007	-.124	-2.75	0.40

The above table shows coefficients of estimated parameters (coefficients of independent variables), significance coefficient as well as significance level or confidence level of coefficients of the model parameters which are as follows.

$$Y = 17/32 + 0/861X1 + 0/142 X2 - 0/761X3 + v_i$$

$$\text{Over.Pro} = 17/32 + 0/861 \text{ Labor.Pro} + 0/342 \text{ QWL} - 0/161\text{Time} + v_i$$

$$T3 = 6.173 \quad T1 = 2.713$$

$$T4 = -2.755 \quad T2 = 3.753$$

$$R^2 = 92$$

$$F = 14/460 \quad DW = 1/989$$

Estimated results of the overall productivity function of Particle board industries in Golestan province:

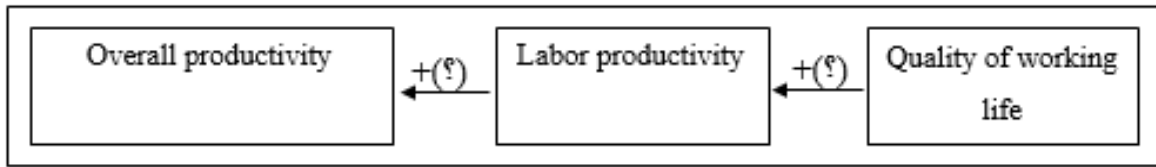
A) Due to the flexibility in labor productivity in particle board factories and industries in Golestan province, consequently in the estimated model assuming the other factors to be constant, assessment of, 0.86 percent of changes caused by dependent variable (overall productivity of particle board industries in Golestan) result from changes in labor productivity in particle board companies in Golestan, in other words, if one percent improvement is created in labor productivity of particle board industry in the province, it will increase overall productivity of particle board industry in the province by 0.86 percent.

B) Quality of working life of employees is one of the main factors affecting overall productivity; the more quality level

of labor's working life is improved or upgraded, the more it will increase overall productivity. In the above estimation model, assuming other factors to be constant, 0.34 percent of changes from the dependent variable i.e. overall productivity results from changes in (increase of) quality level of working life of employees of particle board industries in Golestan province.

C) In the above estimation model, time is one of the factors affecting overall productivity; as trend variable from April to March, therefore by passing time from April to March, overall productivity has been decreased. In other words, the closer we get from the beginning to the end of the year, the more overall productivity of particle board industries decreases in Golestan. Based on above estimation function, assuming other factors to remain constant, 0.16 percent of changes in overall productivity of the particle board industry in Golestan province are related to changes in time.

Estimation of labor productivity function: Research has shown that life quality of employees in manufacturing companies is of the main factors affecting labor productivity, simply said, if employees live in relative prosperity, they will spend all their power and force performing their tasks correctly and properly so that this would increase labor productivity in manufacturing companies including particle board Industries in Golestan province, which eventually would increase overall productivity of particle board Industries. The following chart shows this.



Owl: quality of working life  
Time: Time

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + v_i$$

OLS method of least squares has been again used through Eviews 4 and Spss computer program to estimate labor productivity function in particle board industry in Golestan province in order to estimate the desired parameters. In the estimated function, dependent variable (labor productivity) has been appeared affected by factors of independent variables as main simple linear or logarithmic form. Labor Productivity = F (Owl, Time)  
Labor pro: labor productivity

As it can be seen, in this research, estimating the desired function, the impact of each one of the independent variables (quality of working life, time as the trend variable and....) has been measured on the dependent variable (labor productivity) and it has been analyzed at the end.

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.985a	.960	-.159	26.00386	.034	.177	2	10	.040	2.013

a. Predictors: (Constant), Time, QWL

b. Dependent Variable: Labor.Pro

ANOVA b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	239.393	2	119.696	9.177	.040a
1 Residual	6762.006	10	676.201		
1 Total	7001.399	12			

a. Predictors: (Constant), Time, QWL

b. Dependent Variable: Labor.Pro

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.681	19.962		6.787	.004
1	QWL	.942	.424	.123	3.339	.02
1	Time	-1.651	2.244	-.215	-4.594	.03

a. Dependent Variable: Labor.Pro

$$Y = 5/68 + 0/942X_1 - 1/651X_2 + v_i$$

$$\text{Labor.Pro} = 5/68 + 0/942 \text{ QWL} - 1/651 \text{ Time} + v_i$$

$$T3 = -4.59$$

$$T1 = 6.78$$

$$T2 = 3.33$$

$$R^2 = .98$$

$$DW = 2/01$$

$$\overline{R^2} = .96$$

$$F = 9/170$$

Conclusion

Results from estimation of overall productivity functions in the particle board industry in Golestan province in this study is as follows: A) with regard to flexibility of labor productivity in Golestan province particle board factories and industries, finally in the estimation model, assuming



other Factors to remain constant, 0.86 percent of changes from the dependent variable (overall productivity in Golestan particle board industries) are caused by changes in labor productivity in Golestan province particle board companies, in other words, if one percent improvement is created in labor productivity of particle board industry of the province, it will increase overall productivity of particle board industry of the province by 0.86 percent.

B) Quality of working life of employees is one of the main factors affecting overall productivity; the more quality level of labor's working life is improved or upgraded, the more it will increase overall productivity. In the above estimation model, assuming other factors to be constant, 0.34 percent of changes from the dependent variable i.e. overall productivity results from changes in (increase of) quality level of working life of employees of particle board industries in Golestan province.

C) In the above estimation model, time is one of the factors affecting overall productivity; as trend variable from April to March, therefore by passing time from April to March, overall productivity has been decreased. In other words, the closer we get from the beginning to the end of the year, the more overall productivity of particle board industries decreases in Golestan. Based on above estimation function, assuming other factors to remain constant, 0.16 percent of changes in overall productivity of the particle board industry in Golestan province are related to changes in time.

Estimated results from labor productivity function in Golestan province particle board industry:

A) As we know, quality of working life of employees is one of the main factors affecting labor productivity; the more quality level of labor's working life is improved or upgraded, the more it will increase their labor productivity. In the above estimation model, assuming other factors to be constant, 0.94 percent of changes from the dependent variable i.e. labor productivity of employees of particle board industries in Golestan province results from changes in (increase of) quality level of working life of employees of particle board industries in Golestan province.

1. B) In the above estimation model, time is one of the factors affecting labor productivity; as trend variable from April to March, therefore by passing time from April to March, labor productivity has been decreased. In other words, the closer we get from the beginning to the end of the year, the more tired and despondent the employees get and the more labor productivity of particle board industries decreases in Golestan. Based on above estimation function, assuming other factors to remain constant, 1.65 percent of changes in labor productivity in Golestan province particle board industry are related to changes in time.

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