

INDUSTRIAL LABOR INPUT INDICES AND EMPLOYMENT ANALYSIS¹

SANAYİ İŞGÜCÜ GİRDİ ENDEKSLERİ VE İSTİHDAM ANALİZİ

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Öz: Bu araştırma sanayi işgücü girdi endeksleri ve istihdam verileri dikkate alınarak farklı istatistik yöntemler kullanılarak analiz edilmesi şeklindedir. Gelişmiş ve gelişmekte olan dünya ülkelerinin dış bağımlılığının azalması ya da azaltılmasında önemli olan sanayi gücü Türkiye açısından dünden bugüne gelişmesini devam ettirmektedir. Son on yıl içerisinde Türkiye'nin sanayi girdi ve istihdam oranlarına bakıldığında oldukça iyi olduğu gözlenmektedir. Her ne kadar kayıt dışı istihdamın önüne geçilememiş olsa da sanayi sektörü açısından gelişmesini devam ettirmektedir. Araştırma uygulamalı olarak gerçekleştirilmiş ve araştırmada TUIK den elde 2002-2015 yılına ait elde edilen veriler kullanılarak E-Views8.0 programı ile analiz edilmiştir. Yapılan regresyon ve korelasyon analizleri sonucunda işgücünü en çok etkileyen faktörler belirlenmiştir.

Anahtar Kelimeler: İşgücü, Girdi Endeksi, Sanayi, İstihdam, TUIK

Abstract: This study analyses the industrial labor input indices and employment data through various statistical methods. Industrial power, which plays an important role in reduced foreign dependence of developed and developing countries of the world, has continued to develop in Turkey until today. It can be observed that Turkey has performed very well in terms of industrial inputs and employment rates during the last decade. Although the problem of informal employment has not been solved yet, it continues its development in industrial sector. The study was conducted in a practical manner. The data obtained from the Turkish Statistical Institute (TUIK) for the 2002-2015 period were analyzed through the software E-Views 8.0. The most influential factors on labor were determined through regression and correlation analyses.

Key Words: Labor, Input Index, Industry, Employment, TUIK

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INTRODUCTION

Development level of a country can be only explained by its industrial labor. Developed world countries are observed to have more developed, systematic, powerful and effective labor force when compared to other countries. One of the main indicators in underdeveloped or developing countries is that they have relatively lower real income per capita. Another important factor in the underdeveloped and developing world countries is larger rural population, lower rate of literate people, shorter life expectancy and less economic sufficiency. The most important factor of development indicators is the level of economic development. Competitiveness of a country with other world countries, its superiority, preferability and most importantly, its economic powerfulness are dependent on high industrial power and production rates. An industrially undeveloped world country cannot be expected to have a high level of welfare, because economic sufficiency is only proportional to parallelism of employment and welfare level. Employment of a country's individuals and their level of economic income are the indicators of welfare and development for that country.

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

According to traditional foreign trade theories, every country has an aspect in which it is

superior to (has advantages over) other world countries (Landmann, 2004:18). Underdeveloped world countries are foreign-dependent (Stiglitz, 1984:42). They have to purchase goods or services from abroad in order to be able to make production. With the globalization emerging towards the end of 1980s, each world country has become a market (Pissarides et al., 2004:1-4). Quotas and restrictions have been eliminated by globalization, and the free market system has become dominant (Malley and Mustacelli, 1997:96-99). The main thing to be considered at this point is that production has become globalized. We can call the movement of capital as financial globalization and economic superiority (Chang etc., 2009:328-334). Before globalization and during the times when there was no development discourse, buying and selling goods were shown as the start of economic events. Today, however, buying and selling goods and services are considered as an international activity (Petersen et al. 2007:16). Every developed world country has an aspect in which it is superior to (has advantage over) others in terms of services or goods (Cave-laars, 2005:46-48-52-54-59). It transfers this superiority to other world countries through trade, and it gets economic benefits thanks to its advantage (Wakeford, 2004:1-4-9-20). When the comparative advantages theory is taken in its traditional form, it suggests that the underdeveloped countries are required to get



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specialized in the production of food, mine and agricultural raw materials, to export such goods and to import many of their industrial products from developed countries due to their factor endowment and technological structure (Yusopet, et al., 2005:97-100). In Turkish industry, the employment rate has increased by 0.5%, total hours of work by 0.5% and the gross income level by 3.6% since 2014. We can suggest that Turkey's foreign dependence has decreased in each year in parallel with the development of its industrial power. In the 3rd quarter of 2014, the seasonal calendar effect has decreased by 0.5% compared to the previous quarter. It is observed that employment index has increased by 2.2% compared to the previous year. Informal employment is one of the most important problems in Turkey¹ (Pazarlıoğlu, Çevik, 2007:1-12-15). The income and wage policies cause many enterprises to continue informal employment, and this leads many individuals not to have social security, which in turn results in reduced economic input in public sector (Baumol, 1994:205-206; Cohen, 2001:29; Solow, 2004:269; Kaldor, 2007:116). Employment policies are negatively affected by the strict attitude in current wages policies and by the fact that the real wages policies are below living standards (Tunç, 2007:3-4-86-88). One of the most important factors leading employers

and employees to informal employment is that the current minimum wage is still below the level of quality living standards (Hall, et al., 2007:1-2-11-13-21-23). The problems in the labor market and informal employment have been heavily focused on in recent years (Şahin, 2006: 375). Employment, which is one of the important indicators of economic growth, constitute the most important indicator between the qualified labor force and required labor force (Malley and Mustacelli, 1997:96-99). There are many problems resulting from the high number of unemployed young people and the insufficient level of women employment (Yusuf, 2007:153-155-159). Productivity in labor and industrial sector can be only achieved through the improvement of wages policies (Gali, 1999:258-269). Therefore, we can suggest that productivity and employment are parallel to each other (Diboğlu and Enders, 2001: 495-496-507). Fair waging for properly employed workers and granting all the rights they deserve will enhance qualified labor and increase productivity and performance (Malley and Mustacelli, 1997:96-99).

Aim, Scope and Method

This study examined in a practical manner the relation among the basic variables of labor based on TUIK-Press Releases / Industrial Labor Input Indices. Variables were determined for the period between 2002 and 2015.

1 <http://www.paraanaliz.com/m/?id=1507>
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Data Analysis

The data acquired in this study were analyzed through the software E-Views 8. The factors with the biggest impact on the labor were determined through regression and correlation analyses.

Hypothesis of the study

- ✓ **H0:** There is no relation among the variables.
- ✓ **H0:** There is no relation between employment index and other variables.
- ✓ **H0:** There is no relation between working hours and other variables.
- ✓ **H0:** There is no relation between the wage index and other variables.

IMPLEMENTATION AND ANALYSES

Abbreviations of the variables

- EMP: Employment
- HW: Hours worked
- ME: Wage index
- LII: Labor input index

CORRELATION ANALYSIS

H0: There is no relation among the variables.

The results of the correlation analysis are provided below.

- Employment index has a high correlation with wage index and working hours and a moderate correlation with labor.
- Working hours has a high correlation with wage index and a moderate correlation with labor index.
- Wage index has a moderate correlation with labor index.

Table 1. Pearson Correlation

	EMP	HW	WI	LII
EMP	-			
HW	0.94	-		
WI	0.78	0.70	-	
LII	0.50	0.46	0.42	-

REGRESSION ANALYSIS

H0: There is no relation between employment index and other variables.

Following results were obtained from the regression analysis which examined employment index and other labor statistics together.



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- ✓ A one-unit increase in working hours increases employment index by 0.80 unit.
- ✓ A one-unit increase in labor index increases employment index by 0.10 unit.
- ✓ A one-unit increase in wage index increases employment index by 0.07 unit.

Table 2. Employment regression

Dependent Variable: EMP				
Method: Panel Least Squares				
Date: 06/13/15 Time: 21:57				
Sample: 2012 2015				
Periods included: 4				
Cross-sections included: 39				
Total panel (balanced) observations: 156				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HW	0.808769	0.029365	27.54217	0.0000
WI	0.077998	0.012950	6.022855	0.0000
LII	0.102803	0.022858	4.497401	0.0000
R-squared	0.913756	Mean dependent var	112.2173	
Adjusted R-squared	0.912628	S.D. dependent var	9.163055	
S.E. of regression	2.708482	Akaike info criterion	4.849697	
Sum squared resid	1122.389	Schwarz criterion	4.908348	
Log likelihood	-375.2764	Hannan-Quinn criter.	4.873519	
Durbin-Watson stat	0.261217			

H0: There is no relation between working hour and other variables.

Following results were obtained from the regression analysis which examined working hours and other labor statistics together.



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✓ A one-unit increase in wage index increases working hours by 0.26 unit.

✓ A one-unit increase in labor index increases working hours by 0.61 unit.

Table 3. Working hours regression Dependent Variable: HW

Method: Panel Least Squares				
Date: 06/13/15 Time: 22:03				
Sample: 2012 2015				
Periods included: 4				
Cross-sections included: 39				
Total panel (balanced) observations: 156				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
WI	0.265142	0.028398	9.336664	0.0000
LII	0.611064	0.038859	15.72513	0.0000
R-squared	0.344220	Mean dependent var	109.6481	
Adjusted R-squared	0.339961	S.D. dependent var	9.148597	
S.E. of regression	7.432573	Akaike info criterion	6.862359	
Sum squared resid	8507.443	Schwarz criterion	6.901459	
Log likelihood	-533.2640	Hannan-Quinn criter.	6.878240	
Durbin-Watson stat	0.852539			

H0: There is no relation between wage index and other variables.

✓ A one-unit increase in labor index increases wage index by 1.35 units.

Following results were obtained from the regression analysis which examined wage index and other labor statistics together.



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Table 4. Wage index regression Dependent Variable: WI

Method: Panel Least Squares				
Date: 06/13/15 Time: 22:05				
Sample: 2012 2015				
Periods included: 4				
Cross-sections included: 39				
Total panel (balanced) observations: 156				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LII	1.355743	0.014899	90.99256	0.0000
R-squared	0.165768	Mean dependent var	152.8692	
Adjusted R-squared	0.165768	S.D. dependent var	23.01667	
S.E. of regression	21.02257	Akaike info criterion	8.935460	
Sum squared resid	68502.01	Schwarz criterion	8.955010	
Log likelihood	-695.9659	Hannan-Quinn criter.	8.943400	
Durbin-Watson stat	0.921595			

CONCLUSION AND ASSESSMENT

- Employment index has a high correlation with working hours and wage index and a moderate correlation with labor index. Working hours has a high correlation with wage index and moderate correlation with labor index. Wage index has a moderate correlation with labor index.
- A one-unit increase in working hours increases employment index by 0.80 unit.
- A one-unit increase in wage index increases employment index by 0.07 unit.

- A one-unit increase in labor index increases employment index by 0.10 unit.
- A one-unit increase in wage index increases working hours by 0.26 unit.
- A one-unit increase in labor index increases working hours by 0.61.
- A one-unit increase in labor index increases wage index by 1.35 units.



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