Applied Economics Studies, Iran (AESI) 59

Volume 8, Number 36, Winter 2021

The Effect of the Industry Sector's Value Added on Employment in Iranian Provinces: A SemiParametric Panel Data Approach

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Abstract

Increasing employment and achieving sustainable development is one of the main goals of Iran's economy. Industry plays an important and vital role in creating jobs and growth in production due to its connection with other economic sectors. The aim of the present study is to examine the impact of the industry value added on employment in the country during 2005-2016. To analyze the relationship between the variables, first, based on the ratio of "industry value-added to GDP", the provinces of the country were divided into two groups: provinces with high value added share and those with low value added share. Then, in each group, the effect of industry value added on employment was estimated using the semi-parametric panel data approach proposed by Baltagi and Li. The findings of the parametric section showed that in both groups, increasing the value added for the industrial sector and capital stock led to a significant increase in employment, and an increase in real wages led to a significant decrease in employment. In the first group, however, employment was mainly affected by value added than the second group. Increasing the productivity of the total factors involved in production in both groups led to a decline in employment, but the decrease in employment was significant only in the first group. Following the non-parametric results, the impact of human capital on employment was positively significant, except that in the group in which the share of industry value-added is higher than the average level, the effect of human capital on employment is nonlinear and has a decreasing return. In other words, the rate of employment response to human capital at a low level of human capital is greater than in the higher level of human capital. In the second group, in which the share of industry value-added was lower than the average level, the relationship between human capital and employment was linear and positive.

Keywords: Value-Added of Industry Sector, Employment, Semiparametric Panel Data Approach, Iran.

Jel Classification: C23, D24, E24, J21, L60.

1. Introduction

Employment is one of the priorities and concerns of policymakers and planners in Iran. Different sectors of the economy have various contributions to employment and active labor force recruitment. One of the most important

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economic sectors is the industry that provides suitable employment through increased production and economic growth. Because of the value added realized in producing goods and services, changes in the industry sector value added lead to employment changes based on growth theories. Indeed, the increase in the industry value added leads to a rise in the economy's revenues and an increase in the demand for industrial goods and services of the market leading eventually to an increase in total production and employment growth (Jamaliah, 2016). In Iran's economy, the industry sector can act as the engine of economic growth and capital accumulation, and the share of its value added in the income and production could increase. The share of the labor force absorbed in the economy increases directly and indirectly in industry and other sectors, respectively, along with the growth of the industry sector's value added. Therefore, economic theories point out the important role of the industry in economic growth and development and, also, in job creation. Emphasizing the importance of the industrial sector in economic growth, Kaldor (1966) showed that the industry sector has positive externalities that directly affect economic growth as a whole (Mercan et al., 2015). Also, Kaldor (1975) states that in the manufacturing industry there is a positive relationship between employment growth and production growth (Walwick, 1992). According to Mirdal (1968), modern industry leads to an increase in labor productivity, the promotion of value added, and the growth of national production; increased production leads to increased savings and investment in the industry; investment growth ultimately increases production and income. (Mirdal, 1968: pp. 1150-1151). Surqine and Chenery (1989) believe that faster productivity growth in the industry sector would increase economic growth and labor productivity.

The purpose of study is to investigate the effect of industry sector value added on employment in the country due to the importance of the problem.

2. Martials and Method

The purpose of the study is to examine the effect of industry value added on employment in Iran during 2005-2015. The model of Guisan and Expositio (2013) was used to study the relationships between variables based on the following equation (1).

$$l_{it} = \gamma_i + \delta v_{it} + \mu k_{it} + \eta pr_{it} + \Gamma x_{it} + \varepsilon_{it} \quad i = 1, \dots, N; \; t = 1, \dots, T \qquad (1)$$

where, l_{it}, v_{it}, k_{it}, pr_{it}, and x_{it} are the logarithm of employment, the logarithm of industry sector's value added, the logarithm of total factor productivity, the logarithm of capital stock, and the logarithm of human capital, respectively. Also, γ_i denotes the individual effects, ε_{it} is the error term following the white noise process, *i* and *t* indicate the provinces and years.

To analyze the relationship between the variables, first, based on the ratio of "industry value added to GDP", the provinces of the country were divided into two groups: provinces with high value added share and low value-added share. Then, in each group, the effect of industry value added on employment was estimated using the semi-parametric panel data approach proposed by Baltagi and Li.

3. Results and Discussion

The results of model estimation in both groups indicate the goodness of fit. In the first group, the variables affected employment significantly so that the logarithm of industry value added and the logarithm of capital stock had a positive effect on employment and the logarithm of total factors productivity and logarithm of wages had a negative impact on employment. The findings further showed that the elasticity of employment relative to the industry value added is about 0.321; that is, with a one percent increase in industry sector's value-added, the employment will rise by 0.321 percent. The nonparametric relationship between employment and human capital was estimated using the spline function. Figure (1) shows the nonlinear and positive relationship between the two variables with a 99% confidence interval. Accordingly, following the increase in human capital, the amount of employment increases at a decreasing rate until it reaches its maximum, i.e. 2.1; after that and with human capital continuing to increase, the level of employment decreases to 1.8.

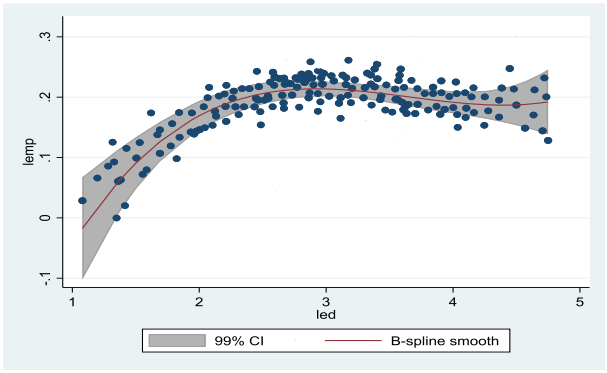

Fig. 1: Nonparametric relationship between human capital and employment in the first group

Findings of model estimation for the second group indicated that, similar to the first group, the variables affected employment significantly except for the logarithm of total factors productivity so that the logarithm of industry value added and the logarithm of capital stock had a positive effect on employment and the logarithm of wages had a negative impact on employment.

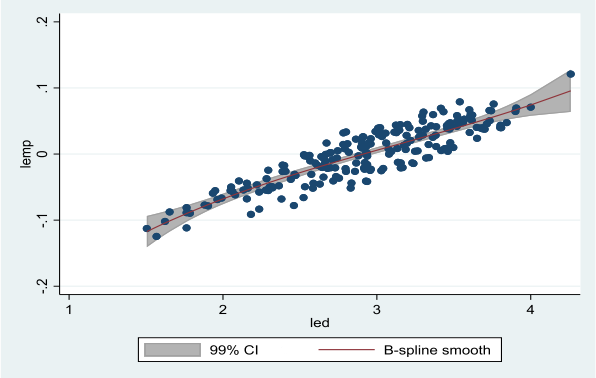

Fig. 2: Nonparametric relationship between human capital and employment in the second group

Also, the results revealed that the elasticity of employment relative to the industry value added is about 0.157; that is, the employment rises by 0.157 percent with a one-percent increase in the industry sector's value added. Figure 2 shows the nonparametric relationship between employment and human capital at a 99% confidence interval. As shown in Figure 2, the slope of the spline function is less than one and is about 0.9. That is, a one percent increase in human capital increases employment in the second group by less than one percent.

4. Conclusion

From a macroeconomic perspective, the industry sector acts as an engine of development. Accordingly, the present paper examined the effect of industry's value added on employment in the Iranian provinces utilizing a semiparametric panel data approach provincial data in the time range of 2005-2015. The results showed that the industry sector value added had a positive and significant effect on employment. According to the coefficient of industry value added, with a one-percent increase in the industry's value added, the employment rises in provinces, including a high share of industry value added of about 0.343 and including a low share of industry value added of about 0.175 percent. Therefore, in the first group, employment is mainly affected by value added than in the second group. Estimation of the non-parametric term of the regression model showed that the effect of human capital on employment in both groups of provinces was positive. The difference was that in the group in which the share of industry value added was above the average, the relationship between human capital and employment was non-linear and had a declining return. In other words, the employment response to human capital in the low level of human capital is greater than that in the high level of human capital. But in the second group, the relationship between the two variables was linear and positive.

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