Studying of factors effected on total productivity in Small and medium Food Industry of Khorasan Razavi Province (1996-2012)

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Abstract
This article explains effectiveness of two factors of total productivity of small food industries of Khorasan Razavi province and trend of that for period 1996 up 2012. First one is labor and second is capital. The results presented total productivity has declined form 4 number at beginning of the period to 1 at end of the period, so the situation of productivity have been very critical that years. One of the most important results of this research is replacing of manpower with capital investments in proceeding of production on the period hence total productivity has become lower during that years, therefore the share of capital and mechanization is more affected than manpower in total productivity.

Key words: Total Productivity, SMEs, value added

Introduction
Small and medium enterprises of the world have many similarities, however, it cannot be the same definition for all countries so each country according to their own terms of business has provided special definition. [7] Studies show that the definition of small and medium industries in the countries and regions of the world is very different. Some of the criteria usually applied in the definition of small and medium industries include: the number of employees, amount of capital, the volume of total assets, sales volume and production capacity. But the most common criteria for defining SMEs is the number of employees. The number of employees is less than 500 employees in the United States have called on small and medium enterprises. Where small organizations with less than 100 employees are considered organizations. Some organizations such as the United Nations Industrial Development Organization, companies with more than 1000 employees and less than 7.5 million dollars' worth of machinery, the small companies have in the circle. In Asia, several quantitative criteria used for class if citation of firms that some of the were: "number of employees, value of assets, the annual turnover, investment, employment, production capacity, the export of technology and production unit.[12] Studding the activities of small and medium enterprises in developed countries or the developing world, indicating a close relation between economic development and effective social. Growing SME sin these countries and provide policy support from governments and international organizations active in the development, overall show is important that's mall and medium enterprises is a unique opportunity for the international community.

Literature
Krugerand Tansar[6] studied productivity growth in the manufacturing industry in Turkey in terms of public and private sector, they believed, reducing the productivity of the country’s industries is from trade restrictions. The results of this study also show that while productivity growth of private industry and government in Turkey is same but using of amount of resources and factors of production in governmental industry was higher than that of private industry. Shs hand Reddy[9] to study the productivity for the years Indian artifacts and to calculate productivity in four textile industry cotton, tobacco and beverages, food products and paper and paper products production function trans log index have used Dyvyzhy.Halty vangret al[5] have studied differences of productivity among workers in various industries from 1985-1996 with using of function of production model and concluded that the number of employees, age and
productivity of their human capital.\textsuperscript{7}Azerbaijani\textsuperscript{[1]} researched in the field of productivity at the macro level, the study and using an econometric model by using the ISIC two-digit code And the factors affecting productivity into two groups of factors (TFP) TFP is divided into external and internal production. Internal factors are factors that their control is possible and with appropriate policies can be increase, as resources human but external factors that impact the environment by industrial activities and it is not possible to change simply them.

\textbf{What are problem and the objects?}

The researches shows us , total production in SMEs are becoming down every day and no one knows the reasons of it , hence unknown of efecting factors is our problem that this article wanted to clear them then sages ways of increasing productivity.

\textbf{The role of small and medium enterprises in terms of the gross domestic production (GDP)}

Unfortunately, there is no ofical statistics about the share of small and medium enterprises in the total GDP of country. On the other hand, the lack of such statistical data records causes confusion during decision making. However, regardless of that, by considering the share of this group of industries in the value added of total industries, relatively reliable estimation can be provided that is explained as below:

According to the studies carried out by Nily and partners (2006)\textsuperscript{3} on the industrial development strategy (based on government request), the calculated share of small & medium enterprises was 25\%, while the figure for large organizations was 75 \% of the total added value of industry. Due to the availability of the data regarding the share of added value of industry in the total GDP of country issued by the central bank, the share of small and medium enterprises in GDP can be estimated. (Table 2). As it is observed, the share of SMEs in GDP is a figure between 3 -6 \%. Even though in recent years there was no increase in this figure, but since the share of total industry in added value is less than 20\%, then it is possible to conclude that the small enterprises are relatively in good position.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{figure1.png}
\caption{The share of SMEs in GDP during 1992-2012 years}
\end{figure}

Here we have the share of value added in different countries in Asia

The share of value added in different sizes of industries in some Asian countries

\textsuperscript{7} Nily and partners, Industrial strategy development of Iran, voulm 1, 2006; page 55
Table 1. Reference: Nili, M. et al. 2002

<table>
<thead>
<tr>
<th>Country</th>
<th>Malaysia</th>
<th>Japan</th>
<th>South Korea</th>
<th>Indonesia</th>
<th>Iran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value added of small industries</td>
<td>4.7</td>
<td>13.7</td>
<td>21.2</td>
<td>5.9</td>
<td>21</td>
</tr>
<tr>
<td>Value added of medium industries</td>
<td>21.1</td>
<td>43.3</td>
<td>20</td>
<td>5.6</td>
<td>4</td>
</tr>
<tr>
<td>Value added of large industries</td>
<td>74.1</td>
<td>43.7</td>
<td>58.8</td>
<td>88.4</td>
<td>75</td>
</tr>
</tbody>
</table>

**Effecting of productivity to socioeconomic**

Assessment of economic growth in the countries shows that about 50 percent of some of production to have gained through improving productivity. The concept of comprehensive and overall productivity is increase data necessity for living standards, greater prosperity, peace and purpose on the basis of all the countries of the world. On the other hand, however, increase productivity, effects to some of important indicators such as increased production, reduce of inflation, employment and increase the level of competitiveness of countries. It should be noted in this area between human needs and the availability of goods and services who sere sources used in their production is restricted Population growth would increase demand and consumption on the one hand and on the other hand, the progress in living standard is a wide range of consumer needs increase, while resources are limited. Therefore, in most developing countries improving productivity as one of the most important factors in developing is considered.

**Definition of total productivity:**

A broader gauge of productivity, total factor productivity is measured by combining the effects of all the resources used in the production of goods and services (labor, capital, raw material, energy, etc.) and dividing it into the output. One example is a ratio computed by adding standard hours of labor actually produced, plus the standard machine hours actually produced in a given time period divided by the actual hours available for both labor and machines in the time period. Total productivity is total output of inputs. The total productivity index, a common effect of all the input soused reflects the production output. According of national center of Iran productivity, productivity is combination of two elements: effectiveness and efficiency effectiveness is the degree of achieving to targets and efficiency means the ways of using and optimization of resources.

**Definitions of SMEs**

First of all it is worth to recall one of the most common definitions of productivity, which is as follows: The ratio between the certain amount of the output and one or more factors of production is called productivity.[3]. In various countries of the world, there are many different types of small and medium sized enterprises that share the same general characteristics. But however, there is no any single and uniform definition for them; therefore, the SMEs are defined in a way that reflects the existing conditions of a given country. The world definitions and classifications of SMEs (Small and Medium sized Enterprises) is an ongoing process and in most of the developed and developing countries, SMEs are considered as the engine of the economic growth: a major source of entrepreneurial skills, innovation and employment. The continuous improvement in the business environment for SMEs, the growing entrepreneurship, steady increases of private sector investment and development of worldwide micro enterprises, especially in Europe, have resulted in the formulation of many different definitions for SMEs and introduction of new concepts in the vocabulary of economic terms such as regional fund, capital (investment) companies and business angels.
Total productivity is the outcome of the effectiveness of total facilities, equipments, human resources and capital. Say it another word, the productivity growth of total production factors relates to the part of production growth that is not linked to the lack of labor force and capital. Consequently, the factors, which improve labor force and capital quality level, better allocate the resources and ensure the effective use of resources and available facilities, contribute the enhancement of total factors productivity. As it is known, there are different methods to calculate the total factor productivity (TFP). The best one of these methods is the use of division index to sum up the inputs. In this method, the TFP index is defined as below:

\[ TFP = \frac{V_t}{K^3_t, L^2_t} \]

If the assumption is having linear homogeneity or stable return compared to the used scale, the share of capital in total productivity will be as follows:

\[ \alpha \beta = \frac{\text{value added}}{\text{human resource wage}} = \text{share of labor force in productivity} \]

In full competitive conditions, where every factor is paid according to its final productivity, \( \alpha \) and \( \beta \) represent also the elasticity of production with respect to capital and labor. Thus, in case of absence of the statistical data regarding the share of factors of production, it is possible to use elasticity of production with regard to labor and capital for obtaining the total factors productivity [6]. Below, in figure 2, the calculation of \( \alpha \) and \( \beta \) indices are shown. As it is obvious, the share of capital during the period under study was downward slopped resulting in the increase of labor share. And by drawing the final result of these two figures in the form of TFP, the figure 2 will be resulted.

<table>
<thead>
<tr>
<th>Size of the company</th>
<th>Employee number</th>
<th>Annual financial Performance</th>
<th>Annual balance Sheet value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium</td>
<td>&lt; 250</td>
<td>Million EURO 50 ≤</td>
<td>Million EURO 10 ≤</td>
</tr>
<tr>
<td>Small</td>
<td>&lt; 50</td>
<td>Million EURO 10 ≤</td>
<td></td>
</tr>
<tr>
<td>Micro</td>
<td>&lt; 10</td>
<td>Million EURO 22 ≤</td>
<td>Million EURO 2 ≤</td>
</tr>
</tbody>
</table>
Here we show the trend of total productivity between 1996 up to 2012:

As it is noticed, the TFP from the figure 4 at the beginning of the period has reached to the figure of 1 at the end of the period, but the exception of a temporary growth during 2000 through 2004. And if the performance level in 2001 and 2011 be ignored, the productivity situation will seem to be in crisis. From figures it is concluded that in accordance to the reduction level of capital share in production and its replacement by human resources, the total productivity will be declined. This is due to the undeniable effect of automation (mechanization) on the production growth. And if the three indices of productivity of labor, capital and total factors to be illustrated in one figure, the following will be resulted (figure 4):
The final model of factors influencing the productivity

Results of estimating long and short run coefficients of third model, the dependent variable is TFP productivity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>T-statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>LHC</td>
<td>0.40</td>
<td>3.65</td>
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<tr>
<td>LKL</td>
<td>1.87</td>
<td>9.82</td>
</tr>
<tr>
<td>Linf</td>
<td>-1.33</td>
<td>-9.38</td>
</tr>
<tr>
<td>C</td>
<td>0.09</td>
<td>0.11</td>
</tr>
<tr>
<td>D79</td>
<td>0.46</td>
<td>4.56</td>
</tr>
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<tr>
<td>LHC</td>
<td>0.09</td>
<td>0.91</td>
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<tr>
<td>LKL</td>
<td>1.49</td>
<td>9.36</td>
</tr>
<tr>
<td>Linf</td>
<td>-0.44</td>
<td>-0.28</td>
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<tr>
<td>C</td>
<td>0.09</td>
<td>0.11</td>
</tr>
<tr>
<td>D79</td>
<td>0.46</td>
<td>4.56</td>
</tr>
</tbody>
</table>

\[ R^2 = 0.99 \quad F = 99.46 \]

In sum, entry of mentioned dummy variable contributes to improve the fitting of models and adjusting data.

In addition, the effect of this impulse on TFP (total production factors productivity) is more than its effect on labor and capital productivity. And like the previous models, the estimated coefficient can be included in this model as follows:

\[ TFP = \frac{1}{9} + \frac{1}{9} \cdot LHC + \frac{1}{8} \cdot LKL + \frac{1}{3} \cdot Linf + 0.46 \]

In summary, by the results presented in this part, the positive effects of training (Educational service or human capital) on the productivities of labor, capital and TFP is very clear. Meanwhile, the highest impact of this index is with regard to TFP. With this description, the existence of direct relationship between labor training, wages and capital stock (machinery and equipments) and productivity is proved.

Conclusion

This study shows us, there are two important elements for improving of TFP, the first one is capital, and the second one is labor, normally there is a depending role of behavior between them, if the role of capital coming down in FTP, clearly the role of labor will be increasing in the same time, as we have shown in figure of 2 as we see the trend of capital role is coming down from 1996 up to 2009 and the same time the trend of labor is increasing and there is reverse behavior on the two factors in that time. But the question is why has happened that trend. Although there are many reasons for that but we believe, the efficiency of capital have been low in that period of time because we have investment a lot of machinery but they don't work with full capacity, as a result in accounting of productivity we should divided value of production in to machinery for clearing of share of them separately, in this case the share of capital is decreasing.

Suggestions

- Government needs more affected of feasibility study plan for starting of agro food businesses on Khorasan Razavi Province, it helps private and government sector to understand which one of field of industries will be feasible and how to establish factories to working with full capacity. Indeed private sector in SMEs can't to do this studying.
- Training of workers for using of machinery is very important, because some time, operators can't to operate the machine well.
- Government has to establish a data base center for notification of private sectors to know which factories in their field are operative in the country, It is needed for marketing service of businesses.
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11- The calculation of value added in this chapter was done using the new indices issued by central bank and based on 2004 base year price.