The Determination of Indicators and the Improvement of Production Factors Productivity (Labor Force) in the Central Iron Ore Company of Iran (Bafgh)

Mohammad Jahanmanesh and Hasan Dehghan Dehnavi

Department of Management, Bafgh Branch, Islamic Azad University, Bafgh, Iran.
Department of Management, Yazd Branch, Islamic Azad University, Yazd, Iran.

Abstract

Market growth and development and global competitiveness on the one hand and the need to implement new techniques for survival and development of the market share, is irrefutable. Among the attention toward efficiency factor, especially labor force productivity, whether in the production level or in the distribution and sale level, and in other words, the whole cycle of product’s life is glaring more than any other components; hence, in the present study in addition to the determination of the labor force productivity indexes in the central iron ore company of Iran, their prioritization has also been considered. Also, the statistical tests of Wilcoxon nonparametric and one-sample sign were used in order to test research hypotheses. The results of this research have specified 12 of the most influential affecting factors on the labor productivity and have provided their guidelines in both organizational and individual level.

INTRODUCTION

Resources and facilities limitations have always been proposed from the past to the present time which is the post-modern information and the science and technique significant development era; and to be in the future in order to impose and prove its superiority on the socio-economic conditions. Hence, the optimization use of facilities and the available resources and the performance promotion in order to access to welfare and the accountability for the progressing needs have been turned to a very important issue. However, couple of individuals also believe that the term “resource limitations” is not correct and it is rooted in the materialism ideas and what is worrying, is wasting and lacking of proper and appropriate use of resources [13]. On the other hand, scientific and economic development of developing and powerful countries have revealed the necessity of other countries’ attention to the growth barriers and effective factors in the economic development.

In the meantime our country Iran has not been exempted from this important issue and of course their Iranian Islamic ideals has doubled the importance of paying a faster and more fundamental attention to the economic development and growth factors. Among these cases that have been considered in the 20-year long-term outlook of the general policies of the Islamic Republic of Iran, general policies of principle 44, quintet programs development and most recently, in delivering general policies of resistive economic by the Islamic Revolution supreme Leader, is paying attention to productivity and particularly labor force productivity. On the other hand, the mining industry of the country as a non-oil export terminals of country require serious consideration in optimizing costs and productivity and therefore this study is trying to identify indicators and improvement of production manufacturing factors, especially labor productivity in the Central Iron Ore Company of Iran (Bafgh) by presenting an effective strategies and indicators, paved the way for future research. In this study, after reviewing the theoretical foundations, research hypotheses were proposed and were used of Wilcoxon nonparametric test and one-simple sign in order to test them. At the end, the strategies of research have proposed in two level of individually and organizational.

Corresponding Author: Hasan Dehghan Dehnavi, Department of Management, Yazd Branch, Islamic Azad University, Yazd, Iran.

E-mail: H.dehghan@iauyazd.ac.ir
Theoretical Foundations of Study:

In the following section after providing a description of productivity, labor force productivity has been described in particular:

Definition of Productivity:

The word ‘productivity’ is literally the synonym of efficiency, function, ability, skill and usefulness, and its main aim is to achieve maximum efficiency, by considering all factors of production or servicing activities. The word productivity is the translation of the English word “productivity” which means the power and functionality of production. In the Britannica Encyclopedia, the productivity in the economy defined as a proportion of what is required to produce. In The Oxford dictionary, productivity means functional performance that in the industry is measured by the comparison between the production and the wasted time or resources which were used to produce it. Generally, efficiency can be known as the using rate of in applied resources in the production process. The framework of the productivity definitions are near to each other and the most important task which is presented in all definitions is the ratio determination of what is produced for production to what is obtained from the manufacturing process. In addition, from the history of using the term productivity is clear that on the arrival of the term “productivity” to the economic activities have been the main focusing point which is given toward human resources and all the efforts have focused on improving the efficiency of human resources [6].

Labor Force Productivity:

Human resources play an important role as one of the main institutions and factors of each organization in the quantity and quality of that organization’s campaign. The growth and development of human resources and skills, creativity and knowledge of the workforce at all levels of the organization for the directors from the 90 AD (nineties) are considered strategic priority, and now is the same. The importance of this issue has caused more attention toward productivity of human resources, the status determination and its role in the production of goods and services [4]. Generally human resources play an important role in the development and deepening of productivity activities of workshops, and more efficient use of physical sources activities and also to advance research activities and development of knowledge. However, all of these features are depended on the human resources including education, skills, experience and other factors that caused to a difference in between the method of role and its effect on different levels. According to the theory of human capital, as the human physical capability increased the capital economic production, consequently, the human capital caused by learning, developed the ability of people. Labor Training can modify it and prepare them for the adoption of new processes and techniques to allow productivity to have a rapid growth. The results of productivity enhancement in the organizations require the emphasizing on human sources in terms of quality and to prevent from the premature labor force in their profession. Also, as the number of employees with higher education degree in industries gets more, and to be placed in the proper position of their work, they can use from physical capital more efficiently and thereby increase the productivity (mehregan and soltanisehat, 2014).

Labor Productivity Index:

In order to measure the labor productivity in the level of one part of the economy can be used of the value added ratio according to the number of employees. However, in addition to the information about the number of employees, the information about worked hours, paid work hours is also available, it can be used from each of the noted information instead of the number of employees in the denominator of index (For example, individual – consumed work hours), and accordingly, labor productivity can be achieved with greater accuracy. The labor productivity is the most common measure which can be used in the economy, industry, or a production unit. Among the reasons of this task can be referred to the relatively large share of labor costs in the value of the most products and also the availability of data related to the labor inputs in comparing with statistics and presented information of other inputs such as capital. Changes in labor productivity are because of various reasons such as changes in the quality of labor due to the education, obtaining experience and being expertise in the work, changing the working conditions, management skills and much more. Identifying the cause or causes of changes in labor productivity is important, because in this way, it can change the labor productivity freely [16].

Research Background:

In this part, research background provided as the internal and external studies:

Internal studies:

Etemadi and cooperation [7] in their study, investigated the assessment of the labor productivity impact on the accepted stock companies efficiency in Tehran stock Exchange. In this study, they were investigated 112 companies as the sample in the period of 2003 to 2007. The finding results of the regression analysis and correlation reflect that there were no differences between the labor productivity and capital productivity and the user and capital companies’ stock efficiency, and also the industry effect on this relation has been negative.
Mohammadv and Jabery [12] in a study by using the auto regression model with extensive lag (ARDL) and by the method Bounds testing approach, were studied the long-term relationship between the productivity of all production factors and labor productivity in Iran during the 1973-2008. The results of this research showed that long-term and bilaterally relationship between all productivity factors and available labor productivity have a significant positive impact on each other. Shah Abadi and Amiri the effect of knowledge (in the context of knowledge-based economy) on labor productivity in developing countries over the time period of 1980-2004 were tracked by using unbalanced panel data. The results showed that during the studied period, the three section of “innovation system”, “information infrastructure” and “economic and institutional regimes” had significant positive effect on labor productivity in the developing world and the fourth-centered which means “education and human resources” have positive but pointless impacts on labor productivity of developing countries. It is also due to the technical gap between developing countries and developed technology and the low absorption capacity in developing countries, the positive effect of the ratio capital variable toward labor on labor productivity have got meaningless. Alvani et al. [2] in their study investigated the organizational culture variables (including competition, results-oriented atmosphere, paying attention to people, relationships, identity, management support, acceptance of the values and norms) on the labor productivity in the health and treatment network of Zanjavan Vajaranood. They were used from 28 questions-based questionnaire based on Likert scale and were used of targets matrix for measuring labor productivity indices in order to measure organizational culture variables. Their research hypotheses were approved with statistical analysis of the correlation and t tests and as a result it was found that there is a direct and meaningful relationship between the variables of organizational culture and productivity of human resources. Abrishami et al. [1] in their study investigated the relationship between the inflation and labor productivity in some of the oil exporting countries. By using panel data over the time period of 1982 to 2007 and co-integration analysis, they concluded that there is a one-way relationship from inflation to the efficiency in a way that the nature of inflation in oil exporting countries was more due to the demand side factors such as rising oil revenues and increasing in liquidity and on the other hand, the inflation will reduce the efficiency of the workforce in these countries. Komejani et al. [11] were studied the effect of human capital on labor productivity growth in the Iran economy over the past three decades. They found that by using ARDL, factors such as "Foreign R & D accumulation", "human capital in terms of number of employees with higher education", "physical capital accumulation" and "Investment in ICT" are important factors which explains the growth of labor productivity over the years. So that the internal R & D accumulation and average years of schooling have a negative effect on labor productivity. Feizpour and Rezaei [8] in their research, has analyzed the components of "the firm size", "labor productivity" and "Exiting of newcomer manufacturing industries firms of Iran" and in answering to the question of whether the firm size has effect on productivity and accordingly the possibility of exiting from market or not, they were used of panel data model and the Cox proportional hazard. Their results of the survey on the status of the firms studied over a period of 5 years (1384-1379) showed that labor productivity is influenced by firm size, and this in turn will have a significant effect on the exiting of newcomer firms of the industry.

Foreign Studies:

Morikawa [15] in his study showed that the presence of trade unions have a statistically and economically significant impact on the productivity of the companies. The unions impacts were also positive on wages and their size is little more than productivity in terms of quantity. Reducing the number of employees in the companies with trade union is more than the companies without trade union and difference in employment growth is mainly attributed to a change in the number of employees who work part-time, consequently, in order to increase efficiency, close cooperation between management and unions is necessary. Braun [3] in his paper analyzed the overall industry productivity changes method and company performance in comparing to a competitive labor market by two system of group and individually exchanges and showed that the choice between individually exchanges and within company can own the exchanges between productivity and product prices in the country. Giordano and Giugliano [9] in their study presented the first quantitative assessment of labor productivity in the industrial sector of Italy during the years of 1911 to 1951 and its relationship with the competitive policy changes of that country. According to the results of this research, the most important reducing factor of marked speed for productivity growth, are the interventionist industrial policies adopted by the fascist regime in 1926-7. This essay ultimately seen the optimistic accounting of fascist industrial policies in a halo of ambiguity and confirmed the findings of the literature research based on the necessity of reduction of the role of government in Italy Industry. Sniukiene and Sarkane [17] in their article discussing the theoretical aspects of information and communication technologies and provided the theoretical frameworks of effective ICT development on labor productivity and economic growth and they were also detected the criteria and indices of ICT development assessment. Calcagnini and Travaglini [5] in their study analyzed the labor productivity in every working hours in the manufacturing industry of 4 industrial countries of Germany, France, Italy and America during the years 1950 to 2010 and by using "the process of common-common cycle" was divided data set into trends and cycles. They found that these 4 national manufacturing industry in 3
common method and trends cycle are common, so that the negative trends and cycles of innovation, supported the opportunity cost of productivity growth and usually (except Italy), the innovation process is greater than innovation cycle.

Research Method:

Due to the development of the tests and the pages limitation, in this part, the general approach of the research is proposed:

Since the data of this study were collected by using the Likert scale and questionnaire, therefore, the society normality assumption cannot be accepted and accordingly, the condition of using the parameter statistics methods and formula was not appropriate and should be used of nonparametric statistical methods, so that the one-sample sign and Wilcoxon tests which are in the group of non-parametric tests were used in order to statically analyze the presented research collected data. On the other hand, the reason is that in this study can be used of both tests at the same time, in the Wilcoxon test, the second society considered as an equivalent for average in which one-sample sign average test also uses the same logic. Finally, the test have been conducted by using the software SPSS21.

Research Hypotheses:

To achieve the objectives of the study, 12 following hypothesis have tested:

1. There is a significant relationship between the partnership working environment and the productivity of human resources.
2. Creating motivation through the increasing and non-permanent intake for staffs will increase the productivity of human resources.
3. Having skill, ability and readiness and training these items to employees will increase the human resources productivity.
4. The staff’s explanation about the tasks duties and giving continuous feedback to employees will increase the human resources productivity.
5. Working order and discipline and purposeful planning will increase the human resources productivity.
6. The director’s supporting of personnel and creating job security will increase the human resources productivity.
7. Export development will increase the productivity of labor.
8. The relationship between the labor productivity and capital productivity is straightforward.
9. Employees’ strong and positive religious faith have impact on manpower productivity.
10. Using the local labor force has a positive impact on productivity.
11. Pilgrimage excursion tours of staffs has a positive effect on labor productivity.
12. Jihad managers’ management will increase the productivity of human resources.

Research Findings:

Since the significance level of all assumptions are less than five percent, we cannot reject none of zeros hypothesis research and thus all hypotheses have been confirmed. On the other hand the importance of each factor which have been proposed in the hypotheses can be detected from Z value. As the absolute value of hypothesis Z (factorial) get higher, accordingly its importance get higher. Since this study used the Wilcoxon and the one-sample sign test, should be obtained two ratings for the factors. Since the both tests used the same logic as it is shown in the picture (1), the same ranking have been resulted.

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>Hypothesis ranking</th>
<th>Negative ranking</th>
<th>Positive ranking</th>
<th>Equal ranking</th>
<th>Wilcoxon Z</th>
<th>One-sample Z</th>
<th>Significance level</th>
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<tbody>
<tr>
<td>First</td>
<td>2</td>
<td>378</td>
<td>22</td>
<td>85</td>
<td>16.233</td>
<td>-17.750</td>
<td>.000</td>
</tr>
<tr>
<td>Second</td>
<td>7</td>
<td>145</td>
<td>10</td>
<td>39</td>
<td>-10.031</td>
<td>-10.763</td>
<td>.000</td>
</tr>
<tr>
<td>Third</td>
<td>3</td>
<td>302</td>
<td>16</td>
<td>70</td>
<td>-14.645</td>
<td>-15.982</td>
<td>.000</td>
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<tr>
<td>Fourth</td>
<td>1</td>
<td>445</td>
<td>45</td>
<td>189</td>
<td>-16.877</td>
<td>-18.025</td>
<td>.000</td>
</tr>
<tr>
<td>Fifth</td>
<td>4</td>
<td>283</td>
<td>27</td>
<td>78</td>
<td>-13.646</td>
<td>-14.483</td>
<td>.000</td>
</tr>
<tr>
<td>Sixth</td>
<td>5</td>
<td>211</td>
<td>21</td>
<td>59</td>
<td>-11.409</td>
<td>-12.408</td>
<td>.000</td>
</tr>
<tr>
<td>Seventh</td>
<td>12</td>
<td>91</td>
<td>49</td>
<td>54</td>
<td>-3.685</td>
<td>-3.465</td>
<td>.000</td>
</tr>
<tr>
<td>Eighth</td>
<td>6</td>
<td>152</td>
<td>8</td>
<td>34</td>
<td>-10.258</td>
<td>-1.305</td>
<td>.000</td>
</tr>
<tr>
<td>Ninth</td>
<td>8</td>
<td>119</td>
<td>27</td>
<td>48</td>
<td>-6.043</td>
<td>7.531</td>
<td>.000</td>
</tr>
<tr>
<td>Tenth</td>
<td>10</td>
<td>84</td>
<td>42</td>
<td>68</td>
<td>-3.007</td>
<td>3.65 (3)</td>
<td>.000</td>
</tr>
<tr>
<td>Eleventh</td>
<td>11</td>
<td>50</td>
<td>20</td>
<td>27</td>
<td>-3.731</td>
<td>-5.466</td>
<td>.000</td>
</tr>
<tr>
<td>Twelfth</td>
<td>9</td>
<td>61</td>
<td>15</td>
<td>21</td>
<td>-4.794</td>
<td>-5.162</td>
<td>.000</td>
</tr>
</tbody>
</table>

So according to Table (1), the ranking factors affecting on productivity can be defined as follows:

1. The staffs’ explanation about the tasks duties and giving continuous feedback to staffs
2. Collaborative work environment in the organization
3. Having skill, ability and fitness and training these items to staffs
4. The discipline and order of work and purposeful planning
5. Director’s supporting of employees and having job security
6. The capital productivity
7. Creating motivation through the increasing and non-permanent intake for staffs
8. Staffs’ strong religious faith
9. Export growth
10. Jihad Leaders management
11. The using of local troops
12. Providing pilgrimage excursion tours for staffs

Research’s Practical Approaches:
According to the aim of study, which is enhancing the productivity of human resources in the central Iron Ore Company of Iran (Bafgh). In this section, guidelines based on the basis of research has been presented for improving the productivity. These solutions are proposed in two stages of organizational level (of which the Iron ore company of Iran can use it) and individual level (of which in addition to the company, its employees can use them):

Organizational-Level Solutions:
One of the organizational level solution about increasing the productivity factors is using the participative style of management and their protection and supporting of employees. Particularly, in the sensitive and critical issues, because the individual working era has finished, management is a participatory management rather than an individual one. So it is recommended that appropriate measures be considered in the texture of selecting directors so that the selected directors create the tension for supporting employees in decision making at various stages of aiming, implementing and controlling and create a participation environment in organization.

One of the main factors that cause the production company staffs to be encouraged and accordingly increase their productivity is increasing the learning and education level of the employees. So that the staffs by increasing their knowledge and capabilities, provide the proper conditions for a better application and dedication in works. So having an orderly education system in a group which is running by the participatory management can lead to an increase in human sources productivity in that group.

Individual-Level Solutions:
Individual solutions are proposed in the 3 areas of individual and organizational goals, positive perception of their profession, and consultation and taking advantage of others’ experiences and recommendations.

A) Providing Individual and Organizational Goals:
Organization is better to work in a way that the individual follows company’s goals in addition to individual goals. Staffs are usually supporting such goals which they are able to understand them and it is necessary in all levels that individual goals guided toward the company’ goals.

B) A Positive Perception of Their Profession and Job:
One of the other individual goals is considering the work beneficial, having the feeling of being useful, applying curiosity, creativity senses and bringing positive motivations into themselves and others in which have significant effect on individual productivity.

C) Counseling and Taking Advantage from the Experiences and Suggestions:
Every man would love to be respected by others and others take his comments into consideration, recognizing his ability and functions and appreciate him and paying attention to his needs. Perhaps, it was because of this requirement that consulting in this level is recommended in Islam. So people are the ones who need the advice and consult and those who are consulting with others in their tasks, if the success achieved, a little jealousy is attracted toward them. Because others considered his achievements as their own ones. On the other hand, if the failure comes to the table, others not only object him, but also will have a sense of compassion for him.

REFERENCES