SURVEYING THE RELATIONSHIP BETWEEN INNOVATION AND HUMAN RESOURCE PRODUCTIVITY AT MOGHAN'S AGRO-INDUSTRY COMPANY

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ABSTRACT

This study focuses on innovation and productivity of Iranian Moghan's agro-industry company in Ardabil Province. Data has collected from 68 engineering of Moghan's agro-industry company by two standard questionnaires with study of variables. Innovation Questionnaire, a 36 item scale according to Dorabjee& et al. (1998) theory and human resource productivity Questionnaire, a 21 item according to Hersey & Goldsmith, (1990), all the reliability and validity of measures has examined. Questionnaires had high reliability. To analyze the data resulted from collected questionnaires deductive and descriptive statistical methods are used, and to test the hypothesis of the research we used Pearson correlation coefficientsandT-test has performed to compare means of the constructs between variables.The results show that Innovation and their dimensions are all significantly and highly related with HR Productivity. Strong positive correlation was found between Debates and productivity (r=0/921 and t=15.22). Also was found Strong positive relationship between all dimensions of innovation and HR productivity.

Key words:innovation, productivity, Human Resource productivity

INTRODUCTION

Unlike some 50 years ago when the productivity movement was born, productivity has become more dependent on knowledge as the key to innovation, competitiveness and growth. In the knowledge era, it is vital that we strive collectively to raise the level of productivity of knowledge workers to meet the new challenges brought about by the latest developments in all sectors of industry and society [1].What we mean by the term "productivity" is fairly easy to understand although difficult to measure: it is the quantity of output that can be produced using a given level of inputs. If productivity is to be used as a measure of innovation, there is an implicit assumption that increases in output not accompanied by increases in inputs are due to innovative activity.

The productivity of an economy can grow in two different ways. First, productivity can be increased by raising the value of goods and services produced (e.g., shifting production from standardized commodities based on existing technologies to new, higher performance technologies for which consumers are willing to pay a premium and also gain greater economic

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benefit). Second, productivity can grow by producing a given set of goods or services in a more technically efficient manner. Although these two methods of raising productivity cannot be rigidly associated with any of the various kinds of innovation described above and are in fact complementary, product innovation is more likely to promote transitions from lower to higher value-added products while process and organizational innovation are more likely to improve technical efficiency. Often policy makers around the world have stress the first form, and give short shrift to the second, even though the latter approach is where most productivity gains come from [2].

Raising productivity is not a matter of working harder or working longer hours. Making production more technically efficient requires getting more out of existing work hours, not raising the number of hours worked. Although having workers work harder can yield short-term productivity gains, it is not a route to sustained, long-term growth in technical efficiency, which can be obtained only through new capital equipment and software, higher skills, or new ways of organizing work.

Furthermore, shifting the mix of goods and services toward those that consumer's value more highly has nothing to do with working harder or longer. Some fear that productivity growth will lead to job losses because fewer workers will be needed to produce the same amount of goods and services. This fear is misplaced. Although productivity growth can cause job displacement in particular firms (which should be addressed through workforce adjustment and full-employment policies), historically it has led to an expansion of output and demand that generates new jobs that more than make up for the initial losses. [2].

Human resources, as the most expensive and most valuable source of capital and the organization is considered as the most important factor in the operational chain of any organization, have long proven a great success, and organizations that have paid attention to this issue miniature the works place. The main goals Understanding factors affecting productivity of human resources is the main goal researchers following. According to Taheri (2007), all researchers believe that human resources increase productivity but cannot be offered to improve productivity combined effect of various factors. One of the most important goals in any organization is to promote productivity and given that humans are created productivity central to the demands he puts behind organizations key work [3].

Oulton (1990) studied about labor productivity in the industrial sector in England during the 1970s and 1980s using the panel data. The results show that investment in new technology gives significant contribution towards growth of labor productivity in the industrial sector, whereas, increase in price of intermediate goods makes labor productivity to decrease. Apergis et al. (2008) studied the relationship between labor productivity, innovation and technology transfer in the services industry in six selected countries in Europe. They found that research and development (R&D), human capital and international trade could accelerate innovation process and facilitate transfer of technology. The results show that there is a balanced relationship between labor productivity, innovation and technology transfer in the long run. Furthermore, R&D, trade and human capital statistically have important and significant impact towards labor productivity through innovation and indirectly through increased spread of technology [4].

In terms of the dimensions of human resources productivity a vast amount of researches and surveys have been carried out. In consideration, "Hersey and Gold Smith" Model, due to its universality and attention to recognition of components which are effective in providing human resources productivity (John Wiles & et.al, 2011, p31), has been chosen as the significant ground for the exploration of the dimensions of human resources productivity in this proposal, especially

because this model has been the basis of tens of studies in this field. Based on this theory, human resources productivity consists of seven dimensions. These dimensions are composed of: A- Ability (knowledge and skills), C- Clarity (conception or imagination of the role), H- Help (organizational support), I- Incentive (intention), E Evaluation (operation feedback), V- Validity (justice), E- Environment (environment proportionality).

Combining all the seven letters makes up the word ACHIEVE, which the model is known by Bernard C. Beaundreau(2009) [5]. The dimensions of this model are defined below:

- Ability (knowledge and skills): It refers to the knowledge and skills of the followers in doing a task successfully which includes the knowledge related to the task, experience related to the task and merits related to the task.
- Clarity (conception or imagination of the role): It corresponds to the conception and acceptance of the work method, place and the way to deal with the job. This conception needs clarity in objectives and distinct way in reaching them.
- Help (organizational support): Some of the organizational supports include human resources, budget, facilities, accessibility of products and the quality.
- Incentive (intention): People by nature are inclined to follow those tasks which end up in rewards and refrain from other tasks. Rewards can be palpable or impalpable.
- Evaluation (operation feedback): Evaluation is said to be the daily actions feedback and occasional assessments. If people are not aware of their shortcomings, improvement of their actions cannot be expected.
- Validity (justice): It is referred to proportionate and realistic decisions made by the manager for the human resources.
- Environment (environment proportionality): It is referred to those foreign agents that can affect actions even when having necessary capability, clarity, support, and incentive. The key environment components are competition, changes in market conditions, government regulations, preparations and … [6].

In the last decade, an increasing number of economists have come to conclude that innovation—the creation and adoption of new products, services and business models—is the key to improved standards of living. Manual (2005) says that "An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations." [7].

In spite of the apparent clarity of the definition of innovation in the Oslo Manual (2005), measuring innovation in a form that is useful for statistical analysis has proved challenging. The central problem is that no two innovations are alike. Some innovations (e. g., the invention of the telephone or perhaps the telegraph) create a whole new market sector whereas others are useful but trivial, and there is a wide range in between. In general we can say that smaller innovations are more numerous than game-changing ones. Table 1 in Acs and Audretsch (1990) shows this clearly. During the year 1982, over 85 per cent of the innovations they identified from a comprehensive review of over 100 trade journals were modest improvements to existing products and none created entire new markets. Fewer than 2 per cent were considered even the first of its type on the market in existing market Categories [7].

Innovation involves putting new ideas into commercial use; in this way it differs from invention, which does not necessarily involve actual use. There are several kinds of innovation: the creation of new products or services ("product innovation"), the use of new production technologies and techniques ("process innovation"), and the implementation of new ways to organize work and business processes ("organizational innovation"). Each of these may involve either an innovation

new to the world (e.g., the introduction of the personal computer or the Internet) or one that is simply new to a particular firm or organization (e.g., the use of electronic communication to manage retail supply chains). (The latter is often referred to as the diffusion of innovation.) Each may be "radical" (completely different from existing products, processes, or organizational forms) or "incremental" (changing existing products, processes, or organizational forms in small ways to create new ones) [8]. Some product or process innovations may result from formal research and development programs, while others may be developed as a byproduct of the production process or through feedback from the production process to formal R&D, while still others may come from interactions with users [9]. All these types of innovation are important for improving the organization standard of working and living. Innovation in today's economy takes place in at least four distinct innovation trajectories, each with its own needs for government assistance [10].

The *cutting-edge science-based* trajectory involves industries, such as biotechnology and parts of information technology, that depend on cutting-edge university research, which is typically patented and licensed, sometimes to new, small firms that rely on venture capital for financing.

The *related diversification* trajectory involves using existing technologies to create new market opportunities, either in existing firms or in new ones. For example, the University of Akron has sought to help Akron-area firms find new applications for polymer technology, which was the core technology of the region's tire industry. In this innovation trajectory, firms' technology transfer needs are more applied and distant from cutting-edge science.

The *upgrading* trajectory is the one often followed by firms in more mature industries that do not depend much on cutting-edge science. It involves constant, usually incremental innovation in products, processes, or ways of organizing production.

Firms and industries on the *project-based* trajectory produce customized services that require creative solutions to problems (although these often follow a standard form) [10].

The innovation surveys have typically measured innovation in two ways: first, by asking whether the firm introduced an innovation of a certain type (product, process, organizational, marketing, etc.) during a preceding period (usually the past three years) and second, by asking what share of the firm's sales are due to products introduced during the same preceding period. The first measure has a number of drawbacks, which have become quite evident as it has been used in many empirical studies. When examined across a range of firm sizes, it produces the misleading results that larger firms are more likely to be innovative, whereas in truth larger firms are involved in a wider range of activities and therefore more likely to have an innovation in at least one of them. So this variable cannot be used to make the kind of statements that one sometimes hears, such as "large firms are more innovative than small firms."

The main purpose of this paper is surveying the relationship between innovation and human resource productivity at Moghan's agro-industry company. Therefore, the focus of this study is surveying of innovation on productivity of Employees at Moghan's agro-industry company.

RESEARCH HYPOTHESES

In this paper, we have one main hypothesis and nine secondary hypotheses. The statistical way of analysis of hypotheses is two ways, H_1 is acceptance of hypothesis and H_0 is rejecting of hypothesis. In other words, it means that H_1 has positive meaning and H_0 has negative meaning.

1- There is a relationship between Innovation and HR productivity in Moghan's agro-industry company.

1-1- There is a relationship between Challances / Involvement and HR productivity in Moghan's agro-industry company.
1-2- There is a relationship between Freedom and HR productivity in Moghan's agro-industry company.
1-3- There is a relationship between Trust/ Openness and HR productivity in Moghan's agro-industry company.
1-4- There is a relationship between Idea Time and HR productivity in Moghan's agro-industry company.
1-5- There is a relationship between Playfulness/Humer and HR productivity in Moghan's agro-industry company.
1-6- There is a relationship between Cnflicts and HR productivity in Moghan's agro-industry company.
1-7- There is a relationship between Idea Support and HR productivity in Moghan's agro-industry company
1-8- There is a relationship between Debates and HR productivity in Moghan's agro-industry company
1-9- There is a relationship between Risk-Taking and HR productivity in Moghan's agro-industry company

METHODOLOGY

This study focuses on innovation and productivity of Iranian Moghan's agro-industry companyin Ardabil Province. Data has collected from 68engineering ofMoghan's agro-industry companyby two standard questionnaires with study of variables. Innovation Questionnaire, a 36 item scale according to Dorabjee & et al. (1998) theory and human resource productivity Questionnaire, a 21 item according to Hersey & Goldsmith, (1990), all the reliability and validity of measures has examined. Questionnaires reliability was estimated by calculating Cronbach's Alpha via SPSS software that is shown in the table 1.

Table 1.Results of questionnaires reliability from SPSS software

Variables	Cronbach's Alpha
innovation	0.82
productivity	0.87
All	0.83

In order to analyze the data resulted from collected questionnaires deductive and descriptive statistical methods are used, and to display some statistical data we used column diagram and in deductive level to test the hypothesis of the research we used T-test has performed to compare means of the constructs between variables and Pearson correlation coefficients. The analysis has performed with SPSS.

ANALYSIS AND DISCUSSION

1- Descriptive Analysis

The responder's degree is 5 percent PHD, 38 percent master degree and 57 percent have Bachelordegree. It means that the most of the engineering have Bachelordegree. (Table 2)

Table2- Responders degree

Responders degree					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bachelor	39	57	57	57
	Master	26	38	38	95
	PHD	3	5	5	100.0
	Total	68	100.0	100.0	

Table 3 shows work experience of the responders. According to table 3, from the precedence point of view about 10 percent of responders have less than 5 years' work experience, and 28 percent have between 6-10, 35 percent 11-15, 23 percent 16-20 and 3 percent do not answer to this question. It shows that people with more experience are less than 15 years.

Table 3- Work Experience of the responders

Work Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<5	7	10.29	10.29	10.29
	6-10	19	27.94	27.94	38.23
	11-15	24	35.29	35.29	73.52
	16-20	16	23.53	23.53	97.06
	Missing	2	2.94	2.94	100.0
Total		68	100.0	100.0	

Table 4 reports descriptive statistics including means and standard deviation for samples.

Table 4: Means and standard deviations for variables

Statistics											
		Challances /	Freedom	Trust/ Openness	Idea Time	Playfulness /Humer	Cnflicts	Idea Support	Debates	Risk-Taking	HRP
N	Valid	68	68	68	68	68	68	68	68	68	68
	Missing	0	0	0	0	0	0	0	0	0	0
Mean		19.23	20.48	21.32	18.55	20.01	21.60	20.6	20.47	20.27	60.36
Std. Deviation		5.69	4.27	4.15	5.08	4.87	5.02	5.45	4.85	4.58	11.35

2- Hypothetical Analysis

Table 5, which present the correlations and t-test of each of the eleven items of first main hypothesis "There is a relationship between Innovation and HR productivity in Moghan's agro-industry company". The results show that Innovation and their dimensions are all significantly and highly related with HR Productivity. Strong positive correlation was found between Debatesand productivity (r=0/921 and t=15.22). Also was found Strong positive relationship between all dimensions of innovation and HR productivity (see table 5).

Table 5- Pearson's correlation coefficients and t-test of variables

Independent Variables	dépendent Variable	n	Pearson Correlation	t	sig.
Challances / Involvement	HRP	68	0.820	8.43	.000
Freedom	HRP	68	0.871	5.61	.000
Trust/ Openness	HRP	68	0.831	18.43	.000
Idea Time	HRP	68	0.615	13.01	.000
Playfulness/Humer	HRP	68	0.801	16.45	.000
Cnflicts	HRP	68	0.806	12.67	.000
Idea Support	HRP	68	0.828	12.94	.000
Debates	HRP	68	0.921	15.22	.000
Risk-Taking	HRP	68	0.548	6.53	.000
Innovation	HRP	68	0.892	16.82	.000

Findings show that, that there is a positive relationship between Innovation and HR productivity inMoghan's agro-industry company.

CONCLUSIONS AND SUGGESTIONS

The foregoing survey of the relationship between innovation andHuman resource productivity finds a significant impact of innovation on productivity and a somewhat more ambiguous impact of process innovation.

A very interesting line of work would be to understand the extent to which innovativeactivity on the part of entrants and the existing firms is behind the results in Foster *et al.*(2008). That is, the paper provides evidence on the composition of aggregate productivitygrowth but not on its sources. Aghion*et al.* 2009 find that foreign firm entry intechnologically advanced UK sectors spurs both innovation (measured as patents) andproductivity growth, whereas entry by such firms in lagging sectors reduces innovationand productivity growth by domestic firms in those sectors, arguing that this is due to thefact that firms are discouraged by the cost of catching up. On the other hand,Gorodnichenko*et al.* 2010, using data from emerging market countries in Eastern Europeand the former Soviet Union, find a robust relationship between foreign competition (self-reportedby the firms) and innovation in all sectors, including the service sector. Thus wehave evidence that at least some kinds of entry encourage innovative activity, althoughrelatively little that traces the path from entry to innovation and then to productivity.

As to the regulatory and financial environment that encourages innovation on the part offirms, following important efforts led by the World Bank to collect data on entry regulation,the rule of law, and other country characteristics, a substantial cross country growthliterature has developed that relates these characteristics to entry [11]; [12]; [13], investment [14],productivity[15], and firm size and growth [16]; [17]. Briefly summarized, stronger entry regulation and/or higher entrycosts are associated with fewer new firms, greater existing firm size and growth, less investment, and higher profits [18]. Most of the studies cited have made a seriousattempt to find instruments or controls which allow them to argue that this relationship iscausal. Thus far none of these studies explicitly looks at the impact on innovative activityand its relationship with productivity, although one can argue that the entry of new firms isa form of innovation.

Finally, Innovation is important because it leads to the development of new products and technologies as well as because it drives organizations economic growth. However, productivity growth is the best aggregate measure of the economic consequences of innovation. The most

common measure of productivity, labor productivity, can be defined as value added per unit of labor. Productivity growth is the key to higher standards of living because it lets workers produce more for the same amount of work. For increasing of productivity, we suggest that:

- Allow chances for independent action
- Allow them to use their own initiative and style
- Allow to display expertise
- Conduct regularly scheduled, consistent activities
- Find different ways of doing things
- Give careful, clear instructions
- Give chances to display their broad view of a situation, including its impact on others and possible solutions
- Give opportunities to study and explain
- Have them promote ideas to others
- Let them make use of tools and machines (performing, crafting, composing)
- Make use of art projects and dramatizations
- Pay attention to details
- Provide consistent feedback
- Provide for situations requiring clever ways to solve problems
- Provide opportunities for communication (writing, etc.)
- Provide opportunities for personal contact
- Provide opportunities for planning, designing and inventing
- Provide opportunities for their input
- Provide short-term projects
- Provide tasks requiring endurance, risk and chance
- Supervise to keep on task
- Use a team approach to problem-solving
- Use activities that allow for growth and development of ability and skills

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