Research Journal of Business Management

ISSN 1819-1932

Academic Journals Inc.

www.academicjournals.com

Research Journal of Business Management 6 (4): 134-143, 2012
ISSN 1819-1932 / DOI: 10.3923/rjbm.2012.134.143

Compensatory Payments and Labor Productivity of Industrial Cooperatives in Iran

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ABSTRACT

The performance of a cooperative organization depends to a large extent on the productivity of its workforce and determines its survival and growth. It is therefore, imperative for cooperatives at national and local levels to explore ways of improving and updating environmental facilities in order to make the workforce more conducive and productive. The main objective of the study is to find out, whether any increment in wage payments of the laborers in industrial cooperatives, can be as an effective measure to cause a substantial increase in the rate of industrial cooperative's value added. For this purpose and in order to investigate the effects of compensatory payments received by the employees on their productivity, the Cobb-Douglas model and panel data regression analysis were designed to analyze the productivity performance of laborers working in industrial cooperatives of 30 provinces during the period 2006-2008. The results showed that the variable of compensatory payments including direct and indirect wage payments have positive and significant effect on Iran's industrial cooperative's value added. That is concluded that any increase in wage can cause labor productivity increase in production in such a way that 1% increases in wage payment raises the average added value of industrial cooperatives by 0.184% while, 1% increases in other payments raises the average added value only by 0.124% in this sector.

Key words: Productivity, industry, cooperatives, compensatory payments, performance

INTRODUCTION

Most of the economists believe that every country's feature and development process is identified first by human sources quantitatively and qualitatively and then by natural sources and physical asset (Todaro, 1998). Moreover, that is truly said that the wealth of a nation as well as socio-economic well-being of its people depends on the effectiveness and efficiency of its various sub components. Labor is generally regarded as the most dynamic of all the factors that are employed for the creation of wealth, having the potential to energize and serve as catalyst to all of the other resources (Yesufu, 2000). Theoretically, the success in productive human capital investment will afford an upcoming advantageous for the members of cooperative enterprises in the form of better supports and services (Andri, 2006). Productivity is of fundamental importance to the individual worker of whatever status, to the organization whether commercial or not and to the national economy at large and accordingly therefore, to the uplifting the welfare of the citizen and the reduction if not total eradication of mass poverty (Akinyele, 2007). In this regard, wage should be identified in a way that wage increase with having impact on staff's working will raise their productivity.

Cooperatives involve a group of people based on common beliefs of Participation and making value added and profitability is among the main goals of organizations and economic firms including cooperative societies. These sorts of organizations play an important role in making decisions by the member's active Participation (Alvarez, 1999; Ilskog *et al*., 2005). Participation means motivating people and increasing their understanding and capability in order to response development plans that have strong relation with the rate of success in human resource management. In other words, participation involves people's interference in decision making process, plans performing and sharing the interest of the development plans and interfering in evaluation of plans (Shahraki *et al*., 2011). Many studies indicated the important role of individual's participation in cooperatives success and development (Huntsinger and Fortmann, 1990; Ladele *et al*., 1994; Finsterbusch and van Wicklin, 1989; Fleischer and Applebaum, 1992). These studies focus on the subject that collective and participation approaches are useful for desired management of human resources for making more effective decisions on optimizing the profitability of the organization. Baticados (2004) emphasized the important role of member's integration and durability of small group's participation in exploiting resources and success of cooperatives. Now-a-day, effective participation of Laborers for making more constant use of resources with economical as well as environmental value has become a principle (Mbaiwa, 2005). On the other hand, observations done by international foundations such as International Cooperative Association (ICA) emphasize the issue that the cooperative societies have direct and indirect impact on social and economic development of the communities under their coverage; so that activity variety and commercial scheduling have rendered these purposeful institutions can be known as among the largest firms in goods production, distribution and consumption besides being job creator and profitable. Simmons and Birchall (2008) believed that in the line of growth, development and livelihood improvement, the growth tone should be in compliance with centrality of social justice and from this point of view cooperatives are considered the best mechanism for stable development and of the factors of poverty reduction. For many reasons, Birchall (2003) believed that development of cooperatives caused the economic sector to be known as a good model for poverty reducing and increasing social welfare of the community. In an investigation about farmer's organization in Turkey, Kocturk (2006) concluded that the cooperatives could not be activated because of the lack of interest of their members and are in need of professional management and financial support to make them successful. Regarding the marketing efficiency of cooperatives in Iran, Kheirandish and Gowda (2012) revealed that in many cases the cooperative societies and processing companies are not involved in the marketing of their products because of the inefficient performance of the cooperative. The main objective of this study is to consider the relationship between compensatory payments (Direct and Indirect payments) and labor productivity in industrial cooperatives of Iran during the years 2006-2008. In other words, to say whether any increment in wage payments of the laborers in industrial cooperatives, could be considered an effective measure to cause a substantial increase in the rate of industrial cooperative's value added.

COOPERATIVE SECTOR IN IRAN

At present the economy of Iran is the seventeenth largest in the world by Purchasing Power Parity (PPP) and twenty-sixth by market value (World Bank, 2010). That is a mixed and transition economy with a large public sector and some 50% of the economy centrally planned (Economist, 2003). According to the Article 44 of the Iranian Constitution, the economy of Iran

consists of three sectors: state, cooperative and private. The cooperative sector is to include cooperative companies and enterprises concerned with production and distribution, in urban and rural areas. By virtue of Cooperative Sector Law, cooperative societies under Ministry of Cooperatives are classified to create job for members, to meet needs and to boost competitiveness of Small and Medium Enterprises (SMEs) and to satisfy members' welfare requirements. A survey by Ministry of Cooperatives revealed that share of cooperative sector in GDP has been 1.6% in 1994, 2.82% in 1996, 3.5% in 1998 and about 5.5% share in 2005 (Cooperative Ministry, 2011). The fifth development program on Iran emphasis on the importance of cooperative sector and making effort to obtain 25% portion of economic activities at the end of the program has brought about the necessity of paying attention to this important economic sector more than ever to reach long and short-term aims of job creation and poverty reduction (Najafi, 2009). Of course, it should be mentioned that, despite the importance of cooperation sector in the country, this activity sector of the economy couldn't yet reach its real position and powerful merits. Since the current approach of economic policy making in line with the country's perspective document is private sector growth and development and government minimization, one of the ways of absorbing small capitals and developing nonpublic sector can be cooperatives reinforcement to make added value, employment and economic growth that is the result of their economic activity. For this purpose it's necessary to consider the factors influencing economic efficiency of this sector including labor productivity increase. The purpose of the present study is to answer the fundamental point that whether the changes in the amount of staff services compensation in industrial cooperatives of Iran could bring a meaningful impact on labor productivity of this sector during the course of study?

MATERIALS AND METHODS

Productivity so defined by McBeath (1996) is a measure of how well resources are brought together in organizations and used for accomplishing a set of results. Based on this view, productivity implies reaching the highest level of performance with the least expenditure of resources. To investigate the importance of the labor productivity issue and thereby the socio-economic growth, a lot of studies have been done through production functions assessment such as Trans-log production function and CES production function by involving the variables affecting labor productivity increase and subsequently economic growth. Among the variables which can be discussed are the added value, capital volume, labor's skill and specialty, actual wage, taxes and subsidies and credit facilities. Also, some studies have been done relating to influence of the actual wage variable and compensatory payments on labor production increase and thereby economic growth which are generally based on the theory of efficient wage. In this study, the panel data method has been used; sections included 30 provinces for the duration of three years. The general form of panel data method can be investigated as follows in which there is N sections, K variables and T period (Eq. 1):

$$Y_{it} = \beta_{1it}x_{1it} + \ldots\ldots\ldots + \beta_{kit}x_{kit} + u_{it} \quad (1)$$

In this study, Cobb-Douglas production function is used for the reasons of simplicity, high description ability and its high application in economic studies and also through the feature of possibility of substitution between factors in the course of production. The general model of Cobb-Douglas production function is considered in Eq. 2:

$$Q = A L^{\alpha} K^{\beta} \quad (2)$$

Where:

Q: Actual production of industrial cooperatives sector with ten workers or more
L: Employment in industrial cooperatives sector with ten workers or more
K: Actual capital volume in industrial cooperatives sector with ten workers or more
α and β: Labor productive elasticity and capital productive elasticity, respectively

To obtain the proper model, the labor average added value has is considered labor productivity:

$$APL = \frac{Q}{L}$$

and inserted into the model as dependent variable, along with the number of staff, capital per capita volume and per capita industrial cooperatives compensatory payments as independent variables. Based on the studies done and present economic viewpoints, Average Productivity of Labor (AVL) is a function of employment level (L), per capita capital volume (AK), per capita compensatory payments (AWP) and other related factors. Per capita capital volume and per capita services compensation are obtained through Eq. 3, 4 and 5, respectively:

$$AK = \frac{K}{L} \quad (3)$$

$$AWP = \frac{WP}{L} \quad (4)$$

$$AVL = AVL (L. AK. AWP) \quad (5)$$

To estimate the model based on the ordinary least squares method, nonlinear relation of Cobb-Douglas Production function is converted into linear relation and used as the following logarithmic form (Eq. 6):

$$Log\ AVL = Log\ A+\alpha\ Log\ L+\beta\ Log\ AK+\theta\ Log\ AWP \quad (6)$$

Finally, the parameters of the research model are estimated by using the ordinary least squares method and panel data method as follows (Eq. 7):

$$Log\ AVL_{it} = Log\ A_{i}+\alpha\ Log\ L_{it}+\beta\ Log\ Ak_{it}+\theta\ Log\ AWP_{it}+u_{it} \quad (7)$$

The main objective of this study is to consider the relationship between compensatory payments and labor productivity in industrial cooperatives with ten or more staff during the years 2006-2008. Further by separating compensatory payments into two parts of wage and other payments (such as rewards, donations, etc.) we'll consider if the impact of the payable wage on labor productivity in the cooperatives sector of the country is equal with the impact of other payments on productivity.

The source of data related to the study have been collected from Iran's Statistics Center (2009) publications and Cooperative Ministry for the years 2006-2008 the statistical community is composed of industrial cooperatives (ten workers and more) belonging to 30 provinces of the country.

RESULTS

The statistics shows that to the end of the year 2008, a total number of 606 industrial cooperative workshops with ten workers and more have been operating in the country (Table 1). Distribution of these workshops in major activities was as follows: 36% in "drink and foodstuffs industries" sector, 18.5% in "industries of non-metal and mineral productions" sector, 7.9% in "rubber and plastic productions industries" and other workshops were occupied with other industrial activities (Table 2). Also, the most centralization of industrial cooperative workshops was in the provinces Mazandaran, Gillan and Khorasan Razavi with around 8.7, 7.9 and 7.1%, respectively and the least centralization was in the provinces Elam, Kerman and Sistan and Balochestan with around 0.3, 0.7 and 0.8%, respectively (Cooperative Ministry, 2011).

To investigate the relationship between compensatory payments and labor productivity in industrial cooperatives, considering the first model, the effect of staff services per capita compensation (AWP) including wage and other payments on labor productivity was

Table 1: Data specifications of industrial cooperatives (2006-2008)

	Year		
Specification	2006	2007	2008
No. of cooperatives	515	548	606
Relative number to total cooperatives (%)	21/3	45/3	85/3
No. of employees	17610	18490	19379
Relative number to total industrial employees (%)	64/1	68/1	68/1
Compensatory payments (1000000 Rials)	532427	638693	803366
Relative share to total industrial sector payments (%)	95/0	93/0	95/0
Value added of cooperatives (1000000 Rials)	1644920	1972375	2328929
Relative share to total industrial sector value added (%)	61/0	60/0	60/0
Labor productivity (1000000 Rials) (value added/No. of employees)	Apr-93	7/106	1/120

Cooperative Ministry (2011) Iran

Table 2: Activity-Based industrial cooperatives in Iran (2011)

Activity	No. of cooperatives	No. of employees	Value added (1000000 Rials)
Total	606(100)	19379(100)	2328929(100)
Foodstuffs and Drinks Products	218(36)	7934(40.9)	799667(34.3)
Textile Industries	24(4)	1122(5.8)	61363(2.6)
Cloths Making Indnstries	26(4.3)	563(2.9)	29555(1.3)
Paper Products	Jan-00(3.5)	438(2.3)	34645(1.5)
Chemical Products	29(4.8)	693(3.6)	152916(6.6)
Plastic Products	48(7.9)	966(5)	97726(4.2)
Non Metal and Mineral Products	112(18.5)	3032(15.6)	471983(20.3)
Basic Metals indnstries	20	541(2.8)	123222(5.3)
Original Metallic Products	38(6.3)	1196(6.2)	156965(6.7)
Other Activities	70(11.4)	2894(14.9)	400887(17.2)

Values in parenthesis are share %, Cooperative Ministry (2011) Iran

estimated. Further, the second model was studied by distinguishing services compensation variable into two parts of wage and other payments to investigate comparatively the impact of per capita wage (AW) and other payments per capita (AP) on labor productivity. The aim of estimating the second model is to answer the question that which one of wage and other payments variables such as reward, etc., can have more impact on labor productivity?

To study the impact of two variables of wage and other payments on labor productivity, the per capita form of these variables has been used, the calculation that is the same as functions 3 and 4; per capita wage (AW) and other payments per capita (AP) have been shown. To investigate the existence of homogeneity or heterogeneity in sections and to specify the matter that in the case of homogeneity, the aggregated ordinary least squares method and in the case of heterogeneity, the panel data method are used, the zero hypothesis based on sections homogeneity was tested by Limer test (F).

In the test statistic (F), the amount of RRSS indicates restrict residual sum of squares, the amount of URSS is un-restrict residual sum squares, K shows the number of descriptive variables, N is the number of sections and NT is the number of total observations. As it is shown in Table 3 ,the amount of obtained statistic F for both models implies the zero hypothesis rejection. So that is concluded that using panel data method is more desirable. In order to identify whether the models should be estimated considering constant or random effects, the Hausman test was used (Hausman, 1978). With reference to the calculated statistic (chi-square statistic) and comparing it with critical amounts, it was apparent that the zero hypotheses based on more efficiency of random effects couldn't be rejected (Table 3). The result is that both models are estimated based on random effects.

Table 3: Model estimation output for industrial cooperatives (2006-2008)

Variables	Statistics	Model 1	Model 2
Probability of Limer	F(v1,v2)	1/76	1/78
	Probability	0/34	0/032
Hausman test	Chi-Square	0/41	0/921
	Probability	937/0	921/0
Likelihood ratio test	Chi-Square	76/74	75/23
	Probability	00/0	00/0
	Coefficient	α_0 = 0/33	β_0 = 0/262
Log (L)	Probability	00/0	00/0
	Z	17/6	11/53
	Coefficient	α_1 = 0/458	β_1 = 1/358
Log (AK)	Probability	00/0	00/0
	Z	45/58	11/21
	Coefficient	-	β_3 = 0/184
Log (AW)	Probability	-	00/0
	Z	-	4/55
	Coefficient	-	β_3 = 0/124
Log (AP)	Probability	-	00/0
	Z	-	4/33
	Coefficient	α_2 = 0/22	-
Log (AWP)	Probability	00/0	-
	Z	5/3	-
Log likelihood		48/66	47/62

L: Employment, AK: Per capita capital, AW: Per capita wage, AP: Other payments per capita, AWP: Per capita compeusatory payments

Moreover, since the number of sections including 30 provinces is more than the time series and there is the possibility of heterogeneous variance, the heteroscedasticity variance test was done based on the likelihood ratio test. The test results with a 5% meaningful level shown in Table 3 indicates variance heterogeneous for both models. So, to remove the problem and estimate more properly, the Feasible Generalized Least Squares (FGLS) method is used.

DISCUSSION

Many studies regarding the factors affecting labor productivity and economic firm's added value such as the impact of services compensation, payment and salary have been done. Samadi (2004) investigated the relationship between wage and labor productivity in Iran's large industrial workshops, using convergence methodology and error correction model during 1979-2002 and found that there is a one-sided causal relationship from wage to productivity, but there is no causality relationship from productivity and unemployment to wage. He concluded that Iran's large industrial workshops can affect their own firm added value by raising the worker's wage. In another study regarding the effects of manager's power on capital structure of Italian agricultural cooperatives, Russo *et al.* (2000) come to the conclusion that member participation is one of the effective factors in cooperatives performance. Taheri (2003) also investigated the relationship between wage levels and labor productivity in Iran's industries sector for the years 1994-2000; by measuring the labor's generalized mean productivity in industry activities and providing theoretical. The results for the country's industrial workshops in the form of nine activity groups showed that in the course of study there was a direct relationship between wage levels and labor productivity and that the structure of this relationship has been the same for different activities of industry. In order to show the effective factors on cooperatives success in Iran, Amini and Ramezani (2008) and Nekooee-Naeeni (2006) concluded in different studies that, the extent of member's participation and their motivation incentives such as compensatory payments are effective factors in cooperatives success.

Further, Wakeford (2003) investigated the relationship between wage, employment and productivity of labor in Southern Africa's industry sector in the years 1983-2002 and concluded that there is a long-term balance relationship between actual wage and labor productivity; so that 1% increases in actual wage level causes 58% increase in industry sector productivity. In order to answer the question that if the wages can cause productivity increase, Levin (1992) used production function to describe the differences in wages in South America and tested the wage efficiency theory. He concluded that there is a meaningful and positive relationship between productivity and wage. So that, those commercial units increasing workers' relative wage with the same human capital are able to cover the expenses arising from increase in wages through obtaining the interests arising from productivity. In another attempt, Gordon (1987) used productivity equations to measure the relationship between labor productivity growth and actual wage in Japan, America and Europe and showed that increase in actual wage causes labor productivity increase and added value and finally welfare level increase and economic growth in the society. The main focus of present study also was on finding out the relationship between compensatory payments (Direct and Indirect payments) and labor productivity in industrial cooperatives of Iran during the years 2006-2008.

The concluding part of the above-mentioned studies and the present work confirm that in economic firms there is a bilateral relationship between two variables of labor productivity and staff services compensation. In such a way that wage increase should rise according to productivity level

and also productivity should rise in proportion to wage increase. In this situation it is expected that any wage increase causes labor condition improvement in economic firms so this issue should be explained to the staff that they must enhance their productivity in proportion to the increased wage so that the increase made in wages be economical in term of management for the employer. Also, to prevent staff welfare reduction it's necessary that any increase in wage levels be according to the present inflationary conditions. Since the amount of the wage being received has a great impact on families' consumption basket and providing their minimum needs, so if wages are not increased rationally in line with goods and services price level, this matter will lead to reduction of families' welfare level, reduction of their motivation for working in environment and finally reduction of labor productivity in society.

Cooperative movement was incorporated in Iran's Constitution; Article 44 and explicitly shows the importance of cooperative sector of national economy when it reads that public sector operation should be limited to a certain extent and that private sector is complementary to the two other public and cooperative sectors. The provisions specified for legal support of triple sector's ownership suggest the strength of cooperative sector and an emphasis on its development. The present study confirms the idea for the case of industrial cooperatives in Iran, that any increase in wage can cause labor productivity increase in production; in such a way that 1% increases in the amount of compensatory payments in industrial cooperatives raises the average added value of this sector by 0.22%. Research findings also imply the effect of both wage and other payments variables on labor productivity separately. Of course, the effect of wage increase on labor productivity is more than that of other payments increase such as rewards, donations, etc., so that, 1% increases in wage payment raises the average added value of industrial cooperatives by 0.184% while, 1% increases in other payments raises the average added value only by 0.124% in this sector.

CONCLUSION

Despite the emphasis made by Iran's Constitution in the context of cooperative movement, the cooperative sector is still an integrated part of poor economic system running in the country. In order to promote the basic principles of cooperative movement and formulate relevant legislation to meet cooperative requirements, that is necessary to facilitate government legislative policies support with particular reference to inspecting laborer's wage payment regulatory laws. It is also recommended that the labor productivity of industrial cooperatives is substantially influenced by staff compensatory payments in this sector. Moreover, research findings show that since wage increase has more effect on productivity level than increase in other payments, so it is recommended that the efficient type of wage specification must be well considered.

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