Studying the Effect of Bank Credits in Development of Employment in Agriculture Sector

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ABSTRACT: Application of the existing resources and facilities optimally in order to satisfy human needs and wishes including increased production, income, employment, social welfare and etc. is one of the most important development goals of any country. For this purpose, it is usually tried to reach such goals by using various policies and executive tools through development plans. In this regard, monetary and credit policies are of significant importance. Development economists have attributed successful development plans to existence of an appropriate monetary and credit system. Using the credits either in new investments or in supplying working capital leads to improved production and thus can influence employment.On the other hand, existing indications and evidences imply that in the process of development and growth, employment in the agriculture sector has been usually descending due to several reasons such as capital-intensive production and using modern technologies, while this trend has been ascending in two other sectors, namely industry and services. It will be demonstrated in this paper demonstrates that the agriculture sector in Iran has not optimally used all its existing capacities and thus it seems that there is some employment opportunities there. This issue was investigated by looking at the agriculture sector and using statistics of time series from 1970 to 2000 as well as econometric models. The results of this research demonstrated that the credits of Agri-Bank have positively influenced employment in short-term and investment in long-term. Therefore, application of a credit regime at least in short-term can develop employment opportunities in this sector. **Studying the Effect of Bank Credits in Development of Employment in Agriculture Sector** *J Am Sci* 2013;9(2):125-132]. (ISSN: 1545-1003). http://www.jofamericanscience.org. 17

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Introduction

It is well known that employment and its rate are influenced by various factors like any other economic and social variable. Some of these factors are production rate, investment rate, level of wages and prices, monetary policies, financial policies, foreign trade and etc. By changing each variable, employment rate is directly or indirectly influenced with both employment and unemployment rates being determined in the market. Each variable might have positive or negative effects on the market process. As a result, consequences and effects of each variable must be studied in order to positively influence the employment rate and provide more job opportunities through identification of the barriers and mitigating or resolving them. In this regard, bank credits are known as an important and influential factor on employment, which develop job opportunities for job seekers by providing investment opportunities for the manufacturers. Bank credits are allocated to various economic activities in terms of priorities of development goals, while the agriculture sector also benefits from these credits for development of production, investment and at last employment. Most of the bank credits for the agriculture sector (more than 50% of them) are financially supplied by Agri-Bank (Table 1), which plays a significant role as financing options for the farmer. Therefore, it can have positive and important effects on this economic sector in terms of production, income, investment and employment. However it has been numerously insisted in the development literature that employment in the agriculture sector is decreased with its excess labor force being shifted to other sectors of industry and services during the development process, it must be noted that this case occurs just when all the existing facilities are completely used (Gharabaghian, 2002, pp. 554-556). In Iran, land, water, variety of climates, technology and etc. are not completely and optimally used. Thus, it is still possible to develop employment alternatives in the agriculture sector by proper planning and by using the existing resources or creation of new ones. Importance of this issue beside emphasis on existence of the existing capacities in is this fact that the cost of creating jobs in this sector is much lower than the two other sectors.

Thus an interesting solution to resolve unemployment crisis could probably be changing the approaches rather than investment costs in current situation where the country is exposed to budget deficit and lack of foreign currency. When believed that the existing agricultural resources are not completely and optimally exploited and there is loss of resources or it is possible to create new facilities for development of the activities in this sector just by small investment, one can expect development of the job opportunities in this sector. So, since the employment is the agriculture sector is not saturated in Iran, this study aims to investigate one of the effective factors on employment in this sector, i.e. credits, in

order to evaluate the effect of this factor on employment and development of the agriculture sector and suggest some solutions by analysis of the results. This paper is organized as follows: importance of credits in employment, experimental studies, source of agricultural credits in Iran, studying trend of value added, employment, investment and bank credits in the agriculture sector, research data and method, discussion, conclusion and suggestions.

Importance of Credits in E

Monetary and financial markets are of significant importance in economic regime of any country. They are accounted for essential requirements to achieve sustainable economic development, such that optimal and proper development of these markets are known as important tools of development (Central Bank of the Islamic Republic of Iran, 2003, pp.72-74). Financing the manufacturing enterprises is known as the most important management issues of any regime either in terms of working capital or development of new activities and investments. Therefore, a branch of management entitled financial management is mentioned in theoretical and practical issues, the performance of which is critically important in maintenance, survival and development of the activities for any regime. In fact, receiving loan or credit, and money transfer from one person to another or from one institution to another plays a key role in supplying credits for various economic activities. Loan and credit can be introduced as temporary transfer of purchasing power from an actual or legal individual to another. Credits are used to supply different inputs of the production such as labor force, capital input, technology, and raw materials purchase. Thus, they have great significance in growth and development of investment and production activities. It is normally observed that the credit or loan influences the employment in manufacturing enterprises or new job opportunities directly or indirectly. From theoretical perspective of macroeconomics and their economic correlations, the effect of loan and credit can be briefly discussed on production and employment. It can be observed that introduction of loan and credit to the production as the working capital in short-term will improve employment due to the constant volume of the capital. However in long-term, where stream of loan and credit is transformed to a fixed capital, it incorporates some technological changes. If the technological changes are neutral, that is no change is caused in the ratio of capital input to job, the employment rate will remain constant. Vice versa, if the technological changes are not neutral, variation in the ratio of capital input to job will alter the employment rate. Thus, some positive consequences of proper and optimal application of the stream of loan and credit could lead to increased investment, production and employment. However, it must be noticed that the efficiency of monetary and financial regimes of any country as well as how the existing economic enterprises are managed financially, are necessary a sufficient to achieve these positive economic outcomes. Whenever this process is not sufficiently efficient either in credit allocation or consumption, the credits may fail to provide desired and expected results. They might even lead to negative outcomes in this case.

Experimental Studies

Experimental studies demonstrate that credit and loan have positively influenced the stream of production and employment. For example, Burges and Pande have investigated the effect of increased number of new branches established by Central Bank of India on Indian rural development (during 1969 to 1992). Their results show that these newly established branches have changed the structure of production and employment, and they have finally reduced poverty and inequality (Burges & Pande, 2002). Moreover, Monge-Naranjo and Hall have explored the effect of access to credits in Costa Rican manufacturing. Their research reveals that the access to credits has positive effect on performance and employment of these manufacturing companies (Monge-Naranjo & Hall, 2003). Furthermore, in Iran a similar research conducted by Ghavam in 1992 indicates that the agricultural credits have not satisfied the expectations of potential changes despite their successes and production growth reported so far (Ghavam, 1992). Thus, it is observed that production and employment effects of the credits are different among various countries in practice due to their dissimilar social and economic structures, so each country must adequately concentrate on this issue according to its existing conditions. This necessity is better understood when considering that the first solution to solve production and unemployment problems is always allocation of money and credit, that is to say investment. Particularly in Iran which expends some budgets annually in terms of imposed facilities, construction credits and bank credits to increase production and employment. However, there have been just a few researches which have adopted to answer the following questions: What are the effects of these monetary and bank policies in terms of economic sect. Attention to these issues and studying them are of higher importance and position nowadays when unemployment and production crises are major problems of Iran. For this purpose, current paper aims to study the effect of credits provided by Agri-Bank on employment of the agriculture sector. Thereby, this could be an introduction to future works and optimal policy making for solving the existing problems.

Source of Agricultural Credits in Iran

Farmers typically have only two finance options to increase their profit and production, in addition to improve performance and productivity of their products: (1) using their savings, (2) using credits (Duru et al., 1993, p.9) Rural families in developing countries usually do not have significant savings to finance their activities due to their insufficient annual income and they must inevitably supply part of their financial needs from official and unofficial sources. There are three official credit sources in the rural economy:

1) Commercial banks: Banks which have special criteria for giving collateral and secured loans. In most cases this makes some problems for the farmers to get their needed credit or loan timely, so they should refer to other official or unofficial sources to supply their financial need.
2) Specialized agriculture banks: These banks are established to compensate for inability of the commercial banks in providing adequate services to the farmers. They can thus significantly influence the agriculture either in positive or negative manner.
3) Public sector: Includes gharzolhassane funds which help the farmers to supply their financial needs (Taleb, 1993, p. 68).

Unofficial sources of loans mainly involve the followings: urban shopkeepers or local traders, self buyers, landlords, owners of tangible assets such as tractors and etc., friends and relatives, gavellers, and other rich people (ibid, pp. 62-66). Interest rates of loans and credits in the unofficial sectors are usually high, such that the farmer should sell almost all of his/her products to repay principal and interest of the loans. Consequently, income of the farmers will be considerably decreased and they will be unable to resume production once again. Statistically, the existing information shows that Agri-Bank has a considerable contribution in the credits allocated to the agriculture sector.

Long-term Effect of Agri-Bank Credits on Investment in the Agriculture Sector

Based on ARDL method, there is a direct long-term correlation between Agri-Bank credits and fixed investment in the agriculture sector (Table 1).

Table1. Based on ARDL method

Variable	Coefficient	Standard Deviation	t-statistic
constant number	-430	111.4	-3.8
value added of the agriculture sector to fixed price	0.007	0.0044	1.7
employment rate of the agriculture sector	0.0001	0.00003	4.8
credits of the agriculture sector	0.0003	0.00013	2.3

Research Data and Method

Durability Test

In order to examine durability of the time series a Dickey-Fuller test has been used in this study the results of which confirms non-durability of the series except for employment. Making the variables durable was implemented using their first order differential. The results of ADF test based on Schwartz-Bayesian Criterion (SBC) indicates that the values added and investment series become durable by first order differential and agriculture credits with second order differential (Table 2). Thus, it is observed that each time series is associated with a different order of accumulation. Philips-Prawn test was additionally utilized which provides much similar results to those of ADF test.

Table2. Results of extended Dickey-Fuller test*

Variable	Extended Dickey-Fuller Statistic	Critical Value	Number of Pauses (SBC)
DIC	-4.9181	-3.9117	1
DVADDC	-4.1893	-3.0522	surface
E	-3.6921	-3.6921	1
DDCREDITC	-3.8576	-3.0660	1

* Reference: Research results

Co-integ

The economic concept of co-integration is that when two or more time series are theoretically correlated to each other to show a long-term correlation, they follow each other in spite of their stochastic trend (being not-durable). Thereby, the differential between them becomes durable. Thus, existence of co-integration among the time series implies a long-term correlation. Since the time series have different orders of accumulation, the results of normal least squares and regression estimations will be relevant just when a co-integration exists among model variables. In this case, no spurious regression will be present with the both F and t statistics being significant. Estimations of linear least squares and self-explanatory model with large pauses demonstrate

that there is a long-term equilibrium correlation between the time series under study (Table 3).

Table3. Long-term estimation of coefficients using ARDL method *

Variable	Coefficient	Standard Deviation	t-statistic
constant number	3541823	153595	23.1
value added of the agriculture sector to fixed price	-76.4	32	-2.4
investment of the agriculture sector to fixed price	2893	620	4.7
credits of the agriculture sector	-4.2	1.67	-2.5

* Reference: Research results

It should be noted that the correlation between value added and Agri-Bank credits is negative in long-term, while the correlation between investment and employment is positive (i.e. increasing the value added for 1 trillion Rials will reduce the employment for 76 men; increasing the fixed investment for 1 trillion Rials will enhance the employment for 2893 men; and increasing 1 million Rials in the Agri-Bank credits will decrease the employment for 4 men). However, one must bear in mind that the employment rate is typically decreased during the agriculture development process, so the correlation between value added and employment becomes negative. Nevertheless, the negative correlation of employment and credits in this sector (negative effect of credits on employment) might be attributed to the inefficiency of the Iranian banking system in allocation of credits to farmers or this fact that the bank credits in long-term fixed investment usually make the agriculture sector more capital-intensive.

Co-integration Vectors

The co-integration test in vector error correction model is conducted based on maximum eigenvalue test and impact test via Johansson's method. According to the impact test, when the calculated statistic of the test is smaller than that of Johansson and Julius, null hypothesis is adopted which means existence of r co-integration vectors. Thus, considering the obtained results, existence of three co-integration vectors are accepted in the model under study because the test statistic (1.1) is smaller than the critical value at 95 and 90 % levels (4.2 and 3.0%, respectively). Meanwhile, with respect to the maximum eigenvalue test, existence of three equilibrium co-integration vectors is confirmed among these variables, which means that there are long-term equilibrium correlations between model variables.

Table 5. Hmjmy test test test and the maximum eigenvalue Maximum eigenvalue test

95Percent critical	Statistics	H1	H0
23/92	31/99	R=1	R=0
17/68	15/79	R=2	r
11/03	12/30	R=3	R
4/16	1/13	R=4	R
39/81	61/22	R=	R=0
24/05	29/23	R	R
12/36	13/44	R	R
4/16	1/13	R	R

Source: research findings H * Reject the hypothesis 0

Estimation of VAR Model and Reaction Functions

Self-explanatory model (VAR) was estimated for studying the effect of shock on model variables. The number of pauses in VAR model was considered 4 based on AIC, while CUSM test revealed that the model is correctly verified and does not have any structural fracture. The reaction functions have been extracted based on VAR model. The effect times of the shocks on individual model variables are examined using the reaction functions which show what will happen when a shock is applied to each model.

The estimation results from the reaction function are summarized below:

A) The results of shock effects of standard deviation in the employment rate on the employment rate indicates that the effect of shock is intensified up to the sixth period once a shock is introduced and it is then decreased with a descending trend with the effect of shock being persistent (Figure 1).
B) If a shock is incurred on the value added equation, it will have a small positive effect until the ninth period and thereafter it shows an ascending-descending trend with the effect of shock being persistent (Figure 2).
C) Whenever a shock is introduced to the investment equation, it shows an ascending

effect until the fifth period and then becomes ascending-descending, while the effect of shock is still persistent (Figure 3).

D) If a shock is applied on the agriculture credit, it will demonstrate a negative effect until the tenth period and then introduces an ascending-descending effect, while the effect of shock still remains (Figure 4).

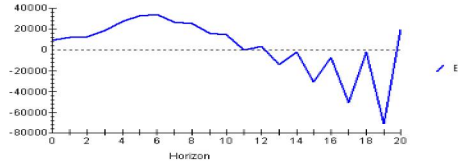

Fig.1. Extended reaction function of shock on employment equation

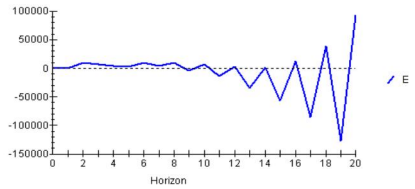

Fig.2 Extended reaction function of shock on fixed value added equation of the agriculture sector

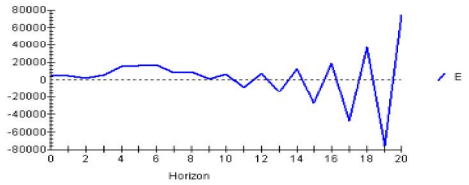

Fig.3. Extended reaction function of shock on fixed investment equation of the agriculture secto

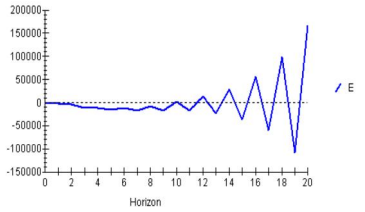

Fig.4. Extended reaction function of shock on fixed credits equation of the agriculture sector

As evident from the figures, employment of the agriculture sector is influenced by the shocks from value added, investment and credits of the agriculture sector.

Another application of VAR model is variance analysis. Variance analysis is used to evaluate exogenous behavior of the variables. Contribution of the fluctuations of each variable is determined toward the exogenous shocks applied on system variables. The effect of shock applied on each variable can be measured versus time by variance analysis. It can be inferred from the results of variance analysis that by introducing a shock on bank credits of the agriculture sector, its effect on employment is ascending during the first period and then its fluctuations become weak, such that there is almost no variation of fluctuations after the ninth period. It can be observed that the most significant effect of bank credits (13.7%) is associated with the first period (Figure 5).

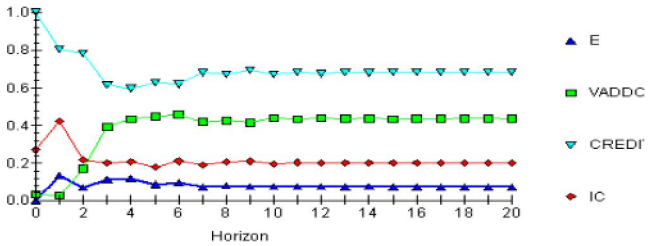

Fig.5. Extended variance analysis for fixed credits of the agriculture sector

Error Correction Model

Error Correction Models (ECMs) have found numerous applications since they connect short-term fluctuations of the variables to the long-term equilibrium values. In spite of the co-integration among the variables under study and existence of three convergence correlations between them, this model can be utilized. The results of this model are listed in Table 7. ΔE 1

Table 7. Estimation using model 4*

Variable	Coefficient	Standard Deviation	t-statistic
ΔE1	0.43	0.196	2.2
ΔE2	-2.53	0.185	-1.4
ΔE3	0.65	0.174	0.73
ΔVADDC	18.29	27.612	0.7
ΔVADDC1	-15.59	27.817	-0.6
ΔVADDC2	104.04	28.459	3.7
ΔIC	212.95	147.829	1.4
ΔIC1	-405.88	158.850	-2.6
ΔIC2	-442.36	132.988	-3.3
ΔCREDITC	-0.14	0.104	-1.3
ΔCREDITC1	0.55	0.139	3.9
ΔCREDIT2	0.43	0.191	2.2
ΔINTERCEPT	595444	161171	3.7
ECM(−1)	-0.17	0.049	-3.4
R2=0.97		F(13,13)=24.88	

*** Reference: Research result**

It can be seen that all coefficients in the employment model expect value added are statistically significant (t-statistic), while the R2 coefficient obtained as 0.97 is indicative of the great explanation power of this model. Coefficient of ECM was estimated -0.17 which is also called modification rate. It implies that inexistence of equilibrium in a period of employment in this sector is modified for 0.17 each year in the next period. So it can be argued that the movement of modification toward equilibrium is rather slow.

Conclusion and Suggestions

The results of implemented analyses and studies uncover a correlation between bank facilities and agriculture development in current situation, though such a correlation did not exist in the past.

Among investments in various economic sectors, investment in the agriculture sector is of great importance and significance. It contributes to the communications with other economic activities beside development and employment in other sectors, in addition to cause growth in production and employment in the agriculture sector. Managers must also pay attention to supporting policies of the agriculture sector. In other words, they must conduct some initiatives to improve security of investment in local and national levels in addition to take into account the agriculture as an economic concept. For this purpose, the managers must adopt policies for export and import which supports sustainable production. This means that when someone decides to invest in a field of the agriculture sector, he/she must exactly know what are the needs of the country? To what extent he/she can export? The investor should believe that the policies are stable and do not change frequently. In other words he/she can be able to design a long-term plan. Agri-Bank regarding its main objectives by sharing a part of agriculture and livestock costs, especially financing agriculture projects, contributes to the economic growth as well as promotion of rural lifestyle.

It is well known that the agriculture sector is mentioned as the axis of independency with the Agri-Bank being its financial level. Since nearly 90% of the Agri-Bank facilities are allocated to the agriculture sector and its associated industries, it seems rational to expect the managers to assist the bank in receiving its claims.

The main goal of facilities in the agriculture sector is to support inactive projects as well as small enterprises and entrepreneurship which can lead to increased production, economic stimulus of provinces and fair distribution of the facilities among deprived regions, in addition to create new job opportunities and further reinforce employment. This is an important issue which must be paid more attention by the managers.

This paper can be concluded as follows:

1) Value added series of the agriculture sector, investment of the agriculture sector and credits of Agri-Bank are all non-durable to fixed price. Except for the credits of the Agri-Bank which become durable by twice differentiation, others are made durable by just one differentiation.
2) Estimations show that there is a long-term co-integration correlation between employment and value-added, investment and credits of Agri-Bank with the convergence test revealing three long-term correlations. The long-term assessment demonstrates that the correlation between value added and Agri-Bank credits in

equilibrium employment model is negative, while the correlation of investment and employment is positive. However, it should be noted that the employment rate is decreased during agriculture development. Thus the correlation between value added and employment is negative, which can be attributed to inefficiency of Iranian bank system in allocation of credits to the farmers and also this fact that the bank credits in long-term fixed investment makes the agriculture sector more capital-intensive. Therefore, the agriculture sector becomes more capital-intensive at lower employment rate. That is why the development policies of the agriculture sector must take into account this fact that it is necessary to apply development policies of other economic sectors to maintain rural production. This can protect the rural labor force and increase income of the villagers.

3) Based on the studied conducted so far, whenever a shock is introduced to the employment equation, it will have an ascending effect up to the sixth period, then will cause a descending effect until the tenth period and thereafter will create ascending-descending effects on employment. Meanwhile, this shock will have a small positive effect up to the ninth period, followed by an ascending-descending effect on employment which seems to be persistent. In this regard, whenever the investment equation experiences a shock, it will be ascending until the fifth period with a persistent effect and thereafter, it will have an ascending-descending effect on employment. Thus, the credits of Agri-Bank are negatively influenced by the shock applied more significantly which confirms the abovementioned finding.
4) Variance analysis shows that by applying a shock on bank credits of the agriculture sector, its effect on employment is ascending during the first period, then its fluctuations are decreased such that fluctuations do not show change after the ninth period anymore. It can be seen that the maximum effect of bank credits of the agriculture sector belongs to the first period (13.7%).
5) Estimations of ECM demonstrates that the ECM coefficient is equal to -0.17. This implies that inexistence of equilibrium in a period of employment in this sector is modified for 0.17 during each year in the next period. So it can be argued that the movement of modification toward equilibrium is rather slow. The results show that the effect of Agri-Bank credits on employment is positive in short-term and negative in long-term due to existence of an equilibrium correlation. Thus, this issue must be considered upon planning and policy making for the employment in this sector. In short-term, the employment rate of this sector could be improved by allocation of timely and quick credits and also by adoption of a proper executive and supervisory system. On the other hand, this sector becomes more capital-intensive by using the credits for investment and technological changes. This will not have a positive effect on the employment rate, and must be considered in the development plans of the country. Consequently, adoption of proper monetary and credit policies by the government as well as accurate and optimal executive, managerial and supervisory mechanisms can at least in short-term develop job opportunities in this section. Thus, the following recommendations can be made:
    A) Supervision and control on allocation of credits to farmers,
    B) Development of rural banking and crediting systems as well as providing savings,
    C) Mitigate dominant bureaucracy in crediting systems of Iran,
    D) Organization of unofficial credit sector in villages,
    E) Continuous study on proper job opportunities in villages and allocation of required credits to them,
    F) Pay attention to production issues including market and marketing, price stability in order to make rural employment stable.

However, the development trend of agriculture sector in long-term is such that the employment rate is decreased and the process becomes more capital-intensive. Therefore, it is required to exclusively take into account non-agricultural employment in the development policies of agriculture and rural sectors for keeping the rural labor force and protecting the production centers (i.e. villages).

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