

## **Financial Repression and Agricultural Growth: The Case of Islamic Republic of Iran (1962-2007)**

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### **Abstract**

*There have been few studies working on effects of financial repression policies on Iran's economic growth. Considering the huge share of agricultural sector, we have been trying to fill this gap by the help of time series data from 1962 to 2007 on agricultural GDP, unproductive government expenditure, human capital, industrial price index, political instability, and financial repression measures. Results show that controlling the bank reserve requirement ratio as a proxy for financial repression has negative effect on economic growth of agricultural sector. This indicates that reducing controls on this parameter will help government to achieve higher rate of growth.*

**Keywords:** Financial Repression, Agricultural Growth, Cointegration Tests, Structural Breaks, Iran.

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### **1. Introduction**

Financial repression is a set of governmental legal restrictions which prevent financial intermediaries in the economy from functioning at their full capacity level (Gupta, 2005). Financial repression as government intervention in financial systems can be implemented through determining a real negative interest rate (interest rate lower than inflation rate); the lower interest rate for special groups of loan demanders or through directed credits policies.

After 1970s, many countries suffered from high and persistent rates of inflation, the stagnant economic growth and external imbalances under financial repression policies. To cope with these difficulties, some experts like McKinnon and Shaw (1973), offered different solutions such as liberalization policies. One of key policies is to increase interest rate to accelerate capital stock accumulation and to achieve higher rate of growth and lower rate of inflation. In fact, higher rate of interests will lead to the substitution of unproductive assets by bank deposits and increase in investment; and finally to higher rate of growth and lower inflation rate.

There are different theories arguing effects of financial repression policies on capital productivity and economic growth rate. Government intervention on controlling interest rate, reserve requirements and other limitations on banking system are known as financial repression policies which reduce capital stock formation and its productivity which lead to lower rate of economic growth.

In Iran several studies have investigated the effective factors on economic growth but only in few studies [(Samadi (1999), Khataei and Saifipour (1999), Keshavarzian and Azimi (2005), and Araghi and Taghavi (2005)] financial repression policies have been considered. There is no research in which the effect of these policies has been investigated on separate sectors' of economy. The main purpose of this study is to fill this gap considering the effects of financial repression policies on economic growth in agricultural sector.

The main question of this article is that, how distribution of education - as a proxy for human capital - affects economic growth in agriculture sector? We consider structural breaks in agriculture sector and use cointegration technique in the presence of structural break.

The rest of the paper is organized as follows: Section 2 briefly reviews the related literature. Section 3, presents the model and its econometric specification. Section 4 discusses the results and at last section 5 is about the conclusion.

### **2. Literature Review**

Samadi (1999) evaluated McKinnon and Shaw (1973) models by the help of Iran's economy data during 1962 to 1995. The results of this study support McKinnon & Shaw hypothesis. Based on McKinnon and Shaw (1973) theory, financial repression policies will slow the speed of economic development by

reducing real growth rate and the capacity of financial system. Samadi suggested that if government liberates financial repression policies and increases the real interest rate, real investment and saving levels will be increased and this will lead to higher revenue and economic growth.

Khataei and Seifipour (1999) show that, financial repression affects economic growth through two channels of capital stock formation and technological innovation. They evaluated the casual relationship between financial development and economic growth using seasonal data from 1989 to 1996. The results of this study showed that long term development of stock market and private financial resources has positive effects on economic growth.

Nazifi (2004) states that financial development brings economic growth when appropriate field of efficient allocation of resources is ready and lead to an increase in capital efficiency. The results of study showed that financial development has negative effect on economic growth. She claims that the main causes of this effect can be inappropriate implementation ways of financial liberalization, weakness in banking system management and lack a harmonious financial market. All these factors lead to a decrease in capital productivity through inappropriate allocation of resources.

Keshavarzian and Azimi (2005) evaluated the effects of interest rate liberalization on investment and Iran's economic growth rate during 1966 to 2002. They showed that real interest rate has positive relation with investment level and economic growth, because Iran's interest rate is low while the volume of liquidity is too high. By interest rate liberalization and its adjustment in banking system, real money demand will decrease while on the other hand long term bank deposit and other financial investment will increase which brings economic stability with itself.

Araghi and Taghavi (2005) believe that Iran's dependency to oil revenues among other different factors such as underdeveloped money and capital market, and inefficient institutional system is the main reason that persuades Iran's government to choose financial repression policies.

Haslag & Koo (1992) evaluated financial repression, financial development and economic growth relationships using 119 countries' time series data. In this study, inflation rate and reserve requirement were assumed as a proxy of financial repression measures. Inflation had no effect on growth rate but normally higher rate of reserve requirement was accompanied by lower rate of growth. They showed that there is a real strong relationship between financial repression and financial development measures. And financial repression will cause a delay in financial development, and in turn lower the economic growth rate.

Fung et al. (2000) investigated the long-run effect of credit and interest rate controls on Chinese economy and showed that if governmental stock interest rate increases, inflation rate will be decrease without slowing down the

economic growth rate. On the other hand, if available credit level for individual households decreases, inflation rate and economic growth will decrease as well. Increase in nominal deposits interest rate will have recessionary effects on economy which means it may lower economic growth and increase inflation rate.

Demetriadis and Luintel (2001) show that, there is a positive relationship between financial development, bank system control levels and mild interest rate repression. According to their model, in the presence of loan interest rate control policies, increases of deposit interest rate have no effect on financial development.

Financial repression and economic growth causal relationship was evaluated by Ang and Mckibben (2007). Based on their conclusion, financial liberalization has positive effect on economic development in Malaysia through liberalization of financial repression policies. And there is a positive interaction between mentioned indexes of financial repression and economic growth.

To sum up financial repression effects on economic growth depends on each country's political, economic and institutional circumstances. In few studies such as Demetriades et al (1998), and Calomiris and Himmelberg (1999) effects of financial repression policies were evaluated on agricultural economic growth.

### **3. Model**

Financial repression was originally introduced by McKinnon and Shaw (1973) in developing countries.

As mentioned before, financial repression is the technique of keeping interest rate under its market equilibrium rate (Fry, 1980). Roubini and Sala-I-Martin (1995) summarize government reasons for implementing financial repression policies as follow:

- 1- Interest rate control policies help government fight against usury.
- 2- A better chance for controlling money supply by controlling banking system policies.
- 3- The assumption that government are more capable of recognizing market failure and allocating their restrict capital resources to the most efficient projects.
- 4- Increasing monetary base by interest rate controls and earning some kind of inflationary revenue.
- 5- An appropriate way for intangible collection of taxes with lower cost comparing to other existing ways.
- 6- Techniques that help governments redistribute their revenue among different income share levels.

Since the break of the colonial empire, many developing countries were observed to suffer from stagnant economic growth, high and persistent inflation

and external imbalances under the financial repressed regime. To cope with these difficulties they were persuaded use financial liberalization policies which are mainly based on higher rate of interests (Gupta, 2005). There are several arguments regarding effects of financial repression polices on capital productivity and economic growth.

As we explained in section 2, few researchers have worked on investigating effects of financial repression policies on agricultural growth. In this paper we have tried to do the same by the help of Barro's growth model (1990) as follow:

$$(1) \quad y_t = a_0 + a_1 FIN_t + \beta X_t + e_t \quad t = 1, 2, \dots, T$$

In this model

$y_t$  represents agricultural GDP (AGDP),  $FIN_t$  is a financial repression measures and  $X_t$  are control variables such as:

*Unproductive Government expenditure (UNGOV)*

*Human capital (PRIM&SEC)*

*Political instability (SECURITY)*

*Industrial price index (IND)*

*Unproductive Government expenditures (UNGOV),*

Following Sala-i-Martin (1992), unproductive government expenditure (UNGOV) is computed by deducting education, safety and defense expenditure from total government expenditure.

Political instability (SECURITY), a dummy variable is chosen which take 1 for war and revolution time, and otherwise is zero.

Financial repression measures (*FIN*):

There are different ways to measure financial repression, because there is no direct available measure. So empirical investigation rely on proxies such as real interest rate (Roubini & Sala-i-Martin, 1952) and the interest rate premium (Demetriades and Devereux, 1992). In this paper we have measured financial repression directly by the help of collected information on interest rate control policies, reserve requirement and directed lending programs following Demetriades et al. (1998) research. Three dummy variables are determined for each policy and one as the combination of all three types<sup>1</sup> for simulating the situation when all three types of financial repression is implemented simultaneously.

1. Our first financial repression measure (FININT) is a dummy variable for denoting interest rate control policies. It takes zero when real interest rate is

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1. For more detail you may check the thesis under the name of "Effects of financial repression policies on capital productivity and growth in agricultural sector, Sanaz Mansouri (2007).

positive and takes one when it is negative and it is between 0 to 10, at last it takes two, when real interest rate is negative and higher than 10. We have used the 5 years deposits interest rate as nominal interest rates which are converted to the real rate by deducting the inflation rate from them.

2. Second financial repression measure, (FINRES) is a proxy for reserve requirement control policy. Following Roubini and Sala-i-Martin (1992) reserve requirement is calculated from the ratio of the total bank deposits to the summation of money (M1) and quasi money (M2). FINRES takes 0 when this ratio is less than 10%, takes one when it is between 10 to 20%, takes 2 when it is between 20 and 30%. At last it will take 3 when the ratio is more than 30%.

3. Third financial repression policy (FINC) is made for directed credits to agricultural sector which is computed through the share of agricultural credits from total credits. If this ratio is less than 10 it will take 1, when it is between 10 and 20% it takes 2 and at last when it is between 20% and 30% it will take three.

4. These dummies can be used in growth equation to quantify the effect of each policy separately. Given that we have a whole range of policies implemented simultaneously, we have used the fourth measure (named FINM) which is a simple arithmetic average of all three mentioned measures. FINM takes all joint influences of previous three mentioned policy variables into account<sup>1</sup>.

#### **Human capital (PRIM&SEC):**

In economic literature, it has been discussed that human capital has a positive effect on economic growth. This result has been supported in few studies while the majority of them have denied the correlation. Several researchers tried to solve the paradox of education and human capital effect on economic growth. Reasons such as ignoring the quality of human capital, neglecting the channel which education may affect growth and institutional barriers, were presented in this regard. Lopez et al (1998) believe that distribution of education is of significant importance in creating economic growth. They show theoretically that the effect of human capital on revenue depends on optimized distribution of education.

Nili and Nafisi (2004), based on the Iran's time series data for the period of 1966 to 2000 came to a conclusion that the dispersion in Iran's education is more than the optimized amount and for improving the economic growth dispersion in education shall be reduced and they shall emphasize on primary and secondary education instead of higher education.

According to Lopez et al (1998) and Nili and Nafisi (2004) two variables of primary and secondary education (PRIM&SEC) as the proxies of human capital

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1. Principle Components Analysis (PCA) method can also be used instead of calculating the simple mathematical averages.

have been entered separately in the model.

The main difference of this model with the presented researches in Iran is to consider the financial repression and distribution of education.

**4. Empirical Results**

As time series data are taken for this paper, unit root tests are needed to be done before estimating long-term relationships among variables. On the other hand we usually face with structural break in Iran’s economic data so using valid tests in the presence of structural breaks seems essential. Zivot & Andrews (1992) test was used for this purpose.

Table (1) shows the results of comparing estimated statistics with Zivot and Andrews (ZA) critical values which imply that in our growth –financial repression model, agricultural GDP, primary school and industrial price index are I(1), while secondary school and agricultural growth rate were I(0). Structural break points are presented in table 1 based on the chosen model.

Considering ZA test results and evaluating long-term relationships between growth and financial repression policies, Dynamic Ordinary Least Squares method (DOLS) was used to estimate long-term relations between variables. Estimation results are summarized separately for each financial repression measure in tables 2 to 5 which we can sum up as follow:

AGDP<sub>t-1</sub> coefficient was positive and significant in all 4 cases when first and third financial repression measure was used.

**Table 1. Zivot –Andrews (1992) Unit root test results**

variable	Variable explanation	T	$\hat{T} \lambda$	K	The least statistics	Chosen model	Integration order
AGINCOME	Agricultural GDP	42	1379	0	-7.7	C/S	I(0) ***
AGDP <sub>t-1</sub>	Agricultural GDP <sub>t-1</sub>	42	1367	2	-4.09	C/S	I(1) **
UNGOV	Unproductive government cots	42	1373	1	-5.57	C/S	I(0) **
PRIM	Primary school	42	1366	0	-2.77	C/S	I(1) ***
SEC	Secondary school	42	1371	2	-8.57	C/S	I(1) ***
IND	Industrial price index	42	1378	5	-2.66	C	I(1) **

Note: \* \*\* \*\*\* shows significance in 1, 5, 10 % certainty level.

T is the number of observation; Tλ is the break point, K Is the lag order used in the model

Primary school (PRIME) has significant negative effect on agricultural growth rate while secondary school (SEC) has positive significant regardless the type of financial repression measure used. Unproductive government expenditure (UNGOV) is negative and significant except for third financial repression measure is used. War and revolution as proxies of political instability (SECU) have negative effect on growth rate and are significant only when third measure was used.

Industrial price index (IND) has negative effect and it is significant when first and third financial repression measure are used. Its negative effect shows any increase in industrial prices index hurts agricultural growth rate.

Financial repression has negative effect -except when third measure is used- on agricultural growth rate and it is significant only when reserve requirement is used as a measure of financial repression which imply that relaxation of these control policies will lead to higher agricultural growth rate in the next years.

**Table 2. Estimation results of growth model and the first financial repression measure (FININT): DOLS method**

Variable name	Variable Explanation	coefficient	SE
AGDP <sub>t-1</sub>	Agricultural GDP	0.0006	0.0002**
PRIM	Primary school	$-2.32 \times 10^{-6}$	$-8.42 \times 10^{-6}$ **
SEC	Secondary school	$-5.36 \times 10^{-8}$	$-1.542 \times 10^{-6}$ **
SECU	Political instability	-1.68	0.78 **
UNGOV	Unproductive government costs	1.73	3.82
IND	Industrial price index	-0.02	0.008 **
FININT	Financial repression measure	-0.71	0.61
R <sup>2</sup> =0.78		DW=2.1	F=7.40

1- One, two and three asterisk denotes statistical significance at 1, 5 and 10 % certainty levels respectively

2- Lags and leads coefficients are not reported in the table

**Table 3. Estimation results of growth model and the second financial repression measure (FINRES): DOLS method**

Variable name	Variable Explanation	coefficient	SE
AGDP <sub>t-1</sub>	Agricultural GDP	0.0001	0.0003
PRIM	Primary school	$-1.1 \times 10^{-7}$	$1.12 \times 10^{-7}$
SEC	Secondary school	$4.4 \times 10^{-7}$	$1.5 \times 10^{-7}$ **
SECU	Political instability	1.25	1.30
UNGOV	Unproductive government cost	-1.90	6.58***
IND	Industrial price index	-0.007	0.01
FINRES	Financial repression measure	-2	0.07**
R <sup>2</sup> =0.78		DW=1.88	F=16.13

1- One, two and three asterisk denotes statistical significance at 1, 5 and 10 % certainty levels respectively

2- Lags and leads coefficients are not reported in the table



**Table 4. Estimation results of growth model and the third financial repression measure (FINC): DOLS method**

Variable name	Variable Explanation	Coefficient	SE
PRIM	Primary school	$-1.8 \times 10^{-6}$	$6.42 \times 10^{-7}***$
SEC	Secondary school	$2.97 \times 10^{-7}$	$1.42 \times 10^{-7}**$
SECU	Political instability	$-6 \times 10^{-8}$	0.92***
IND	Industrial price index	-0.02	0.07**
AGDP <sub>t-1</sub>	Agricultural GDP	0.0004	0.0002**
FINC	Financial repression measure	0.68	0.55
UNGOV	Unproductive government cost	-1.78	4.14**
R <sup>2</sup> =0.91		DW=2.1	F=15.13

1- One, two and three asterisk denotes statistical significance at 1, 5 and 10 % certainty levels respectively

2- Lags and leads coefficients are not reported in the table

**Table 5. Estimation results of growth model and the fourth financial repression measure (FINM): DOLS method**

Variable name	Variable Explanation	coefficient	SE
AGDP <sub>t-1</sub>	Agricultural GDP	0.0005	0.0003
PRIM	Primary school	$-2.27 \times 10^{-6}$	$1.18 \times 10^{-6}***$
SEC	Secondary school	$4.71 \times 10^{-8}$	$1.6 \times 10^{-6}***$
UNGOV	Unproductive government cots	-10.19	4.92**
SECU	Political instability	-0.8	1.44
IND	Industrial price index	-0.02	0.01
FINM	Financial repression	-0.71	0.83
R <sup>2</sup> =0.85		DW=2.01	F=6.17

1- One, two and three asterisk denotes statistical significance at 1, 5 and 10 % certainty levels respectively

2- Lags and leads coefficients are not reported in the table

**Table 6. Summary of growth model estimation and financial repression policies**

Variable name	Variable explanation	FININT (As the first financial repression measure)	FINRES (as the second financial repression measure)	FINC ( as the second financial repression measure)	FINM (as the second financial repression measure)
AGDP <sub>t-1</sub>	Agricultural GDP	Positive and insignificant	Positive and insignificant	Positive and significant	Positive and insignificant
PRIM	Primary school	Negative and significant	Negative and insignificant	Negative and significant	Negative and significant
SEC	Secondary school	Positive and significant	Positive and significant	Positive and significant	Positive and significant
UNGOV	Unproductive government cost	Negative and significant	Negative and significant	Positive and insignificant	Negative and significant
SECU	Political insecurity	Negative and insignificant	Positive and insignificant	Negative and significant	Negative and insignificant
IND	Industrial price index	Negative and significant	Negative and insignificant	Negative and significant	Negative and insignificant
FIN	Financial repression measure	Negative and insignificant	Negative and significant	Positive and insignificant	Negative and insignificant

### 5. Concluding Remarks

A financial repression effect on growth rate depends on economic, political and institutional situation of countries and their implementation method. Researchers such as hung (2005), Nazifi (1383), Bai, Lee and Qian (2000) believe in positive effect of financial repression on growth rate while on the other hand McKinnon and Shaw (1973), Roei (2003), Ang and Mckibben (2007), Samadi (1999), Khataei and Seifipour (1999) believe in negative effect of these policies.

Our research shows that:

1- Lagged value of agricultural GDP (AGDP<sub>t-1</sub>) has positive significant effect which implies the higher level of GDP in the previous year will lead to a higher growth rate in the next years

2- Primary school has negative effect, while secondary school has positive effect regardless the type of financial repression measure. Considering the employment of labor force with the average education in Iran's agricultural sector, this result is in accordance with Lopez et al (1998), Nili and Nafisi (2004) approaches. So, implementing policies with emphasizing more on primary education period is recommended.

3- Unproductive government expenditure has negative effect on growth rate

of agricultural sector.

4- War and revolution as proxies of political instability are of negative coefficients. War and political instabilities usually cause changes in allocation of resources. These changes are mainly for the sake of military, security and defense expenditure and against productive expenditure of the government thus this will cause reduction in agricultural economic growth.

5- Industrial price index has negative effect which shows that increases in industrial prices hurt agricultural economic growth. Price increase in industrial sector with keeping prices unchanged in agricultural sector will discourage investment in agriculture sector. In fact, we expect low growth of the agricultural sector. This is what that has happened in Iran's economy.

6- Reserve requirement as financial repression measure has negative effect on agricultural growth which shows releasing controls on reserve requirements will help agricultural growth rate. Imperative determination of interest rate in banking system and government failure in providing appropriate investment ground in agricultural sector are the two reasons for the insignificance of interest rate and directed credits.

Considering huge share of agricultural sector in Iran's economy, government can direct special credits for investment projects and persuade attendance of more educated and high-skilled people. So, provision of appropriate investment grounds for simultaneous improvement of growth rate and capital productivity will be inevitable.

In this paper only long-term interest rate was used. Inclusion of the other interest rates i.e. short-term interest rate and agricultural sector interest rate enables us to compare the results.

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