Iranian Economic Review, Vol.8, No.8, Spring 2003

Government Banking and Economic Growth in Iran

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Abstract

One of the measures taken by the 1979 Revolutionary Government of Iran was to denounce the mixed public-private ownership of the banking system of the pre-revolutionary era and implement a full scale banking nationalization and merging scheme. Since then the banking system has been operating under close supervision and scrutiny of the government - exercising its power to impose a variety of restrictions and interferences, including: restrictions on branch expansion, interest rate repression and discretionary credit allocation. This paper is intended to evaluate the impact of the government restrictive and regulatory policies on financial savings, investment, efficiency and economic growth in Iran. The analysis is carried in terms of a model similar to the model implemented by Ketkar (1993). This model is essentially derived from combining McKinnon-Shaw hypothesis with Harrod-Domar growth model via the dynamic adjustment mechanism formulated by Molho. The findings indicate that branch restrictions and also credit ceilings had a negative relationship to economic growth, while the increase in credit to priority sectors (agriculture, industry and construction) had a positive relationship. The effect of interest rate reduction on economic growth in Iran was, however, inconclusive.

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I- Introduction

The role of financial markets and institutions in speeding up economic growth and development has been a subject of interest to many economists of the contemporary era. For example, Gurley & Shaw (1955), Goldsmith (1969) & McKinnon (1973) and Nultaranee (2000) attribute the differences in economic growth of different countries to the quantity and quality of the services offered by their respective financial markets. The basic functions usually envisaged for the financial sector are: risk management, enterprise control, exchange facilitation, savings mobilization and resource allocation. These functions are believed to affect economic growth through capital accumulation and technological innovations as two of the strategic instruments of development[1].

During the 1950's and 1960's, in the hey days of various nationalization schemes and market control policies, a relatively large number of governments in developing countries embarked upon introducing financial market distortions of various kinds predominately in the form of government interferences in the free market interest rate determination and credit extension which later came to be termed as "financial repression". The reasons usually offered for adhering to financial repression are: (1) the urge to interfere in the free market determination of interest rates because of a conviction to implement usury laws; (2) the need to have a better control on the supply of money implied by a tighter control and deeper regulation of the banking system; (3) the desire to conform with the view that governments are in a better position than markets (or private banks) to realize the benefits of optimum allocation of savings or socially desirable investments;(4) to try reduce the costs of government debt under financial repression which arises when interest rates repressed below market rates (Roubin & Sala,1992); (5) to try prevent a prevalence of monopolistic and exploitive behavior among shareholders of domestic financial corporations; (6) to try to boost investment by holding interest tares at low levels; (7) to maintain a stable banking system through holding the saving rates below what normally prevails under competitive situations (Reese,1966); And finally (8) to find easy access to revenue through inflation tax which is made possible under financial repression(Fry, 1978).

McKinnon (1973) and Shaw (1973) are among the first ones criticizing the policy of financial repression and instead propose what they have called the policy of "financial liberalization". McKinnon (1973) argues: if investors have limited access to external financial resources and if they are large enough, they

may be constrained to accumulate their investment funds in the form of financial assets (such as bank deposits), which then they can draw on to invest in physical assets. In such circumstances an increase in deposit rate may increase savings and investments. Shaw (1073), in lieu of recognizing the role of deposits as a source of funds for financial intermediaries, argues that higher interest rates on deposits will encourage savings and investment. Fry (1978 & 1987), while recognizing the saving constraint on investment argues that relaxing financial control and the consequent rise in interest rates will increase savings and thus investment. He also argues that increases in interest rates will limit low yielding investments previously financed under low interest rate regimes and this in-turn implies an increase in average capital productivity. The end result, according to Fry, is that an increase in interest rates will speed up economic growth via increases in investment and also increases in average productivity.

On the other hand, proponents of new structuralism, such as Moore (1986 & 1989), believe that the effect of interest rate on savings is ambiguous and the effect of financial liberalization on economic growth depends on income effects and also the degree of substitutability between bank deposits and non-productive assets such as cash or gold held in household asset portfolios. McKinnon (1981), Kapur (1989) and Bergen (1983) also believe that even if the increase in savings and investment resulting from interest rate increases under a liberalization scheme may be negligible, still the improvement in the quality of investments and the consequent increase in investment productivity will speed up economic growth. Proponents of financial liberalization also maintain that even though the effect of interest rate on savings is ambiguous, the positive interest rate will stimulate financial savings more than non-financial savings, promoting sustainability and growth in financial markets and also in economies under consideration. The positive effect of growth in financial intermediaries on economic growth and development has empirically been verified by Rousseau & Wachtel (1998) & Jung (1986).

The experience of implementing financial liberalization policies in South Korea, Malaysia, Argentina, Chile, and Uruguay has produced mixed results. South Korea and Malaysia have attained a high degree of financial development without any particular difficulties. Argentina, Chile, and Uruguay have also attained a high degree of financial development as the result of liberalizing their financial sectors, but not without adverse economic impacts resulting from

increased instability, increased loan defaults and bankruptcies in financial, producing and commercial institutions.

Mirakhor & Villanueva (1993), drawing on the experience of liberalization in different countries, conclude that having a stable economic and a strong banking supervision system are a prerequisite to any successful attempt to carry financial liberalization. Fry (2000) recommends budget improvements in the way of relieving the burden that the budget imposes on the financial sector. He argues that the financial repression policies can act as an income source for the government and also can act to reduce the costs of government debt and subsequently government deficit through holding interest rates at low levels. Therefore, he argues, abandoning financial repression may result in abnormal increases in interest rates, explosions in government budget, instability in the whole economy and even reductions in economic growth.

The Iranian financial sector presents an interesting case for studying some of the concerns reviewed above. In Khordad 17, 1358 (June 7, 1979) after the triumph of the Islamic Revolution, the then Revolutionary Council opted for nationalization of all banks previously held in private hands and gave the government full authority to take complete charge of the banking system. Shortly after this date, the government embarked on passing the necessary laws and issuing the necessary decrees to consolidate its power over controlling and managing the banking sector, including: introduction of major changes in the structure and functions of this sector as deemed warranted. For example, in Azar, 1358 (December, 1979), the government implemented a project for merging Iranian banks in a way that 36 active banks were merged into 9 and more than 1500 branch banks were shut down, precipitating a policy of what later came to be called "bank branch non-expansion". However, after a decade of implementing this policy, the government once again adopted and has followed since then a policy of "bank branch expansion".

Also in 1358(1979), the Iranian government acted to eliminate usury interest charges from the banking system through the mechanism of reducing interest rate charges on deposits and loans and to reiterate the remaining charges as if they were enumeration on invested funds and minimum guaranteed profit in a perspective compliant with Islamic Dictates. However, starting 1369(1991), the government initiated a phased increase in nominal interest charges on deposits and bank loans any way.

Meanwhile since the chronic budget deficits prevailing during the War Years (1981-1989) precipitated dramatic inflationary measures, the government undertook specific policies in the language of "permissible increases in financial facilities" or imposition of "credit ceilings" in order to relive inflationary pressures and prevent economic imbalances. This policy coupled with obligatory purchases of government bonds by banks was intended to limit credit extensions to the private sector. However, as the war carne to an end and liberalization policies were put into effect, starting 1367(1987) the constraints on credit extensions were relaxed once again.

Meanwhile, one of the other policies that the post-revolutionary government has constantly kept in focus is credit extension to "priority sectors" including agriculture, industry and construction. Under the policy of "permissible increases in financial facilities by economic sector" (financial facility ceilings by sector), banks have been required to allocate relatively more credit to production sectors, particularly agriculture; and less credit to the sectors of services and commerce.

The main objective of this paper is to analyze the effect of the Iranian government's banking policies (acting mostly to repress this sector) on financial savings, investment productivity and economic growth in Iran. Hence after this brief introductory section we have tried to make a qualitative evaluation of the Iranian government' banking policies and the changes induced by these policies in the banking sector. Section II presents the empirical model which following Ketkar is derived by integrating McKinnon-Shaw hypotheses with Harrod-Domar via the dynamic adjustment mechanism of Molho for determination of households' and investor's savings behavior. Section III is devoted to a discussion of statistical data sources. Model econometric results and discussions are presented in Section IV. Finally, Section V presents a summery of the whole paper and offers some policy recommendations.

II- Government Policies and Banking Development

As we mentioned earlier in the introduction to this paper, right after the nationalization of banks in Iran, the government implemented various policies affecting bank branches, interest charges, and credit extension. Each of these are further spelled out below particularly from the standpoint of changes induced by them.

1- Limits on Bank Branches

In 1358(1980), the Iranian government decided to shut down more than 1500 bank branches reducing them from a high of 8275 at the end of 1357(1979) to a low of 6581 at the end of 1361(1983), because it was thought that the expansion of the banking network falling within service sector activities would cause grave damage to the allocation of financial and physical resources of the country and also because, it was thought, that it would pose serious difficulties for the correct implementation of monetary and credit policies(Sammadi,1999). During 1359-1366(1981-1988), as the government pursued a "non-expansionary bank branch policy" the growth of bank branches was limited to an annual average of 1.3 percent (Fig. 1). But with implementation of "expansionary bank branch policy" in 1367(1988), which was aimed at attracting more deposits, the growth in bank branches was increased to an annual average of 6.7 percent during the1367-1377 (1988-1995) period. It is worth noting that the average annual growth in bank branches in the pre-revolutionary period of 1339-1357(1961-1979) was 12.5 percent and this figure is about three times the corresponding figure for the post-revolutionary period of 1359-1377(1981-1989) which stood to an average annual growth growth of 4.43 percent. Comparison of these magnitudes clearly reveals that government policies after the revolution have generally moved in a way to limit the number of bank branches.

2- Extended Financial Facilities

The pre-revolutionary growth in the balance of financial facilities extended to the private sector by banks[2] considerably slowed down after 1358(1980)(Fig. 2). This in part is due to the slow down in the growth rate of bank deposits after the revolution. In fact, bank deposits grew at a much slower rate after the revolution compared to before it (Fig 3). The growth of banking financial facilities is generally expected to slow down in proportion to the slow down in the growth of banking deposits. However as Fig.4 shows the proportion of the balance of financial facilities extended by banks to banking deposits after the revolution has taken a downward trend without due regards to the trend in banking deposits, which means extension of fewer facilities in relation to any given amount of deposit during the post-revolutionary era. Therefore, reductions in banking facilities extended to private sector after the revolution can't be solely attributed to the slow down in the growth of banking deposits. There are

other reasons such as imposing tighter credit controls including credit ceilings and requiring banks to purchases government bonds as well.

Referring to Fig 5 and 6 we can notice the relative increase in the share of agriculture in the balance of financial facilities extended by banks and a relative decrease in the share of services and commerce which can be attributed to the post-revolutionary policy of government to extend more credit to priority economic sectors, particularly agriculture. Briefly speaking, the Iranian government's credit policy after the revolution has produced a reduction in facilities extended by banks and an increase in the share of agriculture in the balance of extended facilities.

3- Interest Rate Charges

Due to the critical role of interest rate charges in economic affairs and also its impact on savings and in a different way on investments, the various governments of Iran have made some attempt at using ceilings on interest rate charges on deposits and on credit facilities for bringing interest rates under control. The available data indicate that in the pre-revolutionary period of 1967-1979, the annual weighted average of nominal interest rate paid on deposits has grown at an increasing rate from yearly 4.52 percent in 1346 (1967) to 8.74 percent in 1357(1979). However the annual weighted average of nominal interest rate on credit facilities in the same pre-revolutionary period has stayed constant. The annual weighted average of nominal interest rate charges on deposits and credit facilities in the period after the revolution has declined to 7.23 and 5.34 percent in 1358(1980), respectively. Following the multi-staged increase interest rate charges in 1369(1990) the nominal interest rate on deposits and on facilities surpassed the pre-revolutionary levels and their weighted annual average reached 12.5 and 17.22 percent in 1374(1995), respectively. However, considering the rate of inflation which in most of the years after 1352(1974) has been in two digit figures, the annual weighted average of real interest rate on deposits from 1352(1981) onwards has been perpetually negative and in 1374(1995) with inflation rate reaching 49.4percent, recorded its lowest levels at -36.9 percent. The weighted annual average real interest rate on financial facilities has been negative too except for the years 1354(1975), 1357(1979), 1364(1971) and 1369(1976). It is worth noting here that the average real interest on deposits and facilities has been substantially lower after the revolution compared to before it, that is a rate on deposits of -1.57 percent for the 1346-

1357(1967-1979) period compared to the -11.76 percent for the1358-1377 (1980-1989) period and a rate on credit facilities of -3.89 percent for the period of 1352-1357(1974-1979) compared to a rate of -9.61percent for 1358-1377(1980-1998).

III- The Empirical Model.

This section is intended to present an analytical framework for studying the effect of government induced banking market distortions on the economic growth of Iran. The model used here is similar to the model used by Ketkar (1993) in conjunction with evaluating the role of bank nationalizations in economic growth in India. The model essentially combines Harrod- Domar growth model with McKinnon-Saw hypotheses about financial liberalizations via the dynamic adjustment mechanism proposed by Molho[3]. After making some manipulations in the model to fit the Iranian case the following general form emerged.

$$D_t = a_0 + a_1 GDP_t + a_2 EINF_t + a_3 IRDAE + a_4 IRDAE_{t-1} + a_5 RAA + a_6 NOB_t + a_7 CAG_t + a_8 W_t \quad (1)$$

$$INV_t = b_0 + b_1 RR_t + b_2 IRCAE_t + b_3 D_t + b_4 GGDP_{t-1} + b_5 FC_t + b_6 EDD_t + b_7 CAG_t \quad (2)$$

$$MPK_t = c_0 + c_1 K_t + c_2 INVG_t + c_3 CAG_t + c_4 CAG_{t-1} + c_5 EC_t + c_6 INF_t \quad (3)$$

$$GGDP_t = d_0 + d_1 MPK_t + d_2 INV_t + d_3 GAG_t + d_4 GOG_t + d_5 GOG_{t-1} \quad (4)$$

The structural model designated as (1) is a financial savings model. According to this model, real financial savings or real bank deposits (D_t) are expected to increase with an increase in Real Gross Domestic Product (GDP_t) ($a_1 > 0$). Real wealth (W_t) also exhibits similar effects ($a_8 > 0$). The inflation rate is known to be a kind of return to real assets or alternatively the opportunity cost of holding money so that any time people expect prices to increase they are likely to substitute monetary assets with real assets. Thus, the expected inflation rate (EINE) has a negative impact on banking deposits ($a_2 < 0$). There are several methods for measuring expected inflation rate. We have, however, followed

Crockett & Owens (1980), Driscoll & Lahiri (1983), Darrat (1988) and Ketkar (1993) in using t-1 period's inflation rate as an estimator of the next period's expected inflation rate. As we briefly mentioned before the effect of the real current year interest rate ($IRAE_t$)[4] on deposits depends on the relative force of substitution and income effects and in the final analyses, the greater effect of the two will rule ($a_3>0$ or <0). An increase in t-1 interest real ($IRDAE_{t-1}$) will reduce the current year's financial deposits. According to Molho, any changes in the past interest rates can only induce income effects in the current period and hence only the negative effects upon current savings will rule. ($a_4<0$). An increase in real rate of returns on competitive assets (RAA_t) such as gold, land and stocks will increase household propensity to convert their deposits to these assets ($a_5<0$). The impact of an increase in the number of bank branches on deposits could seem indeterminate. As Ketkar (1993) has noticed, an increase in the number of bank branches will likely improve individuals' accessibility to banks and hence reduces transaction costs. Therefore an increase in the number of bank branches in different regions of the country will likely increase effective rates of return on banking deposits and this increase has a positive substitution and a negative income effect and also diverts savings from non-formal credit markets to the organized financial sector. As a result, the final effect of bank branch expansion on deposits is indeterminate ($a_6>$ or <0). An increase in credit to priority sectors (CAG_t) also can have two opposing effects on banking deposits ($a_7>0$ or $<o$). An increase in accessibility to banking credit may reduce the need to domestic savings reinforcing the negative impact of increases in CAG_t on banking deposits. On the other hand any increase in credit is likely to increase society's liquidity and some of this increased liquidity is likely to find its way back to banks in the form of deposits [5].

The structural equation for real investment (INV_t), represents the combined positive effect of return to investment designated as RRC_t with $b_1>0$, negative effect of the cost of raising funds (investment costs) designated as $IRCAE_t$ with $b_2<0$, positive effect of banking deposits represented by D_t with $b_5>0$ and the positive effect of expected domestic demand designated as EDD_t with $b_6>0$ respectively. The positive effect of foreign investment stems from tow sources: first, foreign investment complements domestic savings and second, the associated influx of modern technology raises the rate of return on investment. The positive effect of domestic demand ($EDD_{t)}$ on investment is rather obvious. The variable CAG_t is included to determine the effect on investment of

government interferences in the allocation of banking credit. If credit uses are efficient and production oriented, the effect on investment is expected to be positive. But, if credit is allocated for purposes other than production, such as aid to groups hit by natural disasters or for income redistribution purposes, then the effect on investment might turn out to be negative. It is worth noting that sometimes credits extended by banks for specific production purposes may not be consumed for purposes they were intended to and therefore even though government may have required banks to target credit for production, there is no guarantee that it will be used that way and any credit used for a purpose other than production could have a negative effect on investment. Therefore one might conclude that the effect of CAG_t on investment is not theoretically predictable ($b_7 >$ or <0).

The relationship of marginal productivity of capital (mpk_t), or changes in production divided by changes in capital (structural equation 3) to real capital stock (K_t) can not be anticipated beforehand: it may turn out to be positive or negative. Gross Domestic Product (GDP_t) is expected to increase with an increase in capital stock, given other factors affecting production. However the increase in GDP_t can come about at an increasing or at a decreasing rate and depending on the situation, the coefficient of K_t might turn out to be positive or negative ($c_1>1$ or < 0). The effect of public sector investment ($INVG_t$) on MPK_t cannot be determined beforehand either. Government investment in infrastructures is likely to yield positive effects on marginal productivity of capital, but government investment in State owned corporations is likely to yield negatively. Therefore the outcome is not clear ($c_2>0$or<0). Foreign exchange controls and imports (EC_t) and inflation (INF_t) are expected to affect marginal productivity of capital in a negative way (c_5, $c_6 <0$). It is generally argued that sustained inflation is likely to divert investment from production to those activities, which provide a secure shield against inflation and yield negative long-term negative impacts on marginal productivity of capital. The impact of credit to priority sectors is controversial and depending on whether credit is allocated to production and efficient activities or to low yielding activities, the impact on marginal productivity of capital may be positive or negative (c_4, $c_5>$ or <0).

Increases in investment (INV_t) and marginal productivity of capital (MPK_t)(Equation 4) are expected to affect the growth of Gross Domestic Product ($GGDP_t$) negatively (d_1, $d_2>0$). The impact of agricultural sector growth

on economic growth is expected to be positive ($d_3>0$). This sector still plays an important role in the Iranian economy. As Edmundson & Sukhatme (1990) have argued, a low production not only raises the price of 'agro-based-inputs' but also reduces accessibility to food commodities, thereby lowering labor productivity. Finally, the variables GOG_t and GOG_{t-1} in the model represent the value added of the oil sector in the current and last period respectively. These are expected to have positive impacts on economic growth with the latter being measured by the growth of GDP (d_4, d_5 >0).

IV- The Data Sources.

The data on the number of bank branches has been compiled from the Annual Statistical Yearbook published by the Iranian Statistical Center[6]. The authorities of the Central Bank of Iran have provided the balance of extended credit [7]. The authorities in the Deputy Ministerial Office for Monetary Affairs of The Ministry of Economics and Finance[8] have provided the data on weighted average real interest rate on deposits for the time period starting 1362(1973) and onwards and the authorities of the Central Bank have provided the raw data required to calculate the same statistics for the period prior to 1362(1973).

The weighted average Real interest rate on Financial Facilities also was calculated by the raw data obtained from the authorities of the Central Bank.

The capital stock (K_t) in Iran for the years prior to 1373(1984) were obtained from The Plan & Budget Organization [9], and the following formula (5) was used to generate the series for the years after 1373(1984).

$$K_t=K_{t-1}(1-d)+INV_t \quad (5)$$

In equation (5), INV_t designates Gross Capital Formation in year t and d designates the average depreciation rate on capital stock, estimated from previous years.

The real volume of money plus real stock of capital and government real deposits with the central bank were used as a proxy for real wealth of the society. The data on the consumer price index of goods and services in urban areas were used to calculate inflation rate and the previous period's inflation was assumed to predict the current period's inflation rate. Due to the inaccessibility of land prices in Iran and also the lack of a well developed stock market with stocks of production units held by only a small minority of the population, the rate of return on gold was used as a proxy for the rate of return on competitive

assets (RAA) .The authorities of the Central Bank of Iran provided us with data about gold prices. The foreign loans and foreign private investment and also Iranian government use of foreign long-term credit were used to represent foreign inflow of capital (FC_t). Data of these variables were compiled from the balance sheets of the Central Bank of Iran. The rest of the data were compiled from various sources notably from Economic Statistic Magazine published by Deputy for Economic Affairs, Ministry of Economics and Finance[10], the Balance Sheets of the Central Bank, and Economic Indicators and Reports published by Central Bank of Iran[11]. All the data in current prices were converted into 1361(1981) constant prices based on urban consumer price index of goods and services.

V- The Model Estimates.

The structural model composed of equations 1-4 above was estimated using tow-stage least squares with instrumental variables. Estimates are summarized in the table below. The values obtained for R^2 and F statistics from the estimates are indicative of the relatively high degree of reliability of the estimated parameters. Due to data limitations, data series do not all cover the same time period and each model was estimated using a different time period depending on series availability.

Table 1

Dependent Variable	Fixed Coefficient	$GGDP_t$	$IRDAE_t$	NOB_t	$DCAG_t$	W_t	BN_t	R2/F/D.W
D_t	2399 (5.16)*	11.98 (1.44)	7,9 (1.15)	0,0919 (2.037)	2.548 (1.97)	0.067 (2.23)	765 (3.22)	0.91/24.6/1.82
Dependent variable	**Fixed Coefficient**	**D_t**	**$IRCAE_t$**	**BN_t**	**$GGDP_{t-1}$**	**FC_t**	**BN_{67}**	**R2/F/D.W**
INV_t	453.67 (1.4)	0.249 (4.8)	-8.16 (-1.12)	906.97 (5.31)	15.679 (1.96)	0.2 (2.099)	-584.53 (-1.9)	0.80/12.8/2.04
Dependent Variable	**Fixed Coefficient**	**K_t**	**$INVG_t$**	**$DCAG_t$**	**$DCAG_{t-1}$**	**BN**		**R2/F/D.W**
MPKt	1.64 (6.47)	-0.000045 (-1.33)	-0.00099 (-2.95)	0.0023 (1.28)	0.0079 (3.73)	-0.68 (-2.067)		0. 69/9.82 / 2.04
Dependent Variable	**Fixed Coefficient**	**NVP_t**	**MPK_t**	**GAG_t**	**GOG_t**	**GOG_{t-1}**		**R2/F/D.W**
$GGDP_t$	-4.8 (-2.08)	0.0025 (1.62)	6.076 (5.33)	0.52 (2.79	0.159 (5.55)	0.121 (4.23)		0.7/16.85/2.23

The figures in parenthesis are t Values

The banking deposit model (D_t) was estimated using data covering 1354-1377(1985-1988) period. Preliminary estimates indicated the existence of serial correlation in the error term. This was corrected by applying the Cochrane-Orcutt iterative procedure. Problems of severe autocorrelation among the independent variables were also observed in the preliminary estimate. To correct for these we had to eliminate EINF, because about 90% of the variations in this variable were explained by other variables in the model. The variable GDP was replaced by its growth rate, designated by $GGDP_t$ and the change in the balance of credit to agricultural sector ($DCAG_t$) was used as a substitute for the balance of credit extended to the agricultural sector (CAG). These modifications substantially reduced the severity of auto-correlation among variables and as Table 1 indicates the signs of all variables except $GGDP_t$ and $IRDAE_t$ turned out to be as theoretically expected. The positive sign of the interest rate variable is an indication that the substitution effect (positive) outweighs the negative income effect. The positive and statistically significant coefficient of NOB_t variable indicates that an increase in the number of bank branches is likely to have a positive effect on banking deposits. The coefficient of $DCAG_t$ is found to be positive and significant at a relatively high degree of confidence. This is indicative of the positive effect of increases in agricultural credit on banking deposits. The $IRDAE_t$ and RAA_t variables did not pass the statistical tests of significance and therefore were eliminated from the model. The dummy variable

BN was set to zero for the years before the revolution and to one after it. The estimated coefficient of this variable is positive and statistically significant, indicating that banking deposits have, on the average, increased about 765 units (in billions of constant rials). The reason for this may be an increase in people's confidence in the banking system after restoration of its usual activities in the years following the 1979 Revolution, particularly as compared to the immediate years before the Revolution when people's confidence in the banking system had severely eroded.

The investment model (the second row in Table 1) was estimated using data series for the 1352-1377(1973-1998) period. Because of the lack of data the EDD_t and RRC_t variables had to be eliminated from the right-hand side variables. The CAG_t variable was also eliminated, because of an insignificant coefficient and also because it was found to be strongly correlated with the CAG_t variable. The estimated equation summarized in the second row of Table1 indicates a statistically acceptable effect of real deposits, economic growth lagged one year and foreign investment flows on investment expenditure as theoretically expected. According to the value of D_t in the model, an increase of 100 units in banking deposits is likely to increase banking deposits by only 25 units and this may be attributed to two reasons: firstly, not all banking credits have accrued to investment, and secondly government limitations in the form of enforcing credit ceilings, high legal reserve ratios and banks' statutory obligations to purchase government bonds might have retarded credit activities of banks vs. a given amount deposits. The sign of the $RCAE_t$ coefficient is negative as expected, but it is not meaningfully different from zero. The reason may be because most investments in Iran are financed by non-bank sources and also because the interest on bank facilities is substantially lower from the market interest rate.[12] The present interest rate charges on bank facilities do not justify real cost of obtaining funds for investment purposes. The dummy variable, used to isolate the effect of the Iranian Revolution, has a positive and statistically significant coefficient, meaning more average annual investment during the period before the Revolution, compared to the period after it. This may be explained in-terms of the 1353(1974) oil shock and the resulting increase in oil revenues of Iran. The dummy variable designated by BN67 was set to one for 1367(1988) and zero for the other years in the series. In this particular year the enemy missile attacks on urban areas and installations were severely intensified and as a result the current government expenditures soared at the same time that

revenues from oil exports dipped. Consequent to these events, government investment expenditures in 1367(1988) dropped and capital formation diffracted. This can also be inferred from the negative sign of the coefficient of the BN67 variable, which also happens to have a high significance level.

The estimated model for marginal productivity of capital based on 1348-1377(1969-1988) with the exception of the years 1360(1981) and 1359(1980) [13] indicates a negative relationship between K_t and the marginal productivity of capital. However, this relationship is not significant at an acceptable level of confidence. The negative and statistically significant coefficient of $INVG_t$ may have resulted from the fact that most of the government investment has taken place in state owned enterprises and the operational inefficiencies usually prevailing in these enterprises have reduced the marginal productivity of capital. The positive coefficients of $DCAG_t$ and DCGAt-1 reflect the positive effect of credits extended to agriculture on marginal productivity of capital. The explanation may be that some agricultural loans are used to enhance mechanization and thereby increase agricultural production and Gross Domestic Product. Since agricultural credit usually has a delayed impact before it can materialize into production, it is not surprising to find that the coefficient of $DCAG_{t-1}$ is statistically significant and larger than the coefficient of $DCAG_t$. The BN variable was included to measure the impact of the 1979 Revolution on marginal productivity and its negative and statistically significant coefficient is an indication that the marginal productivity on the average has declined after the Revolution.

Finally, equation 4(the fourth row of Table 1) was estimated using the data covering the same time span as used in equation 3 above with the $INVP_t$ variable substituting for INV_t. The $INVP_t$ was obtained using the following relationship:

$$INVP_t = INV_t - PIC_t$$

Where PIC_t designates private investment in construction. The coefficient of $INVP_t$ was found significant at 85% confidence level and its positive coefficient is indicative of the positive effect of investment on economic growth. The rest of the coefficients are found to be significant at 95% confidence level as well. The sign of coefficient attached to MPK_t is the same as expected[13]. The coefficients of GAG_t, GOG_t, and GOG_{t-1} are indicative of Iran's dependency on oil and agricultural sectors with a comparatively more significant effect resulting from the latter.

IV- Summary and Conclusions.

The analyses carried in this paper showed that government interferences in the banking sector of Iran since the nationalization of banks have drastically reduced the number of bank branches, repressed interest rates and also reduced the amount of credit extended vs. a given amount of banking deposits. However credit extended to the agricultural sector in the period after the Revolution has been on the rise.

Our findings also indicated that increases in the number of bank branches have a positive effect on financial savings. Increases in savings are likely to increase investment and thereby speed up economic growth. Previous empirical work by Laumas & Porter-Hudak (1986), Laumas (1990) and Ketkar (1993) indicated a positive effect of expansion in financial intermediaries on saving and investment. One can safely say that the Iranian government policy with respect to the number of bank branches after the revolution has not generally had a favorable effect on economic growth.

According to the estimates summarized in Table 1, increases in the balance of credit to the Iranian agricultural sector (implicitly the same as credit extended to this sector) are identified as a source of economic growth in Iran. This has come about in two ways: first, via the role played by agricultural credit in increasing banking deposits and consequently investment and economic growth and second, via the role played by agricultural credit facilities in increasing productivity and economic growth. Therefore one may conclude that Iranian government policy for extending more credit to agriculture has speeded up economic growth after the Revolution.

The estimated model also showed that banking deposits have a positive effect on economic growth. Therefore any policy, which reduces the value of D_t or its coefficient in investment model, is likely to reduce economic growth as well. It may be observed that the Iranian government policy of devising credit ceilings and statutory obligation of banks to purchase government bonds after the Revolution has adversely affected economic growth. Finally, our study of the impact of interest rate depressive policies on economic growth in Iran was inconclusive.

At the end it may be speculated that the whole nationalization scheme of post 1979 Revolution will soon come under stringent review with strong intentions to move towards a privately oriented and more competitive banking system which can strongly bear meeting the badly needed financial requirements of economic growth in the Islamic Republic of Iran.

Note

1- The strategic instruments of development are usually classified as capital, natural resources, labor, and technology {see, for example, Sen. (1983) in the citations to this paper}.

2- "Facilities" is a term coined by Iranian banking authorities to refer to banking credit as a form of profit sharing enterprise, which together with other profit and loss sharing activities fall under Islamic Contractual Agreements. In this way accusations of engaging in usurious activities, which run contrary to Islamic mandates, are avoided. However the credit function of banks, for all practical purposes, remains as ordinarily understood. Therefore, in this paper we use "facilities" and "credit" interchangeably. Furthermore, due to lack of access to the data on credit extended (a flow variable), to the private sector by banks, the balance of facilities extended (a stock variable) to private sector was used instead. This latter variable follows from the following equation.

$$CR_t + REP_t - BF_{t-1} = BF_t$$

Where,

CR_t= credit extended in year t;

REP_t= loans repaid in year t;

BF_{t-1}=balance of credit extended in year t-1;

BF_t =balance of credit extended in year t.

3- McKinnon-Shaw hypotheses consider financial savings as a prerequisite to capital accumulation and economic growth. Molho (1983 & 1986) have interpreted these hypotheses to mean that the behavior of savers and investors are determined by a combination of forces in a dynamic manner. The mechanism of Molho's dynamic Adjustment states that considering heavy investments in physical assets and absence of financial intermediary in developing countries (which are faced with financial repression), investors will be forced to save in the form of financial assets. Therefore funds resulted from savings in a given period are invested in physical assets on the condition that the risk-adjusted rate of return on capital exceeds the rate on deposits. Consequently, short-term increases in the rate of interest on sight deposits appear to decrease investment, although the long run effect on investment could be positive provided that higher interest rates lead to more

financial saving and increases in the supply of loan able funds. Thus, financial savings and investments can be considered as substitutes in the short-run, but as complements in the long run. The effect of capital stock on investment is measured based on Harro-Domar' model of economic growth. According to this model, economic growth rate is determined positively by investment rate and also by output-capital ratio.

4- $IRDAE_t$ is a weighted average of interest rate on deposits, which is used as a substitute for interest rate on deposits in equation (1).

5- One of the objectives of the government's imposition of credit ceilings after the Revolution has been to counteract the increase in monetary base.

6- The Iranian Statistical Center of the Management and Plan Organization publishes an Annual Yearbook containing the most comprehensive statistics on Iran. See: Islamic Republic of Iran, Iranian Statistical Center, in the reference citations to this paper.

7- The Central Bank of Iran publishes an annual report containing macroeconomic data and analyses. See: Islamic Republic of Iran, Central Bank of Iran, in bibliographical citations to this paper.

8- The Ministry of Economic and Financial Affairs compiles macroeconomic of its own, mostly in unpublished form. See: Islamic Republic of Iran, Ministry of Economic and Financial Affairs, in the bibliographical citations to this paper.

9- See Amini, Alireza et at., in the bibliographical citations to this paper.

10- See, Islamic Republic of Iran, Central Bank of Iran, in the citations to this paper.

11- See, Islamic Republic of Iran, The Ministry of Finance, in citations to this paper.

12- For reasons that the calculated MPK for the years 1359(1981) and 1360(1982) were dubious, and affected the quality of the estimated model adversely, the data for these years were excluded from final estimation.

13- See Stickley S. Thomas and Hosseini-Nasab, Ebrahim in the citations to this paper for a discussion of institutional and non-institutional credit, including interest rate and credit use variations in Iran. See also a paper by the same authors on supervised credit program of The Agricultural Bank of Iran

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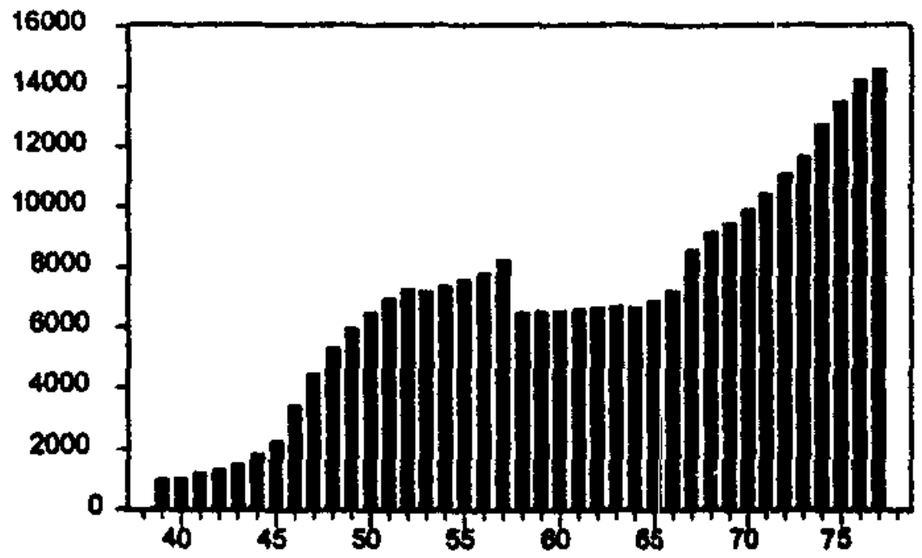

Fig 1.The number of bank branches, 1339-77(1959-98)

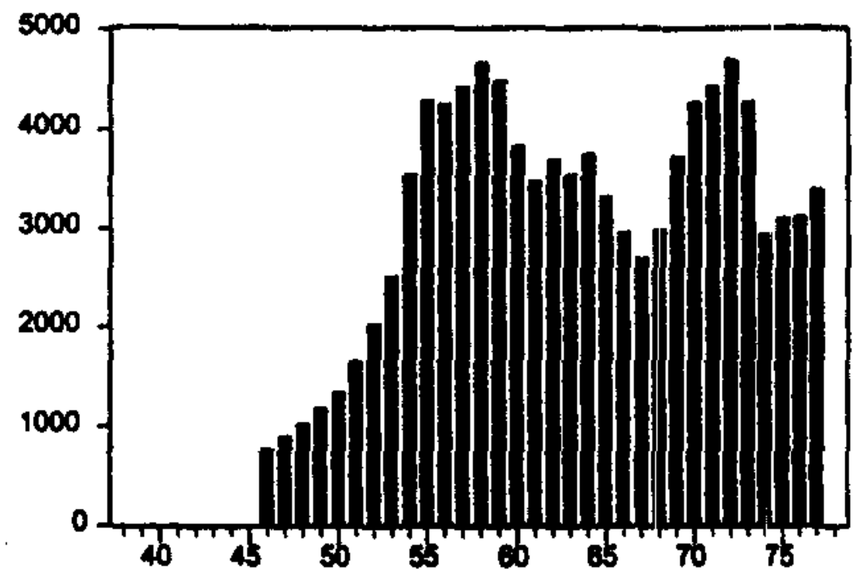

Fig 2 The balance of banking facilities,1346-77(1968-98)

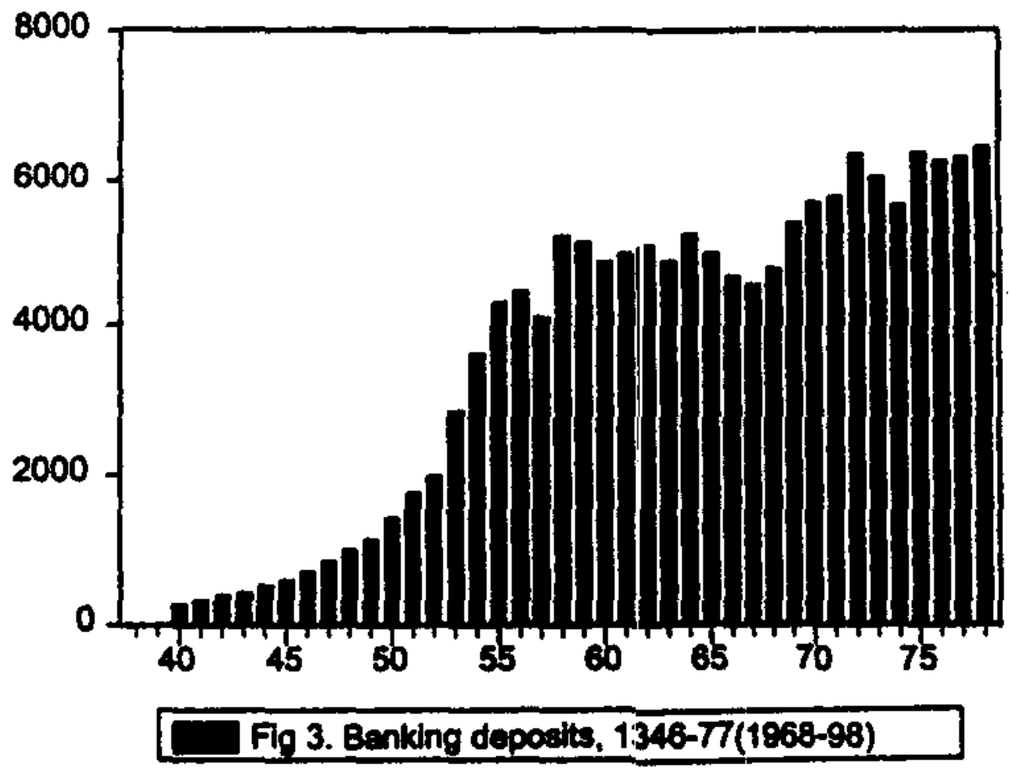

Fig 3. Banking deposits, 1346-77(1968-98)

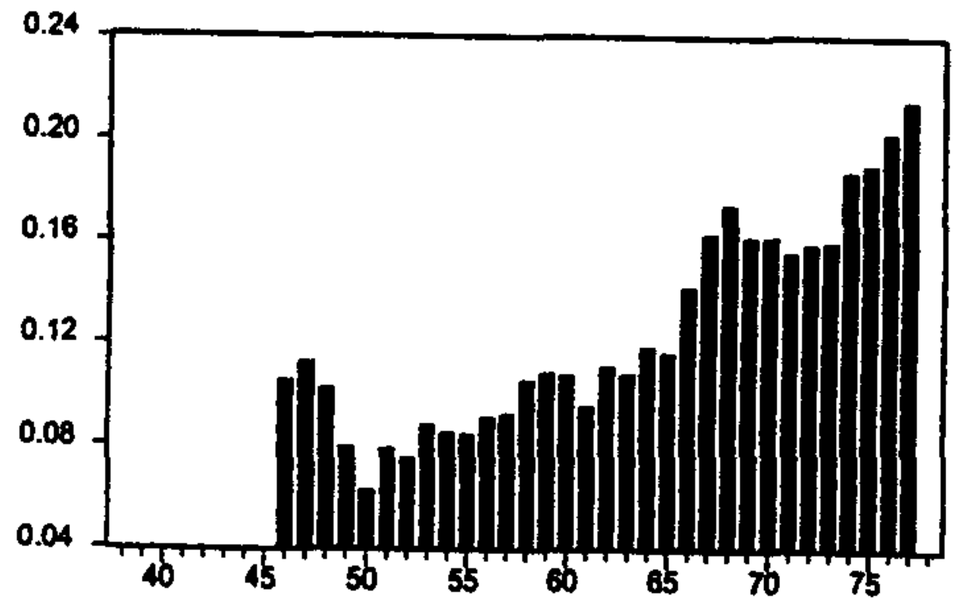

Fig 5. Share of agricul. in banking facilities,1346-77(1968-98)

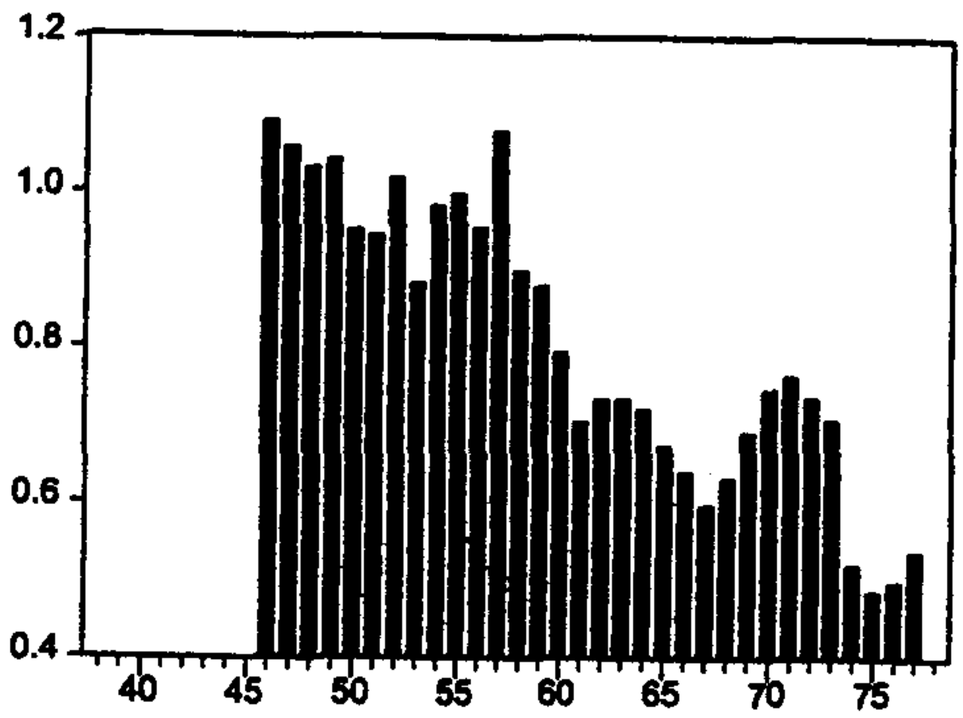

Fig 4. banking facilities/deposit ratio,1346-77(1968-98)

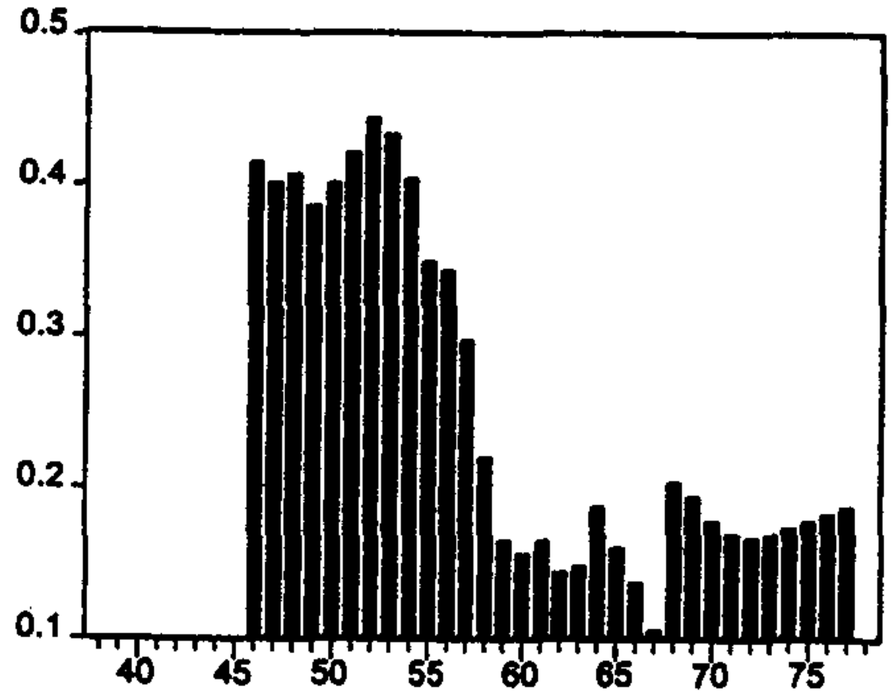

Fig 6.Share of commercrce in banking facilities.1346-77(1968-98)