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The Role of Banking System Development in Economic Growth: The Case of Iran[1]

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Abstract

This paper empirically investigates the relationship between banks and economic growth emphasizing the transmission channels from financial development to growth in Iran using time series methodologies, namely Johansen's co-integration and Granger causality methods in the context of error correction models (ECM). The results show that in our case study banks affect economic growth mainly through the capital accumulation channel. Because of financial backwards and market imperfections, agents face many borrowing constraints, which may hinder their ability to invest at optimal levels. In this situation, the role of banking system in increasing investment through capital accumulation is expected to be strong. In our study, we do not find an evidence for productivity channel, perhaps reflecting inefficiency of the Iranian banking system, which imposes many restrictions on bank choices such as credit rationing and directed finance under financial repression. Our results strongly support the supply-leading hypothesis. The main policy message of the paper is that banking system development matters for investment and economic growth in Iran. Therefore, policies that affect financial system are also likely to influence investment and economic growth.

JEL classification: O16; G21 ; E47; O11

Keywords: Bank development, economic growth, causality, supply-leading hypothesis, demand-following hypothesis

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1. Introduction

A large body of theoretical literature exists on financial system as an important determinant of economic growth. Early examples of this literature include Goldsmith (1969), McKinnon (1973) and Shaw (1973). These papers emphasize the role of financial system in economic development and conclude that there is a strong positive correlation between financial development and economic growth. Some recent studies such as Kings and Levine (1993a) and Levine and Zervos (1998) conclude that financial development enhances economic growth through various channels.

Furthermore, in the recent endogenous growth models, there has been considerable debate regarding the relationship between financial system and economic growth (Pagano, 1993). In neo-classical growth models, the most important source of growth, total factor productivity growth is treated exogenously and is thus unrelated to the financial system. These models predicts that financial variables only influence the level of income rather than the growth of income because of the presence of diminishing return to capital. However, in recent endogenous growth, investment can be broadened to include research and development, human capital, learning by doing, improved management, and other elements of total factor productivity (Romer 1990; Stiglitz, 1998). This opens up the possibility of studying how the financial system affects long-run growth. In the endogenous growth theory, it is assumed that increased investment by one firm has spill over effect of other firms. As a result, increases in productivity are generated for the industry as a whole and hence economic growth can result from increased investment. A key implication of endogenous growth theory is that financial development may affect the steady state rate of economic growth not only by raising the saving rate but also by raising the amount of saving channelled to investment and/or raising the social marginal productivity (Pagano, 1993).

Theoretically, the support of the existence of a growth-finance relationship is strong but empirically the causal nature of this relationship is known to exhibit considerable variation across countries (Arestis and Demetriades, 1996). This may indicate that institutional factors or policies may play a critical role in determining how the process of financial development affects economic growth.

Recently, a number of studies has been investigated the effect of financial development, in particular, banks development, on economic growth in Iran (for example, see Al-Yousif, 2002; Jbili et al., 2004 ; Al-Awad and Harb, 2005). To the best of my knowledge, none of these papers has sought to investigate the channels of transmission by which financial development affects economic growth. To help shed light on this issue, in this paper I attempt to examine the effect of financial development on the economic growth in Iran over the period 1960-2004 by emphasizing the various transmission channels of financial development to economic growth.

To this end, I present two alternative competing hypotheses regarding financial development and economic growth in terms of their causal relationships, namely the supply-leading and demand-following hypothesis. In the first hypothesis, financial development leads to economic growth by different channels. First, by raising the level of investment and capital accumulation; and second, by raising the productivity of capital. In contrast, in the second hypothesis, financial development follows economic growth. As the real side of the economy develops, its demand for new financial services increases, leading to the growth of these financial services.

The empirical investigation in this paper is conducted by employing time series methodologies, namely Johansen's co-integration and Granger causality testing procedure in the context of error correction models. When variables are not stationary, this method is an efficient technique of testing causality.

The rest of the paper is organized as follows. Section 2 briefly reviews the current empirical literature regarding the finance and growth nexus. Section 3 briefly presents an overview of the Iranian financial system, reviewing key issues as well as some stylized facts regarding financial development and economic growth. Econometric methodology and data description are outlined in sections 4 and 5, respectively. Section 6 outlines the empirical results, and section 7 concludes the paper.

1 Financial development and economic growth: A literature review

Theoretical development regarding the importance of financial development for economic growth has induced many empirical investigations. These studies use different econometric methodologies including cross-sectional approach and time series modeling which offer different results regarding the existence and direction of causality between financial development and economic growth. A good survey of the literature can be found in Levine (1997, 2005). We present a brief review of the literature.

Levine and Zervos (1998) use cross-sectional data for 47 countries show that stock market liquidity and banking development both positively affect growth, capital accumulation and productivity. Beck and Levine (2004) investigate the impact of stock markets and banks on economic growth using a panel data set for the period 1976–1998 and applying generalized method of moments techniques developed for dynamic panels. On balance, the result tends to support the view that stock markets and banks positively influence economic growth.

Some recent studies have used time series modeling to explore the finance- growth nexus. For example, Neusser and Kugler (1998) examine the causality between financial intermediation and economic performance for many OECD countries. They point out that financial sector and GDP are co-integrated for many OECD countries; the causality turns out to be weak for the most of the smaller countries, which may be explained by degree of capital mobility. However, the results suggest a more complex picture than is apparent from cross-sectional evidence. In other words, the causal structure varies widely across countries which points at the importance of historical, institutional factors and the flow of international capital.

Arestis et al. (2001) examine the relative impact of stock markets and banks on long-run economic growth in Germany, the USA, Japan, the UK and France. They find a positive effect of banks and stock markets on economic growth in most of the countries, but the effect of the former are more powerful. The same result is found by Hondroyiannis and Lolos (2005) for the Greek economy as well.

2. Banking system and growth in Iran: stylized facts

The banking system consists of six state-owned commercial banks, four state-owned specialized banks, a state-owned Postal Bank (licensed in 2004) and six recently established small private banks and some small private non bank credit institutions.

Banking system is a major part of financial sector in the Iranian economy. The value added of banking sector has been a major component of the total value added in the financial sector in the 1980s. However, recent contribution of other intermediaries such as insurance and investment companies and reopening the stock market in 1989 has led the share of banking in the financial system to decline.

Banks are main source of financing economic activities. During the period 1990-2004 loans made by banks construct about 30 percent of total investment in Iran. Therefore, banks could play an essential role for investment and growth.

Figure 1-1 shows the relationship between GDP per capita growth and banks development indicator measured by change in ratio of banks claim on private sector to GDP for the Iranian economy. In general, these variables tend to move with each other, but the relationship is not strong in some years, where despite development in financial sector, economic growth has not increased. The relationship between physical capital stock per capita growth and banks development has been plotted in Figure 1-2. The figure shows a positive relation between these two variables where the correlation coefficient over the period under consideration is 0.44 .

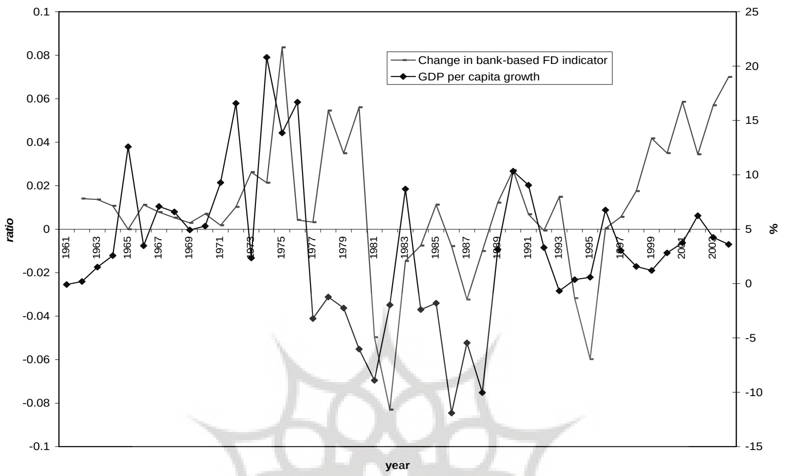

Figure 1-1: financial development and economic growth in Iran, 1961-2004, (growth scaled in the right axis)

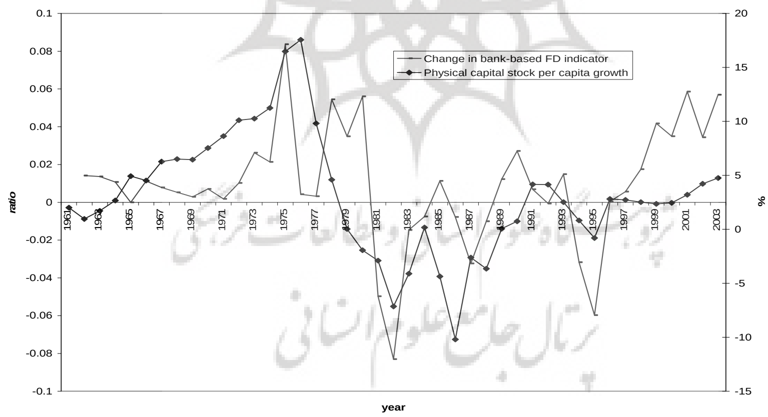

Figure 1-2: financial development and physical capital growth in Iran, 1961-2004, (capital growth scaled in the right axis)

3. Econometric Methodology

Our investigation regarding how financial development affects economic growth is carried out by using the Granger causality test in the context of the co-integrated VAR model. The standard Granger causality test assumes that variables in the model are stationary, while most time series economic data are non-stationary. Hence, the standard test is ineffective as the test statistics, in general, lack standard distribution (Sims et. al. 1990, Toda & Philips 1993). Furthermore, Engle & Granger (1987) show that a VAR model in first difference with co-integrated variables is misspecified, and therefore, results based on such models may lead to incorrect inferences. As a result, several alternative methods of testing for causality in co-integrated VAR have been emerged in the literature. The popular approach has been to re-parameterize the VAR model into the equivalent vector error correction model (VECM) and to conduct causality tests following the Johansen-type error correction model (Hall & Wickens, 1993). In this approach after determining the order of co-integration, we conduct the causality in the resulting rank-reduced model.

The Johansen (1988) method is based on a vector error correction (VECM) representation of a VAR(p) model which can be written as follows:

$$\Delta X_t = \gamma D_t + \sum_{j=1}^{p-1} \Gamma_j \Delta X_{t-j} + \alpha(\beta' X_{t-p}) + u_t \qquad (1)$$

Where X_t denotes an $n \times 1$ vector of I(1) variables. In our case X_t={per capita output, per capita capital stock, financial development indicator(s)}. D_t is set of deterministic variables such as constant, trend, and dummies; u_t is a vector of normally and independently distributed errors with zero mean and constant variance. Γ_j s are $n \times n$ short-run coefficients matrices.

The long-run relationship between variables in the model is given by the rows of β' thereby $\beta' x$ form stationary processes. The parameters in α are the weight by which each co-integrating vector enters the equations. They can be interpreted as speed of adjustment-parameters, in a sense that they measure the degree to which each variable adjusts to deviations from the long-run stationary relationship.

Equation (1) is a basic specification for the test for causality. A test of zero restrictions on the α s is a test of weakly exogenous in the long-run. Arestis et al. (2001) use weak erogeneity tests to examine the issue of long-run causality between the variables in the system. However, the interpretation of weak erogeneity in a co-integrated system as a notion of long-run causality does not preclude being Granger causality between variables in short run (Pesaran et al., 2000). Therefore, following Hondroyiannis and Lolos (2005), I consider both long-run and short-run parameters at the same time to do the causality analysis. Consequently, testing procedures for causality when variables have unit roots require restrictions on some parameters. Since in our case vector X includes three variables { y, z, x }, we consider the following model.

$$\Delta y_t = \gamma_1 D_t + \sum_{j=1}^{k} \Gamma_{1j}^{\ 1} \Delta y_{t-j} + \sum_{j=1}^{k} \Gamma_{1j}^{\ 2} \Delta z_{t-j} + \sum_{j=1}^{k} \Gamma_{1j}^{3} \Delta x_{t-j} + \alpha_1 . \varepsilon_{t-1} + u_{1t}$$

(2)

$$\Delta z_t = \gamma_2 D_t + \sum_{j=1}^{k} \Gamma_{2j}^{\ 1} \Delta y_{t-j} + \sum_{j=1}^{k} \Gamma_{2j}^{\ 2} \Delta z_{t-j} + \sum_{j=1}^{k} \Gamma_{2j}^{3} \Delta x_{t-j} + \alpha_2 . \varepsilon_{t-1} + u_{2t}$$

$$\Delta x_t = \gamma_3 D_t + \sum_{j=1}^{k} \Gamma_{3j}^{\ 1} \Delta y_{t-j} + \sum_{j=1}^{k} \Gamma_{3j}^{\ 2} \Delta z_{t-j} + \sum_{j=1}^{k} \Gamma_{3j}^{3} \Delta x_{t-j} + \alpha_3 . \varepsilon_{t-1} + u_{3t}$$

where ε_{t-1} is $\beta' X_{t-1}$.

We apply the standard Wald test to test for causality. This can be done by imposing zero restrictions on the short-run coefficients as well as the error correction term(s) in equations (2). For example, the null hypothesis of Granger non-causality running from *z* to *y* in presence of *x* is H_0: $\alpha_1 = 0$ and $\Gamma_{11}^{2} = ... = \Gamma_{1k}^{2} = 0$. In this case, the Wald statistic will be asymptotically χ^2 distribution with degree of freedom equal to the number of restrictions.

4. Data Description

Output is measured by the Non-oil GDP per capita (at constant 1997 prices). We use non-oil GDP because on average 15 percent of GDP in Iran is related to the oil sector, which is affected by the oil price and political-related factors. Investment in this sector is mostly financed by the government budget and less affected by the domestic financial development. Therefore, in our case the Non-oil GDP may show economic activities better than the total GDP.

Data on capital stock is measured by physical capital per capita in the Non-oil section. Since this data is unavailable, I construct it from the respective real gross investment series using the perpetual inventory method as:

$$K_t = (1-\delta)^t K_0 + \sum_{i=1}^{t} (1-\delta)^{t-i} I_i \qquad (3)$$

where K_t is the capital stock at time *t*, *I* is the level of investment and δ is the capital stock depreciation rate.

Equation (3) shows that to calculate the capital stock it is necessary to know, in addition to the amount of investment, the initial value of the capital stock and the depreciation rate. The depreciation rate is assumed about 5%, on average, in the non-oil sector.

[1] Initial capital stock is estimated by following the method used by Filho (2002). The author generates the initial capital stock as

$$K_0 = \frac{1+g}{g+\delta} I_0 \qquad (4)$$

where *g* represents the investment growth.

Financial development is measured by the *ratio of banks' claims on the non-financial private sector to GDP*. However, for more sensitivity of results I also use total banks claims on private and state-owned enterprises divided by GDP as another measure[2] because credits allocated to state-owned companies construct considerable share of total credit due to state-dominated feature of the Iranian economy.

The source of data is the Iranian Central Bank Bulletin. The data frequency is annual and covers the period 1960-2004. The choice of the period is based on the availability of time series data for all variables.

5. Empirical Results and Discussion

Before conducting causality analysis using the procedures mentioned in the previous section, it is necessary to carry out some pre-tests, specifically, unit root and co-integration tests.

Unit Root Tests

I use Perron (1989) tests to test the presence of unit root for each variable because, there are structural breaks like the 1979 revolution and the eight year war with Iraq during the period under consideration. In this case, ADF test has low power. The results of Perron test in Table 1.1 show that all

1. I estimated the depreciation rate based on the methodology employed by Dadkhah and Zahedi (1986). The results also confirm the 5 percent depreciate rate in the non oil sector.
2. This measure has some drawbacks. The banking systems that funnel credit to state-owned enterprises may not evaluate selecting investment project, pooling risk, and providing financial service to the same degree as the banking system allocates credit to the private sector (King and Levine, 1993). In fact, governments may pressure banks to channel financial resources to priority sectors, as defined by the government, rather than to the projects with the best risk-return opportunities.

variables are level non-stationary, denoted as, I(1), except the productivity growth which is stationary, denoted as, I(0).

Table 1.1: The Perron unit root tests of variables

description	Name of variables	Statistics		Conclusion at the 5% level
		levels	difference	
Log of real non-oil GDP per capita	*LNOGDPP*	-2.12	-4.78	I(1)
Log of real no-oil physical capital stock per	*LNOCAPP*	-0.24	-4.36	I(1)
capita	*RDCR*	-0.12	-7.05	I(1)
Ratio of total banks claims on state-owned				
enterprises and private sectors to GDP	*RPSCR*	0.69	-6.55	I(1)
Banks claims on private sector to GDP	Δ *TFP*	-5.14	-	I(0)
Total factor productivity growth				

Note: The critical values are obtained from Perron (1989), tables IV.B, V.B and VI.B where the 5% critical values for Models A, B, and C are -3.72,-3.94 and -4.22, respectively. The corresponding 10% critical values are -3.44,-3.66 and -3.95. $\lambda \approx 0.4$

<u>Banks' development and economic growth</u>

Having verified that the variables are integrated of the same order, I(1), now I can perform co-integration tests. I use both the trace and maximum eigen value tests developed by Johansen (1988) to examine the existence of the long-run relationship between variables. The model includes three variables: a bank-based financial development measure (RPSCR), an output indicator (*LNOGDPP*) and capital stock per capita (*LNOCAPP*). In order to consider the structural break in the model, I also use a dummy variable which is 1 for the period 1978-88, 0 otherwise. The dummy coincides with the 1978/79 revolution and the imposed war with Iraq (1980-1988). In this period, infrastructures and capital stock in the economy were damaged and also investment decreased due to the unstable situations happened as a result of the war and revolution. To take into account this issues, an intercept dummy for the period 1978-88 has been introduced in the co-integrating space, thus reflecting changes in the drift of the variables.

The number of lags in the VAR model is determined through an extensive diagnostic test of the residuals. I select lag length using a specific-to-general approach of increasing the number of lags in the VAR until the Lagrange Multiplier test of serial correlation in the residuals fails to reject the null hypothesis. As shown in Table 1.2, the test statistic which has $\chi^2(d)$ distribution with degree freedom of d is $\chi^2(9) = 4.0(p = 0.91)$. This indicates that VAR(4) has no serial autocorrelation. Therefore, I choose lag=4 as an appropriate lag.

The results of co-integration test reported in Table 1.2 suggest a single co-integrating vector based on the trace and eigen value statistic. Therefore, long-run relationship between real output, banks development, and capital accumulation receives statistical support for the case of Iran over the period under examination.

The long-run relation is estimated by employing the Johanson maximum likelihood approach. Furthermore, for the statistical significance of variables in the co-integrating vector I use the likelihood ratio test. These results are reported in the lower part of Table 1.2.

To identify the co-integrating relationship, I restricted the coefficient of the real GDP to equal one. The co-integration vector shows a positive and significant relationship between the real GDP per capita and banking system development as well as a positive and significant capital stock per capita effect in the Iranian economy. The model also includes a trend showing the effect of exogenous technological changes over time and other development in the banking system, e.g., the payment system.

Table 1.2: Banks development and real output (Johansen co-integration analysis)

I(1) Variables entered$^{\times}$: LNOGDPP, LNOCAPP, RPSCR

I(0) Variable: D7888

Lag length of $VAR = 4$

Sample period: 1960-2004

Vector autocorrelation test based on Lagrange Multiplier at the 4th order: $\chi^2(9) = 4.00$ [0.91]

H0: $rank = r$	*Trace Statistic*	*Critical value at 5%*	*Max-Eigen Statistic*	*Critical value at 5%*
$r \leq 0$	56.6	42.9	37.1	25.8
$r \leq 1$	19.5*	25.8	17.8*	19.3
$r \leq 2$	1.6	12.5	1.6	12.5

Estimated co-integrating vector:

Normalized on LNOGDPP	LNOCAPP	RPSCR	Trend
Coefficient	0.500	0.183	0.014
Standard error	0.125+	0.459+	0.002
LR	6.43(0.04)	13.7(0.001)	n.a.

Notes:

× Definition of variables entered: *LNOGDPP* = output indicator (Logarithm of non-oil real *GDP* per capita), *LNOCAPP* =Logarithm of non-oil real capital stock per capita, *RPSCR*= ratio of banks claims on private sector to GDP.

The model includes a dummy variable *(D7888)* which is 1 for the period 1978-88, 0 otherwise.

Asterisk * shows the hypothesis cannot be rejected at the 5% level.

+ shows significance at the 5% level.

LR shows likelihood ratio test statistic. Number inside parenthesis indicates p-value

Having estimated the long-run relations, now I can conduct Granger causality tests based on the error correction models (ECM) specified in Equations 2 to analyze the different channels by which banking system may cause economic growth. Two main channels suggested in the literature are investigated: Capital accumulation and productivity of capital.

To identify the above causality transmission channels, I follow procedures similar to those employed by De Gregorio & Guidotti (1995), Benhabib and Speigel (2000) and Ghirmay (2006). If financial development is found to causally affect economic growth when the effect of change in the capital stock is controlled for in the model, it indicates that financial development influences economic growth by changing the productivity of capital. Then this causality supports the endogenous growth theories that finance affects economic growth mainly through the enhancement of investment efficiency.

Similarly, to assess the second channel, i.e., the capital accumulation channel, I test the causality between financial development indicators and capital stock growth when the effect of output is controlled for in the model.

The reverse causality issue, i.e., whether economic growth causes financial development is also examined. Therefore, the following three causality questions are tested:

1. *Banks' development causes economic growth through increasing the productivity of capital*
2. *Banks' development causes economic growth by increasing the capital accumulation*
3. *Economic growth causes banks' development*

The result of causality tests using the standard Wald test in the context of Granger causality test based on ECM models (2) are reported in Table 1.3. It is worth noting that in the testing procedure, the specification of the error correction model pass a series of diagnostic tests, including serial correlation based on Lagrange Multiplier test.

Table 1.3: Banks development and economic growth: causality tests

Hypothesis:	*Wald test statistic:*	*Results at* 5% level	*Results at* 10% level
Productivity channel $RPSCR$ does not cause economic growth	$\chi^2(5) = 4.11$ [0.53]	Not rejected	Not rejected
capital accumulation channel $RPSCR$ does not cause economic growth by capital	$\chi^2(5) = 16.07$ [0.01]	Rejected	Rejected
Reverse effects Economic growth does not cause $RPSCR$	$\chi^2(5) = 3.12$ [0.68]	Not rejected	Not rejected

Definition of variables: RPSCR= ratio of banks claims on private sector to GDP.

Numbers inside brackets indicate p-value.

As shown in Table 1.3, during the period under consideration the null hypothesis that "banks development does not Granger cause economic growth when the capital stock is controlled for in the model" is not rejected at the 5 percent level. However, the null hypothesis that "banks' development does not Granger cause the capital stock growth in the presence of output" is rejected at the 5 percent significant level. This evidence implies that banks' development affects economic growth through increasing the capital accumulation channel in the Iranian economy but evidence for the productivity channel is not found. This result is quite reasonable with the financial system in the Iranian economy. Because of financial backwards and market imperfections in Iran, agents face with many borrowing constraints which may hinder the ability to invest at optimal levels. Therefore, in this situation the role of the banking system development in increasing investment, through capital accumulation is expected to be strong. Furthermore, policies that restricts bank choices and credits allocation has made the banking system inefficient weakening the productivity channel. Overall, these results provide evidence that supports the supply-leading view according which financial developments promote economic growth through the capital accumulation channel.

The null hypothesis that "economic growth does not Granger cause banks development" is not rejected at the 5 percent significant level. In other words, the reverse effect, i.e., the causality running from economic growth to finance is rejected. Therefore, based on the results during the period under consideration, empirically no support is found for the demand-following view in the banking system in Iran.

These results are consistent with those in Al-Yousif (2002) who found some support for the causality between banking system development and economic growth in the case of Iran. However, my findings of a significant effect of banking development on output in the long-run as well as the causality running from finance to economic growth through the capital accumulation channel are in sharp contrast to those of Al-Awad and Harb (2005) who found no evidence of co-integration between financial development and economic growth as well as no evidence of causality in the Iranian economy. This contrast remains in different empirical approaches pursued in this study. It is, thus, possible that the apparent insignificant effect of banking development on growth in those studies might be due to their failure to use an accurate indicator for output in ran[1].

Sensitivity analyses

I conduct a wide array of sensitivity analyses to check the robustness of the results. First, I use the ratio of total banks claims on the private sector and state-owned enterprises to GDP (RDCR) as an alternative measure of banks development,. The results[2] do not change our conclusion reported in Tables 1.2 and 1.3. I find one co-integrating vector showing a positive association between real GDP, banking sector development and physical capital. The causality runs from finance to growth but the feedback effect is not significant.

Second, I re estimate the effect of banks development on economic growth through productivity channel by constructing different proxies for the productivity of capital. One of the measures in the literature is the Incremental Capital-Output Ratio (ICOR), defined as the ratio of investment to change in output, which equals to 1 divided by the marginal product of capital. The essence of ICOR is that it measures the increment in capital required in order to produce an additional $1 worth of output; the higher the ICOR, the lower the productivity of capital. The ICOR can be thought of as a measure of the inefficiency with which capital is used. This measure,

1. Their model includes four variables: total real GDP, real government spending, real narrow money M1 and ratio of private credit to monetary base as an index for the financial development. However, their model does not take into account the structural breaks.
2. The results are not reported here but available from author upon request.

however, basically attributes the current output to the current change in the capital stock. Part of an increase in current output may be as a result of not the current investment, but the past investment. Although the problem can be diluted in cross-section studies because of averaging out ICOR, in a time series framework it is likely to be a very unreliable measure of capital productivity. To solve this problem, following Demetriades et al. (1998), I use $\frac{GDP_t}{k_{t-1}}$ as a proxy for the average productivity of capital.

Another measure for the productivity of capital which has been used in the literature is based on the "Solow residual" approach (Levine and Zervos, 1998). This involves subtracting the contribution of the capital stock from output growth as follows.

***Productivity growth* = (*output per capita growth*) - α $\times$(*capital stock per capita growth*)**

Where α is the share of capital in output estimated $\alpha = 0.5$ for the case of Iran (see: Table 1.2).

Table 1.4 reports the results of causality test between different measures for the productivity growth and the banks development indicator. The results show that the null "*banks development does not Granger cause the capital productivity growth*" is not rejected at the 5% significant level. The result is consistent with that obtained in Table 1.3 where the productivity channel of finance to economic growth is tested using an indirect approach.

Table 1.4: Granger Causality Tests

Period: 1960-2004

Lags: 2

Null Hypothesis:	*F-Statistic*	*Probability*
$\Delta(RPSCR)$ does not Granger Cause ΔFP	2.69	0.08
ΔFP does not Granger Cause $\Delta(RPSCR)$	0.32	0.72
$\Delta(RPSCR)$ does not Granger Cause ΔTFP	0.58	0.56
ΔTFP does not Granger Cause $\Delta(RPSCR)$	1.47	0.24

ΔFP = productivity growth based on ICOR approach; ΔTFP =productivity growth based on Solow residual approach; $RPSCR$ = bank based financial development indicator

6. Summary and Conclusions

This paper has employed the Johansen method and Granger causality procedures in the context of error correction models to investigate empirically how banking system and the stock market development affect economic growth in Iran over the period 1960-2005. It also examines two main transmission channels through which financial development affects economic growth: Capital accumulation and the productivity of capital.

The findings suggest that there is a long-run relationship between banking system development and real GDP per capita in Iran during the period under consideration. Furthermore, the causality analyses indicate that banks affect economic growth mainly through capital accumulation channel, but not the productivity of capital. This result should not be surprising because given the economic conditions in Iran where gents face with many borrowing constraints, which hamper the ability of agents to invest at optimal levels. Therefore, in this situation, the role of the banking system development in increasing investment, through raising capital accumulation is expected to be strong.

In general, our findings are consistent with the supply-leading view because we found that financial development promotes economic growth through increasing the level of investment through capital accumulation. Therefore, policies that affect financial system are also likely to influence investment and economic growth.

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