Effect of Financial variables on investment in Iran

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Abstract

In this article, I try to find out what are the effects of financial variables such as ratio of private sector deposits to GDP and ratio of bank credit to private sector to GDP and value of stocks trade in Tehran stock exchange to total current value of stocks and private sector liquidity to GDP on total investment.
We use two models to test our hypothesis the first is a model for Iran and the second is a panel data regression model for china, India, Indonesia, Iran, Pakistan, Turkey a united Arab Emirate. Finding out that all these variable a positive effect on investment

Introduction

Some of economists in Iran believe that one the major obstacles to growth in Iranian Economy is lack of enough productive investment. Rising efficiency of financial market and promoting the level of financial development might solve this problem.

In Iran, financial markets are not homogenous and are unorganized. A large portion of saving canalized to borrower through unofficial market or unofficial economy. Most of investment projects are not really profitable because of financing with low cost loans. Most of credits given to private sector are allocated by direct order of government.

Schumpeter (1911) believed that development of financial intermediation had a direct and positive correlation with investment and growth. After him many of researchers have offered a lot of empirical evidence which showed countries with more developed financial systems have accumulated more capital and had higher growth rates. (Mc Kinnon 1973 Glodsmith 1973). King and Levine in their article showed that there was a systematic relationship between a set of financial indicators and investment. They argued that financial intermediate were specialists in evaluation of investment projects and on average could make higher return on their assets in comparison with other agents, and could transfer part of this higher return to depositors so their activities encourage people to prefer saving to consumption. If there were no intermediation, people wouldhave to insure themselves against liquidity shocks. Since financial intermediary has faced less liquidity shocks, they have lower insurance costs, so they can earn higher return on their assets and pay higher interests to savers.

Another argument which shows the importance of financial development for investment and growth, is neoclassical growth theory. According to this theory balanced growth path is shown by:

$$sf(k) = (n + g + \sigma)k$$

The right hand side shows the break- even investment, is the amount of investment which is needed to maintain the economy on its balanced growth path, and the left hand side is saving (Romer D. 2002, Ch.1).

If financial markets can increase the average (or marginal), propensity to save the economy move up to a higher balanced growth path.

In world Bank Report (1993) it who pointed out that the ratio of gross saving to gross domestic product in economies in middle income group

with the above average performance in Asia in 1990 s had been about 40 percent. The report emphasized that in many of these countries higher saving rate had acted as an engine of growth, since they have financed higher investment rates.

Structuralists argue that low interest rates are the result of weak financial markets and this weakness in less developing countries are a serious obstacle to growth. An extended network of financial institutions, diversified financial instruments and expansion of activities of these institutions could have a positive effect on saving and investment process and through them on growth.

Greenwood and Jovanvic argued that when an economy was faced with unforeseen or unexpected shocks, financial intermediaries could analyze and provide adequate information about them. Thus with better allocation of resources, increase the accumulation of capital and growth rates would increase.

Post Keynesian theory emphasized is on the role of conventions and institutions for reduction of uncertainties in relation to decision making in capitalist countries. In most post- Keynesian models, a certain institutional background is assumed. This is a framework which banking system is developed and financial markets are organized. In post-Keynesian theory financial system is divided in two groups:
   A.   capital market based
   B.   bank based

In capital based systems, shares (stocks) and bonds are the main source of long- term financing and many instruments are treaded in capital markets, and many institutions provide services which compete with each other.

Prices are determined by supply and demand. Financial institutions have close relationship with firms and this is assumed structure in post-Keynesian theory. In bank based systems, capital markets are weak and firms are too dependent to banks, and with growth of their investment projects, their liabilities to bank will grow. Changes in rate of interest will change their financial expenditure drastically, and increase in rate of interest will bring recession in production. In countries with underdeveloped financial markets, since conditions of granting a loan depends on liquidity preference of banks, if this preference is high banks will not grant any credit (R. Stud art 1993).

Empirical works

1) Dong He and Pardy (1993, PP1-12) in their research by choosing a sample 32 countries from Asia, Africa and Latin America, for period of 1978-1990, has concluded that a positive and significant correlation existed between financial development variables and ratio of investment to gross domestic products.

2) Glude and Pattillo (2006) in their research has concluded that for sub- Saharan African countries a more efficient financial sector could increase savings, provide information about investment opportunities, direct resources to most productive uses, improve risk management and facilitate exchange of goods and services. Financial system in countries in the sample are bank based systems and most of the financial assets are owned by banks. Provision of credit to private sector is not developed and number of bank in relation to countries size are very low. In 2004 savings on overage was only 19 percent of gross domestic product and ratio of credits to private sector to gross domestic product was only 13 percent.

3) Dornbusch and Reynoso (1993, PP. 55-88) in their work on financial depth and its effects on ratio of investment to gross national product in Mexico has concluded that in late 1950s and early 1960s despite controlled financial systems, Mexico has experienced growth and stable prices, but in 1970s and 1980s because of high government budget deficit and inflexible interest rates, rate of growth has declined, and price become unstable. In this period reduced financial intermediation was reflected in capital flight and this has reduced the ability of financial system to promote macroeconomic stability, productive investment and reduced growth rates between 1940 to 1960, low inflation rate and low nominal interest rates brought about low financial depth, dollarization of economy and capital flight. Average inflation rate in 1940s was 11.9 percent and in 1950s was 7.8 percent, but long-term deposit rate in this two decade was less than 3 percent. Low saving plus higher required reserve ratio was an obstacle to availability of credit to private sector.

Form 1960 to 1971 financial depth in Mexico increased and deposits in commercials banks and financial institution, on average increased by 17.1 percent and liabilities of financial system was 45 percent of gross

domestic product. A combination of positive real rate of interest, lower rate of inflation and stable rate of foreign exchange made the financial system more developed the rate of Inflation were about 3.5 percent per year, and exchange rate was stabilized at 1$=12.5 peso, nominal interest rate were fixed a 4.5 percent and budget deficit were kept at low level, and an increasing portion of government expenditures were used for accumulation of capital. Low budget deficit and increase in financial depth decreased the need for inflationary financing and loans from abroad.

In period of 1971-82, prices and foreign exchange rate were unstable and inflation rate increased again, but long term nominal interest rates were fixed at 3.5 percent, so capital flight increased and financial depth decreased. Table below shows the performance of Mexican economy for period of 1945-55 to 1980-87.

Economic performance and financial depth in Mexico 1945-55 to 1980-87

period	GDP growth rates	inflation	financial depth	ratio of investment to GDP
1940-55	5.7	11.6	24.3	12
1955-70	6.5	4.6	45.8	17.5
1970-80	6.5	17.9	45.6	22.7
1980-87	-0.2	81.1	41.9	20.1

1) Benzina and Trigui (2001), in their article titled "Financial deepening and economic development: theory and lessons from Tunisia try to answer the following question:

How can financial reforms increase the efficiency of financial systems for financing investment and capital accumulation. In Tunisia financial reform started from 1986, before 1986 financial system in Tunisia had very little depth, because firms could not attract private savings by selling their share to people. Most of these firms were small and owned by few people, and the owners had no intention to share their company with others. so financial system in Tunisia was a bank based system. In 1990 Tunisia Stock Exchange became active and investment in companies stock increased and between 1991 to 1994, the sale of stocks grew by 300 per cent, and by increasing financial depth, investment and income growth begun.

2) C. Kularthne (2001), in his paper, he investigated the effect of financial deepening on long- term growth in South Africa in period of 1945-92. He developed two models using Johansen Vector

Error Correction Mechanism structure (VECM). The first model investigated whether the financial system had a direct or indirect effect on per capita output via the investment rate. In the second model he attempted to investigate the possibility of feedback effect between the financial and real sectors. He concluded that both dimensions of the intermediation and securities, effect economic growth in both models, furthermore, both models revealed that the financial system had an indirect effect on GDP via the investment rate. Feedback effects were also found to exist between the real and financial sectors.

3) Farzanhe Ebrahimi (2005) in her M. SC dissertation test the following hypothesis for Iranian Economy:

a) Financial deeping indicators has a direct and significant relationship with investment.

b) Between ratio of credits supplied to private sector and GDP and investment, there exists a direct and significant relationship.

c) There exist a direct and significant relationship between stock market growth and investment.

She concluded that:

1. Ratio of credit to private sector to GDP with one lag has a positive and significant effect on investment in machineriy.

2. Ratio of Private sector deposits to GDP has a positive and significant effect on investment on machinaries.

3. Between ratio of M_2 to GDP and investment in machineriy exists a negative but significant relationship.

4. Between required reserve ratio and investment in machineriy exists a positive and significant relation ship.

5. Between ratio of credit to private sector to GDP and investment in residential buildings exists a positive and significant relationship.

6. Between ratio of traded stock and current value of stocks in Tehran Stock Exchange and investment in residential buildings exists a positive and significant relationship.

7. Ratio of credit to private sector to GDP does not effect investment in residential building in short run but has a positive in significant effect on them in the long run.

8. Between ratios of stock market size and credits to private sector to GDP and total investment there is a positive and significant relationship.

Estimation of Models

Two models was estimated in this paper The first one was a regression equation for estimation of effects of financial variables on investment in Iran. The second one is a panel data fixed effect model for estimation of effect of financial variable on investment in a group of 8 countries (Bahrin, China, Iran, Indonisia, India, Pakestan, Turky and United Arab Emirate).

In the first model we used quarterly data for the period of 1993 to 2005 and Johansen- Jusilius method. In the second model we used yearly data for period of 1991-2005.

The first model is:

$$LOGTI = \beta_1 + \beta_2 LOGNPDGDP + \beta_3 LOGBCNGDP$$
$$+ \beta_4 LOGSTCST + \beta_5 LOGCTSGDP + \beta_6 LOGLIQGDP$$
$$+ E_t$$

Dependent variable in this model is total investment in Iran and independent variables are:

BCNGDP=ratio of credit to private sector to GDP
STCTS=ratio of stock traded to total value of stock in Tehran Stock Exchange
NPDGDP=ratio of private sector deposits to GDP
CFSGDP=ratio of current value of stocks to GDP
LIQGDP=ratio of private sector liquidity to GDP
The second model is:

$$LOGTI = \beta_0 + \beta_1 LOGMQG + \beta_2 LOGM_2GDP + \beta_3 INV(-1)$$

The dependent variable is total investment the independent variables are:
MQG=rate of growth of money
M_2GDP=ratio of M_2 to GDP
Inv(-1)=Investment with a one year lag

A- First model hypothesis:

1. Ratio of private sector deposits to GDP has a positive a significant effect on total investment.
2. Ratio of value banks credits to private sector to GDP has a positive and significant effect on total investment.
3. Ratio of value of stocks traded in Tehran Stock Exchange to total current value of stocks has a positive and significant effect on total investment.
4. Ratio of total value of stock in Tehran Stock Exchange to GDP has a positive and significant effect on total investment.
5. Ratio of private sector liquidity to GDP has a positive and significant effect on total investment.

B- Second model hypothesis:

1. Rate of growth money in countries in our sample has a positive and significant effect on total investment in their economy.
2. Ratio of private sector liquidity to GDP in countries in our sample has a positive and significant effect on total investment in their economy.
3. Investment with a one year lag in countries in our sample has a positive and significant effect on total investment in their economy.

To avoid precarious regression, we first tested the stationiarity of time series, by using unit root Augmented Dicky- Fuller test.
In table below results are reported:

Table 1- Augmented Dicky Fuller test

Series	Calculated ADF	MC Kinnon 1%	Critical 5%	Value 10%
TI	0.65	-3.57	-2.92	-2.6
NPDGDP	4.67	-4.17	-3.51	-3.18
BCNGDP	9.3	-3.58	-2.92	-2.6
STCTS	-2.66	-3.58	-2.92	-2.6
CTSGDP	-0.67	-3.58	-2.92	-2.6
LIQGDP	5.1	-4.17	-3.51	-3.18
DTI	-5.59	-3.58	-2.92	-2.6
DSTCTS	-6.46	-3.58	-2.92	-2.6

DCTSGDP	-4.03	-3.58	-2.92	-2.6
DLIQGDP	-6.56	-3.58	-2.92	-2.6

Table 1 shows that some of our variable are I(0) and some are I(1), but the first difference of all of them are I(0), so the most appropriate method to used is Johansen- Jusilius method, therefore used trace and Eigenvalue test to find out the number of long- term relationships. Results are shown in table 2.

Table 2a- Eigenvalue test

Null hypothesis	Alternative hypothesis	Test statistic	Critical value at 95%
$r > 0$	$r = 0$	73.26	40.07
$r > 1$	$r \leq 1$	31.59	33.87
$r > 2$	$r \leq 2$	23.07	27.58
$r > 3$	$r \leq 3$	17.1	21.13

Table 2b- Trace test

Null hypothesis	Alternative hypothesis	Test statistic	Critical value a 95%
$r > 0$	$r = 0$	155.31	95.75
$r > 1$	$r \leq 1$	82.05	69.81
$r > 2$	$r \leq 2$	50.45	47.85
$r > 3$	$r \leq 3$	21.37	29.79

According to Eigenvalue test one long term relationship and according to trace test 3 long term relationship should be estimated.

So we assume there are at least one long term relationship and estimate the one indicated by Eigenvalue test, by Johansen- Jusilius method. Results are shown in table 3.

Table 3- Estimation of Coefficients for model 1

Variable	Coefficient	Standard deviation	t- statistic
NPDGDP	37.18	3.44	10.8
BCNGDP	0.39	0.48	0.8
STCTS	0.43	0.08	0.1

CTSGDP	-0.44	0.09	4.8
LIQGDP	-3.81	2.57	10.6
CONSTANT	-15.4	---	---

Estimation results for second model are shown in table 4.

Table 4- Estimation of Coefficients for second model

Variable	Coefficient	Standard deviation	t- statistic
MQG	0.03	0.006	4.21
M2GDP	0.12	0.058	2.01
INV(-1)	0.85	0.034	24.9
Constant:			
China	3.5		
India	3.4		
Indonisia	4.22		
Iran	3.2		
Pakestan	3.05		
Turky	3.24		
UAE	3.09		
$R^2 = 0.99$	$\bar{R}^2 = 0.99$	$DW = 1.86$	$f = 35$

Results of test of hypothesis are reported in table 5.

Table 3- result of hypothesis testing

hypothesis	Estimated Coefficients	t- statistic	Acceptance or rejection
Part A:			
1- positive and significant relation between NPD GDP and TI	37.18	10.8	Cannot be rejected
2- positive and significant relation between BCNGDP and TI	0.39	0.8	Cannot be accepted
3- positive and significant relation between STCTS and TI	0.43	5.1	Cannot be rejected
4- positive and significant relation between CTS and TI	-0.44	-4.8	Cannot be accepted
5- positive and significant relation between LIQGDP and TI	-38.1	10.6	Cannot be accepted
Part B:			
1- positive and significant relation between MQG and TI	0.03	4.21	Cannot be rejected
2- positive and significant relation between M2GDP and TI	0.12	2.01	Cannot be rejected
3- positive and significant relation between INC(-1) and TI	0.85	24.9	Cannot be rejected

Summary

Estimation of our two models revealed that ratio of private sector deposits to GDP and ratio of value of stocks traded in Tehran Stock Exchange to total value of stocks have a positive and significant effect on total investment in Iran's economy.

We also found that in our second model rate of growth of money, ratio of private sector liquidity to GDP and investment with one period lag have a positive and significant effect on total investment in countries in our sample.

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