

Investigating the Impact of Formal and Informal Economy on the Private Investment in Iran

Roya Aleemran*¹ and Sepideh Tahmasebizad²

¹ Assistant professor & Member of Academic Staff, Department of Economic, Tabriz Branch, Islamic Azad University, Tabriz, Iran

² M.Sc. Student at Economics Department of Islamic Azad University, Tabriz Branch, Tabriz, Iran

ABSTRACT

Investment has the primary role in the economical growth and development in all of the world countries. Investment in each country is proportional to some variables such that their effects can be studied solely or together as a group. This paper investigates the simultaneous influence of formal and informal economy on private investment. The total gross investment in machinery and building is introduced as the investment of the private sector and the risk of investment is obtained through the composite risk index which denotes the informal economy. Furthermore, variables of labor productivity, income distribution, opening degree of economy are presented as the indexes of the formal economy. Investigation is performed by auto regressive distributed lag method (ARDL) in a time interval of 1980 to 2009. Results show that labor productivity and the income distribution has a positive and meaningful effect on the private investment, in long run also the risk of investment and opening degree of economy has negative impact on it. Structural stability analyses, cumulative sum (CUSUM) and cumulative sum of square (CUSUMSQ), show that the approximated coefficients are constant in studying period.

KEY WORDS: labor productivity, opening degree of economy, income distribution, risk of investment, ARDL

1. INTRODUCTION

Investments and its induced capital accumulation is one of the effective factors in economical growth of the country. Investment, especially in the developing countries is performed by both private and governmental sectors. Private investment as a portion of the total demand also provides the future growth and job opportunities (Sameti & Faramarzpor, 2004, 45). Regarding the positive effect of the private investment on the economical growth, some incentives and supports such as setting up a suitable environment for investment and developing the underlying issues are proposed (Hozhabrkiani & Rahimzadeh, 2009, 30). This work, considering simultaneous effect of formal and informal economic, estimates the investment function in Iran. The investment risk is taken as the informal sector's index and formal economy is studied through variables such as labor productivity, income distribution and opening degree of economy as well. The estimation, based on the data of years 1980-2009, is carried out by ARDL¹ method via the well established Microfit software. Used data are provided from the central bank, statistics center, statistics bank and labor market information as well as annual reports of IBC (ICRG)². Proceeding sections comprise introduces the basic aspects of investment as well as the effective parameters and continues with the performed calculations and its results.

2. Theoretical basics

2-1. formal economic: economic sectors with maximum recognition ability those are included in official statistics. In this paper the labor productivity, openness degree of the economy as well as the income distribution are recognized as formal economic indexes and their influence on the private sector investment in positive or negative way is studied.

2.2. Informal economic: generally speaking, this term refers to all activities that are not reported or mentioned in national accounts and they are less recognized. Events such as high levels of job risk, high taxes and not supporting the private sector by government result in increasing informal economic. Since the investment risk poses the

1. Auto regressive distributed lags

2. international country risk guide

*Corresponding Author: Roya Aleemran, Assistant professor & Member of Academic Staff, Department of Economic, Tabriz Branch, Islamic Azad University, Tabriz, Iran

properties of the informal economic such as lack of references and information about it, this paper takes this factor as the index of the informal economy and studies its effect on the investment. It is known that the mentioned risk causes economy tendency toward informality and subsequently brings many difficulties in policy and development of country.

2.3. Investment: The expenditure flow used for increasing or stabilizing the real amount of investments. In other word it is the process in which investment commodities are used for producing or servicing. In this article the summation over gross investments in machinery and construction is referred to as the private sector investment.

2.4. Labor productivity: It is the gross domestic product (GDP) per employed population (per capita GDP) and improvement of this factor is the basic of economical development. Raising and growing of the labor productivity leads to an increase in production as well as employee's income and thus results in a developed human life. Job risk is one of the lowering factors of this productivity.

2.5. Opening degree of economic: As the scale of globalization is defined by import and export summation divided by GDP. This index can be effective in investment and thus the economic growth.

2.6. Income distribution: It defines the way that production induced income is distributed over the agents. This research uses the conventional share of richest ten percent divided by share of poorest ten percent as the income distribution and as this index raises the inequality becomes more dominant.

2.7. Investment risk: Lack of confidence in the future gain of an investment brings the risk into play. There is not an established vivid method for calculation of the economic risk. This paper benefits from an institutional calculation that investigates the risk in three political, financial and economical layers and gives a composite risk formula for risk calculation. In this method, mark 100 corresponds to the least risk and mark zero shows highest amount of risk .(Ahanghari & Saadat mehr, 2008, 3).

3. Research background

Rahbar and et al (2007) have investigated the barriers in front of the investment and their effect on the economy growth in Iran. Their paper studies the investment security on the economic growth and shows the statistical meaning and relevance of the obtained results with presented economical theories with concluding that the investment security has a positive and constructive effect on the economic growth.

Sameti and colleagues (2008) have studied the budget deficit on machinery and construction investment of the private sector in Iran. According to the obtained results, by increasing the budget deficit, investment of private sector in machinery increases while it decreases in construction.

Yusefi and Aziznejhad (2009) investigated the determinative factors of private investment in Iran. The results show that Infrastructures and GDP positively affect the private investment. On the other hand, juridical issues and corruption as well as the lack of investing security and ownership are the most important disincentives.

Andrei and Stancu(2008) investigate the economical and social factors on the investment and economic development and show that the investment amount is positively affected by labor wage and productivity as well as the firm numbers.

Alexandra Dawson (2009) studies the effect of human resources and production cost on the private investment. It is shown that the company expenditures can be lowered by increasing the labor productivity.

Poulton and Macartney (2011) investigate the influence of government investment on private sector investment and conclude that partnership between government and private investors is one of the investment raising methods.

4. DATA ANALYSIS (INTRODUCING MODELS AND ESTIMATION METHOD)

The investigated model in this paper is taken from Andrei and Stancu .Such that some corrections and variation are performed to suit Iran economy as:

$$LPVI = f(LPRLB, LOPNE, LINDS, LRSKP)$$

In which LPVI represents the logarithm of private sector investment, LPRLB indicates the logarithm of labor productivity, LOPNE shows the opening degree of economy, LINDS demonstrates the logarithm of income distribution and finally LRSKP refers to the logarithm of the investment risk. Since most of the time series have unit root, the econometric method of Autoregressive Distributed Lag (ARDL) is applied.

5. Static test of variables:

The static test of variables in this paper employs Dickey Fuller and augmented Dickey fuller through the Eviews software (Nofereesti, 1999, 76).

Table 1 – single root test for applied variables

Variable	With intercept	With time Trend	ADF statistic	Critical value in level 1%	Critical value in level 5%	Critical value in level 10%	Result
<i>LPVI</i>	C	T	-2.2698	-4.3239	-3.5806	-3.2253	unstable
<i>LPRLB</i>	-	-	-0.5847	-2.6569	-1.9544	-1.6093	unstable
<i>LOPNE</i>	C	-	-2.1681	-3.6998	-2.9762	-2.6274	unstable
<i>LINDS</i>	-	-	-0.8081	-2.6471	-1.9529	-1.6100	unstable
<i>LRSKP</i>	-	T	-2.0176	-4.3239	-3.5806	-3.2253	unstable

Regarding table1, Dickey Fuller test gives unstable level for all the variables. Now, the Augmented Dickey Fuller approach in first order differential level for the unstable variables is carried out.

Table2 – extended Dickey Fuller test for the applied variables

Variable	With intercept	With time trend	ADF statistic	Critical value in level 1%	Critical value in level 5%	Critical value in level 10%	Result
<i>D(LPVI)</i>	-	T	-5.9039	-4.3560	-3.5950	-3.2334	stable
<i>D(LPRLB)</i>	C	T	-4.9329	-4.3560	-3.5950	-3.2334	stable
<i>D(LOPNE)</i>	-	-	-4.6288	-2.6501	-1.9533	-1.6097	stable
<i>D(LINDS)</i>	-	-	-5.2421	-2.6501	-1.9533	-1.6097	stable
<i>D(LRSKP)</i>	-	-	-3.2675	-2.6501	-1.9533	-1.6097	stable

According to the augmented DF method after one differentiation, all of the variables are stable and dynamism of them is proved.

6. ESTIMATION RESULTS

6.1. Short term estimation result

Table3 – result of the convergence test for dynamic pattern of private investment function

regressor	Coefficient	Standard error	t-ratio(prob)
<i>LPVI</i> (-1)	0.64366	0.061787	10.4175(0.000)
<i>LPRLB</i>	0.88773	0.16317	5.4405(0.000)
<i>LOPNE</i>	1.3337	0.23638	5.6425(0.000)
<i>LOPNE</i> (-1)	-0.70882	0.30339	-2.3363(0.031)
<i>LOPNE</i> (-2)	-1.1901	0.25529	-4.6619(0.000)
<i>LINDS</i>	0.50848	0.24648	2.0629(0.053)
<i>LINDS</i> (-1)	0.50869	0.30485	1.6687(0.112)
<i>LINDS</i> (-2)	1.2204	0.31581	3.8644(0.001)
<i>LRSKP</i>	-0.74840	0.11366	-6.5845(0.000)
$R^2=0.96550$	$\overline{R^2} = 0.9509$	DW=2.7402	F=66.47(0.000)

The ARDL model with step 2 according to the Schwarz Bayesian criterion reveals that all of the variables in 95% level are meaningful. Furthermore, the F statistic indicates that the whole model is meaningful. As is expected the investment risk is inversely proportional to the private sector investment but the labor productivity positively affects that. As the opening degree of economic raises the private investment increases. However, since the dominant export of the country is based on oil, the increase in investment can be related to the national income. The

relation between private sector investment and income distribution is positive. It is understandable that richest persons feel less risk about investing their excess wealth.

6.2. Long term evaluation and estimation results

Via the presented convergence test by Banerjee, Dolado & mestrre the calculated statistic is obtained as -5.76 which confirm the long term relation (Tashkini, Ahmad, 1384, 154). The obtained long term results are as follows

Table4 – long term estimation results

Regressor	coefficient	Standard error	t-ratio(prob)
<i>LPRLB</i>	2.4913	0.56676	4.3956(0.000)
<i>LOPNE</i>	-1.5862	0.42523	-3.7302(0.001)
<i>LINDS</i>	6.2795	0.72866	8.6179(0.000)
<i>LRSKP</i>	-2.1003	0.21857	-9.6092(0.000)

According to table4 it is concluded that the variables with a confidence level of 95% are meaningful and the signs in this regime with an exception for opening degree of economy are identical. It can be said that the proportion of the elasticity of investment to the labor productivity is equal to 2.4 meaning that with a 1% increase in labor productivity, the private sector investment raises by 2.4%. Investment elasticity per opening degree of economy is -1.5 so with every percent of increase in openness degree, private sector investment decrease by 1.5%. Furthermore, the ratio of private sector investment elasticity to the income distribution is +6.2. Such that, when the income distribution is elevated by 1%, the investment raises 6.2%. Finally, the proportion of investment to investment risk is -2.1. So, for every percent of the risk amount increases, private investment drops by -2.1%.

6.3. Error correction of the model

Table5-error correction representation for ARDL

Regressor	coefficient	Standard error	t-ratio(prob)
<i>dLPRLB</i>	0.88773	0.16317	5.4405(0.000)
<i>dLOPNE</i>	1.3337	0.23638	5.6425(0.000)
<i>dOPNE (1)</i>	0.1901	0.25529	4.6619(0.000)
<i>dLINDS</i>	0.50848	0.24648	2.0629(0.052)
<i>dLINDS (1)</i>	-1.2204	0.31581	-3.8644(0.001)
<i>dLRSKP</i>	-0.74840	0.11366	-6.5845(0.000)
<i>ECM(-1)</i>	-0.35634	0.061787	-6.5845(0.000)
$R^2=0.83836$	$\bar{R}^2 = 0.7703$	DW=2.7402	F=16.42(0.00)

Presented error correction method in table5 demonstrates that in each period, a few percents of instability is balanced to long term relation. In this research the mentioned estimation is obtained as -0.35634 meaning that in each period about 36 percent of inequilibrium investment is resolved.

7. Structural stability test

CUSUM³ and CUSUMSQ⁴ tests are performed to study the stability of regression estimation coefficients. Where, they show systematic variation in regression coefficients and sudden deviation from stabilized coefficients, respectively. Regarding figure1 and figure2, the statistics pathway remains between two lines which represent the 95% confidence. So, the null hypothesis for which there is no structural break is confirmed and thus the model is stable.

3.cumulative sum of residuals

4.cumulative sum of squared residuals

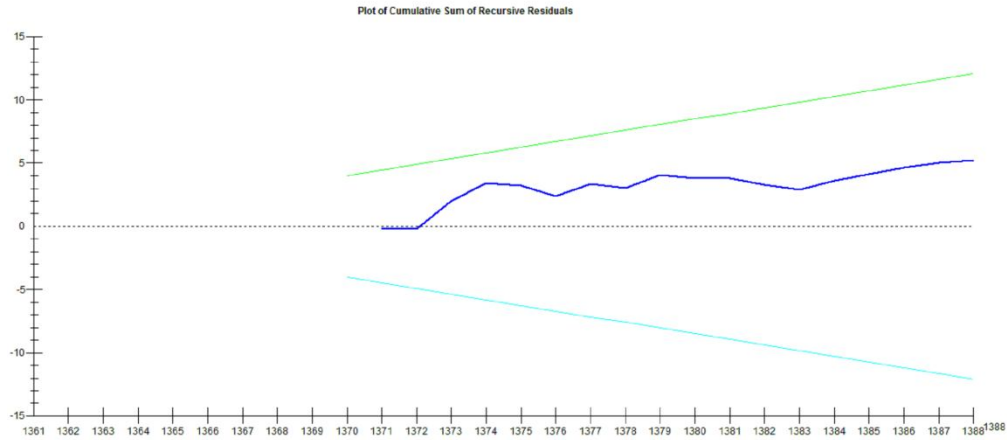


Figure1 - Diagram For Cusum Test

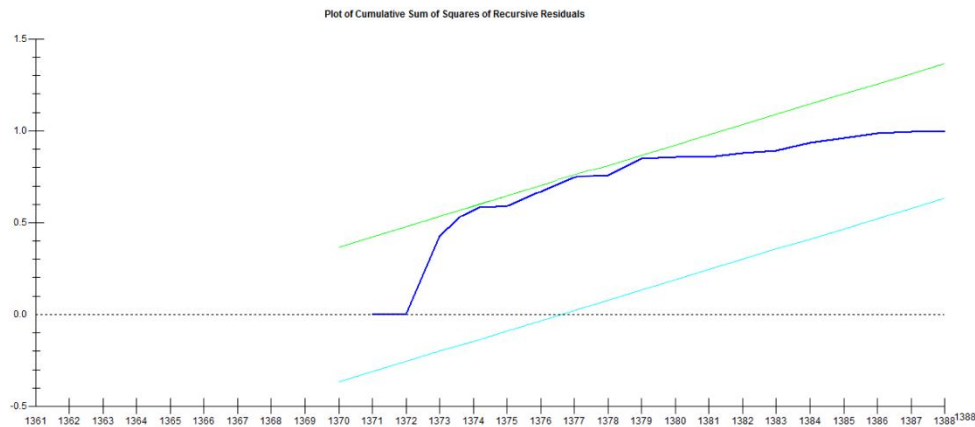


Figure2 - Diagram for CUSUMSQ Test

8. Conclusion

Labor productivity, opening degree of economy and income distribution as formal economy's indexes effect private sector investment. According to our results, labor productivity in both short and long term positively affects the investment by raising the production and lowering its cost. Hence, many people would go for investment and firms do not need additional labor force for production increase. Labor productivity can be obtained by increasing the wage and providing secure jobs. Openness degree of economy affects the private sector investment positively in short term and negatively in long term, This is explained by the fact that Iran is an oil exporting country and sometimes the oil price is earned through importing commodities and this causes the internal production to decrease, This decrease results in lowered investment and thus the openness degree of economy in long term negatively influences the investment. Suitable trade politics may reduce the openness degree of the economy by lowering the import and subsequently causing a higher GDP and private sector investment. Income distribution also positively affects the investment in both short and long term. It can be said that as the income is concentrated on wealthy people and causes them to invest more and Income distribution must be compatible with country's culture and regulated in such a way not to cause poor people get poorer or rich people reluctant to investment, Because, regarding the country's culture, balanced income distribution could result in mentally excited individuals and lead to economic growth by intercommunity or on the other hand cause reduced saving and investment. Furthermore, the investment risk as the index of informal economy affects the investment negatively both in short and long term Investment risk should be lowered by raising investment security and raising job security and lowering risk of investment results to avoiding the informal economy which includes illegal and hidden productions and leads to increased private sector investment. CUSUM and CUSUMSQ tests show the stability of the investment function in Iran for the studied period.

9. REFERENCES

- Ahangari,A. & M.saadatmehr ,2008,"Realation Ship Between Risk & Private Investment In Iran,J.Alomeensani& Ejtemaee ,3,30.
- Dawson, A., 2011, Private Equity Investment Decisions In Family Firms: The Role Of Human Resources And Agency Costs, J. Of Business Venturing, 26, 2, 189-199
- Tudorel,A.& S. Stancu ,2008, Econometric Methods Used To Study The Informal Economy And Regional Development ,Revistainformatica Economica,3(47).
- Bank Labor Market Statistics, Central Bank Of Iran (Time Series) And The Statistical Center Of Iran
- Hajhbar Kiani,K.& A. Rahimzadeh,2009, The Relationship Between Private Investment And Economic Growth In Iran (With Emphasis On Endogenous Economic Growth),J.Danesh& Tosee,Year17, 30.
- Noferesti,M., 1999 ,Unit Root And Cumulate In Econometrics, Moasseye khadamat farhangiyeh Resa,PP.76.
- Colin ,P.& J. Macartney ,2011,Can Public–Private Partnerships Leverage Private Investment In Agricultural Value Chains In Africa? A Preliminary Review", School Of Oriental And African Studies (SOAS), UK
- Farhad, R. , F. Mozaffari Khamenei & Sh. Mohammadi, 2007, Barriers To Investment And Its Impact On Economic Growth In Iran, J. Of Economic Research, 81, 111-138.
- Sameti,M.& B.Faramarzpor,2004 , Review Of Barriers To Private Investment In The Agricultural Sector Of Iran,J. Agricultural And Development Economics, 45,91-112.
- Sameti, M., M. Sameti & Z.Shirvani Fakh,2008, Examining The Effects Of Government Deficits On Private Investment In Machinery And Building On The Economy Of Iran, The Quarterly Economic Review, 1, 135-158.
- Tashkini,A.,2005, Applied Econometrics With Microfit, J.Moasseye farhanghi honariye dibagharane tehran,PP. 145-167
- Yosefi,M.&S. AzizNejhad,2009, Examine The Determinants Of Private Investment In Iran With Var Method ,J.Pajhoheshhayeeghtesadi,Year 9, 1, 70-100.