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THE IMPACT OF MONETARY VARIABLES ON ECONOMIC GROWTH IN SELECTED ISLAMIC COUNTRIES

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ABSTRACT

Achieving a high level of development and economic growth (GDP) has been one of the main objectives of economic planners and policymakers for every country; and tools, variables and policies that can help to achieve this important issue attract a special attention. In this situation, a policy that can be effective in creating GDP growth is to apply appropriate monetary policy for the country. It will be more effective when the effectiveness of each monetary policy tools and variables on the rate of GDP growth is clear and specific. Current study aims to determine the effectiveness of monetary policy variables on the growth of GDP in selected countries (Iran, Turkey and Malaysia) and it examined the influence of the exchange rate, inflation rate, liquidity variables and credit facilities as independent variables on the GDP growth as the dependent variable. The results of the study indicate that each change in selective variables can effect the GDP growth in Iran, Malaysia and Turkey where some of them affect directly and others indirectly.

Keywords: GDP, Inflation, Exchange Rate, Liquidity, Utilities, Islamic Countries

INTRODUCTION

Economic growth attracts a special attention of countries and economic planners and is particularly important in developing countries. In these circumstances and in this group of countries, the variables that can affect economic growth are considered and examined in order to do better planning to achieve higher economic growth determining the extent and how they relate to economic development. In this regard, the governments are pursuing to apply policies in order to achieve a high level of economic growth. Monetary policy is always considered as one of the macroeconomic policies. In such circumstances, the study of impact of monetary policy on economic growth can lead to extremely rewarding planning, goal setting and macro policy.

Literature

The Definition of Economic Growth and Development

Economic growth of a country includes real per capital national output for the country in a given period. Definition of development is more difficult than growth. Literally, development means improvement. In fact, development is multi-dimensional and is a concept far beyond more production. Development should be seen as a multidimensional process that requires fundamental changes in specific issues, public attitudes and national institutions; and it accelerates economic growth and reduces inequalities. Thus, the transformation and fundamental changes in social, cultural and political structures of the country leads to development dominant on economic growth. Thus, it can be expected that economic development is in parallel with economic growth (with a time delay), but economic growth may not necessarily mean development.

In 1367, Nili conducted a study on the effect of increasing money on economic system of Iran based on statistical data for 1338-1362. He made a model for studying the effect of government spending on liquidity, changes of liquidity on the price level and total investment. In 1370, a research was designed for studying the appropriate monetary policy to stabilize economic activity in Iran by a group of Iranian researchers under the supervision of Dr. Komijani. He studied the mechanism of the influence of money in Iran economy in 9 monetary econometric models based on statistical data from 1353 to 1369. The results of mentioned research that is more comprehensive than other studies indicate that changes in the money stock in the years after the Revolution are affected by the government budget deficit and the credit

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borrowed from the central bank; and due to non-sensitivity of investment to interest rate which arises from the risk of investment in Iran, have no effect on the real output and investment and its effects are transmitted on the price level.

A. Delqandi studied the mechanism of transmission of money effect on the price level and real economic variables from 1340 to 1370. The results of estimating the model indicate that the main cause of the increase in the volume of money in Iran is deficit that has been borrowed from the central bank; and because increasing amounts of money has weak effects on the production, increasing the quantity of money increases the price level so inflation is the main sources of budget deficit. Thus, monetary policy in Iran is under the influence of fiscal policy. Jalali Naeeni and Shiva in a paper entitled *monetary policies, rational expectations of production and inflation*, investigated the effects of monetary policy on inflation and output in the period of 1340-70, using existing data and evaluated several different statistical methods. Econometric model that they used to test their hypothesis was Barrow model and the results of regression model was so that first medium and long-term liquidity have no substantial and significant contribution in the money growth and GDP without oil in the mentioned period. Secondly, money growth and liquidity have led to perpetual inflationary pressures. In 1991, Garygoro in a paper entitled *effects of inflation on economic growth* studied the relationship between inflation and economic growth in 12 Latin American countries and tested his hypothesis that was the negative relationship between inflation and economic growth for the 12 Latin American countries over the period of 1950-1985. Bang et al. published a paper entitled *the effects of inflation on the natural rate of production*. They have two main objectives of our experimental work. 1) To examine the relationship between inflation and output in the United States of America for the period of 1955-1990. 2) To examine the effects of inflation on the natural rate of output. valish in his research entitled *money and development* tried to determine the relationship between economic growth and monetary variables in 43 countries, including Iran for the period of 1956-1965 and considered monetary variables in its broad sense, including structures of assets of the fiscal system, the international reserves, debts of money system, money growth and acceptance change and inflation rate. Laghaei in a thesis entitled *inflation and economic growth* provided a model in proportion to the situation of Iran. In the next step, he provided an econometric model to investigate the effect of inflation on growth and estimated gold equation by OLS method for the years 1338-1374. Bahmani (1372) in his study uses a simple model proposed by Edwards in 1986. He joins GDP fiscal policy measures (G), monetary policy (M), the real exchange rate (p^* / p E) and process variable (T) and forms the following equation:

$$GDP_t = f \left[T_t, G_t, M_t, \frac{p^*}{p} E \right] + w_{it}$$

The results of Granger causality for above equation between GDP and nominal and real exchange rates show that there is a two-way causal relationship among them in Iran economy. Sometimes, a causal relationship has a long-term process. Also, with respect to the coefficient lag, short-term causal relationship is true. Because it results in the depretation of dollar value in proportion to Rial downfall in domestic production. Gylfason & schmid (1983) were among the first ones who looked doubtful on the basis of an experimental study on the effect of reducing the value of money on production in developing countries. In fact, they proposed monetary devaluations, tightening of monetary devaluations and inflation and recession caused by macro-economic structures in semi-industrialized countries. So, they estimated parameters of a simple macroeconomic model for the 10 countries included five industrialized countries and five developing countries. They showed in short term and long term, experimental evidence in some countries confirmed the traditional view which led to improvement in the trade balance, followed by the production growth. Edwards (1986) in time-series cross-sectional sample related real GDP showed nominal and real exchange rate indices, government spending and growth of trade and money, according to the following equation:

$$GDP_i = f(G_t, TOT_t, M_t, E_t, e_t)W_{it}$$

For this purpose, data from 12 developing countries from 1965 to 1980 is used to estimate the behavior of real output. The result showed that depretation in first rate had a weak contraction effect but in the second year the decreasing effect was reversed and in long term effects of the devaluation of the national

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currency was neutral. Edwards' estimations show the primary impact of the devaluation of money during the present recession. Agnor (1991) estimated production growth in cross-sectional time series of the country and the real exchange rate, the real depreciation of the expected changes in the real exchange rate, government spending, the money supply and foreign income. He indicated that although surplus in loss of real exchange rate increases output growth, but the increase in the level of the real exchange rate applies a depression effect. Developing the use of VAR models for studying the macroeconomic behavior in developing countries, not only produces limited effects on the exchange rate but also more information is obtained. The following studies have focused on these patterns. Rogers & Wang (1995) in an attempt to analyze the change of Mexico output during the period of 1990-1997 designed a five variable VAR model of production, government spending, inflation, exchange rate on monetary growth. They showed that the most significant variables in Mexico production have been assigned to the shocks of their production. In their model, shocks to the real exchange rate (i.e., devaluations of domestic monetary system) led to a decrease in production. Kamin & Rogers (2000) studied the production and the real exchange rate. They used a four variable VAR model for GDP, price rate, exchange rate and inflation rate. Analysis of GDP variance showed that about 20-30% of domestic product is determined by the exchange rate. The results also revealed that the reaction of the real exchange rate leads to a reduction in the medium term and long term. The results indicate that the most important factor affecting the exchange rate in Mexico is the GDP. Hosoya & Yao (2000) in a study entitled *conclusive evidence on the effects of unilateral and macroeconomic data in Japan* examined the causal relationship between the GDE, export and import of money volumes and the nominal exchange rate. The results revealed that the money is the cause of income, but the reverse mode is not true. Also, it seems that their findings imply the fact that monetary policy is ineffective in Japan's foreign trade and economic growth of Japan mainly derives from exports.

MATERIALS AND METHODS

Research Method

Due to the structure of the study and the data needed for research, econometrics of panel data is used to conduct the research because time series estimation is often used in economic research in which enough data is available and there is no linear problem. But in cases where research is faced with a lack of data or linear problem, this method has not high validity.

In contrast, sectional estimation techniques are used in a given time period in which case the model is able to explain changes over time. So, researches conducted using panel data, cover time and sectional effects. Therefore, this study will use panel data method. In order to select countries for the study, being Islamic and developing countries considered as two main criterions. Thus, according to these criteria and influenced standards, Iran, Malaysia and Turkey have been selected whose data between 1990 and 2013 is to be investigated.

Analysis of the Research

1- Model Introduction

According to the theoretical principles and the results of other research, basic model is presented to examine the relationship between money and economic growth in selected Islamic countries as follows.

$$GDP = C + \alpha_1 MON + \alpha_2 INF + \alpha_3 EXC + \alpha_4 LEN + U$$

Where

GDP is real Gross Domestic Product in studied countries

MON is Liquidity in each of studied countries

INF is Inflation in studied country

EXC is exchange rate in a studied country in which equality of U.S. dollar with national currency of each country (Iran, Malaysia and Turkey) has been considered

LEN shows the facilities in each of studied countries

Since the main purpose of the research is to investigate the effects of independent variables on the rate of economic growth (GDP), dependent variable in the model is given in logarithmic form.

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2- Stationary of Variables

1- Stationary of GDP

Pool unit root test: Summary

Series: GDP_IR, GDP_MAL, GDP_TUR

Date: 02/12/15 Time: 16:56

Sample: 1990 2013

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.92976	0.0000	1	22
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.16250	0.0008	1	22
ADF - Fisher Chi-square	12.0615	0.0024	1	22

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

2. Stationary of Liquidity

The results below are the stationary of the variable liquidity for Iran, Turkey and Malaysia.

Pool unit root test: Summary

Series: MON_IR, MON_MAL, MON_TUR

Date: 02/12/15 Time: 17:01

Sample: 1990 2013

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 4

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-2.21863	0.0133	3	47
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat			2	25
ADF - Fisher Chi-square	5.78046	0.2162	2	25
PP - Fisher Chi-square	4.60691	0.3301	2	29

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

3. Stationary of Inflation

The results of the study to evaluate the stability of inflation for countries (Iran, Malaysia and Turkey) are as follows:

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Iran

Pool unit root test: Summary

Series: INF_IR, INF_MAL, INF_TUR

Date: 02/12/15 Time: 17:03

Sample: 1990 2013

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.40237	0.0000	3	53
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat			2	31
ADF - Fisher Chi-square	20.9876	0.0003	2	31
PP - Fisher Chi-square	34.6017	0.0000	2	32

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

4- Stationary of Exchange Rate

The following results were obtained from a study of the stationary of the exchange rate for studied countries:

Pool unit root test: Summary

Series: EXC_IR, EXC_MAL, EXC_TUR

Date: 02/12/15 Time: 17:06

Sample: 1990 2013

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.61804	0.0001	3	66
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat			2	44
ADF - Fisher Chi-square	12.0565	0.0169	2	44
PP - Fisher Chi-square	12.0424	0.0170	2	44

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

5- Stationary of Granted Facilities

Finally, the results of stationary for variable of granted facilities can be seen as follows:

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Pool unit root test: Summary
 Series: LEN_IR, LEN_MAL, LEN_TUR
 Date: 02/12/15 Time: 17:04
 Sample: 1990 2013
 Exogenous variables: Individual effects
 Automatic selection of maximum lags
 Automatic lag length selection based on SIC: 0 to 1
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.20993	0.0000	3	64
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat			2	43
ADF - Fisher Chi-square	25.7322	0.0000	2	43
PP - Fisher Chi-square	28.4563	0.0000	2	44

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

As can be seen, due to the data obtained, all variables at 95% significance level and first order difference are stationary. Thus we can carry out the next steps and finally estimation.

3- The Estimation of Main Model

The results (stackability, Hausman, etc.) show that the model should be tested considering the fixed effects and cross section weights. Therefore, the main model is tested following these tips and the results are obtained as follows:

Table 16: Cross section weights Test (estimation of main model)

Dependent Variable: LOG(GDP?)
 Method: GLS (Cross Section Weights)
 Date: 10/07/14 Time: 11:03
 Sample: 1990 2013
 Included observations: 24
 Total panel (unbalanced) observations 56

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXC?)	-0.108375	0.031219	-3.471475	0.0010
LOG(INF?)	-0.182648	0.032593	-5.603960	0.0000
LOG(MON?)	0.850353	0.042185	20.15789	0.0000
LOG(LEN?)	0.127177	0.046357	2.743446	0.0082
Fixed Effects				
_IR--C	4.280291			
_MAL--C	2.579058			
_TUR--C	-9.976348			
Weighted Statistics				
R-squared	0.957688	Mean dependent var	5.282186	
Adjusted R-squared	0.952507	S.D. dependent var	0.711509	
S.E. of regression	0.155059	Sum squared resid	1.178121	
Log likelihood	57.53139	F-statistic	369.6852	
Durbin-Watson stat	1.157719	Prob(F-statistic)	0.000000	
Unweighted Statistics				
R-squared	0.967495	Mean dependent var	5.181283	
Adjusted R-squared	0.963515	S.D. dependent var	0.824582	
S.E. of regression	0.157505	Sum squared resid	1.215578	
Durbin-Watson stat	1.102337			

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According to the results, more than 95% of changes in the dependent variable (growth of GDP in selected countries) were related to changes in the independent variables (liquidity, exchange rate, inflation and the granted facilities). Also, considering the coefficients obtained, all independent variables were significant and the coefficients can be interpreted. The results showed that the most effective influence of selected variables is related to liquidity in which a 1% increase for liquidity will increase GDP growth rate by 85.0%. In addition, the effect of exchange rates and inflation variables on GDP growth is negative and the effect of liquidity and granted facilities on GDP is positive.

Conclusion

According to current research and studies, the findings of this study can be expressed as follows. In Islamic developing countries (Iran, Malaysia and Turkey) monetary variables can affect the GDP. Variables such as liquidity and granted facilities have positive effect on GDP and their increase will increase GDP growth. On the other hand, changes in exchange rates and inflation rates as well as monetary variables could affect GDP. In countries such as Iran, Malaysia, Turkey, between 1990 and 2013, inflation has impacted negatively on GDP and its increase has decreased the growth of GDP. Therefore, in this group of countries, in spite of the fact that GDP growth leads to increased liquidity, since on the other hand can exacerbate inflation, inflation will have a negative impact on GDP. Therefore, the policy changes should be done with careful planning. Also, one of findings of this study is the importance of exchange rate changes. In this group of countries, changes in exchange rates have a negative influence on GDP. Thus, the devaluation of the national currency in these three countries will reduce GDP growth. So, it is essential that economies of these countries must consider exchange rate stability in their agenda. Based on the findings of the study, there is a positive correlation between liquidity and economic growth. Therefore, it can be noted that in Iran, Turkey and Malaysia, as liquidity increases, it can have a positive impact on economic growth and improve it.

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