EMPIRICAL ANALYSIS OF MONETARY POLICY OF UZBEKISTAN

Azimov Shakhzod Qakhorovich

Independent researcher at Tashkent State University of Economics

ABSTRACT: In this article, the researches on the factors causing inflation are analyzed, and the general factors affecting inflation in Uzbekistan are determined based on the results. Also, in this study, the development stages of the monetary and credit policy implemented by the Central Bank of Uzbekistan were studied. After the Central Bank of Uzbekistan switched to the strategy of inflation targeting, an eonometric analysis of the factors affecting the fulfillment of the set targets was carried out. Conclusions and proposals were formed as a result of analysis and studies.

KEY WORDS: inflation, inflation targeting, central bank, price level, exchange rate, monetary policy.

INTRODUCTION

At any stage of economic development, the monetary policy implemented by the Central Banks of countries directs to achieve a number of similar strategic and tactical goals. However, the priority of goals varies from country to country based on their socio-economic conditions. In particular, if the central banks of developed countries focus their monetary policy more on price stability, in developing countries, in addition to internal price stability, the issue of the exchange rate is also chosen as a priority goal [1].

In the context of the reforms implemented in Uzbekistan in recent years, studying and analyzing the actions of the monetary policy to achieve the above-mentioned goals (internal price stability) and determining the factors affecting its effectiveness is an important and urgent issue in ensuring economic stability and development.

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Many researchers have mainly used three different types of data sets in the study of inflation factors: 1) variable data for one country over time, 2) cross-section of some countries at the same time, and 3) group of countries. over a certain period of time. It is noted in the studies that the use of the first two data sets may lead to some shortcomings, since they imply the simultaneous analysis of other countries and different time periods, respectively. The third approach is to provide a more reliable result of the data for statistical analysis [3].

Regarding inflation factors, Cohen and Marrese [4] analyzed monthly data from January 1992 to November 1994 and found that the growth of the money supply in Russia had the greatest impact on inflation after 2-4 months. Also, Khan and Gill [5] studied money supply, budget deficit, exchange rate, inflation expectations, interest rate, import value and confirmed that exchange rate depreciation, increase in import prices and inflation expectations are the strongest factors of inflation in Pakistan as causes of inflation.

Bhattacharya [6] focused on the transmission mechanisms of monetary policy in Vietnam to explain high inflation relative to Asian markets. Following a small open economy model in which inflation is a weighted average of changes in the prices of tradable and non-tradable goods, inflation is determined to be a function of aggregate demand/real output, the money supply, the nominal effective exchange rate, the nominal interest rate, and foreign exchange. Analyzing the 2004-2012 period using the VAR model, he showed that while short-term nominal effective exchange rate changes are the main factors for inflation, GDP growth and credit growth are the main factors for inflation in the medium term.

Mohanty and John [7] studied the factors affecting the inflation rate in India for the period covering 1996-2014 and concluded that oil prices, GDP gap, fiscal policy and monetary policy have a significant effect.

Ha et al. [8] examined the domestic and global drivers of inflation in 26 developing countries and 29 rapidly developing countries from 1970 to 2017.

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They conclude that 75% of the variation in inflation is due to domestic shocks, and note that supply-side factors are the most important. However, they acknowledge that since 2001, supply-side shocks have declined in importance, while changes in global demand and oil prices have become the dominant global shocks to inflation.

In recent years, many measures and researches have been implemented in Uzbekistan to combat inflation, and it has been reduced to some extent. However, it is often unsustainable and has a negative impact on the savings and investment decisions of market participants. To study the real reason for this, it is important to first of all study the history and current situation of the development of monetary policy in Uzbekistan.

The problems of the above-mentioned problems, sach as the long-term low economic growth, high unemployment and price instability in Uzbekistan required a fundamental improvement of the macroeconomic policy implemented by the state. The current inefficient fiscal and monetary policy does not correspond to the requirements of the principles of modern market economy, it showed that the whole economic system will be eroded from the inside and eventually the economic recession is inevitable.

In this regard, from the end of 2017, the government started a new stage of reforms aimed at increasing the role of market mechanisms and liberalizing the economy. This, in turn, required the Central Bank to introduce a more flexible, transparent and accountable inflation targeting monetary policy strategy.

In order to avoid possible negative shocks caused by the reforms and to gradually implement the transformation process, the decision of the President of the Republic of Uzbekistan "On improving the monetary and credit policy by gradually moving to the inflation targeting regime" In 2021, a set of measures for the gradual transition to the regime of development and inflation targeting was established. This strategy led the Central Bank to focus on domestic prices and liberalize the exchange rate regime.

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The ability of the monetary policy of the Central Bank of Uzbekistan to respond to shocks in the inflation and foreign exchange market depends, firstly, on how well it provides the necessary conditions for the transition to the inflation targeting regime, and secondly, it depends on the effectiveness of the transmission mechanism of the monetary policy.

Based on the studies, there are the most important preconditions required at the stage of transition of the monetary and credit policy of the Central Bank from the monetary targeting regime to the inflation targeting regime, which are summarized in Table 1.

Table 1. Preliminary conditions for the introduction of the inflation targeting regime

A group of factors	Terms and Conditions
Institutional independence	The central bank should have full legal autonomy and be free from fiscal and political pressures that conflict with the inflation target.
Development of technical infrastructure	The central bank must have inflation forecasting and modeling capabilities and the necessary data to implement them.
Economic structure	Price regulation should be completely abolished, the economy should not be overly sensitive to commodity prices and exchange rates, and dollarization should be minimal.
A sound financial system	In order to minimize potential conflicts with the goals of financial stabilization and to ensure the effective implementation of monetary policy, the banking system should be sound and capital markets should be well developed.

It can be seen from the table that the first and most important requirement of the inflation targeting regime is the ability of the Central Bank to conduct monetary policy with a certain degree of independence. No central bank can be completely independent of government influence, but it should be free to choose the instruments to achieve the level of inflation that the government deems acceptable.

This in turn limits the "fiscal advantage". That is, it is a limitation of the ability to control the monetary policy in achieving the goals of the state's fiscal policy. Limiting fiscal leverage means that government borrowing from the central bank is low or zero, and that domestic financial markets are sufficiently

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developed to accommodate government debt, such as treasury bills. It also means that the government's revenue from its domestic currency monopoly should not be relied on regularly and seriously. If fiscal leverage exists, the resulting inflationary pressures undermine the effectiveness of monetary policy by forcing the central bank to adapt to government demands, such as lowering interest rates to meet fiscal targets.

Second, the central bank's monetary policy is focused only on price stabilization, that is, its willingness and ability not to direct other indicators such as wages, employment rate, or exchange rate to regulatory goals.

It is also necessary to ensure a number of other conditions, and implementing all of them at an optimal level will increase the effectiveness of reforms in improving the monetary policy based on the concept of inflation targeting.

METHODOLOGY AND RESULTS OF ANALYSIS

An econometric analysis was carried out in order to determine the main factors that have a negative effect on the effectiveness of the monetary policy of the Central Bank of Uzbekistan in terms of stabilizing the price level. This analysis used secondary data sources for Uzbekistan between 2016 and 2022. Given the limited number of data observations and the short-term fluctuations of many variables, monthly data were used. In addition, the length of the period is limited by the availability of data for the variables in this model. The data set was obtained from the Central Bank of the Republic of Uzbekistan, the Statistical Committee of the Republic of Uzbekistan and the World Bank statistical data base. The following econometric model equation was formulated based on the main goals of monetary policy, in particular, inflation targeting.

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$$\Delta\tau^{dev}{}_t = \beta_0 + \sum_{i=1}^{i=p} \beta 1\Delta\tau^{dev}{}_{t\text{-}1} + \sum_{i=1}^{i=q} \beta 2\Delta M2_{t\text{-}1} + \sum_{i=1}^{i=n} \beta 5PR_{t\text{-}1} + \sum_{i=1}^{i=l} \beta 6CR_{t\text{-}1}$$
$$+ \sum_{i=1}^{i=k} \beta 3XR_{t\text{-}1} + \sum_{i=1}^{i=m} \beta 4FinDev_{t\text{-}1} + \varepsilon_t$$

$$(1)$$

$$t = 2020\ (1m, 2m, 3m, \dots 12m), \dots$$
$$p,\ q,\ k,\ m,\ n,\ l - optimal\ lag$$
$$\beta_1 \dots \beta_6 - coefficient\ of\ variables$$

where: Dependent variable: $\Delta\tau^{dev}$ – dependent variable, inflation gap (that is, the difference between the intermediate inflation target and the actual inflation rate - the degree of deviation from the target).

Optional variables: $\Delta M2$ – change in money supply; XR - exchange rate (against the US dollar); FinDev is an indicator describing the level of development of the financial market (monthly turnover of the financial market); PR – the main rate of the central bank (refinancing rate); CR – lending interest rate (lending average interest rate).

Table 2. General statistical information about variables

Variables	Observations	Mean	Std. Err.	Min	Max	VIF test
$\Delta\tau dev$	30	-0,2	1,1	-1,8	3,4	-
$\Delta M2$	30	1,9	3,7	-6,9	9,4	1,27
XR	30	10491,8	435,7	9526,3	11400,2	1,98
PR	30	14,7	1,1	14,0	17,0	1,16
CR	30	5,4	1,3	3,5	7,8	2,06
FinDEV	30	172,8	551,4	0,7	303,2	1,50

Source: Calculated by the author in STATA.

Choosing the right model for the data set is a prerequisite for the accuracy of the analysis results and the absence of any errors.

Since the data is a time series (Time series data), the selection of the analysis model is based on the results of the unit root test, which determines the stationarity of the variables [12].

The model allows controlling for possible cointegration between variables. Also, this model was used to quantitatively evaluate the effects of demand and supply factors on inflation, and to study the effect of the rate of change of factors, long and short-term delays in this process. This model also makes it

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possible to estimate the rate of return to the long-term trend of the consumer price index in the case of short-term changes and deviations.

DISCUSSION OF RESULTS

Taking into account that the inflationary pressure is caused mainly by changes in the conditions of the goods, labor force, financial market and foreign exchange market, the factors affecting the deviation of the inflation rate from the intermediate inflation target (target) and the effectiveness of the central bank instruments to prevent them were evaluated. According to the results of the analysis, it was found that there are medium-term statistical correlations between the selected variables and the inflation gap. In addition to the analysis of the main variables, a number of diagnostic tests were performed, which confirmed the correctness of the selected model and data set and the reliability of the regression results (see Table 3).

Table 3. Regression Reuslts

Variables	$\Delta\tau_{dev}^{(ec)*}$	[1]Std. Error	Optimal lag (AIC criterion)
$\Delta\tau^{dev}_{t-1}$	0.69***	(0.197)	1
$\Delta M2$	0.06 **	(0.084)	4
PR	-0.09***	(0.224)	5
CR	-0.17*	(0.677)	2
Log(XR)	1.71*	(4.674)	3
Log(FinDev)	-0.13*	(0.088)	4
Constant	-139.61**	(0.363)	-
Observations	30		
R^2	0.792		
F-statistics	13.97***		

Significance level: *** $p<0.01$, ** $p<0.05$, * $p<0.1$
[1]Robust standard errors in parenthesis.
[(ec)*] –ARDL error correction version of the model.

Source: Calculated by the author in STATA.

The relationship between the inflation gap (Δtdev) and the discretionary variables was shown to be significant. Also, econometric analyzes show that

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changes in interest rates affect inflation with a 1-3 quarter delay due to various factors.

In order to reduce the inflationary pressure caused in the economy as a result of external shocks, the Central Bank mainly regulates the money supply in the economy. It does this by changing the refinancing rate, open market operations, and the reserve requirement ratio, which are the main monetary policy instruments used. Taking into account the above, the impact of the increase in money supply on the dependent variable was studied in order to assess the overall effectiveness of the monetary policy. Based on it, an increase in money supply ($\Delta M2$) by 1 percent causes an increase in the inflation gap by 0.06 percent in the short term (for 1-3 months). This mainly causes inflationary pressure through the channel of inflationary expectations (entrepreneurs and consumers) in the transmission mechanism of monetary policy.

Also, taking into account that the interest rate is the main channel of monetary policy instruments affecting inflation through the transmission mechanism, the impact of changes in the Central Bank's refinancing rate (PR) and lending interest rate (CR) on the inflation gap was studied. The analysis showed that the effect of both variables was statistically significant. The results of the empirical analysis on the level of influence showed that a 1% increase in the Central Bank's key rate (PR) in the short term reduces the inflation gap by 0.09%, and a 1% increase in the lending interest rate (CR) reduces the gap by 0.17%.

The results of the evaluation of the impact of the short-term factors of the inflation gap showed that the exchange rate is statistically significant, but in the long-term period it is relatively weak. It was determined that the depreciation of the Uzbek soum by 1% will increase the inflation gap by 1.71% in the short term (for 1 month) ("overshooting" reality) and by 0.06% in the long term. The insignificance of the longer-term impact of import inflation can be explained by the fact that the fuller impact of this factor is reflected in producer prices.

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In the studies, it was noted that the rapid development of financial markets and the implementation of new types of financial instruments lead to unstable demand for money and a decrease in the effectiveness of monetary policy [13]. In order to study the influence of the development of the financial market on the monetary and credit policy in Uzbekistan, the monthly turnover of the financial market was taken as a descriptive indicator, and its short-term effect showed a negative correlation with the inflation gap. That is, a 1 percent increase in financial market turnover reduced the gap by 0.13 percent. This situation can be explained by the gap created as a result of the lack of development of the financial market in Uzbekistan, which is contrary to the results of other studies.

In addition to the above factors, an inertial component was included in the model, its effect is statistically significant, and it was found that a 1% increase in the inflation gap in the past period causes a deviation of the current inflation gap by 0.69%. It can be concluded that the inflationary pressure in the current period will partly depend on the effectiveness of the measures implemented in the past periods.

Therefore, the ability of the monetary policy of the Central Bank to respond to shocks in the inflation and foreign exchange market depends on the effectiveness of its transmission mechanism. The effectiveness of the monetary and credit policy of the Central Bank is determined by the ability to choose instruments correctly and to use them correctly in different phases of the economic cycle.

CONCLUSIONS

Full transition to a floating exchange rate regime by the end of 2023 in order to increase the independence of the Central Bank and to ensure that the monetary policy is focused on the main goal of domestic price stability. Although Uzbekistan has adopted a de jure floating exchange rate regime, there are features of a creeping exchange rate regime through de facto currency

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intervention. The analysis of the experience of foreign countries showed that 36 of the 45 countries that have switched to inflation targeting have both de jure and de facto free floating (11) or floating (36) exchange rate regimes.

The fourth condition for the transition to inflation targeting through the development of the capital market, i.e., in order to improve the health of the financial system, it is proposed to attract financial resources by developing the market of state securities and expanding the ranks of its participants. Diversification of the stock market by issuing new types of securities has been found to increase the effectiveness of monetary policy in econometric analyses. In this case, it is effective to diversify the financial market by issuing "green" bonds.

In order to increase the effectiveness of the monetary and credit policy in the period of economic stress by focusing on reducing inflation, it is suggested to increase the role of the fiscal policy in quick response to other situations that occur during this period, in particular, the fluctuation of the exchange rate, the high level of unemployment. It is proposed to use automatic stabilizer instruments of fiscal policy. In this regard, based on foreign experience, it is proposed to devise a procedure for the proper taxation (profit tax, income tax and social tax) and social protection (unemployment benefit) payments in the period of economic shocks according to a predetermined procedure without additional parliamentary approval or government decisions.

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