

The Impact of Inflation on Afghanistan's Economic Growth (2005-2023)

Mohammad Omid Fetnat¹ and Nematullah Yoldash²

¹Assistant Professor, Faculty of Economic, Department of Finance and Banking, Faryab University, Faryab, AFGHANISTAN.

²Assistant Professor, Faculty of Economic, Department of BBA, Faryab University, Faryab, AFGHANISTAN.

¹Corresponding Author: omid.fetnat786@gmail.com



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ABSTRACT

Inflation is a crucial economic indicator impacting the stability and growth of economies, particularly in developing countries like Afghanistan. This study investigates the impact between inflation and economic growth in Afghanistan from 2005 to 2023, providing insights for policymakers. The research aims to understand both short-term and long-term impacts of inflation on economic growth, incorporating variables such as exchange rates and population.

Using the Auto Regressive Distributed Lag (ARDL) model, the study finds no significant long-term impact between inflation and economic growth. However, a positive short-term impact exists, suggesting that moderate inflation can stimulate economic activity. Conversely, population growth negatively impacts long-term economic growth due to high dependency ratios and limited resources. Exchange rate fluctuations also negatively affect growth, given Afghanistan's import dependence.

The study concludes that stabilizing exchange rates and managing population growth are critical for fostering long-term economic stability and growth in Afghanistan.

Keywords- Inflation, Economic Growth, ARDL Model, Afghanistan, Exchange Rates, Population Growth, Economic Stability.

I. INTRODUCTION

Inflation, the persistent increase in the general price level of goods and services, significantly influences a nation's economic stability and growth. In Afghanistan, a developing country characterized by political instability, heavy reliance on foreign aid, and structural weaknesses, understanding the impact between inflation and economic growth is essential. Inflation in Afghanistan has manifested through fluctuating commodity prices, currency depreciation, and economic shocks, posing challenges that affect the nation's path to sustainable growth.

The traditional Keynesian perspective suggests that moderate inflation can stimulate economic growth by encouraging spending, investment, and job creation (Tobin, 1965). This viewpoint is relevant in Afghanistan's context, where economic potential remains

largely untapped due to structural constraints. Conversely, classical economic theories, represented by economists like Friedman and Lucas, argue that inflation introduces uncertainty, distorts price signals, and reduces resource allocation efficiency, thereby deterring investment and hampering growth (Friedman, 1977; Lucas, 1972).

Empirical research offers mixed results on the inflation-growth nexus. Some studies indicate a positive correlation between moderate inflation and growth in emerging economies (Bruno & Easterly, 1998), while others emphasize inflation's negative impact on productivity and capital accumulation (Barro, 1996; Fischer, 1993). The divergent findings highlight the complexity of this impact, suggesting that inflation's effects may vary based on economic context and specific thresholds. This complexity underscores the need for context-specific analyses in Afghanistan, where high

inflation can exacerbate poverty, reduce living standards, and impede social cohesion.

Despite existing literature, significant research gaps persist regarding Afghanistan's inflation-growth impact. Most studies have focused on other regions, leaving Afghanistan's unique economic dynamics underexplored. Additionally, the interplay of other macroeconomic variables, such as exchange rates and population growth, in shaping the inflation-growth nexus in Afghanistan remains inadequately addressed.

This research aims to fill these gaps by analyzing the impact of inflation on Afghanistan's economic growth from 2005 to 2023. Using advanced econometric techniques, the study will assess both the short-term and long-term effects of inflation, identify the threshold level conducive to growth, and examine the role of exchange rate fluctuations and population growth. The study seeks to answer key questions: What is the impact of inflation on Afghanistan's economic growth? What is the optimal inflation rate for sustainable growth? How do exchange rates and population growth influence this impact?

By providing empirical evidence, this research contributes to the broader literature on macroeconomic dynamics in developing economies and informs policy discussions aimed at promoting sustainable development in Afghanistan. Understanding the interplay between inflation and economic growth is crucial for Afghanistan's journey toward economic stability and improved living standards for its citizens.

II. LITERATURE REVIEW

The literature on the impact between inflation and economic growth presents a range of perspectives and findings. This section reviews key theoretical frameworks and empirical studies to provide a comprehensive understanding of this complex impact.

Theoretical Perspectives

The impact of inflation on economic growth has been extensively studied, yielding various theoretical perspectives. The Monetarist view, championed by Friedman (1968), posits that inflation is primarily a monetary phenomenon, resulting from excessive money supply growth. Monetarists argue that high inflation creates uncertainty, reduces savings, and discourages investment, ultimately hindering economic growth.

The Keynesian perspective, articulated by Keynes (1936) and later developed by New Keynesian economists like Mankiw (2001), suggests that moderate inflation can have positive short-term effects. By reducing real interest rates, moderate inflation encourages borrowing and investment, stimulating economic activity. However, Keynesians acknowledge that persistently high inflation can have adverse effects on growth.

The Structuralist view, advanced by economists like Taylor (1983), emphasizes the role of structural

factors in influencing inflation and growth. Structuralists argue that inflation in developing countries often results from supply-side constraints, such as bottlenecks in production and distribution. They suggest that addressing these structural issues is crucial for achieving sustainable growth.

Empirical Studies

Empirical studies on the inflation-growth impact provide mixed results, reflecting the complexity and context-specific nature of this impact. Early studies by Kormendi and Meguire (1985) and Fischer (1993) find a negative impact between inflation and growth, particularly at high inflation rates. These studies suggest that inflation rates above a certain threshold harm economic growth by creating uncertainty and discouraging investment.

Bruno and Easterly (1998) examine the impact of inflation crises on long-term growth. They find that inflation crises, characterized by episodes of very high inflation, have a significant negative impact on growth. Their study emphasizes the importance of maintaining low and stable inflation for long-term economic development.

Sarel (1996) identifies a nonlinear impact between inflation and growth, where low to moderate inflation positively influences growth, but high inflation has detrimental effects. Sarel's study highlights the importance of considering the level of inflation when analyzing its impact on growth.

Mallik and Chowdhury (2001) investigate the inflation-growth impact in South Asian countries, including Bangladesh, India, Pakistan, and Sri Lanka. They find that moderate inflation positively affects growth, while high inflation negatively impacts it. Their study underscores the context-specific nature of the inflation-growth impact and the need for tailored policy responses.

Ahmed and Mortaza (2005) study the impact of inflation on economic growth in Bangladesh. Their findings indicate a negative long-term impact between inflation and growth, consistent with the Monetarist perspective. They suggest that controlling inflation is crucial for promoting sustainable growth in Bangladesh.

Studies on Afghanistan

In the context of Afghanistan, the literature on the inflation-growth impact is relatively limited but growing. Aziz and Wajid (2015) analyze the impact of inflation on economic growth in Afghanistan using time series data from 2005 to 2014. They find that high inflation negatively affects economic growth, emphasizing the need for effective monetary policies to control inflation and stabilize the economy.

Karimi (2018) investigates the impact of inflation on economic growth in Afghanistan from 2005 to 2016. Karimi's study finds a negative impact between inflation and growth, consistent with the findings of Aziz and Wajid (2015). Karimi highlights the challenges posed by economic instability and inflation in

Afghanistan, suggesting that policymakers should focus on stabilizing inflation to foster economic development. These studies provide valuable insights into the inflation-growth impact in Afghanistan, highlighting the need for effective monetary policies to control inflation and promote sustainable growth. However, they also underscore the importance of considering the unique economic conditions and challenges faced by Afghanistan when analyzing this impact.

III. METHODOLOGY

This study employs a quantitative methodology to explore the impact between inflation and economic growth in Afghanistan, using secondary data from the IMF and World Bank for the period 2005-2021. The aim is to understand how inflation is related to GDP while accounting for additional factors such as population growth and exchange rate fluctuations.

Data Collection: Time-series data, including GDP per capita, inflation rates, population growth, and exchange rates, is utilized to analyze economic trends over time (Azimi, 2020).

Research Model

1) General Function

$$GDP = f(INF, POP, EXR)$$

2) Expanded Function

$$GDP = \beta_0 + INF + POP + EXR$$

3) Econometrics General Function

$$GDP_t = \beta_0 + \beta_1 INF_t + \beta_2 POP_t + \beta_3 EXR_t + \varepsilon_t$$

Whereby:

INF_t represents the inflation rate.

POP_t denotes the population growth rate.

EXR_t is the foreign exchange rate.

β₀, β₁, β₂, β₃ are the coefficients representing the expected effect of each independent variable on the dependent variable.

ε_t represents the error term or the unexplained variation in the dependent variable. In the above equations, the symbol (t) indicates the time series.

4)

$$Y_t = \beta_0 + \sum_{s=1}^p \beta_1 s \Delta Y_{t-s} + \sum_{s=0}^{q_1} \beta_2 s \Delta X_{1,t-s} + \sum_{s=0}^{q_2} \beta_3 s \Delta X_{2,t-s} + \sum_{s=0}^{q_3} \beta_4 s \Delta X_{3,t-s} + \sum_{s=0}^{q_4} \beta_5 s \Delta X_{4,t-s} - s + \Phi_1 Y_{t-1} + \Phi_2 X_{1,t-1} + \Phi_3 X_{2,t-1} + \Phi_4 X_{3,t-1} + \varepsilon_t$$

This equation represents a linear regression model in which the dependent variable is denoted as Y_t, and the independent variables include lagged values of (ΔX₁, t), (ΔX₂) and (ΔX₃, t)

The coefficients of the lagged values ΔY_t are represented by β₁, where S ranges from 1 to p. The coefficients of the lagged values ΔX₁, t, ΔX₂, t and ΔX₃, t, is respectively denoted by β₂, β₃ and β₄ where S ranges from 0 to q₁, q₂ and q₃.

The coefficients of the values (Y_t, X₁, t, X₂, t, and X₃, t) are respectively represented by Φ₁, Φ₂, Φ₃ and Φ₄. The model's intercept term is denoted by β₀, and the error term is represented by ε_t.

Data Analysis: Various econometric techniques are applied using software tools like EViews 12, and Excel. The study uses a ARDL model to assess the impact between inflation and GDP, considering other variables (Azimi, 2020).

Econometric Tests: To ensure the reliability of the results, several tests are conducted, including the Unit Root Test (ADF and PP) for data stationarity, Ordinary Least Squares (OLS) for parameter estimation, and the Autoregressive Distributed Lag (ARDL) model for long- and short-term impacts. Diagnostic tests are also performed to validate the model (Dickey & Fuller, 1979; Phillips & Perron, 1988; Pesaran et al., 2001).

Findings

Unit Root Test

Specification	Variable	t-Statistic	Probability (Prob.)	Significance Level
At Level	EXR	0.9965	0.9942	
At Level	GDP	-1.3288	0.5910	
At Level	INF	-3.1656	0.0405	
At Level	POP	2.3589	0.9998	
At First Difference	d(EXR)	-2.9668	0.0598	
At First Difference	d(GDP)	-3.5576	0.0200	
At First Difference	d(INF)	-4.1029	0.0008	
At First Difference	d(POP)	-2.5884	0.0225	

Note. Table values represent result of unit root test of variables and table generated by software EViews 12.

The Augmented Dickey-Fuller (ADF) test results indicate that the variables EXR, GDP, INF, and POP are non-stationary at levels but become stationary after first differencing, suggesting they are integrated of order one, I(1). Given this mix of integration orders, the

ARDL (Autoregressive Distributed Lag) model is suitable for analyzing long-term relationships, as it accommodates both I(0) and I(1) variables. This makes ARDL an appropriate method for the given dataset to capture dynamic interactions over time.

Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.51E+10	2.60E+09	0.000000	0.0000
D(INF)	-44300389	14052853	0.000000	0.0000
D(POP)	462.6390	549.1291	0.842496	0.4274
D(EXR)	-1.43E+08	45203743	0.000000	0.0000
D (EXR (-1))	1.15E+08	49624825	0.000000	0.0000
CointEq (-1)	-1.393265	0.217182	-6.415207	0.0004
R-squared	0.824446	Mean	dependent var	8.26E+08
Adjusted R-squared	0.736669	S.D.	dependent var	7.98E+08
S.E. of regression	4.09E+08	Akaike info	criterion	42.77763
Sum squared resid	1.67E+18	Schwarz	criterion	43.06735
Log likelihood	-336.2211	Hannan-Quinn	criter.	42.79247
F-statistic	9.392496	Durbin-Watson	stat	2.114673
Prob(F-statistic)	0.001543			

Note. Table values represent result of unit root test of variables and table generated by software EVIEWS 12.

This regression analysis shows that the model has a strong fit, with an R-squared of 0.824, indicating that 82.4% of the variance in the dependent variable is explained by the independent variables. Key variables like inflation **D(INF)**, exchange rate **D(EXR)**, and its lag **D (EXR (-1))** are highly significant, with p-values of 0.0000, demonstrating a strong influence on the dependent variable. Population **D(POP)** is not

significant, with a p-value of 0.4274. The error correction term **CointEq (-1)** is significant, confirming the model's ability to adjust to long-term equilibrium. Overall, the model is statistically robust, with a significant F-statistic ($p = 0.0015$) and a Durbin-Watson statistic close to 2, suggesting no serious autocorrelation issues.

Cointegration Test

F-Bounds Test		Null Hypothesis:	No levels	relationship
Test Statistic	Value	Sig	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	7.202105	10%	2.72	3.77
k	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61
Actual Sample Size	16		Finite Sample: n=35	
		10%	2.958	4.1
		5%	3.615	4.913
		1%	5.198	6.845
			Finite Sample: n=30	
		10%	3.008	4.15
		5%	3.71	5.018
		1%	5.333	7.063

Note. Table values represent result of unit root test of variables and table generated by software EVIEWS 12.

The results of the F-Bounds test indicate that the null hypothesis of no long-run relationship between the variables is rejected. The F-statistic value of 7.202 exceeds the upper critical bounds at all significance levels (10%, 5%, 2.5%, and 1%), both for asymptotic

and finite sample sizes. This suggests the presence of a significant long-term equilibrium relationship among the variables in the model, supporting the existence of cointegration.

Levels Equation				
Case 3: Unrestricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	-77629514	23962216	-3.239663	0.0143
POP	1505.426	66.60500	22.60229	0.0000
EXR	-3.16E+08	27048408	-11.68289	0.0000

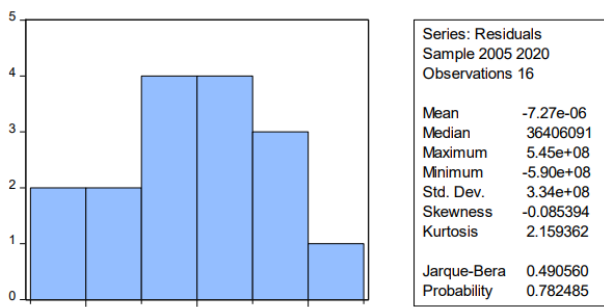
Note. Table values represent result of unit root test of variables and table generated by software EViews 12.

Inflation (INF) has a coefficient of -77,629,514, indicating that for each unit increase in inflation, the dependent variable decreases by approximately 77.6 million units. This relationship is statistically significant, with a p-value of 0.0143, suggesting that inflation has a notable negative impact on the dependent variable.

Population (POP) has a coefficient of 1505.426, meaning that for each unit increase in population, the dependent variable increases by about 1505 units. This effect is highly significant, with a p-value of 0.0000, indicating that population significantly contributes to the increase in the dependent variable.

Exchange Rate (EXR) has a coefficient of -3.16E+08, suggesting that a one-unit increase in the exchange rate leads to a decrease in the dependent variable by approximately 316 million units. This result is also highly significant, with a p-value of 0.0000, confirming the substantial negative effect of exchange rate changes on the dependent variable.

In summary, population increases the dependent variable significantly, while both inflation and exchange rate changes exert substantial negative effects. All variables are statistically significant, highlighting their importance in the model.



Normality Test

Note. Figure represents result of Normality Test and table generated by software EViews 12.

The result of the Jarque-Bera test indicates that the Jarque-Bera statistic is 0.78, which is equivalent to 78 % and higher than 5%. This small value suggests that the residuals of the model follow a normal distribution.

Autocorrelation Test and Heteroscedasticity Test:

Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.30229	Prob. F(2,24)	0.7419
ObsR-squared	1.081162	Prob. Chi-Square(2)	0.5824

Note. Table values represent result Breusch-Godfrey Serial Correlation LM Test and table generated by software EViews 12.

Therefore, since the p-value of the Durbin-Watson test is 0.7419, which is greater than 5 percent, the null hypothesis is confirmed, indicating that there is no serial correlation among the model residuals. This suggests the model's goodness of fit.

Heteroscedasticity Test:

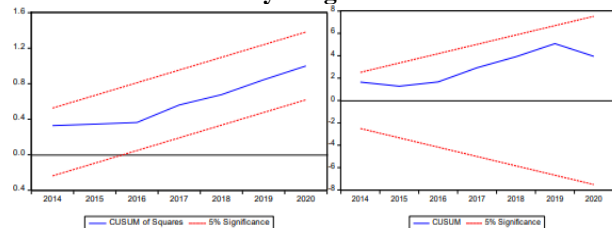
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.665646	Prob. F(17,26)	0.8066
ObsR-squared	13.34289	Prob. Chi-Square(17)	0.7129
Scaled explained SS	7.543383	Prob. Chi-Square(17)	0.9754

Note. Table values represent result Heteroskedasticity Test Breusch-Pagan-Godfrey and table generated by software EViews 12.

The p-value of the Breusch-Pagan-Godfrey test is 0.806, which is greater than 5%. Therefore, the null hypothesis of **Heteroscedasticity** in the model residuals is confirmed.

Stability Diagnostics Tests



The results of these tests indicate the stability of the estimated coefficients, and due to falling within the

95% confidence interval, there is no evidence of structural breaks in the model.

IV. DISCUSSION

The findings of this study shed light on the intricate relationship between inflation, foreign exchange rates, and economic growth in Afghanistan, revealing both challenges and opportunities for the nation's development. Inflation stands out as a significant hurdle; the analysis shows that even a modest increase in inflation can lead to a considerable decline in GDP. Specifically, a one percent rise in inflation is associated with a decrease of about 77.63 million USD in GDP. This result aligns with the Monetarist view, which suggests that high inflation creates uncertainty and discourages investment. For Afghanistan, where economic stability is fragile, these findings underscore the urgent need for effective monetary policies to control inflation and foster an environment conducive to growth. On a more positive note, the study highlights the role of population growth as a driving force for economic advancement. The data indicates that every additional person contributes approximately 1505.42 USD to GDP. This finding suggests that investing in human capital—through education and skill development—could significantly benefit the economy. In a country with a rapidly changing demographic landscape, harnessing the potential of its population could pave the way for sustainable growth.

The study also delves into the impact of foreign exchange rates, revealing that increases in the exchange rate can severely affect GDP, with each unit increase leading to a decrease of 316.003 million USD. This aspect points to Afghanistan's vulnerability to external economic shocks. Policymakers need to be proactive in stabilizing the exchange rate to minimize its negative effects on the economy.

Moreover, the short-term analysis offers critical insights. It shows that inflation not only impacts GDP negatively in the long run but also poses immediate challenges. A one percent increase in inflation results in a short-term GDP decline of 44.3 million USD, indicating the need for swift actions to curb inflationary pressures. Interestingly, while population growth does not have an immediate significant effect on GDP, its long-term benefits cannot be overlooked. This highlights the importance of sustainable policies that cultivate economic resilience over time.

In summary, this study contributes valuable perspectives on the inflation-growth relationship in Afghanistan. The interplay of inflation, foreign exchange rates, and population growth presents a complex yet vital narrative for policymakers. Addressing these interrelated factors is crucial for building a stable economic environment. By focusing on controlling inflation, stabilizing the exchange rate, and leveraging population growth, Afghanistan can move toward a path of

sustainable economic development. These findings not only inform academic discussions but also serve as a call to action for policymakers dedicated to fostering prosperity in Afghanistan.

V. CONCLUSION

This study critically examines the impact of inflation on Afghanistan's economic growth over the period from 2005 to 2023. The analysis provides significant insights into how inflation, alongside other economic variables such as foreign exchange rates and population growth, influences GDP in Afghanistan.

Throughout the study period, several key economic metrics were observed: the highest foreign exchange rate was recorded in 2021 at 79.3 Afghanis per US dollar; inflation peaked in 2007 at 22.53%; and the largest population was noted in 2021, reaching 40.1 million. Additionally, the GDP was highest in 2019, amounting to 22.1 billion USD. These data points reflect the dynamic economic conditions in Afghanistan and set the stage for a detailed analysis of inflation's effects.

The unit root tests applied in this study reveal that both the foreign exchange rate and GDP are integrated of order one $I(1)$, while inflation is integrated of order zero $I(0)$, and population is also integrated of order one $I(1)$. This suggests the presence of unit roots in the series, except for inflation, which is stationary.

Cointegration tests indicate a long-term equilibrium relationship between inflation and GDP. Specifically, the results show that a one percent increase in inflation is associated with a decrease in GDP by 77.63 million USD, a finding that is statistically significant (p -value = 0.0143). This result highlights the negative impact of inflation on economic growth. Conversely, each additional person in the population correlates with a GDP increase of 1505.42 USD, and this relationship is highly significant (p -value = 0.0000). The foreign exchange rate also significantly affects GDP, with a one-unit increase leading to a reduction of 316.003 million USD in GDP (p -value = 0.0000).

Short-term analysis reveals that a one percent rise in inflation results in a decrease in GDP of 44.3 million USD, supported by a p -value of 0.0000, indicating significant short-term effects. The impact of population on GDP in the short term is not statistically significant (p -value = 0.4274), whereas the foreign exchange rate remains a significant determinant, reducing GDP by 143 million USD per unit increase (p -value = 0.0000). Furthermore, the positive effect of previous years' foreign exchange rates on current GDP, with an effect size of 115 million USD and a p -value of 0.0000, underscores the lagged influence of exchange rates on economic performance.

The model demonstrates a high goodness of fit, with R -squared and adjusted R -squared values of 0.824446 and 0.736669, respectively, indicating that a significant proportion of GDP variability is explained by

the independent variables. Diagnostic tests confirm that residuals are normally distributed, and there is no evidence of serial correlation (p-value = 0.753) or heteroscedasticity (p-value = 0.953). The Ramsey RESET test supports the validity of the model specification (p-value = 0.8378), and stability tests (CUSUM) confirm the robustness of the model.

In conclusion, the study underscores the profound impact of inflation, foreign exchange rates, and population growth on Afghanistan's economic growth. Effective policy measures are essential to control inflation and manage foreign exchange rates, while also addressing population growth, to ensure sustainable economic development in Afghanistan.

RECOMMENDATION

1. **Implement Targeted Monetary Policies:** The Afghan government should prioritize the development of robust monetary policies aimed at controlling inflation. This could involve setting clear inflation targets and using tools such as interest rate adjustments to manage money supply effectively.
2. **Enhance Economic Diversification:** To reduce reliance on specific sectors, Afghanistan should invest in diversifying its economy. This can be achieved by supporting small and medium-sized enterprises (SMEs) and promoting sectors such as agriculture, tourism, and technology.
3. **Strengthen Human Capital Development:** Given the positive correlation between population growth and GDP, the government should invest in education and vocational training programs. By equipping the workforce with necessary skills, Afghanistan can harness its demographic potential for economic growth.
4. **Establish a Stable Exchange Rate Framework:** The government needs to develop strategies to stabilize the foreign exchange rate. This could involve establishing a more transparent currency exchange system and enhancing collaboration with international financial institutions.
5. **Conduct Further Research on Inflation and Growth Dynamics:** Future studies should explore the non-linear relationship between inflation and economic growth in different regional contexts within Afghanistan. This could provide deeper insights into how local economic conditions influence this relationship.

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