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The Impact of Exchange Rate and Inflation on the GDP of Afghanistan, 2003–2023

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Research Article

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Abstract

Due to the weak economic system of Afghanistan, it was difficult to predict proper economic indicators that have a vital impact on the economic growth of Afghanistan in the past. After the reestablishment of the new economic system and the publishing of new currency (Afghani), the new opportunities for economic growth have begun. Therefore, exchange rates and inflation in Afghanistan have a vital impact on different economic variables, and they have wide relations in different manners, which have basic importance in the economic stability of the country. Thus, this study attempts to indicate and find the relationships and impact of annual exchange rates and inflation rates on the annual GDP of Afghanistan from 2003 to 2023.

The study also employs the correlation coefficient of variables, and linear regression has run via Ordinary Least Square (OLS). It has been found in the data analysis of this paper that there is a positive relationship between independent variables, and theoretical justification also exists. Furthermore, it has been found that the significance of the data is not strongly reliable due to the unstable economic situation. Despite this, there is a need for more focus on macroeconomic indicators of the country, and policymakers should adopt the stabilized monetary, fiscal, and other related economic policies of the country.

1- Introduction

Exchange rate refers to the price of one country's currency expressed in terms of another currency or group of currencies. For those countries that are actively engaged in international trade, the exchange rate is an important economic variable, and changes in it affect economic activity, inflation, and the nation’s balance of payments. (RBA, 2023)

Inflation is also a much more important variable for the economic growth of the country, which has plunged countries into long periods of instability. (IMF, 2024)

Inflation is referring to the rate of increase in prices over a given period of time. (IMF, 2024) It means the prices of goods and services increase, and the most well-known indicator of inflation is the Consumer Price Index (CPI), which measures the Consumer Price Index measure percentage change in the price of specified goods and services consumed by the household. (RBA, Reserve Bank of Australia, 2024)

Due to the historical data, it has been found that the inflation rate in the United States is 2.40 in October 2024. (Trading Economics, 2024). In many other countries, the different rates of inflation recorded, from negative rates up to around more than 50% rates of inflation, exist in some countries. Afghanistan also experienced a negative inflation rate in 2024. In July of 2024, it was -6.60%. The inflation rate was founded by the National Statistical and Information Authority of Afghanistan. (TradingEconomics, 2024).

According to the DAB analysis, headline inflation[1] recorded in 09/11/2024 was -5.11%, where food and non-alcoholic beverages were -8.27% and the non-food items, tobacco, and services recorded -1.86%. (DAB, 2024) The inflation rate in Afghanistan recorded an all-time high of 47.89 in May 2008, and it also recorded the lower record of -18.37% in May of 2009. (TradingEconomics, 2024).

The nexus among the exchange rate, inflation, and economic growth is an important topic to study and research due to their importance for the economics of Afghanistan. Thus, it has been discussed and debated in the literature whether these variables are interrelated and have an impact on each other in a good manner or badly they have interrelated with each other. As the economy of the country is unstable and fluctuating, prices are rapidly changing, and the value of currency doesn’t keep stability in the long run.

This paper explores understanding and impact of these variables, which exchange rate also defines as the price of the domestic currency with respect to another currency. The purpose of foreign exchange is to compare one currency with another to show their relative values. (BYJU's, 2021) There are different factors affecting exchange rates, which could be specified according to the economic condition of a country. Mostly in Afghanistan, political and economic factors affect this rate, which has a generic impact on the economy of the country. There are three types of exchange rates: fixed/pegged exchange rate system, flexible/floating exchange rate system, and managed floating exchange rate system. (Rawell, 2023) Evidence shows that most of the economies experiencing managed floating exchange rate systems, thus, Afghanistan is one of those countries that adopted this type of exchange rate for so long. Studies show changes in exchange rate have effects on trade balance, inflation rate, foreign investment, interest rate, and increased cost of debt. (Rawell, 2023) These factors are directly related to the economic growth of a country, as weaker economies make it more important to manage these effects. It has been said that it affects an economy and standard of living of a country. (Prudence Attah-Obeng, Patrick Enu, F. Osei-Gyimah, C.D.K. Opoku, 2013) Although it’s difficult to manage exchange rates in less developed countries (LDCs) that practice inflation targeting, policy should respond to exchange rates where fluctuations in the exchange rate affect inflation or real output of the economy. (Airaudo, Macro, et al., 2016) So, it discusses the importance of exchange rate management for better understanding its impact on the economic growth of the country. Despite this, economic growth is the most powerful instrument for reducing poverty and improving the quality of life in developing countries. (OECD, 2024) Thus, it’s important for the economy of the country to understand factors of economic growth. Economic growth means an increase in the quantity or quality of the many goods and services that people produce (Max Roser et al., 2021), where the relationships and effects of exchange rates on different factors of economic growth are essential subjects to be discussed and researched, which the paper deals with. Thereafter, studies show that there are different cases of relationships between them. Chen (2012) found that the real exchange rate and economic growth have positive effects in China, where the data used is from Chinese provincial data from 1992-2008. (Prudence Attah-Obeng, Patrick Enu, F. Osei-Gyimah, C.D.K. Opoku, 2013)

[1] Total inflation in the economy

2- Literature Review

Many studies and research projects explore the impact of different variables on economic growth, which is such an important subject to be researched and discussed. There are many organizations and scholars who have research on these variables in an open dimension of interconnections. These studies explore positive, negative, and even no relationships and nonlinear relationships between inflation, exchange rate, and economic growth. For instance, Bazlul H. Khondker and others (2012) have published a research paper in the International Growth Center entitled “The Exchange Rate and Economic Growth: An Empirical Assessment on Bangladesh”. They have found that, in the long run, a 10 percent depreciation of the real exchange rate is associated with a 3.2 percent rise in aggregate output. Meanwhile, they found as a result that a contractionary effect in the short run, so that the same magnitude of real depreciation would result in about half a percent decline in GDP.

Prudence Attah-Obeng et al. (2013) researched on the economic analysis of the relationships between GDP growth rate and exchange rate in Ghana. They examined the relationships between these two variables (exchange rate and economic growth) from the period 1980 to 2012, where finally they found positive linear relationships between these variables in the scatter diagram. Where the GDPG = 4.23 + 2.33 EXR, where +2.33 is the slope of the equations and 4.23 is the intercept of the diagram. They also found the correlation, which is 0.54847882, which indicates positive relations between GDP growth rate and exchange rate in Ghana. Finally they conclude that a 1% increase in the exchange rate will cause the GDP growth rate to increase by 0.2022% (inelastic).

Aqili Lutfali et al. (2014) researched exchange price and its impact on financial growth in OPEC member countries. They have found that exchange price has a meaningful effect on financial development, and decrees in exchange price cause the financial promotion. They also added that the government intervention in socio-economic organizations could happen to control the economic variations, stability of the rules and regulations, and ownership rights, reducing social and political stabilities with decreasing the exchange price would have the resulting effect on financial development.

Faten, M. Faheem (2020) used the model ARDL (Autoregressive Distributive Lag), which is the most parsimonious technique for specifying the co-integration in small samples. The equation was GDP = f (infl), where the GDP is the dependent variable and inflation is the independent variable of the research, and the log-linear model of GDP and inflation showed the formula as: ln (GDPt) = α0 + α1ln(inft) + et. Where α0 and α1 are parameters that are estimated in the paper, t is time, and is a stochastic term. (Faten, 2020) He found in his research that there is evidence of the short-run positive relationship between inflation rate and economic growth in Afghanistan. Which discussed that Afghanistan can sustain growth even in the period of inflation in the short run; however, the influence of the inflation rate to enhance growth is too low. On the other side, the research indicated there is no co-integration between the inflation rate and economic growth in the long run.

Ekinci, Ramazan; et al. (2020) used the threshold dynamic panel data model for making comparisons between inflation targeting (IT) countries in the study. According to their study’s finding, the threshold value is 4.182% in IT countries; below the threshold, the inflation-growth relationship is insignificant, and above the threshold, inflation affects economic growth negatively. Where, they found as a result of their study, that the inflation-economic growth relationship is nonlinear.

Ahmadi Ajmal, (2021). Explain in a report published by the Bakhter news agency that Afghanistan never had a stable exchange rate; it means Da Afghanistan Bank exchanges currency by the demand and supply, and they give permission by this method as well. He added that the exchange rate of the Pakistani rupee in 2010 was 85 PKR per $1, where in 2015 it was 102 and in 2020 it became 161. It shows economic instability in Pakistan leads to these variations in exchange rate.

Adejayan and others (2021) have found in the past studies the positive relationship between exchange rate management and macroeconomic performances in the Nigeria and Turkey economies. They research and investigate comparative analysis of exchange rate management and macroeconomic performance in Nigeria and Turkey from the period of 1980 to 2017. Toda-Yamamoto (T–Y) Granger causality test results show that gross domestic product, inflation, and foreign direct investment did not Granger cause each other in Nigeria, while imports and exports Granger cause exchange rates but unidirectional. In Turkey, the real exchange rate does not Granger cause economic growth and FDI, but there exists a bilateral causality between exchange rate inflation, imports, and exports. The research result discussed that the exchange rate management has a significant effect on macroeconomic variable performance in emerging markets.

3- Data and Methodology

3-1. Description of Data

The prominent challenge in conducting academic research in many developing countries is the unavailability of accurate data. This had long been a challenge for Afghanistan too. Unfortunately, pre-2001, the exact data doesn’t exist to be analysis and fortunately the post 2001 data is available in some of the world data indicators and national data indexes as well. Thus, for this paper, data collected from world development indicators and the analysis has been made from the secondary sources, like, journals, governmental strategies, policies, laws, procedures and reports and website. Annual base average data since 2001 to 2023 used to for the selected variables of the paper entitled dependent variable, which annual real gross domestic product (GDP) is the proxy of the economic growth and independent variables known as exchange rate and inflation rate of mentioned time serious of this study. The date of above-mentioned variables retrieved specifically from the trading economics (TE) and Afghanistan National information and statistics authority (NISA) date indexes and Da Afghanistan Bank reports.

3-2. Methods and econometrics specifications

Following guidance outlined on how to review the evidence using systematic principles, the approach to identify relevant sources consisted of three separate tracks:

1. A literature search,

2. Snowball, theoretical justification and qualitative analysis,

3. Using the statistical tools to find the correlation coefficient of the existing data.

The paper also employs Simple Linear Regression to find the impact of independent variables by dependent variable. The formula for the SLR (OLS) method is as follow:

$Y = \beta_0 + \beta_1 *x$

Where Y is dependent variable (Gross Domestic Product), X is independent variable (Inflation and exchange rates), β_0 is the intercept term representing the value of Y when X is zero.

β_1 = is the slope of the regression line.

3.3- Model

To analysis and dissect the integrated connection among the predictors and dependent variable, the following model been specified.

GDP= β_0 + β_1. Inflation Rate + β2. Exchange Rate +

The GDP is the dependent variable, which the paper tries to explain or predict and

Inflation and Exchange rates are independent variable, where β is intercept term, represents the value of GDP when both independent variables are zero. B_1 is the coefficient for the inflation rate, and shows the impact of a one-unit change in the inflation rate on GDP, holding the exchange rate constant. B_2 is the coefficient for the exchange rate, showing the impact of a one-unit change in the exchange rate on GDP, holding the inflation constant. is the error term, accounting for the variability in GDP.

Hypothesis

1. Ho: Ho: $\theta_1 = \theta_2 = \theta_n = 0$ (No positive relationship between inflation rate and GDP.)

2. Ho: Ho: $\theta_1 = \theta_2 = \theta_n = 0$ (No positive relationship between exchange rate and GDP.)

3. H1: $\theta_1 \neq \theta_2 \neq \theta_n \neq 0$ (Positive relationship between inflation and GDP.)

4. H1: $\theta_1 \neq \theta_2 \neq \theta_n \neq 0$ (Positive relationship between exchange rate and GDP.)

4- Findings and Discussion

Afghanistan's economic growth is affected by several factors, all of which are discussable and arguable to be researched. Post-2001 economic growth was affected by many factors such as political instability, lack of sufficient investment in the different sectors, high rate of the unemployment rate, corruption, and so on. Currently, those factor may have some influence on economic growth although the role of the exchange rate and inflation could be significant. The exchange rate is measured as the amount of domestic currency per dollars. A depreciation in the domestic currency influence several economic indicators including the level of exports and imports.. The exchange rate in Afghanistan experienced notable fluctuation over the past twenty years which has affected many economic indicators such as inflation, economic growth, employment and the trade balance.

Considering the fragile economic condition of Afghanistan, understanding the effect of the exchange rate and inflation on the economic growth of this country is important. This study will not only assess the role of the exchange rate on the economic growth but also shed light the nexus between economic growth and inflation. Following this objective, the study applies a correlation and regression analysis.

Table-1 statistical model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.593[a]	.352	.287	5434491357.73973

a. Predictors: (Constant), Inflation rate, Exchange rate

Table-2 coefficients of the statistical model

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2110511818.431	6894636763.284		.306	.763
	Exchange rate	220061310.742	104421330.216	.429	2.107	.048
	Inflation rate	-271662523.101	216972541.806	-.255	-1.252	.225

a. Dependent Variable: Annual GDP

Source: research works.

Evidence been found relationship between all the three variables for the study period 2003-2023. Overall model is statistically significant, as indicated by the F-statistic of 6.808 and a p-value of 0.006, which means that the exchange rate and inflation rate, when considered together, have a statistically significant relationship with GDP. The model explains approximately 35.2% of the variation in GDP, while the remaining variation is associated with other economic and non-economic factors that are not included in the model. These factors could be foreign aids, FDI, foreign trade, employment rate, primary sector and other economic sectors productivities and so on.

The independent variables exchange rate appears to be important statistically significant explanatory variable in this model. Its coefficient is positive and statistically significant (B = 253,646,781.662, β = 0.485, t = 2.574, p = 0.018). Since the p-value is below the 5% significance level, thus, here it could say, that the null hypothesis that "the exchange rate has no statistically significant relationship with GDP", is rejected. See the table No ( ) for further clarification. *Therefore, the positive coefficient indicates that, holding the inflation rate constant, an increase in the exchange rate is associated with an increase in the estimated level of GDP of Afghanistan.* If the exchange rate is measured as amount of AFN per US dollar, an increase in the exchange rate represents a depreciation of the AFN currency against the US dollar. It can be elaborate that, a depreciation of the domestic currency makes exports cheaper for foreign buyers or importers as they can buy more of the Afghanistan goods for the same amount of their own currency. This can increase demand for exports, leading to higher sales and revenue for domestic firms (CEOEkanshNimbalkar, 2023). Considering these findings, production capacity of Afghanistan's factories and company has to invest more and also, attract FDI to fulfil the demand of foreign buyers. So, exports development can enhance aggregate demand and domestic production, which may support GDP and GDP growth rate. However, this mechanism should be considered with some caution in the case of Afghanistan. The Afghanistan's economy has a considerable dependence on imported goods since many years, meaning that currency depreciation can also increase the domestic price of imported consumer goods, machinery, energy, and production inputs. Although, the estimated coefficient for inflation in the country is negative, but statistically insignificant, it's B = −276,515,413.517, β = −0.260, t = −1.377, and p = 0.184. Since the p-value is greater than 0.05, so, the null hypothesis concerning the statistical significance of the inflation coefficient can't be rejected. The negative coefficient indicates an inverse estimated association between inflation and GDP. however, the relationship is not statistically distinguishable from zero at the 5% significance level. Therefore, the findings do not provide sufficient evidence to conclude that inflation had a statistically significant independent effect on GDP during 2003-2023. To provide more theoretical justification, the economy of Afghanistan suffers many illegal threats during the 2003-2023. Unofficial economic and business activities, corruptions, political instabilities, presidential election issues, domestic weak production, imbalance of BOT, national budget deficit, foreign aids mismanagement, Covid-19, and many other factors could be considerable in the case of Afghanistan economy. For the further justification, the Phillips Curve primarily describes an inverse relationship between inflation and unemployment in short run. (Anderson, 2026) Similarly, Okun's Law describes the relationship between unemployment and econo**mic output, generally suggesting that** increases in unemployment are associated with weaker output growth, or, this law stipulated that for every 3% rise in the rate of economic growth above the economy's long-term potential growth rate, unemployment would decrease by 1%. (Britannica, 2026) so, these two relationships can provide an indirect framework for thinking about the interaction among inflation, unemployment, and output, but they do not imply that inflation must always have a positive relationship with gross domestic product. It could be mention, that, the relationship between inflation and output can vary across countries and periods depending on the source, persistence, and magnitude of inflation as well as the structure of the economy.

The study found the importance of the exchange rate for the Afghan economy. Given the country's dependency on foreign trade and imported goods, variation in the exchange rate can affect both exports and imports and consequently influence domestic economic activity of the country. Therefore, exchange-rate explanation is important for policymakers of the related sector when considering macroeconomic stability, trade performance, and economic growth. However, exchange-rate policy should take into account both its potential benefits for external competitiveness and its possible costs through higher import prices and inflationary pressures.

Overall, the analysis indicate that the exchange rate has a positive and statistically significant association with GDP, whereas inflation has a negative but statistically insignificant independent association with GDP after controlling for the exchange rate. The significance of the overall model (F = 6.808, p = 0.006) further indicates that the explanatory variables are jointly relevant to variations in GDP. Nevertheless, these results should be interpreted as statistical associations rather than definitive causal effects. Since the analysis is based on annual time-series data for 2003–2023, the stationarity properties of the

variables should also be examined before drawing firm conclusions. If the variables are non-stationary, further time-series techniques may be required to avoid the possibility of spurious regression.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3691026369656	2	1845513184828	6.808	.006[b]
		40200000.000		20100000.000		
	Residual	5421718847734	20	2710859423867		
		90200000.000		4510000.000		
	Total	9112745217391	22			
		30400000.000				

a. Dependent Variable: GDP

b. Predictors: (Constant), FXrate_1, Inflation

The above table show, that the overall the model is statistically significant. This model produces an F-statistic of 6.808 with 2 and 20 degrees of freedom (df) and a sig. level of 0.006. Since the p-value 0.006 is below the 5% significance threshold, the **null hypothesis that the explanatory variables jointly have no statistically significant relationship with GDP is rejected angina**. Therefore, the exchange rate and inflation rate, when considered jointly, significantly explain variations in Afghanistan's GDP during the study period. This finding is consistent with the model summary, which shows an R-squared value of 0.352, indicating that approximately 35.2% of the variation in GDP is jointly explained by the exchange rate and inflation rate, while the remaining 64.8% is attributable to other factors not included in the model, which been mentioned before.

Related to the nexus between these variables the hypotheses stated before and already explain before, are evaluated here in the below table.

Table-3 Testing of the hypotheses

No	Hypotheses		Accepted	Rejected	Description
1	H_0	Negative relationship between inflation rate and GDP.)			There is negative interconnection between inflation and GDP in due to the certain affected factors.
2	H_0	Negative relationship between exchange rate and GDP.)			There is positive interconnection between exchange rate and GDP.
3	H_1	Positive Relationship between inflation and GDP.)			There is negative interconnection between inflation and GDP in due to the certain affected factors. Thus, the H1 is rejected.
4	H_2	Positive relationship between exchange rate and GDP.)			There is positive interconnection between exchange rate and GDP in due to the certain affected factors. Thus the H1 is rejected.

Sources: research works.

Table-4. The correlations between dependent variables and independent variable.

Correlations

		Annual GDP	Exchange rate	Inflation rate
Annual GDP	Pearson Correlation	1	.549**	-.456*
	Sig. (2-tailed)		.007	.029
	N	23	23	23
Exchange rate	Pearson Correlation	.549**	1	-.468*
	Sig. (2-tailed)	.007		.024
	N	23	23	23
Inflation rate	Pearson Correlation	-.456*	-.468*	1
	Sig. (2-tailed)	.029	.024	
	N	23	23	23

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: research work

In Pearson correlation, correlation coefficient measures the strength and direction of the linear relation between above variables. It varies between -1 and1, where -1 indicates strongly negative relationships between two variables and 1 determine strongly positive relationships between two variables.

The above correlation also supports that, there is a positive relationship between the exchange rate and real GDP. And the extent of the correlation is very high about 0.6. Thereafter, there is negative correlation between annual GDP and inflation rate.

The correlation between independent variables is not very strong which a good point, because a high correlation between the independent variables means there is multi-collinearity. Since the correlation between exchange rate and inflation is lower than 0.5, we can say that there is less chance of multi-collinearity. So, the overall correlation analysis shows that the exchange rate has a significant positive relationship with GDP, while inflation has a significant negative relationship with GDP. However, these bivariate correlations should not be interpreted as evidence of causality.

5- Conclusion and concluding

In Afghanistan, many initiatives have been taken for economic growth and development, especially post-reestablishment in 2001. Different factors have been pointed out in different sectors to be managed well and designed demand-based policies for economic growth. The financial sector is one of the important pillars of a country's economic system. Banking provision, financial provisions, market identification and justification, identifying the primary financial market, adopting a floating exchange rate, management of inflation and deflation, and so many other initiatives have been taken.

Two independent variables of this study entitled Inflation and Exchange Rates have interconnections with economic growth and the overall economic situation in Afghanistan.

It has been shown in historical data that there's variation in the inflation rate, which the evidence explores, and that there is no demand-based inflation in the country. Due to certain economic and political reasons, there was 26.41866415% inflation in CPI in 2008, which this year could call out as the worst financial year for the consumers and economic growth of Afghanistan. Historical data shows there was 13.82631955% GDP growth in 2007 and 21.39052839 in 2009, but it was 3.9% in 2008, which is less than the average growth rate from 2003 to 2021, and the inflation rate was 26.4% in the same year.

The finding of correlation also says there is a negative correlation between annual GDP and inflation rate, which is consistent with theoretical justification. The policy implementers and executive have to work better for the management of inflation. It has been found that according to the economy level of the country, the specified inflation rate, which is identified in the beginning of every financial year, is an indicator and predictor of the economic growth. The central bank and other financial and economic sector authorities have to focus on the market and manage the demand and supply in the financial and non-financial sectors. As it has been found in the research that the relationship between inflation and economic growth is nonlinear, and this paper also found that the increasing rate of inflation affects negative economic growth in Afghanistan, which could be the effect of other related factors and instability in the economic system of the country.

It could say, at least a stable economy needs a stable rate of inflation, where the high inflation rate could have a vital negative impact on the economy of the country, so the government has to focus on better implementation of monetary policy, better management of the banking sector, reducing the deficit of the national budget, and other macro and micro factors of Afghanistan's economy to control the inflation rate in the country. In the meanwhile, the exchange rate is also an important factor for the overall economy of the country and has an initial role in Afghanistan's economy.

The finding of the paper says there is a positive relationship between the exchange rate and real GDP, and the extent of the correlation is very high, about 0.549, which is equal to 5.49%, and the P-value is 0.007, which is statistically significant at the 0.01 level. It explores strong evidence of a relationship. Therefore, the correlation coefficient of annual GDP and inflation rate is in negative relations, which is -0.425, equal to -4.56, and the p-value is 0.029 in the 0.05 significant level, which states moderate evidence of relationship.

As a conclusion, the economic growth is mainly related to national income, expenditures, production level, investment, inflation rate, and export and import balance. Whether: It could be actual economic growth and potential economic growth. Therefore, economic growth is related to both economic and non-economic factors in Afghanistan, like natural resources, capital accumulation, organizing of production, distribution of work and measurement of the production, infrastructural changes, social factors, human factors, political factors, and so on. For sustainable growth and development, it has recommended using the potential opportunities and getting an advantage in every sector of the economy. Especially in the financial sector, the monetary, fiscal, and other economic policies, as well as other national and local economic policies, have been implemented properly for the sustainable growth and development of the economy of Afghanistan.

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