Factors affecting the Inflation in Sudan During the period from 2000 -2022

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ABSTRACT

The paper aimed to study the factors affecting inflation in Sudan (2000-2022). The paper followed to econometrics approach thorough a liner regression model on time series data .The paper hypotheses were: that there is a statistically significant relationship between inflation and the money supply, exchange rate, and government expenditure, and the paper reached results, the most important of which is that money supply and the exchange rate affect directly and positively in the inflation rate. The most important recommendations came, the need to pay attentions to reducing inflationary pressures, with the aim of stopping the deterioration of the value of Sudanese pound and then improving it, and this can only be achieved by increasing the real gross product, and paying attention to government expenditure on infrastructure and productive activity that contributes to expanding the productive capacity of economy.

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1. Introduction:

Inflation is considered one of the most important economic indicators by which the economic performance of countries is measure Therefore we find that macroeconomic policies always work to control the general level of prices by designing specific policies that reduce inflation ,rates Sudan like any other developing country has been suffering from the low performance of macroeconomic indicators which is represented by an imbalance between aggregate demand and supply. It from time to time The high rate of inflation in Sudan in recent years is attributed to structural problems that have been associated with the Sudanese economy, as the governments growing expenditure has contributed greatly to the rise in inflation, especially since this spending is not matched by real production as it is funded It has the right to increase the money supply, which is considered one of the most important sources of high local prices .Recent years have witnessed a steady rise in the growth rates of the money supply in Sudan, due to several factors, the most important of which is the increase in the deficit in financing the public budget through borrowing from the Central Bank, and as a result of the increase in government ,expenditure and the lack of public revenues of the state, the fiscal deficit in 2019 reached 11% of the GDP.Total as public revenues (excluding grants) amounted to only 5.4% of GDP in 2020. So the budget deficit was financed by inflationary finance, which led to an increase in the inflation rate, reaching 60% in 2018, and it reached an increase until it reached 230% in October 2020 . (Annual report of the Bank of Sudan, P. 35.2020).What are the factors affecting inflation rates in Sudan? And to what extent does inflation affect of macroeconomic indicators in Sudan?. Based on these questions, the study hypotheses can be follows as formulated :

Paper hypotheses:

1-There is a relationship between Inflation and the money supply .
2-There is a relationship between inflation and the exchange rate.

3-There is a relationship between inflation and government expenditure .

Paper objective::

1- Identify the factors affecting the inflation in Sudan during the period from (2000-2022.)

2-Clarifying the relationship between inflation and macroeconomic indicators in Sudan .

paper Importance:

The paper consists of following, econometerics model to clarify the factors affecting inflation in Sudan studying the data, information and indicators received during the study period from(2000-2022)

Paper methodology:

The paper relied on the analytical descriptive approach, and the Applied econometrics approach using the multiple linear regression model, specifically the OLS method in estimating the relationship between the study variables. The study relied on time series data from some secondary sources such as publications and specialized periodicals during the period from 2000-2022.

Paper Structure:

The paper was divided into four axes as follows, the first axis deals with inflation, its concept and types, the second axis deals with the theories that explain inflation, then the third axis reviews the macroeconomic indicators and the development of inflation rates in Sudan (money supply, exchange rate and government expenditure),the fourth axis deals with building a model Inflation and its impact on the components of the macroeconomic in Sudan, and evaluation of the results of the assessment, and finally the results and recommendations.

Previous studies:

The study of Habbab Al-Tom Sharif (2015): entitled The Impact of Inflation and the Exchange Rate on the Balance of Payments in Sudan during the period from 2002-2013 . The results of the study, the most important of which is that the increase in inflation rates leads to an increase in the deficit in the balance of payments?

The study of Rayan Ibrahim Al-Hussein (2014): entitled Using models of simultaneous equations to study the determinants of inflation in Sudan in the period from 1990 - 2013 . The study aimed to know the factors that affect inflation and indicate its impact on the Sudanese economy. The most important of which is that the independent variables affect inflation, including the money supply, gross domestic product, and the exchange rate.

The study of Amira Muhammad Bashir (2010): Determinants of inflation in Sudan during the period from 1980-2008.The study aimed to know the factors that affect inflation rates in Sudan, and to study the phenomenon of inflation through a model that explains the behavior of the phenomenon. In which the researcher followed the descriptive approach and the standard approach in the analysis, and the study found that there is a direct relationship between import prices and inflation.

The study of Abdul Majid Al-Makawi' (2002): entitled The problem of inflation in Sudan, causes and solutions in the period from 1982 - 1999, the researcher followed the descriptive-historical approach in collecting data and the standard approach in estimating the model to reveal the causes of the problem, and the researcher concluded that the government resorted to borrowing from the Central Bank to finance the budget deficit is one of the main causes of inflation in Sudan.

2. Methodology :

The expression of the economic phenomenon in a mathematical form, and the direction of the relationship between the variables of the study is based on what economic theory provides, and inflation here as an economic phenomenon is similar to behavioral functions in that it is affected by some variables. From this logic, the model variables are determined. Inflation as a dependent variable is defined as the variable that Determine its value According to the values taken by other variables called independent variables.

First axis: inflation concept and types:

Inflation is considered one of the macroeconomic phenomena that preoccupied economists in the seventies and eighties of the last century, due to the large negative economic effects that inflation had on the economy in general. The goal of treating inflation and maintaining price stability is one of the basic goals that governments seek to achieve, which is considered an indicator of Government failure or success.

Concept of Inflation:

Inflation is defined as a continuous rise in the cost of living, due to what the rise in prices leads to the increase in the cost of purchasing commodity groups that the consumer is accustomed to purchasing.

There is another trend in defining inflation that focuses on its manifestations and effects. It defines inflation as a rise in the general level of prices and an increase in the means of purchase in the possession of the public without a corresponding increase in traded goods.

This means that inflation is not just the amount of money, nor is it just an increase in spending, as some might think. If the amount of money increased and that was followed by an increase in employment and consumer goods produced, there would be no rise in prices.(Mohamed Abdalla, P.117 , 2018) .

Types of inflation:

Demand Pull Inflation:

It is inflation due to demand as a large amount of money chasing a small amount of commodities, and this inflation lies in the tendency of prices to rise in the face of excess demand.

On the side of aggregate demand, high prices lead to a reduction in the volume of real money and push individuals to liquefy their interest-bearing financial assets (i.e. convert them into money for the purpose of satisfying their transactions). Interest is the incentive for investment, and the decrease in investment

continues until the original incentive (the rise in prices) stops.

On the aggregate supply side, we find that high prices increase the marginal productivity of the worker at each level of employment, i.e. the labor demand curve shifts to the right, and therefore we find that employment increases without a corresponding increase in wages (Farid Bashir, Abdul Wahab, p. 43, 2012).

Cost Push Inflation :

This explanation of inflation depends on the phenomenon of change in costs on the effect of changes in money wages on the general level of prices. Or in the sense that higher wages push producers to estimate higher prices for goods and services at each level of use, since use and production are directly related through the production function, this means that each level of production will require a higher level of prices, and accordingly the aggregate supply curve shifts up (Farid Bashir, Abdul Wahab, op. Cit, p. 48, 2012).

Second axis: Theories explaining inflation:

Economists presented many theories that try to provide an explanation for the nature and causes of inflation, and multiple criteria and classifications were used for these theories. From the beginning of the fifties until the beginning of the sixties of the twentieth century, the explanations of inflation were based on the concept of excess demand for goods and services. In this context, a distinction was made between the theories of attracting demand and paying alimony as an explanation for the phenomenon of inflation.

With the beginning of the sixties of the same century, modern interpretations of the phenomenon of inflation emerged based on distinguishing between the role of economic variables and the role of non-economic factors in the formation of inflation. These explanations were known as market theories of inflation and non-market theories of inflation.

Another trend emerged to interpret inflation, called the structuralisms, and they refuse to treat inflation as a purely monetary phenomenon. In contrast, they view inflation as a phenomenon with a socio-economic content that is organically linked to the phenomenon of underdevelopment and development challenges facing third world countries.(Farid Bashir, and Abdul Wahab, op. Cit, p. 54 , 2012).

Modern Explanations of Inflation:

With the beginning of the seventies of the twentieth century, the distinction appeared between the variables that explain inflation, whether they were economic or non-economic variables. The explanation of inflation through the interpretation of the behavior of trade units and prices using social and political variables.

The distinction between these two theories for the study of inflation focuses on the fact that the owners of the market theory believe that prices and wages change slowly in response to changes in market forces, whether actual or potential. The content of this is that the focus is on the fact that the increase in prices and wages occurs in response to potential actual conditions of market forces.

As for the supporters of the school that depends on non-economic variables, they believe that prices and wages are taken independently of the state of demand in the markets for goods, services and labor (Mohamed Abdalla, op. Cit, P.119 ,2018).

Market theories of inflation:

A/ inflationary gap model:

The market theory of inflation is based on a clear distinction between conditions of unemployment and the state of full employment. The economist Keynes was the first to introduce this idea, and it was known as the inflationary gap. This idea is based on the distinction between full employment and equilibrium. Equilibrium may be achieved at levels of employment or employment that are higher or lower than the level of full employment, meaning that full employment is a state of balance between other cases.(Farid Bashir, Abdul Wahab, op. Cit, p. 66 , 2012).

The inflationary gap is the situation in which aggregate demand (aggregate spending) is higher than aggregate supply at the full employment level. In the sense that there is a surplus in demand for goods and services, and this surplus leads to an increase in the general level of prices and perhaps wages.

The inflationary gap may also occur as a result of the equality of aggregate supply and aggregate demand, but far from the level (output, income, employment) that achieves full employment. In other words, the inflationary gap occurs when the aggregate supply is equal to the total expenditure, and this equilibrium situation is higher than the full employment level.(Mohamed Abdalla, op.Cit, P.120,2018).

B/ Simple Phillips Curve Model:

As a result of the events that the world went through in the post-World War II period, the inflationary gap model proved incapable of explaining the economic reality, as full employment could not be reached except through a rise in the general level of prices.

And through a historical study of the English economy for a period of one hundred years during the period from 1861-1957, the economist Phillips presented a curve known as the Phillips curve, through which he proved the existence of an inverse relationship between the inflation rate and the unemployment rate.

In this curve, the change in the amount of money affects inflation and does not affect the output, meaning that reducing inflation rates is at the expense of surplus and increasing labor, and vice versa for the classics, that unemployment is constant (Mohamed Abdalla, op.Cit, P.121,2018).

Non-market theories of inflation:

These theories are based on the assumption that wages and prices may rise independently of the state of demand for goods and services in the market, and these non-market theories are based on the fact that inflation is a reflection of social variables.

As for the point of view that prices rise to the top due to non-economic variables, it was presented as an explanation for inflation in Britain after World War II, and this idea is based on the existence of monopolistic powers for trade units, and the dominance of the concept of monopolistic market structures.

So the economic units, through monopoly power, increase the share of wages as a component of national income and protect living standards, and each unit tries separately to reduce its members in relation to the other units.

However, the abnormal increase in wages would create a gap between them and others, prompting the others to try to demand an increase in wages to bridge this gap, and then the continuation of the upward trend in prices due to the increase in wages.(Mohamed Abdalla, op. Cit, P.123 , 2018).

Compared to the competitive market, the industry that is concentrated in a monopolistic market has a greater willingness to accept higher wages, because the alternative is strikes and work stoppages by workers.

Structuralisms Explanation of Inflation:

From the beginning of the seventies of the last century, a new trend appeared in the interpretation of inflation called the term structuralisms, and they refuse to treat inflation as a purely monetary phenomenon. On the other hand, they view inflation as a phenomenon with a comprehensive social and economic content that is organically linked to the phenomenon of underdevelopment and development challenges facing third world countries. It is represented in a group of structural imbalances of economic activity in its dimensions, whether objective, organizational, in-kind or monetary (Mohamed Abdalla, op. Cit, P.126 , 2018).

Third axis: The macroeconomic indicators and the evolution of inflation rates in Sudan:

The stability of macroeconomic indicators is considered a necessary need, to build local and

international confidence in the business environment, and These economic indicators are considered a reflection of the interaction of aggregate demand and supply, and the low performance of these indicators leads to structural imbalances in the economy of any country. Sudan, like any other developing country, suffers from structural problems in the economy, so the need has arisen to address these structural problems so that the Sudanese state is able to establish productive economic relations. Attracting investments, supporting the growth of companies, and improving foreign trade. These imbalances are linked to current economic indicators. All of the following: (Howaida ,op. Cit. p. 61, 2016).

- Current government expenditure, the budget deficit, and deficit financing have witnessed a steady rise in recent years, as the Statistics show that current spending increased in the period from 2010 to 2014 from 24 billion to 38.8 billion, i.e. 25% at a time when The policy adopted was to reduce Spending. This increase in the volume of current spending was not matched by a similar increase in non-public revenues. Oil after oil resources left the budget, which led to an increase in the resource gap and the budget deficit, and the Ministry of Finance was forced to resort to borrowing from the central bank to cover the deficit, and this led to an increase in inflationary pressures, as The fiscal deficit in 2019 reached 11% of the GDP, while the 2020 budget reflected a deficit of 1.6% billion dollars, and government spending represents 19% of the GDP.(Annual report of the Bank of Sudan. P. 35.2020).

-The Sudanese economy witnessed a clear decline in growth rates in the gross domestic product. A year ago, in 2011. (the year of separation), the growth rate in GDP decreased from 5.2% in 2010 to 1.9% in 2011, then 1.7% in 2012 .This is due to a number of reasons, the most important of which is the secession of the South and the exit of oil resources. The structural imbalances that limit Production plays an additional role in the continued decline in growth rates, which led to an increase in imports by filling the supply gap. Local consumption and an increase in the

effects of imported inflation on local prices, in addition to a decline in Growth rates are Structural imbalances related to production result in a continuous rise in production costs. production, which in turn led to an increase in inflationary pressures and a contraction in the Sudanese economy, as a result of the negative growth of the gross domestic product in 2018, when it decreased by 8.2%. In 2020, as a result of the outbreak of the Covid-19 epidemic, the per capita GDP decreased by 62%. During the past five years, the per capita GDP decreased from 1.910% US dollars in 2015 to 0.730 US dollars in 2020 (Guvas Asari et al. p. 43, 2020).

-The deterioration of the national currency exchange rate increases the impact of the external sector on rising prices. It also helps indirectly to raise inflationary pressures, as the impact of the price of... Spending on inflation rates in Sudan is greater and more important than the effect of monetary changes, i.e. (the effect of the growth of the monetary supply), and the current instability of the exchange rate and the increasing gap between the official price and the parallel price, which has reached more than 25%, It created a climate that had a negative impact on foreign exchange sources, and this led to an acceleration of the parallel exchange rate below the official rate until its value reached 250 Sudanese pounds. One US dollar per person in 2020.(Guvas Asari et al., op. Cit., p. 46 2020).

Inflation rates have evolved in Sudan:

Inflation is considered one of the most important macroeconomic indicators by which the level of economic performance of countries is measured. Therefore, we find that the macroeconomic Policies always works to control the general level of prices, by designing Certain policies work to reduce inflation rates, which in turn affects other economic variables, and it has Government expenditure has played a major role in the rise in inflation rates

in Sudan, especially since this spending is not matched by This is real production, as it is financed by printing money. In order to facilitate the analysis of developments in

inflation rates during the period under study, they were divided into three periods: (Abdel-Wahab Othman, p, 42 , 2001)

First period of year 2000-2004:

During the period (2000-2004), the government adopted comprehensive structural and economic reform programs, which were based on consistency between macro and sectoral policies, by rationalizing spending and maintaining the size of To borrow from the banking system at the legal levels and the movement of liquidity, and this has helped Start producing And the export of oil, which subsequently generated foreign exchange, which led to stability in the exchange rate, and Accordingly, inflation rates began to decline successively until they reached a single correct number, and continued Inflation rates began to decline, and this was helped by the start of the production and export of oil, where it was The decline in inflation rates until it reached 8% at the end of 2000, then stabilized in 2004 as a result of the depletion in foreign exchange reserves, as inflation rates ranged between 5% and 8% during the period.

The highest inflation rate was 8% in the year 2000 and the lowest was 5% in the year 2001. The arithmetic mean of the inflation rates during the period was 14.7 and its median was 8.6, and the inflation rates were distributed on the side.

The standard deviation from the arithmetic mean is 13.8 (International Monetary Fund, Country Report No. 14/364, 2014).

Second period of year 2005-2015:

During this period, there were several factors affecting the Sudanese economy. The peace agreement in 2005 AD, then the secession of the South in 2011, which led to an expansion in the rate of government expenditure, a decrease in the states oil resources as a result of its transfer to the government of the south, the global crisis in In 2008, the volume of external transfers decreased and the external flows resulting from Exporting oil, which affected the balance of payments, the exchange rate and the

budget deficit, and these effects were reflected in to inflation rates and gross domestic product. (World Bank, ,Issue No. 02-2012) .

During this period, inflation rates remained stable at single digits and did not rise again, even after the The peace agreement and the accompanying expansion in government spending were signed, and as a result of the global crisis, The secession of the south and the subsequent cessation of foreign investment flows and the withdrawal of petroleum resources from the country' s revenues. Government and expected revenues from petroleum transportation The inflation rate rose to 14% in 2008, and the inflation rate continued to rise slightly, but it rose to 35.1% in 2012 and below 7.2% in 2006, as inflation rates continued to rise and reached its highest level in 2013, when it reached 37.1. %, its lowest level was in 2015, when it reached 16.9%. The arithmetic mean of inflation rates during this period was 14.4, and its median was 12.2. Inflation rates were distributed with a standard deviation from the arithmetic mean of 9.1.(Annual reports of the Bank of Sudan for the years 2000-2021).

Third period of year 2015-2022:

During this period, the Sudanese economy suffered from a continuous and increasing financial deficit, an increase in government expenditure, and a decrease in the states public revenues, as the budget deficit in 2019 reached 11% of the GDP, as public revenues (excluding grants) amounted to only 5.4% of the GDP. Total in 2020. Therefore, the increase in government expenditure and the decrease in the states general revenues made it necessary to finance the budget deficit by borrowing from the Central Bank, which led to an increase in the inflation rate, reaching 60% in 2018, and it continued to rise until it reached 230% in October 2020.(Annual report of the Bank of Sudan .op. Cit, P. 35.2020) .

Fourth axis: building model:

Expressing the direction of the relationship between the variables of the study in the form

of a mathematical form, is based on what is presented by the theory of Interactive, and inflation here as an economic variable is similar to behavioral functions in that it is affected by some other economic variables. From this standpoint, the variables of the model were determined. Inflation, as a dependent variable, is known as the The value of which is determined according to the values taken by the independent variables.

Formation of Economic Relations:

The formulation of a model of the factors affecting inflation in sudan which econometrics models were used to test assumptions related to economic relations in a quantitative, and the data that were dealt with in these models are the money supply, the exchange rate in addition to government expenditure in the period (2000-2022) According to the following formula:

INF = f(MS , OEX , GEX)

whereas:

INF: Inflation measured by the price index (it is the continuous rise in the general level of prices of goods and services during a specific period of time, and the consumer price index is a statistical method for measuring changes in the prices of goods and services purchased by the consumer).

MS: money supply (in the broad sense of M1 and M2, and includes all means of payment for the public).

OEX: the exchange rate (it is the price of the Sudanese pound against the US dollar, meaning that one unit of the dollar is equal to a number of Sudanese pounds).

GEX: Government expenditure (the amounts spent by the government or any public legal person with the intent to achieve public benefit).

Determine the mathematical form of model :

The mathematical form of the model means the number of equations contained in the model (it may be a linear or non-linear model), and the mathematical form shows that inflation is a function of the money supply, the exchange rate and government spending.

$$INF = \beta 0 + \beta 1\ MS + \beta 2\ OEX + \beta 3\ GEX + Ut$$

Data analysis and processing:

Economic relations usually include explanatory variables that are linked to dependent variables through unknown parameters that are estimated by standard analysis in the presence of random errors resulting from errors in the measurement of these variables. Therefore, the accuracy of the estimates depends mainly on the size and nature of the errors, so the accuracy of the model must be improved. Standard through the primary analysis of the data, especially if the data is related to time series. (Tariq Mohammed -Al Rasheed .et al, p,45,2014) .

Series stability test:

A time series is a set of observations whose data are unstable and related to each other, and this instability leads to unreliable predictions. There are many tests that can be applied to time series data, the most important of which are:

1-Testing unit roots: When testing unit roots, it is necessary to determine whether the variables under study are stationary at their level or when calculating the initial difference. There are several tests that can be used through program packages ready to test the stationary of the series, the most important of which are:

1-1Philips-peron Test:

The Philips-Peron test to measure the accuracy of the data and the capabilities of the model to test the stillness and stability of the series or unit root, which is based on including a number of differences with time gaps until the problem of autocorrelation disappears. If the regression coefficient of the standard formula is equal to one, then the model leads to the existence of the unit root problem, which suffers from the instability of the series.(Tariq Mohammed Al-Rasheed et al, p, 45,2014) .

It is known that if the value of the Philips-perron test (calculated value) is greater than (critical value) at 5% significance level for a variable data series, this indicates the stability of the series. According to Table (1), after conducting the test, it was found that all variables stabilized in the first difference.

Tables and Figures are presented in center as shown in Table and Figure .

Table No. (1) Results of Philips - peron test for stability variable

Study variables	Calculated Value (Philips Peron)	The critical value is at a 5% significance level.	The stability level of Series
IF	0.726482	3.004861	The first difference
MS	5.754813	3.004861	The first difference
OEX	6.342862	3.004861	The first difference
GEX	6.523148	3.004861	The first difference

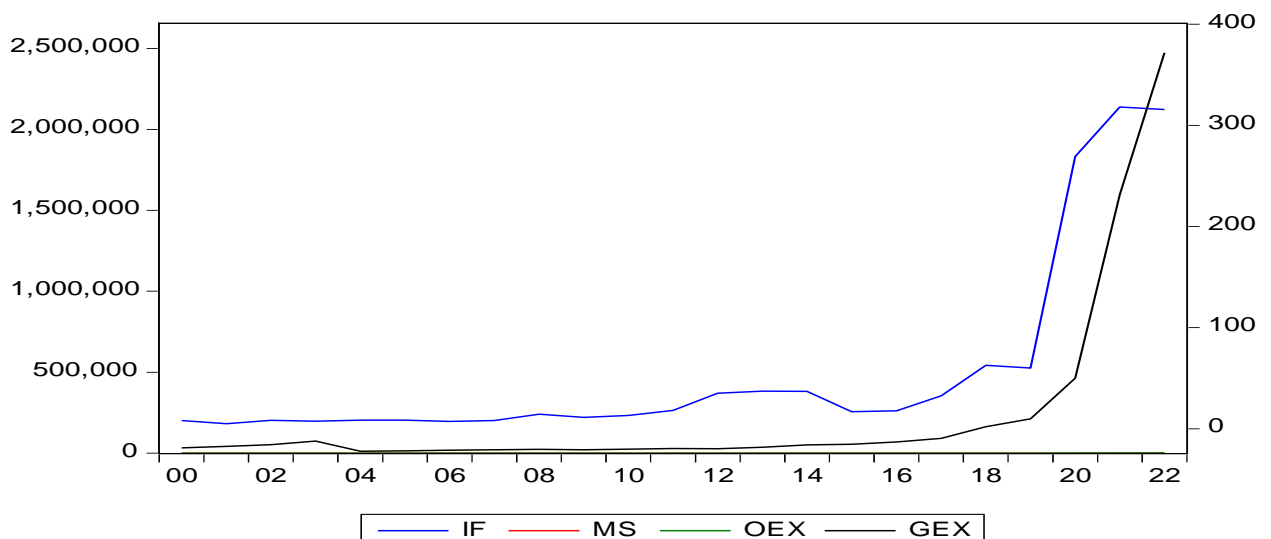.Source: Prepared by the researcher using (Eviews) program

Figure (1) the relationship between the dependent variables and explanatory variables in the period from 2000 - 2022**.**

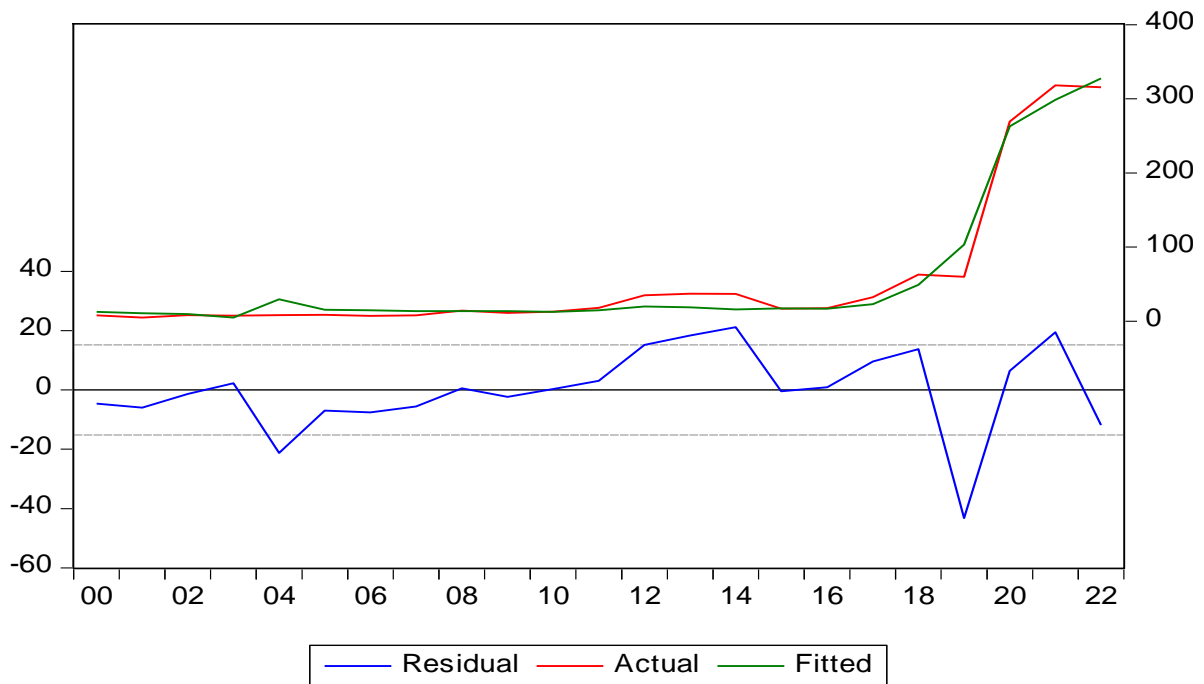Source: Prepared by the researcher using (Eviews) program

Figure (2) - the relationship between the residual & actual & fited model of inflation in the period from 2000)

Source: Prepared by the researcher using (Eviews) program

Table (2) Results of estimating the linear model of the Inflation function.

Variables	Coefficient	Std. Error	t-Statistic	Prob
C(Constant)	15.92457	3.570191	4.460427	0.0003
(MS (Money supply	1.59E-05	3.08E-06	5.146956	0.0001
(OEX (Exchange Rate	0.778089	0.143482	5.422902	0.0000
(GEX (Government expenditure	-0.000333	4.25E-05	-7.840115	0.0000
57.39130	Mean dependent var		0.979288	R-squared
98.19145	S.D. dependent var		0.976018	Adjusted R-squared
8.438030	Akaike info criterion		15.20602	S.E. of regression
8.635508	Schwarz criterion		4393.236	Sum squared resid
8.487695	Hannan-Quinn criter.		-93.03735	Log likelihood
1.922442	Durbin-Watson stat		299.4528	F-statistic

Source: Prepared by the researcher using (Eviews) .

R-square = 0.97, Adjusted R-squared =0.98, Prob (F-statistic)= 29 . F-statistic =0.0000 Durbin-Watson statistic= 1.92

Estimation Command:

LS IF C MS OEX GEX

Estimation Equation :

$$IF = C(1) + C(2)*MS + C(3)*OEX + C(4)*GEX$$

Substituted Coefficient:

MS *05-IF = 15.9245732593 + 1.5855993696e -OEX *0.778088553884 + GEX*0.000332816626262

3. Results and discussion

1- Evaluation of the model according to the economic criterion:

Through the standard analysis table No. (2) and looking at the (Coefficient) column, the Intercept sign was positive (15.92457), which corresponds to the economic theory, and it represents the intrinsic force of the effect of inflation or the general price level (1.59E-05) It agrees with the economic theory that assumes a positive direct relationship between the money supply and inflation, as well as the exchange rate coefficient is positive (0.778089), which agrees with the economic theory that assumes a positive direct relationship between inflation and the exchange rate. The sign of the government expenditure coefficient was negative (-0.000333) which contradicts the economic theory that assumes a direct relationship between inflation and government expenditure .

2 - Evaluation of the model according to the statistical standard:

The significance of the estimated features: It is done through the standard analysis table No. (2) and by looking at the (Prob) column, the probabilistic value of money supply (MS) is equal to (0.0001), which is less than the level of significance (0.05), and therefore we reject the null hypothesis and accept the alternative hypothesis that It states that the parameter is accepted and that it is significant, and it agrees with the economic theory, which states a direct positive relationship between money supply and inflation, and an increase in the rate of money supply contributes to a rise in the rate of inflation.

Likewise, the probabilistic value of the exchange rate (OEX) is equal to (0.0000), which is less than the significance level (0.05). Therefore, we reject the null hypothesis, and the alternative hypothesis is accepted, which states that the parameter is accepted and that it is significant, and it agrees with the economic theory that assumes the existence of a direct positive relationship between inflation and the exchange rate. A constantly high exchange rate leads to a high rate of inflation and vice versa.

The probability value of the government expenditure (GEX) is equal to (0.0000), which is less than the significance level (0.05). Therefore, we reject the null hypothesis, and the alternative hypothesis is accepted, which states that the parameter is accepted and that it is significant, and it agrees with the economic theory that assumes an inverse relationship between inflation and government spending. In the sense that government expenditure plays a major role in reducing inflation, especially if this government expenditure is offset by real production and an increase in GDP that leads to a reduction in inflation.

The quality of reconciliation of the estimated equation: This is done by means of the (R-squared) test, which is called the modified coefficient of determination. What occurs in inflation is due to the independent variables, and the remaining 3% is the effect of random variables that are not included in the model, which indicates the quality of reconciling the estimated equation.

Significance of the overall model: This is done by means of the (F) test and it is

compared with the probability value and the level of significance (0.05). The regression is not significant. And from Table No. (2) through the value of Prob(F-statistic)=29 which was (0.000000) The model as a whole is significant.

3 - Evaluation of the model according to the standard:

The standard criterion is represented in measurement problems, including the problem of autocorrelation, and after conducting the analysis, it was found that the value of Durbin-Watson (1.92), and this value approaches the standard value (2), and this means that the model does not suffer from the problem of autocorrelation.

4 - The problem of difference in variance:

For regression analysis, the random error term is constant, meaning that the average difference between adjacent observations increases or decreases significantly with the passage of time, otherwise the data is characterized by the presence of a problem of difference in variance. Among the tests to discover the problem of difference in variance is the Arch Heteroskedasticity Test:

Table No.(3) to discover the problem of difference in variance. It was found that the value of (0.008)(Obs*R-squared) = and the probability value is equal to (0.9) Prob, and this value is greater than the level of significance (0.05). Therefore, the model does not suffer from the problem of variation in variance.

Table No(3) Heteroskedasticity Test: ARCH

	Heteroskedasticity Test: ARCH		
0.9309	Prob. F(1,20)	0.007700	F-statistic
0.9267	Prob. Chi-Square(1)	0.008467	Obs*R-squared

Source: Prepared by the researcher using (Eviews)

5- Testing the model stability to predict:

One of the tests that is used to determine the model's ability to predict is the Thiel's equality test. The more the Thiel's coefficient is less than one, the more the model has the ability to predict future values, and vice versa. In this model, we find that the value of the Thiel's coefficient is equal to (0.06). Figure (3)value below It is less than one, which means that the model has the ability to predict future .
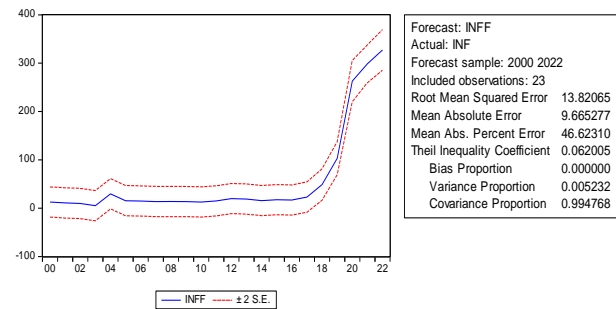

Figure (3) Testing the ability of the model to cpredi

4. Conclusions :

- The positive direct relationship between inflation and the money supply came according to the economic theory that assumes a direct relationship between inflation and the money supply, meaning that there is a clear effect of the money supply on inflation rates, as an increase in the money supply rate contributes to an increase in the inflation rate in light of the stability of the gross domestic product and the lack of income growth Real, the amount of goods and services produced.

-The positive direct relationship between inflation and the exchange rate came according to the economic theory that assumes a direct relationship between inflation and the exchange rate, meaning that there is a clear effect of the exchange rate on inflation rates, as the constantly high exchange rate leads to a high rate of inflation and vice versa.

-The inverse relationship between inflation and government expenditure , according to economic theory, assumes an inverse relationship between inflation and government expenditure . In the sense that government spending plays a major role in reducing inflation, especially if this government expenditure is offset by real production and an increase in GDP that leads to a reduction in inflation.

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