



## The effectiveness of monetary policy in Sudan (for the period 2000-2021)

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### Abstract:

The study aimed to identify the effectiveness of monetary policy in Sudan, and to know the developments that occurred in monetary policies during the study period. The most important results: the most important of which are: that there is a direct statistically significant relationship between the rate of inflation and the money supply. The most important recommendations: the most important of which are: The necessity of building a robust and comprehensive economic database in order to obtain the statistics and data required to manage the overall policies.

**Key words:** monetary policy; inflation; money supply; Sudan.

**Jel Classification Codes:** O, O11

### 1.Introduction:

Monetary policy has played a prominent role in combating inflation rates in many developed and developing countries, and this is what made it take the lead in macroeconomic policies despite the effectiveness of other policies. Governments, through their central banks, direct their monetary policy to achieve economic goals that are consistent with their directions. The structural changes that took place in the Sudanese economy during the period from (2000-2021) within the framework of macro policies brought about major developments or transformations in the monetary sector, which negatively affected the exchange rate of the local currency and a successive increase in inflation rates.

#### 1. Research methodology

##### 1.1 Study Problem

The problem of the study was raised in a number of questions, the most important of which are:

- What is the effectiveness of monetary policy in the Sudanese economy?
- Is there a relationship between high inflation rates and an increase in the money supply?

##### 1.2 Study Objectives

- Assessing the effectiveness of monetary policies in the Sudanese economy.
- Knowing the developments that occurred in monetary policies during the study period.

##### 1.3 Study Importance

The task of the study comes from the role that politics plays in addressing the phenomenon of high prices in Sudan and its negative effects on the performance of the national economy.

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### 1.4 Study Hypotheses

- Monetary policy contributed to price stability.
- There is a statistically significant relationship between price increases and some macroeconomic variables.

### 1.5 Study Methodology

The study followed the descriptive and analytical approach and the use of the (E.views) program to estimate the standard model and test the quality of the model's parameters.

### 1.6 Previous Studies

**Study, Khalid Ahmed (2015):** The study aimed to find the best models of monetary and fiscal policy tools to combat inflation, and to know the extent of the impact of these policy tools in reducing the severity of high inflation rates. The most important findings of the study proved the ineffectiveness of the financial policy tools represented in taxes, government spending and deficit financing in combating inflation. The study also proved the superiority of the dual model of monetary and fiscal policy in combating inflation.

**Study, Noah Hasan (2011):** The study aimed to evaluate the extent of the success of economic policies in breaking the economic stalemate, and evaluating the impact of economic reform and structural adjustment policies on the performance of monetary policies, experiments, and resource employment. The most important results of the research are that the government was able to maintain control of inflation rates at the targeted levels and the stability of the local currency exchange rate. The efficient use and consistency of monetary financial policies affects the level of economic activity positively.

## 2. Study Literature

### 2.1 Monetary Policy Concept

politics means: "the management of a general matter in a group, a measure in which the meaning of improvement and reform predominates." As for idiomatically: "it is intended to manage the affairs of the state" (Ahmed Mustafa, 2009, p.66) And politics became an idiomatic expression for the rules and behaviors by which the nation's affairs are managed in its government, legislation, judiciary, in all its executive and administrative powers, and in its external relationship that connects it to other nations. The affairs of the nation in the aspect related to it, monetary policy is related to the monetary aspect of this nation (Atyea Abdel Wahid, 1993). It was also known as (the principles and rules of community management such as economic policy, monetary policy, agricultural policy and trade policy). Politics is to follow a method or method to manage the various aspects of society, whether it is related to the economic, financial, monetary, agricultural, industrial or commercial aspects (Salih Moftah, 2005).

### 2.2 Quantitative monetary policy tools

Monetary policy represents one of the most important elements of the economic policy system that can be used to achieve the economic goals of society. The monetary policy aims primarily to influence the money supply and interest rates, which in turn affect the level of economic performance in general. The central bank is directly responsible for drawing up and implementing monetary policy, and using Specific tools to achieve set goals. Among the most important tools of quantitative monetary policy (Eniya Ghazi, 1983):

#### **-Open Market Operations:**

Open market operations are the most important (indirect) quantitative monetary policy tools, which represent the main determinant of changes in the money supply and interest rates. The cash reserves of buyers (usually commercial), which means an increase in the ability of banks to grant loans, and consequently an increase in the money supply and a decrease in short-term interest rates (Suleiman Magdy, 2000).

#### **-Change the discount rate:**

The increase in the discount rate leads to a high cost of borrowing from the central bank, which reduces the desire of commercial banks to borrow from the central bank, and thus decreases the

cash reserves available to them and their ability to grant credit, and then the money supply decreases, and the opposite occurs in the case of the central bank by reducing the discount rate. The central bank affects the amount of discounted loans, either through the discount rate or through the amount of discounted loans (Mohammed, 2014).

**-Legal Reserve Ratio:**

The Central Bank has the authority to determine the percentage of cash reserves that banks must maintain to meet customer demands. This authority is an effective tool that the central bank can use to influence the money supply and interest rates. The high percentage of legal cash reserves means a shortage in cash balances that the bank can use to grant loans, which negatively affects the money supply. But if the central bank reduces this percentage This means allowing the banks to grant more loans, which leads to an increase in the money supply of money. The main advantage of using the legal cash reserve ratio is to influence the money supply and interest rates that apply to all banks in a similar manner and are effective in influencing the supply (Ahmed, 2009).

A small change in the legal monetary reserve ratio leads to a tangible change in the money supply, but the administrative difficulties that may sometimes surround the policy of changing the legal monetary reserve ratio may limit the possibility of using this policy, and this policy suffers from another defect, which is that raising the legal monetary reserve ratio It may create a problem of lack of liquidity, especially banks that do not have sufficient excess balances. Moreover, the continuous change of the legal cash reserve ratio creates a state of certainty, which makes it difficult for banks to avoid the problem of lack of liquidity. Therefore, central banks rarely resort to the policy of changing the cash reserve ratio. Legal (Al-Mhal, 2004).

**2.3 Evaluation of monetary policy tools**

it is not necessary to use the three tools when one tool can perform its full function, improving the performance of central banks in controlling the money supply and focusing on money growth to avoid the effects of discount operations and change in the cash reserve ratio, but the use of monetary policy tools sometimes requires combination Between two or more instruments for controlling the money supply and credit, especially the coordination between open market operations and the discount rate policy. When the central bank wants to reduce credit in order to fight inflation by raising interest rates, it sells its securities and the commercial banks meet it as buyers, which lowers their reserves. His policy is to raise interest rates on loans and bonds, and this is what drives depositors to subscribe to bonds, and this leads to a decrease in banks' liquidity, and thus a decrease in bank credit, and sometimes some banks work to avoid a decrease in their reserves, that is, to avoid increasing their indebtedness to the Central Bank.

But due to the pressure of the need in which these banks are to find funds to repay their debts to the Central Bank, they use secondary reserves, and this in turn will reduce credit and raise interest rates. In the case of deflation, the central bank can combine the two tools of the open market and the rediscount rate (Ahmed, 2009), and it enters as a purchaser of securities, and this is what makes the reserves of commercial banks in a good condition, and this procedure is not sufficient because commercial banks may use sums of these Precautions to pay off its debts to the Central Bank, Or you buy other assets that have more revenue, and interest rates may not decrease but rather rise, and in this case the central bank resorts to supporting this with another tool, which is reducing the rediscount rate, and it supports the proposal for coordination between monetary policy tools, especially between the two tools of the open market and the rediscount rate, given For the efficiency of their work with each other rather than the work of each one tool in isolation from the work of the other.

As for the legal reserve tool, it is not widely used as a general tool for monetary policy, such as the use of the tools of open market operations and the rate of rediscounting, because changing the legal reserve ratio confuses the future plans of banks, as it does not differentiate between banks. Any change in the legal reserve ratio causes important effects on banks' reserves, which makes the central bank have to use another tool to combat the work of the reserve tool, such as

open market operations to mitigate the impact of changing the reserve on deposits and lending to banks, and this is true in developed countries because they have money markets And developed finances, but in developing countries, they do not have such markets, and if they exist, they are not developed, but they can control credit through the obligatory reserve tool (Younis, 2013).

#### **2.4 Central bank management of monetary policy**

Central banks, through their management of monetary policy, seek to achieve a set of main objectives, including:

##### **-Increasing the level of employment:**

There are many negative economic and social effects that result from an increase in unemployment rates, and these effects include increasing financial pressures on unemployed individuals and depriving them of the standards of living they enjoyed before losing their jobs, as well as psychological suffering resulting from a lack of a sense of self. The increase in unemployment rates represents a favorable environment for the high rates of various crimes, and negatively affects the members of society.

The presence of a high level of unemployment does not only mean that there are unemployed human resources, but also means that there are other idle means of production such as idle production units and unused machinery and equipment, which ultimately leads to a decrease in the level of GDP (Al-Rih, 2012).

##### **-Increasing the rate of economic growth:**

There is strong relationship between economic growth and the high level of employment. Economic growth is achieved by using and raising the level of efficiency of economic resources. Since work is one of these resources, achieving high rates of economic growth largely includes a high level of employment. The economic administration always seeks to increase the rates of economic growth using various economic policies, including monetary policy, and the economic policy may aim to encourage economic growth directly by encouraging companies to invest or encouraging individuals to save for the purpose of providing more cash resources to companies wishing to invest. It is the main objective of what is known as supply-side policies, which are those economic policies that seek to achieve economic growth by providing tax benefits to companies to encourage them to invest in machinery and equipment, as well as providing tax benefits to individuals to encourage them to save more (Ismail, 2002).

##### **-Achieving price stability:**

The interest in price increases is not new, but the past few decades have witnessed an increasing interest by economic policy makers to work towards achieving relative stability in the general level of prices, in order to avoid the economic and social effects of inflation.

##### **-Stability of interest rates:**

Achieving the stability of interest rates is one of the most important objectives of monetary policy, given the harmful effects of fluctuations in interest rates on the level of the national economy.

##### **-Stability of financial markets:**

The international financial crises of recent years, the collapse of financial markets in 1987, the financial crisis that hit Southeast Asian countries (1997-1998) and the financial crisis of 2008 have made clear the extent of the damage that such crises can do.

#### **3. Evaluate the effectiveness of monetary policy tools**

The effectiveness of monetary policy is measured by the extent to which monetary authorities are able to control the money supply, which is used as an intermediate objective to influence other macroeconomic indicators such as the rate of GDP growth, inflation rate, and the exchange rate of the national currency. In managing monetary policy, the Bank of Sudan went through two different phases in terms of methodology and tools. In terms of methodology, monetary policy in Sudan remained in the first phase, which extended until the mid-nineties, as a mere reflection or product of fiscal policy without having an effective role or an independent personality. Its main role was limited to financing the budget deficit and providing financing to large

government institutions, especially large agricultural projects, and directing banks to allocate their financing to priority sectors. This role of monetary policy continued in the stage in which the Sudanese banking sector was operating in the traditional system, and it remained at the same pace in the first stage after the transition to the Islamic banking system (Al-Rih, 2012).

In the second stage, and since the mid-nineties, monetary policy in Sudan took an active and independent position from fiscal policy, whereby there became a specific methodology according to which objectives, means and procedures are determined. In terms of the effectiveness of monetary policy tools, the first stage, including the first period of Islamization of the banking system, was characterized by focusing on direct tools represented in credit ceilings and directives issued to banks on how to employ their resources. After the mid-nineties, the switch to indirect tools was made. Noting that the tools that were employed in the pre-Islamization period included interest rates and discount rates for government bonds based on the interest rate. In the second stage, the interest rate and all associated tools were excluded and new tools were introduced that comply with the legal foundations. This stage also included the employment of other tools such as the legal cash reserve on deposits in local and foreign currency and financing windows, which also worked to achieve the role of the last financier (the lender), the profit margins and the customer's contribution to Participation contracts in addition to buying and selling foreign exchange.

After 1998, there was a paradigm shift in monetary policy, as the Bank of Sudan devised indirect mechanisms for managing monetary policy and regulating liquidity, as well as making modifications to existing tools to make them more efficient and effective. In June 1998, the certificates of participation of the Central Bank (Shamam) and then the Certificate of Government Participation (Shahama) were introduced as tools for regulating liquidity in the economy. The set of tools currently available to the Bank of Sudan is sufficient to regulate liquidity and manage monetary policy with a reasonable degree of efficiency at this stage of economic development in Sudan, if the capabilities inherent in it are fully utilized. The Bank of Sudan employs the legal cash reserve through Shahama and Shamm, the financing windows, the murabaha margins and the ratios of participants in regulating liquidity.

During the period from 1990-1999, the main role of the legal reserve was the precautionary role to ensure and protect deposits, and Shahama and Shamm certificates were employed during the year 2000 to regulate liquidity. Funding auctions through the investment window play a major role in addressing seasonal funding gaps and meeting the requirements of the leading sectors in the economy while benefiting Many banks out of the liquidity financing window to address their temporary problems. As for the murabaha margins, they are used as an indicator of the banks' desire and direction of the Central Bank with regard to the cost of financing and the rates of return on investment in the economy (Norine, 2010).

### **3.1 Effectiveness of Determining Credit Limits**

Credit ceilings are considered one of the most effective tools for determining the amount of credit, as it is difficult for commercial banks to circumvent them, but it is accepted that they limit the freedom of commercial banks to follow an independent policy to distribute their direct investments and investment portfolios. The Bank of Sudan used sectoral credit ceilings to direct bank credit to certain sectors (the agricultural sector) by directing banks to finance specific ratios for specific production sectors. Some banks did not finance the sectors that the Central Bank of Sudan directed to finance with specific percentages of the ceiling (such as the agricultural sector) due to the high risks in them, and consequently some banks left those resources unused, or they may have turned to financing other sectors to achieve a profit and return for the bank. Lead to the ineffectiveness of this tool (Abdullah, 1999).

### **3.2 The effectiveness of literary persuasion**

The Bank of Sudan continued to use the moral persuasion tool to manage monetary and financing policy, and developed this mechanism in the form of monthly and periodic meetings with the Sudanese Banks Association, as well as with boards of directors and general managers

of commercial banks, with the aim of discussing the policies undertaken by the Central Bank, and the expected role of banks in implementation, in addition to identifying obstacles and problems during the implementation process. The Central Bank of Sudan also used indirect literary persuasion in the form of issuing periodic publications such as the annual report, the statistical summary of foreign trade, the economic and financial presentation, the banking magazine, the monthly economic bulletin, seminars, seminars, and others.

### 3.3 Effective Profit Margins and Participation Ratios

Murabaha profit margins and participation rates are among the first Islamic tools used by the Bank of Sudan in managing monetary and financing policy. These two tools regulate supply and demand for bank financing, and their effectiveness lies in the following aspects (Al-Rih, 2012):

**Regulating the financing offer:** raising the margin of Murabaha and increasing the participation rate increases the banks' offer of financing due to the availability of resources and vice versa. On the other hand, raising the margin and increasing the participation rate limits the demand for financing.

**Creating a balance between the demand and supply of bank financing:** by preparing an appropriate indicator for the profit margin and participation rates.

**Correcting the balance of payments situation:** Increasing the Murabaha margin and the participation rate contributes to raising the cost of production, which leads to an increase in the prices of national products and thus not competing in foreign markets, and vice versa in the case of reducing the Murabaha margin and the customer participation rate, and limiting the effectiveness of these two tools. timeframe and customers defaulted on payment.

### 3.4 Effectiveness of the legal cash reserve

the cash reserve is considered one of the most successful tools used in the field of credit control, financing and liquidity reduction, and that the effectiveness of the reserve ratio is focused on limiting the expansion of credit and financing, as it works to neutralize part of the banks' resources, and it is an effective remedy in the event that it is aimed at reducing Inflation rate. In the event of a recession and the desire to pump more bank financing, the effectiveness of the ratios decreases, and thus the degree of response of commercial banks is slow due to their fear of risks and the lack of verification of the absorptive capacity of their products in the market.

### 3.5 Effectiveness of open market operations

The sale and purchase of Shahama and Shamm certificates is one of the Islamic alternatives for managing monetary and financing policy in Sudan, and the distinguishing feature of the banking system in Islam is the absolute prohibition of receiving or paying the interest rate. Therefore, the certificate of Shamm and Shamm is evaluated. Although the period of time in which the Bank of Sudan deals with magnanimity and Shamm is considered short and not sufficient to pass a judgment on it, the initial evaluation of the experience clearly indicates its success as indirect mechanisms for monetary policy and liquidity management, and that it provides the Central Bank with a reasonable alternative to bonds based on The interest rate for intervention through open market operations. The use of these certificates was very effective, which constituted a catalyst for the success of monetary policies. It also contributed to stabilizing the exchange rate and reducing the inflation rate to 14.2% and then to 8.1% during the years 1999 and 2000 AD, and the volume of financing provided to the private sector increased from 52.6 to 92.5 billion dinars, and the real GDP growth rate increased from 6.2% in 1999 to 8.3% in 2000 AD. However, there are risks to these certificates from the privatization program pursued by the state to dispose of their assets, which is represented in the erosion of the base of the funds representing Shamm and Shahama. Therefore, it is necessary to seek alternative mechanisms. A set of other certificates were developed during the period from 2000-2014 AD (indirect tools) for monetary policy (Nourin, 2010).

#### 4. Applied study

##### 4.1 Specification Model

Based on the model formulation stage, which means expressing the economic theory in a probabilistic mathematical form, the proposed model is as follows:

$$M = B_0 + B_1 INF + U$$

$M \equiv$  money supply (the dependent variable).

$B_0 \equiv$  constant.

$INF \equiv$  inflation (independent variable).

$B_1 \equiv$  inflation factor.

$U \equiv$  random variable.

Economic theory predicts a positive relationship between money supply and inflation and a positive signal.

**Table .1. unit root test**

Variable	ADF Test Statistic	5% Critical Value	Level
<b>M</b>	14.59408	3.1222	(Level)
<b>INF</b>	5.399751	3.1801	(2 <sup>nd</sup> )

Source: Prepared by the researcher, from the study data

It is noted from Table No. (1) that the value of the (ADF) test with respect to (M) amounted to (14.59408), which is greater than the critical value at a significant level of 5% equal to (3.1222), if we reject the null hypothesis and accept the alternative hypothesis that the variable (M) is stable at the level And the value of the (ADF) test in relation to (INF) reached (5.399751), which is greater than the critical value at a significant level of 5%, equal to (3.1801), if we reject the null hypothesis and accept the alternative hypothesis that says the stability of the variable (INF) in the second 2nd difference).

**Table .2. Co integration Regression Durbin Waston**

Variable	Likelihood Ratio	5 Percent Critical Value
<b>M</b>	26.143	15.41
<b>INF</b>	2.6428	3.76

Source: Prepared by the researcher, from the study data

It is noted that the value of the greatest possibility ratio (LR) for money supply amounted to (26.143), which is greater than 5% (15.41). And also that the value of the greatest possibility ratio (LR) for inflation amounted to (2.6428), which is less than 5% (3.76), which means that there is a vector of co-integration and therefore that the data of variables in the long term will behave similarly. The model represents a true, not false regression.

##### 4.2 Estimation Equation

**Table .3. Estimation Equation**

Dependent Variable: M(-1)

Method: Least Squares

Date: 03/24/22 Time: 05:21

Sample(adjusted): 2000 2021

Included observations: 22 after adjusting endpoints

Variable	Coefficien	Std. Error	t-Statistic	Prob.
	t			
C	84.79915	2.335695	3.228353	0.0047

INF(-2)	68.51921	1.559611	6.252793	0.0002
R-squared	0.834749	Mean dependent var	10.96045	
Adjusted R-squared	0.787235	S.D. dependent var	1.312618	
S.E. of regression	3.571938	Akaike info criterion	16.19176	
Sum squared resid	10.32014	Schwarz criterion	16.29133	
Log likelihood	-159.9176	F-statistic	39.09742	
Durbin-Watson stat	1.703428	Prob(F-statistic)	0.000007	

Source: Prepared by the researcher, from the study data

According to the proposed model:

$$M = B_0 + B_1INF + U$$

$$M = 84.799 + 68.51921INF + U$$

$$R^2 = 0.83 \quad D.W=1.70$$

### 4.3 Model evaluation stage

**Evaluation of estimates according to the standard of economic theory:** From Table (3), the constant ( $B_0$ ) represents the average money supply, which is determined by factors other than the variables mentioned in the model. It is noted from the results of the analysis that the value of the constant ( $B_0$ ) is equal to (84.799), which is a positive value and it matches the pronunciation of the economic theory.

As for ( $B_1$ ), which represents the slope of the money supply curve in relation to the inflation rate, the result of the estimation is positive (68.51), which is identical to the utterance of the economic theory, which states that there is a direct relationship between money supply and the rate of inflation. In standard terms of estimation ( $B_1$ ), any increase in the inflation rate by the equivalent of one unit will lead to an increase in the money supply by (68.51).

**Evaluation of estimates according to the statistical criteria:** It is noted from the results of the analysis that the probabilistic value of the inflation rate factor Prob (0.0005), a value less than the level of significance (0.05), and therefore the parameter becomes significant. The probability value of the coefficient of the constant Prob is (0.0047), which is less than the level of significance, and therefore it becomes significant. These significant results indicate a causal relationship between the independent variable inflation rate, and the dependent variable money supply. While the standard error of the estimates is Std. Error, which is used to measure the dispersion of the obtained estimates around the real coefficients, and the greater the size of the standard error of the coefficient, the lower the degree of dependence on it and vice versa. Where the standard errors of the estimated parameters of the GDP coefficient were estimated at (2.335), and for the constant at (1.55) if through the transactions it became clear that there is a decrease and thus it can be relied upon.

It is noted from the results of the analysis that the coefficient of determination R-squared amounted to (0.83), which means that the independent variable rate of inflation affects the dependent variable money supply by 83% and the rest of the amount of 17% is due to the variables not included in the model and this is an indication of the quality of the model. The Adjusted R-squared coefficient of determination was (0.78), which is called the adjusted coefficient of determination and is used for the same purpose, but it is more accurate than the coefficient of determination. The estimation error is S.E. of regression (3.571938) The smaller this number indicates the fewer errors. He estimated the sum squared resid (10.32).

It is also noted that the value of the F-statistic) amounted to (39.09) and the probabilistic value of the test Prob amounted to (0.00007), which is a value less than the probability value (0.05).



#### 4.4 Evaluation of estimates according to the standard criterion

This standard relates to the examination of detection of measurement problems, as follows:

**Detecting the problem of autocorrelation of residuals:** Through a statistical value (Durbin-Watson stat), it is noted that it is equal to (1.70), a value that is close to the standard value that ranges between (1.50 - 2), and this means that the model does not suffer from a problem of autocorrelation of residuals.

**Detection of the variance difference problem:** From Table No. (4) White Heteroskedasticity Test, it is noted that the value of Obs\*R-squared(1.084) is greater than the value of Prob (00.5), and therefore we accept the null hypothesis and reject the alternative hypothesis that there is no problem of variance instability .

**Table .4. Contrast difference**

White Heteroskedasticity Test:

F-statistic	0.936055	Probability	0.064661
Obs*R-squared	1.084476	Probability	0.058642

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 03/24/22 Time: 05:23

Sample: 2000 2021

Included observations: 20

Variable	Coefficien t	Std. Error	t-Statistic	Prob.
C	302572.9	1218688.	0.248278	0.8069
INF(-2)	107943.2	808925.6	0.133440	0.8954
INF(-2)^2	8128.314	120586.7	-0.067406	0.9470
R-squared	0.704224	Mean dependent var	516008.2	
Adjusted R-squared	-0.712926	S.D. dependent var	979769.1	
S.E. of regression	1033611.	Akaike info criterion	30.67250	
Sum squared resid	1.82E+13	Schwarz criterion	30.82186	
Log likelihood	-303.7250	F-statistic	0.036055	
Durbin-Watson stat	1.393073	Prob(F-statistic)	0.064661	

Source: Prepared by the researcher, from the study data

#### 5. Results

1. The study proved that there is a direct, statistically significant relationship between the rate of inflation and the money supply.
2. The study proved the significance of the function based on the foregoing tests of the regression coefficient.
3. The internal inconsistency between macroeconomic indicators has contributed to the ineffectiveness of monetary policy.

#### 6. Recommendations

1. The necessity of improving the local production environment and attracting investments to states where investment opportunities are available in agriculture in order to bring about a balanced development that ensures continuity and national integration.
2. It is necessary to develop a special program for the development of manufacturing industries for agricultural raw materials that are exported as raw materials.
3. The necessity of building the value of the monetary unit of the Sudanese currency against the foreign currency to achieve economic stability.

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