The Impact of Monetary and Fiscal Policy on GDP In Yemen: An Econometric Study for the Period (2000-2022)

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ABSTRACT

This study aims to examine the impact of monetary and fiscal policies on gross domestic product (GDP) in Yemen during the period 2000–2022. The independent variables include broad money supply (M2), total public expenditure, total public revenue, and the trade balance, while GDP represents the dependent variable. The study adopts a descriptive-analytical approach, utilizing time-series descriptive statistics and the Autoregressive Distributed Lag (ARDL) model to test the hypotheses using EViews13. The findings reveal a significant long-run relationship between monetary and fiscal policies and GDP. Approximately 74% of the variation in GDP is explained by the independent variables, while 26% is attributed to other factors not included in the model. The results indicate a positive impact of money supply, public revenues, and the trade balance on GDP, whereas public expenditure exhibits a negative effect.

Keywords: Monetary Policy, Fiscal Policy, Trade Balance, Gross Domestic Product (GDP)

INTRODUCTION

Monetary and fiscal policies are among the most important tools of economic policy used by governments to achieve macroeconomic objectives. Interest in these policies has evolved through various historical phases, particularly in response to global economic crises such as the Great Depression, inflationary episodes, and stagflation. These crises contributed to the emergence of different schools of economic thought, each proposing mechanisms for addressing macroeconomic imbalances through the effective use of policy instruments.

With the advancement of modern economic theory, monetary and fiscal policies have become central pillars for achieving economic stability and development. These policies play a vital role in improving living standards, promoting equitable income distribution, and enhancing the state's capacity to provide essential services such as education, healthcare, and social welfare.

In developing economies, monetary policy is often influenced by fiscal policy, particularly in the context of deficit financing, which may lead to inflationary pressures. While monetary authorities aim to maintain price stability, fiscal authorities can mitigate inflation through improving budget management, increased revenues, and reduced reliance on monetary financing.

In the Yemeni context, the country has implemented several monetary and fiscal reforms since the 1990s. However, the outbreak of civil conflict in 2014 has led to profound institutional and economic disruptions. This study, therefore, investigates the impact of these policies on GDP over the period 2000–2022, covering both pre-conflict and conflict phases.

Study Problem:

The Republic of Yemen has experienced significant economic and institutional transformations as a result of the civil war that began in 2014. These developments raise an important question regarding the effectiveness of monetary and fiscal policies in influencing GDP under conditions of economic instability and institutional fragmentation.

Study Questions:

1. What is the impact of monetary policy (money supply) on GDP?
2. What is the impact of fiscal policy (total public expenditures, total public revenues) on GDP?
3. What is the impact of the trade balance on GDP?

Study Objectives:

The primary objective of this study is to assess the impact of monetary and fiscal policies on GDP in Yemen during the period 2000–2022. This objective is achieved through the following sub-objectives:

1. To evaluate the effect of monetary policy (money supply) on GDP.
2. To assess the impact of fiscal policy (public expenditure and public revenue) on GDP.
3. To analyze the effect of the trade balance on GDP.

Study Importance:

The importance of this study stems from the significance of monetary and fiscal policy, which relies on a set of objectives, tools, and mechanisms to achieve desired goals. These include using these tools to achieve economic stability. The Yemeni economy has suffered for decades from numerous structural imbalances, most notably the imbalance in the production structure and its dependence on oil as the sole source of revenue. This has led to the misallocation of resources, weak production, and exchange rate instability, which is one manifestation of these imbalances. The Yemeni economy has also been subjected to several internal and external shocks, including exchange rate fluctuations and a decline in GDP.

The study gains additional importance because it examines monetary and fiscal policies in light of the fragmentation of the economic and financial institutions responsible for managing these policies in Yemen. This fragmentation is a consequence of the conflicts and wars, and it has inflicted damage on the banking sector in particular and the business sector in general. Furthermore, it has led to discrepancies in foreign exchange rates in areas controlled by warring parties due to the existence of two circulating currencies, as well as variations in the prices of goods and services, all of which impact GDP and economic development.

Study Hypotheses:

Based on the study's questions and objectives, this study tests the following hypotheses:

Main Hypothesis 1: There is a statistically significant long-term effect (at a significance level of 5%) of monetary policy (money supply) on GDP.
Main Hypothesis 2: There is a statistically significant long-term effect (at a significance level of 5%) of fiscal policy on GDP.
Sub-Hypothesis 1: There is a statistically significant long-term effect (at a significance level of 5%) of total public expenditure on GDP.
Sub-Hypothesis 2: There is a statistically significant long-term effect (at a significance level of 5%) of total public revenue on GDP.
Main Hypothesis 3: There is a statistically significant long-term effect (at a significance level of 5%) of the trade balance on GDP.

STUDY METHODOLOGY

This study employs a descriptive-analytical approach that integrates both theoretical and empirical analysis. The theoretical framework reviews monetary and fiscal policy concepts, while the empirical analysis examines the evolution of GDP in Yemen using econometric techniques.

The ARDL model is applied to analyze both short-run and long-run relationships among variables. The study utilizes time-series data and applies appropriate statistical tests, including unit root tests, co-integration analysis, and diagnostic tests, to ensure model validity and robustness.

Study Scope:

The scope of the study was as follows:

1. Subject Matter Scope: The study focused primarily on monetary policy as an independent variable, represented by the broad money supply (M2), and fiscal policy as a second independent variable from which the sub-variables were derived: public expenditure (EXPT), public revenue (GRV), the trade balance (TB), and the dependent variable, the gross domestic product (GDP).
2. Geographical Scope: The study was conducted in the Republic of Yemen.
3. Time Scope: The study spanned the period from 2000 to 2022.

LITERATURE REVIEW:

This section reviews previous studies that examined the relationship between monetary and fiscal policy and GDP or economic growth, which were applied in different contexts, as follows:

The study by Utouh & Kitole (2025) aimed to measure the effectiveness of fiscal and monetary policy on growth and structural transformation in Tanzania from 1966 to 2022, relying on bank data and using the Auto Regressive Distributed Lag (ARDL) model. The study concluded that government spending negatively affects economic growth, while monetary variables such as money supply and exchange rates affect growth differently. The money supply stimulates growth in the short term, while exchange rates have significant long-term effects. Both fiscal policy (government spending and taxes) and monetary policy (money supply) play an important role in structural transformation, promoting global integration, and improving income distribution.

The study by Hakimah Y. (2025) aimed to analyze the role of monetary and fiscal policies in achieving macroeconomic stability, particularly in the context of economic growth and inflation in developing countries. The study concluded that Monetary policy is an effective tool in managing inflation by controlling interest rates and the money supply. In contrast, fiscal policy contributes to stimulating economic growth through government spending and taxes. However, it is often constrained by public debt levels and inefficient resource allocation.

A study by Pervaiz, B., et al. (2024) aimed to evaluate the effectiveness of monetary and fiscal policy tools in achieving economic stability in Pakistan, relying on secondary data issued by the Pakistani government during the period 1986–2022. The results showed that the money supply has an impact on economic growth; its effect was negative in the short term on GDP before becoming positive starting in the third year, witnessing a significant increase. This indicates the effectiveness of expansionary monetary policy in the medium and long term. The study also concluded that fiscal policy was relatively more effective than monetary policy in supporting economic growth. A study by Hanifa and Mustafa (2023) aimed to test the impact of monetary policy on economic growth in the Saudi economy using a sluggish distributed lag autoregression model. (ARDL) during the period (1990–2022). Gross Domestic Product (GDP) was used as the dependent variable, while the independent variables were: (M3, the interbank interest rate, and the inflation rate). The results showed a long-term equilibrium relationship between the study variables, along with a statistically significant effect of monetary policy on short-term economic growth, while its long-term effect was relatively weak.

Al-Burkani's study (2022) aimed to analyze the impact of government stability indicators on economic growth in Yemen, and to measure and analyze the dimensions of good governance, particularly the institutional and economic dimensions. The study concluded that the development programs adopted by the state during the period (2006–2020) did not achieve the desired goals, nor did they meet the aspirations of society. GDP witnessed a gradual decline during the study period until the economy reached a stage of contraction of (30%). The study attributed this to the nature of the Yemeni economy, which is heavily dependent on oil, gas, and agriculture.

Azaizi's study (2023) aims to assess this study the impact of monetary policy tools on macroeconomic indicators in Algeria, aiming to achieve monetary and economic stability and to determine their contribution to internal and external stability. The results show that money supply growth is directly related to monetary stability, while both the rediscount tool and real GDP have inverse effects in the long and short term. In the short term, the required reserve ratio has a positive effect on monetary stability, while interest rates have a negative effect.

A study by Belbas and Al-Juwaijati (2022) aimed to measure the impact of the interaction between monetary and fiscal policies on GDP in Iraq, based on the importance of coordinating these two policy tools to achieve economic objectives. The study concluded that the integration of monetary and fiscal policies positively affects GDP, reflecting the pivotal role of coordination between them in supporting economic activity, creating added value, and enhancing economic and monetary stability.

A study by Samsuddin and Selvia (2021) aimed to analyze the effectiveness of monetary and fiscal policies in achieving economic growth in five Asian countries. (Indonesia, Malaysia, the Philippines, Thailand, and Vietnam) during the period (1998–2019). Monetary policy was measured by the inflation rate, fiscal policy by government spending, and economic growth by the growth rate of GDP at constant prices. The results showed that monetary policy was more effective than fiscal policy in the countries studied, as fiscal policy had no significant impact on economic growth. This is attributed to the inefficiency of public spending allocation, the high proportion of unproductive expenditures, and the influence of political factors on fiscal policy, especially in volatile market environments.

The study by Ramadan and Rabah (2021) aimed to determine the impact of monetary and fiscal policies on economic growth according to specific time periods and individual contexts. It used panel data from several Arab countries during the period 2000–2019, countries that had undergone economic reforms since the early 1990s aimed at enhancing the flexibility and efficiency of economic policies. The study found a positive impact of monetary and fiscal policies on economic growth, represented by the effect of the money supply and public investment on the economic growth rate. Conversely, a negative impact of foreign exchange reserves was observed, albeit to a limited extent. The results also revealed variations in the magnitude and direction of the impact among the countries studied, reflecting the different structural and institutional characteristics of each economy.

The study by Sawwan (2020) aimed to measure the impact of coordination between monetary and fiscal policies on economic growth during the period 1990–2018, focusing on the case of Algeria. The study concluded that a policy mix based on a contractionary monetary policy and an expansionary fiscal policy is the most suitable combination for stimulating growth in the Algerian context. It found that fiscal policy is the dominant policy in Algeria, is cyclical in nature, and is more sensitive to fluctuations in output. Furthermore, it suffers from a limited capacity to control the fiscal deficit due to institutional constraints. This has led to monetary policy being subordinated to fiscal dominance considerations in order to contain public debt and achieve fiscal balance.

A study by Awad (2019) aimed to measure the impact of monetary policy on economic growth in developing countries, using Malaysia as a model during the period 1990–2015. It found an inverse relationship between narrow money supply and the economic growth rate in Malaysia.

A study by Idris (2019) aimed to demonstrate the relative impact of monetary and fiscal policies on output growth in a small, open economy, specifically focusing on the Nigerian economy during the period 1980–2017. The results showed that both policies have a positive and significant impact on economic growth, with monetary policy showing relative superiority in terms of effectiveness. The study emphasized the importance of fiscal discipline, noting that

monetary policy cannot achieve its objectives in the face of persistent fiscal imbalances, and that maintaining a stable macroeconomic environment is a prerequisite for keeping monetary aggregates within the limits of targeted growth. The study by Bashir (2016) aimed to examine the relationship between government spending and GDP in Algeria using annual time series data for the period 1980–2014. The study concluded that there is no equilibrium relationship between government spending and GDP in either the short or long term. Furthermore, the results showed that government spending is not statistically significant in explaining economic growth. The study attributed this to the dominance of unproductive spending, particularly military spending, at the expense of productive and social sectors such as education and health, thus limiting the effectiveness of public spending in supporting economic growth.

The Distinguishes Aspects of this Study Compared to Previous Studies:

This study is distinguished by several methodological and thematic aspects that set it apart from previous research. These can be highlighted in the following points:

1. To the best of the researcher's knowledge, this study is the first in Yemen to examine the impact of monetary and fiscal policies on GDP, taking into account the repercussions of the war and the fragmentation of economic institutions on these variables. This is achieved by relying on official data issued by the conflicting parties during the period 2016–2022. The inclusion of the war and institutional fragmentation within the analytical framework is one of the most significant contributions of this study.

2. The current study relied on three sub-variables to measure monetary policy: the money supply (M2), it also addressed two variables to measure fiscal policy: total public expenditures and total public revenues. Furthermore, the inclusion of an additional variable, the trade balance, enhances the comprehensiveness of the analysis and contributes to explaining the transmission channels between economic policies and GDP.

3. The study was also distinguished by its comparative analysis of economic statistical data issued by the two parties to the conflict in Yemen, represented by the internationally recognized government (Aden) and the de facto authority (Sanaa). This is an aspect that previous studies have not addressed in such a comparative analytical manner.

Applied Econometric Study for the Period (2000-2022)

Constructing Equations and Estimating the Model:

The econometric model formulation stage is one of the most important stages in model building, as it involves identifying the independent variables that can influence the dependent variables. Based on theoretical approaches and previous studies, the following model was developed:

Estimating and Constructing the Model: The Impact of Monetary and Fiscal Policies on Gross Domestic Product:

GDP= f(EXPT, GRV,M2,TB)

$GDP= \alpha_0+ \alpha_1 EXPT+ \alpha_2 GRV+ \alpha_3 M2+ \alpha_4 TB$

Since:

α_0	The constant term represents the remaining factors affecting GDP that were not mentioned in this study.
α_1	Total public expenditure coefficient.
α_2	Total public revenue coefficient.

α_3	Broad money supply coefficient.
α_4	Trade balance coefficient.
GDP	Gross domestic product.
EXPT	Total public expenditure.
GRV	Total public revenue.
M2	Broad money supply.
TB	Trade balance

The Model Adopted in the Study (Analysis Methodology and Mathematical Form of the Model):

The study adopted the ARDL methodology, Pesaran, Shin & Smith (2001). This methodology integrates autoregressive models and distributed lag models into a single model. Consequently, the time series function as a lag function, slowing down their values and the values of the current independent variables. The ARDL methodology is characterized by...

Standard Study Procedures and Tests (Pre-tests):

The standard study involves several stages, starting with stability tests, then examining the relationship in the short and long term, and finally testing the limits and determining lag periods. These stages are represented by the following steps:

Tests of the General Trend of the Study Variables:

This section presents the general trend of the study variables as follows

The General Trend of the Money Supply Variable:

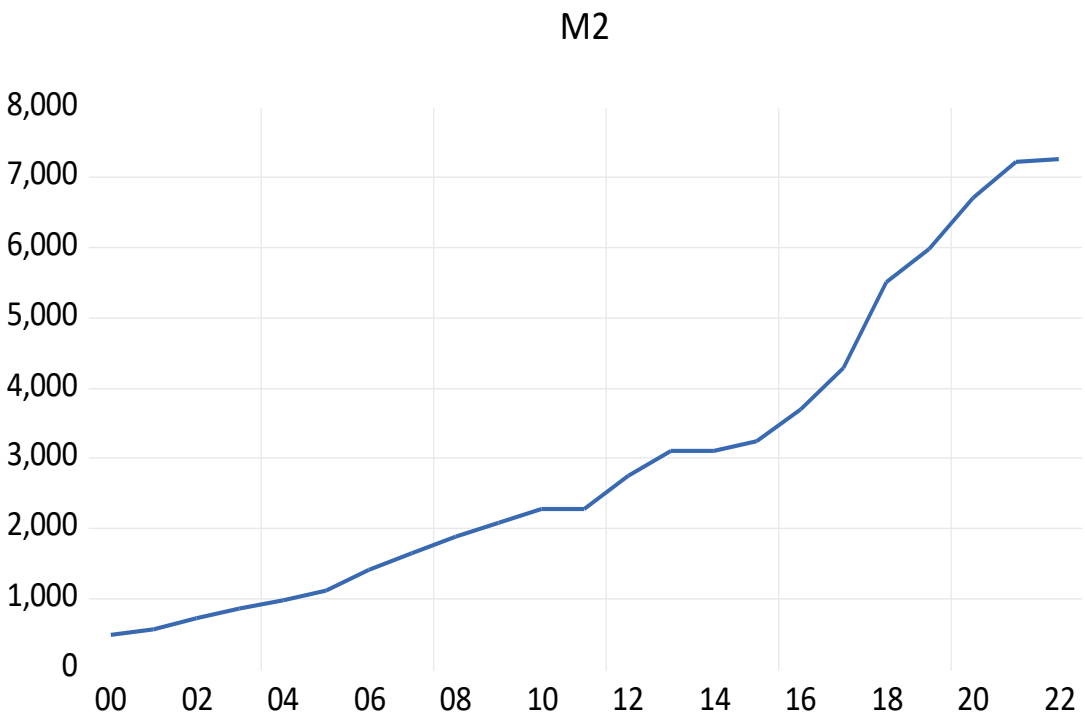

Figure (1) General Trend of the Money Supply Variable

General trend of the public expenditure variable

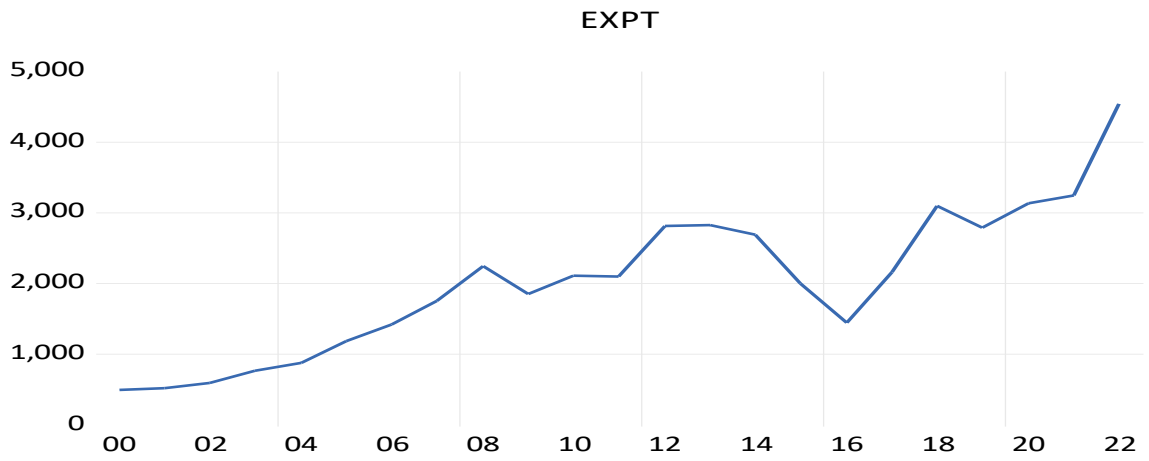

Figure (2) General trend of the public expenditure variab

3-2-1-3: General trend of the public revenue variable

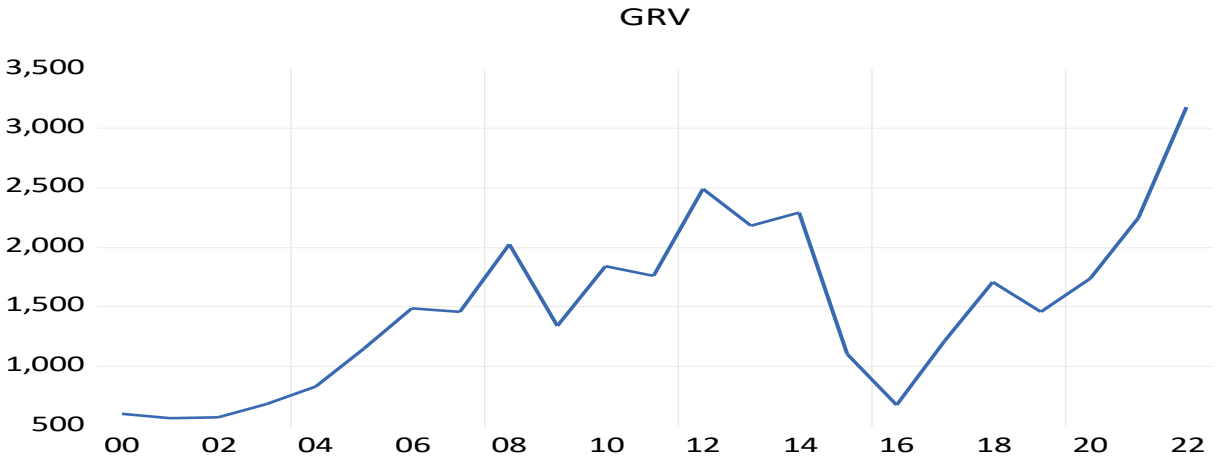

Figure (3) General trend of the public revenue variable

General trend of the trade balance variable

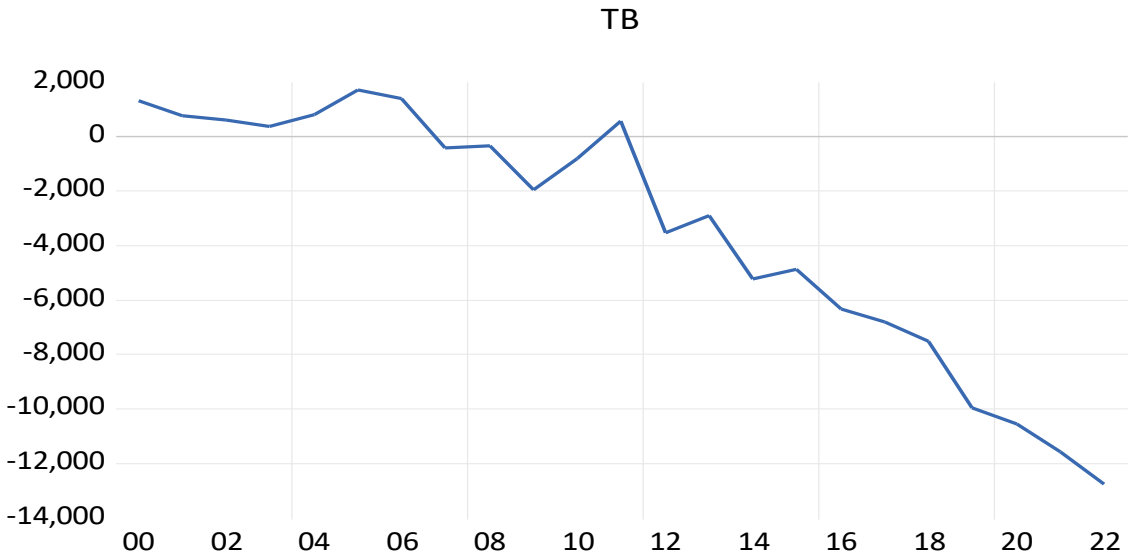

Figure (4) General trend of the trade balance variable.

General Trend of the Gross Domestic Product (GDP) Variable

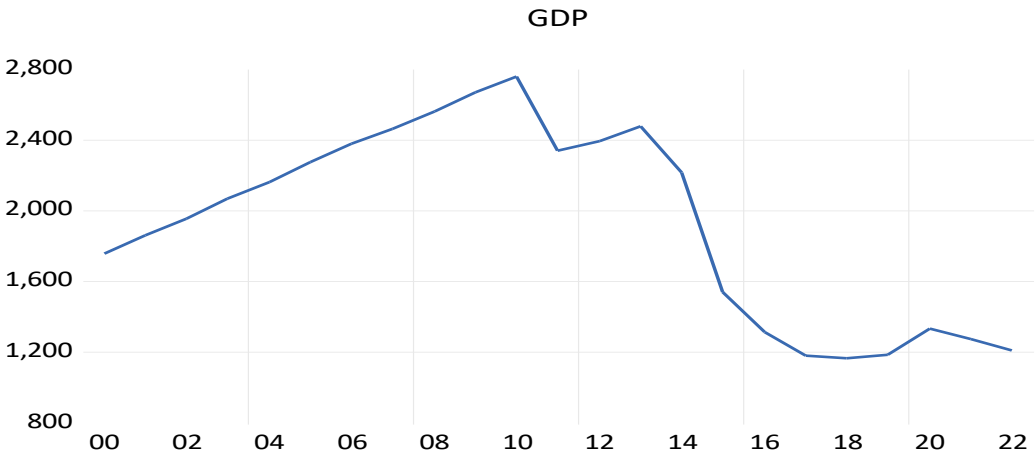

Figure (5) General Trend of the Gross Domestic Product (GDP) Variable

Time series stationarity test (unit roots):

Studying Time Series Stationarity Using the Augmented Dickey-Fuller Test:

Assuming the time series follows an autoregressive model, the cases tested are as follows:

None: $\Delta xi = \rho x_{t-1} - \sum_{j=2}^{p} \phi j \, \Delta x_{t-j+1} + \varepsilon t \ldots\ldots\ldots\ldots$

Intercept: $\Delta xi = \rho x_{t-1} - \sum_{j=2}^{p} \phi j \; \Delta x_{t-j+1} + c + \varepsilon t \ldots\ldots\ldots\ldots$

Trend & intercept: $\Delta xi = \rho x_{t-1} - \sum_{j=2}^{p} \phi j \; \Delta x_{t-j+1} + c + bt + \varepsilon t \ldots\ldots\ldots\ldots\ldots$

The Augmented Dickey-Fuller Unit Root Test Was Applied to Each Variable at The Level, and if a Unit Root Was Present, The Test Was Reapplied at The First Difference.

The following table shows the results of the Augmented Dickey-Fuller test:

Table No. (1): Augmented Dickey-Fuller (ADF) Unit Root Test

Variable		At LEVEL I(0)			At First Difference I(1)		
		None	Trend & Intercept	Intercept	None	Trend & Intercept	Intercept
GDP	T-STATISTIC	-0.7250	-2.0175	-0.9327	-2.8992	-3.0386	-2.8826
	Prob.	0.3904	0.5588	0.7569	0.0059	0.1457	0.0643
	Station	Non-stationary	Non-stationary	Non-stationary	stationary	Non-stationary	Non-stationary
	Lag period				1		
M2	T-STATISTIC	5.5813	-0.8546	2.1408	-4.9674	-2.2861	-2.7395
	Prob.	0.0000	0.9439	0.9998	0.0498	0.4218	0.0843
	Station	Non-stationary	Non-stationary	Non-stationary	stationary	Non-stationary	Non-stationary
	Lag period			_	_1	_	_
EXPT	T-STATISTIC	1.582	-2.1647	-0.1269	-3.129	-3.55_	-3.61_
	Prob.	0.968	0.4832	0.9346_	0.0034_	0.059_	0.0144_

	Station	Non-stationary	stationary	Non-stationary	stationary	Non-stationary	Non-stationary
	Lag period	_	1__	_			_
GRV	T-STATISTIC	-2.3409	-2.3409	-2.2979	_	_	_
	Prob.	0.0218	0.0218	0.1816	_	_	_
	Station	stationary	Non-stationary	Non-stationary	_	_	_
	Lag period	_1	_	_			
TB	T-STATISTIC	2.0933	-1.3919	1.5986	-1.2787	-3.6759	-2.2651
	Prob.	0.98816	0.83140	0.99893	0.17807	0.04978	0.19212
	Station	Non-stationary	Non-stationary	Non-stationary	Non-stationary	stationary	Non-stationary
	Lag period	-				2	

These tests are performed by comparing the tabulated value with the calculated value. If the tabulated value is greater than the calculated value, the series is unstable, and vice versa.

It is observed from Table (1) that the variables (GDP, M2, TB) are unstable at level I(0), while the variables (EXPT, GRV) are stable at level I(0). Therefore, the test was performed at the first difference for the variables (GDP, M2, TB), and they became stable at the first difference I(1). This indicates that all variables are integrated at level I(0) and at the first difference I(1) (with varying degrees of significance). Thus, there is a possibility of concurrent integration.

Standard Test Procedures:

This section deals with the applied (standard) study by conducting appropriate standard tests, such as cointegration tests for models, the ARDL model test, boundary tests, as well as model parameter estimation tests, diagnostic tests, and structural stability tests for the model.

The ARDL Test to Determine Optimal Lag Periods for the Model:

Determining the optimal lag periods is crucial for the study model before conducting boundary tests using the ARDL methodology, as it is sensitive to lag duration. The number of optimal lag periods appropriate for the model is determined to help avoid problems of spurious regression and high variance. Lag periods indicate the extent to which variables influence other variables within the model. The following table shows the optimal lag periods for the model:

Table (2) Results of the Test to Determine Optimal Lag Periods for the Model Variables

Model	Model description	Lag Period
	The Impact of Monetary and Fiscal Policy on GDP	**(2,0,1,0,2)**

The table shows that the model's lag periods are (2, 0, 1, 0, 2).

Bounds Test:

This method involves testing the concurrent integration of different variables. The equation is estimated using the Ordinary Least Squares (OLS) method, and then the coefficients of the long-term relationship are tested to determine if they are statistically explained concurrently (joint significance). This test is known as the Bounds Test, and it can be formulated mathematically as follows:

$$\begin{cases} H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0 \\ H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0 \end{cases}$$

The null hypothesis (H_0) indicates the absence of a cointegrating relationship between the variables. To test this, the Wald test is used, where the calculated F-statistic is compared with the values in the table (Pesaran et al., 2001). If the F-statistic is greater than the upper bound (I(1)), the null hypothesis is rejected. If it is less than the lower bound (I(0)), the null hypothesis is not rejected. However, if the F-statistic falls between the two bounds, the result is inconclusive.

Table (3) shows the results of the boundary test for the study model

Model	Table (F) Value		F Value	Result
	I(0)	I(1)		
GDP	3.058	3.56	3.690	There is a long-term equilibrium relationship

Table (4) shows that the (F) values of the model are greater than the lower and upper boundary values at the different levels identified by Pesaran. Therefore, the null hypothesis, which states that there is no long-run equilibrium relationship between the coefficients of the dependent variable (GDP) and the monetary and fiscal policy instruments included in the model, is rejected. In other words, there is a long-run equilibrium relationship between the coefficients of the dependent variable under study.

Error Correction Model Estimation Test (ARDL-ECM):

Given the correlation between the variables, we can perform an error correction factor test. The results are shown in the following table:

Table (4) Results of Estimating the Short-Run Parameters and Error Correction Parameter

Variable	Coefficient	Std. Error	T.Statistic	Prob.
GDP(-1)*	-0.14972	0.23333	-0.64167	0.53423
EXPT**	-0.11452	0.26959	-0.42481	0.67916
GRV(-1)	0.00819	0.32901	0.02491	0.98058
M2**	0.16040	0.12523	1.28082	0.22660
TB(-1)	0.09942	0.05018	1.98123	0.07312
C	194.42504	429.69592	0.45247	0.65972
CoinTeq*	**-0.1497**	**0.0289**	**-5.1753**	**0.0001**
R-squared	0.7399	Mean dependent var		-30.843
Adjusted R-squared	0.5271	S.D. dependent var		209.112
S.E. of regression	143.7977	Akaike info criterion		13.080
Sum squared resid	227455.7	Schwarz criterion		13.578
Log likelihood	-127.3447	Hannan-Quinn criter.		13.188
F-statistic	3.4772	Durbin-Watson stat		2.262
Prob(F-statistic)	0.0278			
* p-values are incompatible with t-bounds distribution.				
** Zero-lag variable.				

Table (5) Results of Estimating Long-Term Parameters for The First Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXPT	-0.76492	1.884655	-0.40587	0.689903

GRV(-1)	0.054732	2.142162	0.02555	0.979914
M2	1.071345	1.978439	0.541511	0.595182
TB(-1)	0.664004	1.004181	0.661239	0.517321

Tables (4)&(5) The coefficient of determination reached (0.7399), which is an acceptable rate, meaning that about (74%) of the changes in Gross Domestic Product (GDP) are explained by the independent variables, which are: total public expenditures, total public revenues, broad money supply, and the balance of trade. Meanwhile, (26%) of the changes are attributed to other economic variables not included in the first model, indicating that the model has a good explanatory power.

The results in the table estimating the model indicate that the value of the adjustment speed, which represents the estimated parameter for the error correction term, reveals the speed or slowness of the return of the variables to equilibrium. It is assumed that this coefficient should be negative and statistically significant to indicate the presence of a co-integration between the variables, which reached CointEq*= (-0.1497) and a significance level of (0.0001), which is statistically significant. This confirms the validity of the long-term equilibrium relationship, and that the model has an error correction rate capable of adjusting short-term results to align with long-term results at a speed of 0.1497 per period.

It is observed thru the error correction model that most of the variables are significant at the 5% significance level, which means that the independent variables explain the dependent variable (GDP) to a large extent in both the short and long term.

To answer the first hypothesis, the results of the long-term parameter estimation indicate that the model parameters are significant and consistent with economic theory, as there is a direct relationship between the money supply (M2) and GDP in Yemen. Each 1% increase in the money supply leads to a 1.071% increase in GDP, reflecting the continued positive impact of the expansionary monetary policy on GDP in the long term.

The results also showed a negative impact of total public expenditures in the long term, as every 1% increase in total public expenditures corresponds to a decrease in GDP by 0.7649%. It was also found that there is a positive effect of total public revenues; as each 1% increase in total public revenues corresponds to a 0.0547% increase in GDP. In addition to the positive impact of the trade balance, where every 1% increase in the trade balance corresponds to a 0.664% increase in GDP.

Diagnostic Tests to Ensure the Absence of Standard Problems in the Model:

These are tests to ensure the model is free of standard problems and are as follows:

Serial Correlation Test (LM): To analyze the autocorrelation of errors, the Breusch-Godfrey Serial Correlation LM Test is used. This test measures the possibility of a serial autocorrelation of residuals. Table (6) shows the results of this test.

Reliability Test of Homogeneity of Variance: This test is known as the Heteroscedasticity Test (ARCH). The probability value of the coefficient of determination is read and compared with the significance level. Table (6) shows the results of this test.

Normality Test: This test is known as the Histogram Normality Test. The Jarque-Bera coefficient is read and compared with the significance level. Table (6) shows the results of this test.

Table (6) Results of Diagnostic Tests for Study Models

Diagnostic Tests	**Results of Model Test**			
Breusch-Godfrey Serial Correlation LM Test	**F-STATISTIC**	**Prob. F(2,15)**	**Ob*R-squared**	**Prob. Chi-Square(2)**
	1.4255	**0.2693**	**3.4785**	**0.1757**

Heteroskedasticity Test: ARCH	**F-STATISTIC**	**Prob. F(1,20)**	**Obs*R-squared**	**Prob. Chi-Square(1)**
	0.0298	**0.8647**	**0.0327**	**0.8565**
Histogram Normality test	**prob.**		**Jarque-Bera**	
	0.6235		**0.9445**	

Table (6) shows the following:

1- The results of the autocorrelation test showed that the F-value for the model was (1.4255) and the probability F-value was (0.2693), which is greater than the significance level adopted in the study (5%). This indicates acceptance of the null hypothesis that there are no problems related to autocorrelation.

2- The results of the ARCH test for homogeneity of variance showed that the F-value for the model was (0.0298) and the probability F-value was (0.8647), which is greater than the significance level of (5%). Therefore, the null hypothesis that there is no homogeneous variance for the model is accepted.

3- Results showing no problems with the residuals related to the non-normal distribution, where the Jarque-Bera value for the model reached (0.9445) and the probability value reached (0.6235), which is at the 5% significance level. This means that the residuals of the regression equation are free from problems of normal distribution, or that there are no problems related to the normal distribution of the residuals of the regression equation for the model.

Structural Stability Test for Estimated Model Parameters (ARDL):

This section deals with structural stability tests for the estimated model parameters (ARDL) by performing the cumulative sum of residuals (CUSUM) test for each model, as well as the cumulative sum of squares (CUSUM) test for the model, as follows:

Cumulative Sum of Residuals (CUSUM) Test for the Model:

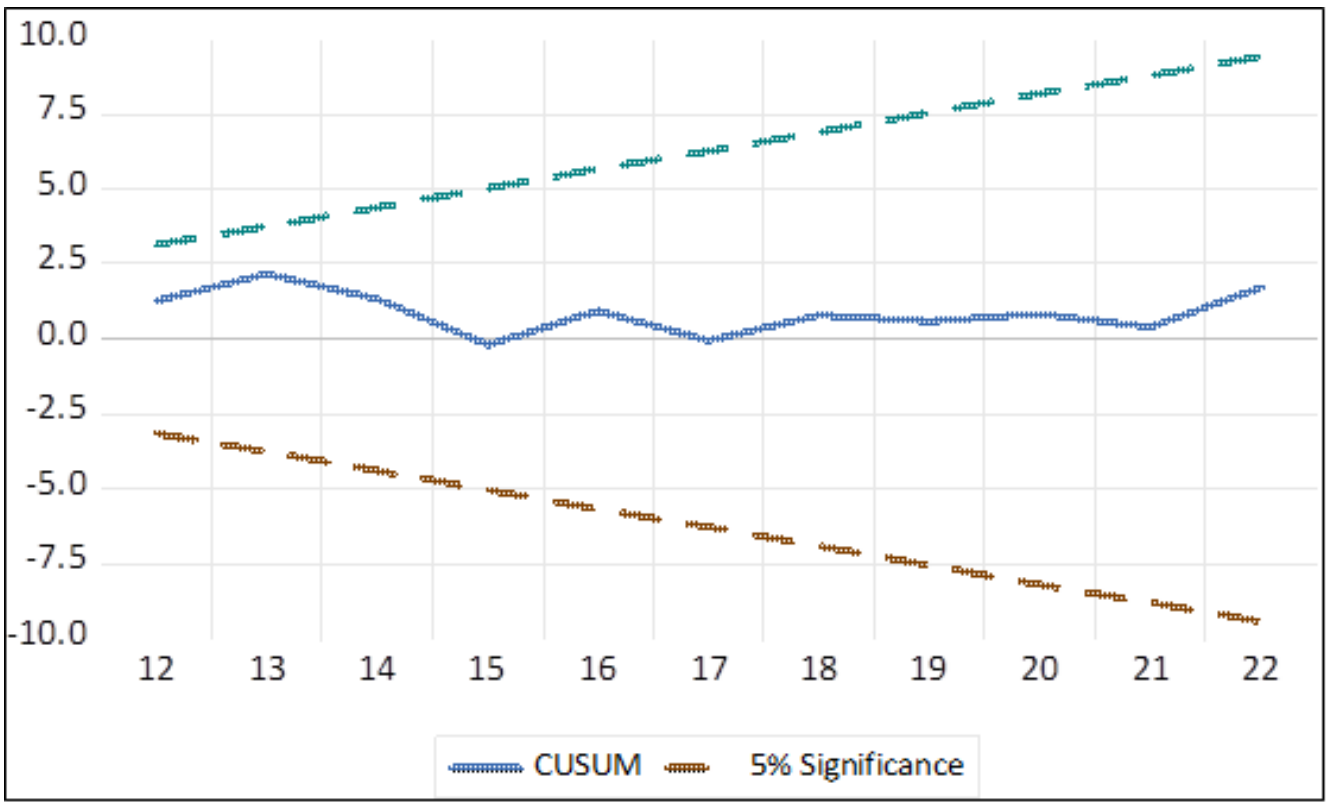

Figure (6) Cumulative Sum of Residuals (CUSUM) for the Model

Testing the CUSUM of Squares for the model:

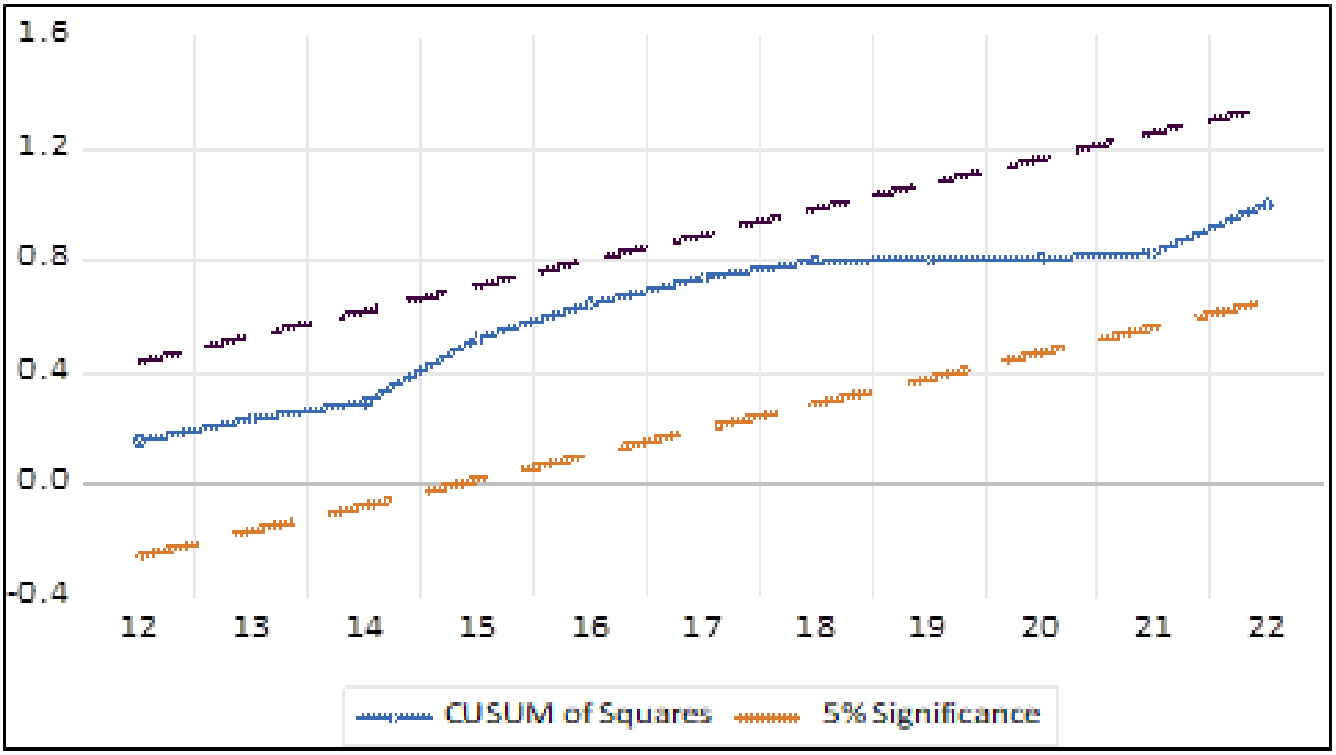

Figure (7) CUSUM of Squares for the model

It is observed from Figures (6) and (7) that the cumulative sum of residuals curve and the cumulative sum of squared residuals curve are within the critical limits at a significance level of 5%, and the two lines of the critical limits (confidence interval limits) do not exceed them. This indicates that the model variables are constant over time, and that there is stability in the model coefficients (short and long term). It can be concluded that there is a long-term relationship between the independent variables (money supply, public expenditures, public revenues, and the trade balance) and the dependent variable (GDP). Errors can be corrected in the long term, and there is no problem with the autocorrelation of errors. There is also no difference in the variance of the error limit. Moreover, the model is free from the problem of the non-normal distribution of the residuals of the regression equation, and its variables are stable over time. That is, there is an ideal model of GDP using the (ARDL) methodology.

CONCLUSIONS

Through in-depth review and careful study of the data related to the study variables and tracking their historical development during the study period (2000-2022), and based on the results of econometric analysis, the study reached the following conclusions:

A statistically significant effect at the 5% significance level was found in the long term for both monetary and fiscal policy on GDP. The results indicate that 74% of the changes in GDP can be explained by the independent variables represented by total public expenditures, total public revenues, broad money supply, and the balance of trade.

Conversely, 26% of these changes are attributed to other economic factors. This reflects the model's explanatory power in analyzing GDP behavior as follows:

Money Supply (M2): It has been shown that there is a positive impact of the money supply on GDP in Yemen; where every 1% increase in the money supply leads to a 1.0713% increase in GDP, reflecting the effectiveness of an expansionary monetary policy in stimulating long-term economic growth. The long-term results indicate partial consistency with several economic theories, with some findings reflecting the specificity of Yemen's

economic structure. On one hand, the positive impact of the broad money supply (M2) on GDP aligns with the propositions of the monetarist school associated with Milton Friedman's work, which confirms a stable relationship between monetary expansion and economic activity, especially in the medium and long term. This effect also aligns with Keynesian analysis, proposed by John Maynard Keynes, in terms of the impact of expansionary monetary policy through lowering interest rates and stimulating investment, although Keynesian thot gives greater priority to fiscal policy. Accordingly, the significance of the (M2) coefficient reflects the effectiveness of the monetary channel in stimulating aggregate demand, in line with general equilibrium models and new Keynesian models that acknowledge the persistent impact of monetary policy in the presence of market distortions.

Public Expenditures: The results showed a negative impact of total public expenditures in the long term on GDP, as every 1% increase in total public expenditures is accompanied by a decrease in GDP by 0.7649%. The negative impact of total public expenditures in the long term deviates from traditional Keynesian predictions, which assume a direct relationship between government spending and GDP thru the spending multiplier. The negative impact of total general expenditures in the long term deviates from traditional Keynesian predictions, which assume a direct relationship between government spending and GDP thru the spending multiplier. This variation can be explained in light of some recent theses, such as the crowding-out hypothesis adopted by the monetary school, where the expansion of public spending leads to a reduction in private investment due to pressure on financial resources or rising interest rates. This result can also be linked to the literature on economic efficiency, which indicates that poor efficiency in allocating public spending, or directing it toward non-productive consumption items, may lead to a counterproductive effect on output. This applies to the case of Yemen, where the expansion of public spending is directed toward non-productive consumption items.

Public Revenues: It has been shown that total public revenues have a positive impact on GDP, with each 1% increase in total public revenues corresponding to a 0.0547% increase in GDP. General revenues: It has been shown that there is a positive impact of total general revenues on GDP, as each 1% increase in total general revenues corresponds to a 0.0547% increase in GDP. The positive impact of total public revenues is consistent with the perspective of financial sustainability, as it reflects an improvement in the government's financing capacity and reduces reliance on inflationary financing or borrowing, which supports macroeconomic stability. This result can be explained within the framework of new Keynesian models, which emphasize that improving the structure of public revenues enhances economic confidence and contributes to stabilizing expectations, thereby supporting growth. This result also intersects with some propositions of the New Classical School associated with the works of Robert Lucas, which focus on the role of expected and stable policies in improving economic performance. This result is attributed to the Yemeni economy's suffering from a limitation in total public revenues due to the decline in oil activities, the inefficiency of the tax system, and the expansion of the informal economy.

Trade Balance: The results have proven a positive impact of the trade balance on GDP, as every 1% increase in the trade balance corresponds to a 0.664% increase in GDP. The positive effect of the trade balance is clearly consistent with open economy models, particularly the IS-LM-BP model, where an improvement in the trade balance leads to an increase in external demand for local goods and services, thereby raising the level of GDP. This result also aligns with the Keynesian theory in open economy, which emphasizes the importance of net exports as a key component of aggregate demand, in addition to being consistent with some trends of the structural school that views the performance of the external sector as a fundamental driver of growth in developing economies.

In general, the results reflect a blend of alignment with both monetarism and neo-Keynesianism, particularly regarding the effectiveness of monetary policy and the role of the external sector. However, they also show partial divergence from the traditional Keynesian perspective concerning the impact of public spending. This divergence reinforces the argument that the effectiveness of economic policies depends not only on their direction (expansionary or contractionary) but also on their institutional efficiency, the structure of the economy, and the nature of resource allocation a common characteristic in developing and transition economies, including Yemen.

Suggestions:

Based on the findings of this econometric study, the following is recommended:

1. Adopt a balanced expansionary monetary policy: This involves a gradual expansion of monetary policy while monitoring inflation levels and focusing on directing liquidity towards productive sectors rather than consumption.
2. Develop liquidity management mechanisms: This involves utilizing unconventional monetary policy tools (such as the reserve requirement ratio and open market operations) to ensure that monetary expansion is channeled towards real investment and not just speculation.
3. Restructure Public Spending: It is recommended to redirect public spending from unproductive consumption items (such as indiscriminate subsidies and inflated wages) towards investments in infrastructure, education, and health with higher economic multipliers.
4. Activate Spending Efficiency Oversight Mechanisms: Establishing an independent unit to evaluate the efficiency of public projects according to economic and social return criteria, and reducing crowding out of private investment.
5. Expand the Tax Base and Rationalizing Exemptions: Reforming the tax system to broaden the tax base and integrate the informal economy, while adopting incentive policies for productive activities to enhance fiscal sustainability.
6. Reduce Reliance on Inflationary Financing and Deficits: Boosting non-oil public revenues to reduce the need for borrowing from the central bank, thereby mitigating long-term inflationary pressures.
7. Strengthen the External Sector as a Driver of Growth: Developing non-oil exports (such as agricultural products and light industries) and improving the terms of trade.
8. Managing the trade balance through exchange rate policy: A feasibility study of using the exchange rate as a tool to improve the trade balance (taking into account the specificities of the Yemeni economy, which suffers from structural constraints), while adopting incentive policies for local import substitutes.
9. Incorporate institutional and political variables: Adding variables such as political stability, quality of governance, and external remittances, especially in the case of Yemen as a country undergoing a transitional phase.

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