INFLATIONARY EXPECTATION, EXCHANGE RATE AND DEMAND FOR MONEY IN SUDAN FROM 1970-2003

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Abstract:
The purpose of this study is to empirically assess the main determinates of demand for money in Sudan paying particular attention to the impact of inflation and exchange rate movements on the estimated function with annual data over the period 1970-2003, using cointegration and error correction methodology.

The results of the cointegration analysis confirm the existence of a stable money demand. The results of the dynamic model of money demand suggest that money demand is influenced in the short run by income, the expected inflation and the exchange rate.

The study recommended that; the broad money aggregate could be used in the process of monetary targeting for inflation control in Sudan. Exchange rate stability can be effective in controlling inflation in short- run.

Key words: cointegration, demand for money, Gangn, Sudan, Expected inflation.

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1. Introduction:

Finding a stable money demand function is generally considered essential for formulation and conduct of efficient monetary policy. Hence, considerable effort has been made in the empirical literature – for both industrialized and developing countries – to determine the factors that affect the long-run demand for money and assess the stability of the relationship between these factors and various monetary aggregates.

The rationale behind used data from (1970-2003) This period witness hyperinflation, uncontrolled exchange rate and some radical policies e.g. move from government intervention to liberalization in early 1992, despite that, the analysis shows broad money aggregate could be used in the monetary targeting for inflation and exchange rate can be effective in controlling inflation in short- run. The inflation can be divided into three periods: first there was a period of moderate to high inflation from 1970 to 1988 with annual inflation rate hovering around 20-30 percent. Second, there was a process of very high inflation from 1989-1996 and in 1996 it grew by 130% the highest rate of inflation in Sudan (three digits). Third, inflation receded to 17% average rate over 1997 – 2003.

In other hand the exchange rate was fixed until 1978 then it started to fluctuate. In mid 1978 a first major devaluation was undertaken, but the devaluation of Sudanese pound occurred in 1972, 1973, 1978, 1979 and 1981 and the exchange rate became uncontrollable from 1992 until reached 2601.6 in the year 2003.

The major research problem to be addressed in this study is to empirically assess the main determinates of demand for money in Sudan paying particular attention to the impact of inflation and exchange rate movements on the estimated function, and then points to the implications of the results for decision-making.

El Ghoul, (1977), Dowaitz and EL Badawi, (1987) and Abdel-Rahman, (1997) have studied the demand for money in Sudan. This study follows this literature to estimate the demand for money for Sudan. In particular we use systems cointegration analysis and error-correction modeling to examine the behavior of broad money for the period 1970-2003. The

statistical properties of the study variables showed that they could be included in the cointegration analysis. The results of such analysis indicated that, the demand for broad money in Sudan is stable. The analysis also suggests that, in the long run, Sudan money demand is influenced by real income, price level, exchange rate and expected inflation. In the short run money the first lag of money growth, income growth, the exchange rate movements and expected inflation influenced demand.

The rest of the paper is organized as follows; Section 2 the properties of the data. Section 3 explains the methodology used and the empirical model. Section 4 the data sources and. Section 5 discussion of the estimation results of the money demand for Sudan and provides the conclusion and policy implications.

2- The Properties of The Data

The empirical studies on the demand for many starts by postulating a demand for money function. In the standard literature money is demanded because of the role it plays as a medium of exchange and as store of value. In most of empirical models demand for money is a positive function of level of economic activities and the price level "because agents demand real balances" money is also a negative function of the cost of holding it.

This study proposes five variables to be included in the empirical study corresponding to the theoretical concepts (Gross Domestic Product (GDP), broad and narrow definition of money, expected rate of inflation, parallel exchange rate and general price level.
First: Money Stock either theoretical considerations or empirical evidence is conclusive in demonstrating aboard definition of the money stock [all the deposit liabilities of the banking system] or narrow definition (covering only currency and demand deposits). However we use the broad definition of money.

The Scale Variable: The most commonly used in studying the demand for money function is the gross domestic product GDP either in developed countries or under developed ones. In the case of Sudan the real GDP is the

best variable for economic scale, but according to demand for money theories many variables can be use such as permanent income, wealth and current income.

There are many variables that can be used to measure the opportunity cost variable for holding money such as interest rate, the interest on other assets and the rate of inflation Cangn (1956).

In this study we used the expected inflation rate to measure the opportunity cost for several reasons: first, financial markets outside the banking system are not well developed, so that the possibilities of substitution between money and other financial assets are limited. Second, the interest rates are often centrally determined and remain unchanged for a long period for example in Sudan. The central bank changed the interest rate only six times. In December 1966 July 1973, August 1973 February 1984 November 1981 and January 1983. Third, interest rates were altogether abolished within an Islamization package in 1984. The study used expected inflation, as in Cangn (1956) and Vito Tanzi (1980), as explanatory variable in determining the opportunity cost for holding money.

These results agreeable with Modigliani's rule of thumb and supported by Dornbusch and Fischer in their macroeconomic textbook[1].

The rule of thumb states that "if the nominal interest rate exceeds the expected rate of inflation, the nominal interest rate should be thought of as the cost of holding money if the expected inflation rate exceeds the nominal interest rate, think of the expected inflation rate as cost of holding money. Due to the increasing dollarization of the Sudanese economy we used the parallel rate of exchange in Sudanese pounds per dollar. This variable intended to pick up the direct opportunity cost effect of holding foreign exchange vis-à-vis domestic real balances. The study used the consumer price index CPI as the price level.

[1] Dornbusch and Fischer (1978), p. 235.

3- The Methodology

The study followed the approach of Error Correction Mechanism focusing on the short-run dynamics while making them consistent with long-run equilibrium. Cointegration is statistical concept that is introduced into the economics literature by Engle and Granger (1987). And have been used widely in studies concerning financial time series. The individual time series should be non-stationary for inclusion in the cointegration analysis. Below we show the technique for testing for stationarity.

3-1 The Stationarity:

Every empirical work based on time series data should first test for stationary before running any estimation to avoid the problem of spurious regression [when running two time series together and obtains a very high R^2 although there is no meaningful relationship between the two variables]. Unit root test is performed to test for the stationary of variables. Dickey and Fuller (1979) (AD) propose a testing method that we use in the study. The simple form of the DF test could be expressed as:

$$\Delta y_t = \delta y_{t-1} + U_t \quad (1)$$

DF test equation with a constant:

$$\Delta y_t = \alpha + \delta y_{t-1} + U_t \quad (2)$$

DF test equation with a constant and trend:

$$\Delta y_t = \alpha + \beta_t trend + \delta y_{t-1} + U_t \quad (3)$$

ADF test equation:

$$\Delta Y = \alpha + \beta_t treend + \delta y_{t-1} + \sum_{i=1}^{k} \lambda_i \Delta y_{t-i} + \varepsilon_t \quad (4)$$

Where;

Y_T = the variable under study. U_t = random variable U_t = IID (0.6^2). The null hypothesis is that $\delta = 0$ and alternative hypothesis $\delta < 1$

The Augmented Dickey and Fuller (ADF) allows for lags of length k in estimation of the coefficient δ. The series is stationary if δ is significantly different from zero i.e. $\delta \neq 0$.

3-2 Co-integration:

Cointegration is relatively new statistical concept introduced into economics literature by Engle and Granger (1987). It is designed to deal explicitly with the analysis of the relationship between integrated series in particular; it allows individual time series to be integrated but requires a linear combination of the series to be stationary.

The basic idea behind cointegration to search for a linear combination of individually integrated time series that itself is stationary.

3-3 Co-integration in multivariate system

The Johansen ML Approach:
Engle and Granger suggested a two equations method for cointegration analysis; however we use Johansen and Juselius procedure, which is a multivariate generalization of the ADF test. Johansen and Juselius (1992) consider the following p-dimensional vector autoregressive (VAR) model of order k

$$X_t = \sum_{i=1}^{k} A_i X_{t-i} + \varepsilon_t \qquad (5)$$

Where X_t is Px1 vector and ε_t is an independently distributed p-dimensional vector of innovations with zero mean and variance matrix Σu.
The maximum likelihood estimation and likelihood ratio test of this model has been investigated by Johansen (1988) and can be described as follows. First letting Δ=1-L, where L is log operator, equation (5) can be expressed as;

$$\Delta X_t = \sum_{i=1}^{k-1} \Gamma_i \Delta X_{t-i} + \pi X_{t-1} + U_t \qquad (6)$$

Where

$$\Gamma_i = -\left(I - \sum_{j=1}^{i} A_j \right) \text{ and } \pi = -\left(I - \sum_{i=1}^{k} A_i \right) \qquad (7)$$

With the PXP 'total impact' matrix π containing information about the long-run relationship between the variables in X_t.

In the context of (eq. 6), the number of distinct cointegrating vectors that exist between the P elements of X_t will be given by the rank of π, devoted as *r*. The rank of a (square) matrix is the number of linearly independent rows (Columns) in the matrix and is given by the number of its 'eigenvalues' that significantly different from zero.
In the context of (eq. 6), if π consists of all zeros, its characteristic equation has solution $\lambda_1 = \lambda_2 = \cdots = \lambda_p = 0$ and rank $\pi = 0$ where λ means an eigenvalue (or characteristic root). In this case, (eq. 5) is the usual VAR model in the first differences and there are *p* unit roots and no cointegration.

Johansen proposes two tests for the number of distinct cointegrating vectors – the trace and maximum eigenvalue tests. In the trace test, the null hypothesis that there are at most r cointegrating vectors is tested (against a general alternative) by calculating the test statistic;

$$\lambda_{trace(r)} = -T \sum_{i=r+1}^{p} \log\left(1 - \hat{\lambda}_i\right)$$

Where $\hat{\lambda}_i (i = 1, \cdots, p)$ are the estimated eigenvalues obtained from the estimated π that has solutions $\lambda_1 = \lambda_2 = \cdots = \lambda_p = 0$. In this case each lag $\left(1 - \hat{\lambda}_i\right)$ will equal zero (since log 1=0) and λ_{trace} equal zero, the more negative is each of expressions lag $\left(1 - \hat{\lambda}_i\right)$, and the larger the λ_{trace} statistic.
In the maximum eignvalue test, the null hypothesis of *r* cointegrating vectors is tested against the alternative of *r+1* cointegrating vectors by calculating the test statistic

$$\lambda_{\max}(r_1 r + 1) = -T \log\left(1 - \hat{\lambda}_{r+1}\right)$$

Again if the estimated eigenvalue, $\hat{\lambda}_{r+1}$, is close to zero, $\lambda_{\max}$ will be small and the null hypothesis that the number of cointegrting vectors is *r* will not be rejected.

3-4 Error Correction Models:

If cointegration relationship is identified $\hat{\Sigma}_t$ is integrated of order zero, then according to the Engle and Granger representation theorem there must exist an error correction representation relating current and lagged first difference at y_t and x_t at least one lagged value of $\hat{\Sigma}_t$. The error correction model can be-written as:

$$\Delta y_t = \beta_1 + \beta_y \hat{\Sigma}_{t-1} + \sum_{j=1}^{r} \beta_{1i} \Delta y_{t-j} + \sum_{j=1}^{s} B_{1i} \Delta X_{t-j} + \nu_t \quad \text{_____ (8)}$$

$$\Delta x_t = \beta_2 + \beta_x \hat{\Sigma}_{t-1} + \sum_{j=1}^{r} \beta_{2j} \Delta y_{t-j} + \sum_{j=1}^{s} \beta_{2j} \Delta x_{t-j} + \nu_t \quad \text{_____(9)}$$

Where β_1, β_2, β_y, β_x, β_{1j}, and β_{2j}, are all parameters $\sum y_t$ and $\sum x_t$ are white noise disturbances and $\hat{\Sigma}_{t-1}$ estimates the deviation from long – run equilibrium in period $t-1$.

The purpose of error correction model is to focus on the short-run dynamics while making them consistent with the long-run equilibrium. In particular, the error correction model show how y_t and x_t change in response to stochastic shocks, represented by $\sum y_t$, and $\sum x_t$ and to the previous periods deviation from long-run equilibrium represented by $\hat{\Sigma}_{t-1}$.

Notice that β_y and β_x can be interpreted as speed of adjustment parameters. For example, the larger is β_y the greater the response of y_t to the previous periods deviation from long-run equilibrium.

On other hand, very small values of β_y imply that y_t is relatively unresponsive to the last period's equilibrium error. In fact for y_t to be unaffected by x_t, β_y and all the $\beta_{12}(j)$ coefficient in (eq. (8) must be equal to zero.

The cointegration and error-correction framework have proved to be successful tools in the identification and estimation of aggregate money demand functions. This type of approach to the demand for money captures the long-run equilibrium relationship between money and its determinants

the short-term dynamics. It is in this sense that this approach represents a significant improvement over the partial adjustment specification, which severely restricts the lag structure by relying solely on ad hoc economic theory without examining the actual data

4- The Data Sources:

The data collected from different sources, the broad definition of money M_2 and the parallel exchange rate collected from the Central Bank. The rate of inflation "consumer price index" and Gross Domestic Product (GDP) from the Central Bureau of Statistic (CBS) and Ministry of Finance.

The period 1970 – 2003 witness some radical's economic policies e.g. intervening of international donors such as World Bank, International Monetary Fund. Moving from government intervention to liberalization so, this period need to be address with some serious studies using advance econometric methods.

5 - The Model Specification and Results.

In this study, we build a demand for money function of the demand for money; therefore, the desired demand for money could be specified as follows:

$$m^d_t = \beta_0 + \beta_1 p_t + B_2 y_t + B_3 e_t + B_4 in + v_t \qquad (10)$$

Where all lower-case letters lettering, henceforth, denotes logarithms of the variables and;

m^d_t = is log desired nominal money
p_t = log of general level of price CPI
y_t= log of real GDP
et= log of parallel exchange rate
in= the rate of expected inflation
vt= error term

The expected signs and the magnitudes of the coefficients are:

$$\beta_1<0,\ \beta_2>0,\ B_3<0,\ B_4<0.$$

The model is based on quantity theory assuming long run demand for money at equilibrium, that is;

$M^d_t = M_a{}^s_t$.

The exchange rate is added to account for the openness of the economy and to

pick up the direct opportunity cost effect of holding foreign exchange as alternative to domestic real balances (currency substitutions) (see Dowaitz and El Badawi, 1987). Expected inflation is included as a measure of the opportunity cost for holding money as Cangn argues (see Abdel-Rahman, 1997).

5-1 Stationarity Result

Before modeling error correction the univartate unit roots were tested to check for stationarity, the unit root tests are given for the log level and first difference (changes) of the data and the result in table (2).

The results of the test statistic ADF showed that the test failed to reject the unit root hypothesis when the variables tested in levels. The ADF confirm the null hypothesis for general level of price in level and difference, while the null hypothesis is rejected for the first difference for the other variable.

Table (1)
Unit Root Tests

Variables	Level ADF-statistics	Lag	First difference ADF-statistics	Lag
m_2	-2.432	(4)	-4.226 **	(0)
p	-3.442	(3)	-2.07	(3)
y	-2.3438	(3)	-3.597 *	(1)
e	-2.084	(4)	-4.654 **	(0)
in	-1.674	(3)	-3.982 *	(1)

Notes:

ADF is augmented Dickey Fuller Test. The null is that the series tested contain until root. Each variable was expressed in log and has been included with four lags; the test includes a constant and time trend for all variables in level and constant for the variables in first differences.

Asterisks * and ** denote rejection of the null hypothesis at 5% and 1% level respectively.

5-2 Co-integration Results

As the results of unit root showed in table (1) we can apply the cointegration technique to estimate the long-run money demand. We used Johansen and

Juselius (1990) because this method, is based on maximum likelihood optimization, and provides more robust results, especially when more than two variables involved, (see Irfan Civeir (1999). In order to test the number of cointegration relationship amongst the variables Johansen and Juselius (1990) provides two different tests to determine the number of cointegration vectors, namely trace and maximum eigenvalue tests. In this study, we include VAR in order two depending on the sequential LR test, include the time trend to capture the changes in monetary policy and devaluation. Table (2) shows the results of estimation.

As can be seen from table (2) the results of testing using ά-max eiginvalue statistics and trace statistics suggest that the hypothesis of unique cointegrating vector is not rejected. The normalized cointegrating vector corresponding to the long-run demand for money is shown in table (2) in row number 8. As seen, the estimated coefficient for price is below unity equal -0.714 while that of income is equal -0.561. The estimated long-run coefficient for price level, rate of expected inflation, exchange rate and trend were statistically significant and the income was not. According we proceed to impose restrictions on the estimated coefficients that are most likely to accept.

The imposition of unitary restriction on the income coefficient is accepted X^2 =1.7327 (0.183)[1] finally we impose unitary restrictions on the price coefficient and is accepted X^2 = -4.285 (0.117) the restricted long-run money demand relationship is written as :[2]

$$m_2 - p = y - 0.2538E - 0.01560in + 0.0659\ trend \quad \text{----- (11)}$$
$$(.016) \qquad (.018) \qquad (.058)$$

[1] The calculated Chi-square is followed by symptomatic P. value in parentheses.
[2] Numbers in parentheses are asymptotic standard errors.

Table (2)

Cointegration Testing and Analysis of the Money Demand

Eiginvalues	0.70870	0.55059	0.43609	0.3806	0.16170	
Null Hypothesis	r = 0	r ≤ 1	r ≤ 2	r ≤ 3	r ≤ 4	
Rank π = r	38.235*	24.79	17.75	14.85	5.46	
95% critical values	37.68	31.79	25.42	19.22	12.39	
Trace-statistics	101.11*	62.87	38.08	20.32	5.4	
95% critical values	87.17	63.00	42.34	25.77	12.39	
Normalized cointegration vectors Restricted cointegration vectors	m_2 1 (0.000)	p -0.714 (0.0839)	y -0.561 (0.2618)	e 0.070 (0.0696)	in 0.0045 (0.080)	trend -0.117 0.0172
X^2 (1): 1.7327 (0.188)	1 (0.000)	-0.766 (0.1100)	-1.000 (0.000)	0.086 (0.0933)	-0.04 (-88)	-0.095 (-0.018)
X^2 (2): -4.285 (0.117)	1 (0.000)	-1.000 (0.000)	-1.000 (0.000)	0.253 (0.058)	0.015 (0.016)	-0.065 (0.018)

Notes: **The estimation period is (1970-2003), the VAR under 2 using the analysis included trend to capture the changes in monetary policy and devaluation Asterisk* denotes significance at 5% level number in parentheses are symptomatic standard error and numbers in brackets are p-value of the X^2 statistics.**

The restricted demand relationship of equation (11) reveals that the income elasticity of nominal M_2 is unity in consistence with the quantity theory hypothesis. The semi-elasticity of nominal money with respect to the exchange rate as well as inflation were statistically significant implying the relevance of the currency substitution hypothesis and the work of Cangn type of mechanism for Sudan. The positive trend implies that the innovation in the monetary institutions, throughout the study period, positively contributes to strengthening of the demand for money.

5-3 The Result of Error Correction Model:

Based on cointegration analysis, the next step is to model the short-run demand for real broad money in a single equation context using error correction model (ECM). The short-run model reveals how the adjustment mechanism works to revert the system to the equilibrium condition when it

is disturbed by exogenous shocks and thus deviations from the long-run level. In the case of money demand, the error correction terms (ECM) represents the disequilibrium from the long-run solution, with money adjusting in the subsequent period. The error term coefficient should have a negative sign be not large than one. The error correction model could be specified as follows:

$$\Delta m_2 = \gamma_{00} + \sum_{i=1}^{k-1} \gamma_{1i} \Delta m_{t-i} + \sum_{i=0}^{k-1} \gamma_{2i} \Delta y_{t-i} + \sum_{i=0}^{k-1} \gamma_{3i} \Delta e_{t-i} + \sum_{i=0}^{k-1} \gamma_{4i} \Delta in_{t-i} + \lambda (ECM)_{t-1} \delta D_t + v_t \quad (12)$$

Where all the variables in the first difference and we include the real balance of broad money and we added dummy to account for the changes in fiscal policy and to capture the high inflation in Sudan during the period 1992 to 1997.

We can specify the model above and divide it into four parts. The first represents the quantity theory of money because it is exogenously determined; the price level is only endogenous variable. So the demand for real money is proportional to real income, the second part is exchange rate, which represents the currency substitution motive, which assumes that agents maximize the return on their wealth subject to given level of risk. Agents can hold different assets and switch between them simultaneously; these assets are domestic money, domestic bonds, foreign money, and foreign bonds (see Irfan Civeir, 1999). In this model the agent substituted the domestic currency with the dollar this phenomena is called dollarization (see Abdel-Rahman, 1997) and (Dowaitz and El Badawi, 1987). The third part refers to the expected inflation and this is based on Cangn hyperinflation type of mechanisms the last part is the error correction term, which accounts for the deviations from the long-run relationship. In this representation short-run dynamics is modeled by estimating in first difference.

The model is fitted to annual data over the period (1970-2003) and ordinary least square estimation was used to obtain the error correction model and the result were shown in table (3).
The R^2 suggests that 63 percent of variation in the dependent variable were explained by the explanatory variables. D.W test suggests that there is no auto correlation problem.

The diagnostic statistics shown in (table 4) do not indicate any misspecification in the model, except the test for non-normality of the residuals, which fail. However, since the normal distribution is only of limited importance for out inference we do not consider these results as problematic.

The estimated coefficients of the ECM were significant and consistent with the economic theory except the exchange rate that economically consistent but statistically insignificant. The coefficient on M_2 (-1) has negative sign and this result is similar to one obtained by (Akinct, 2004) who argued that this sign is expected according to the evidences shown in the extensive literature on empirical money demand.

The coefficient of the ECM was negative and significant and it implies that 35 percent of disequilibrium is corrected each year.

Table (3)

The ECM of Demand For Money For Sudan (1970-2003)

Regressors	Coefficient	F-Ratio	Prob.
Constant	0.4045	4.1285	(000)
Δ rm2 (-1)	-0.1691	-1.218	(0.234)
Δ ry	0.4634	2.4817	(0.020)
Δ e	-0.00187	-0.1121	(0.912)
Δ in	-0.00188	-1.746	(0.093)
ecm1(-1)	-0.3503	-3.633	(0.001)
D	-0.1533	-1.986	(0.058)

$R^2 = 0.630$ Ajusted $R^2 = 0.5419$ F = 7.112(0.000) DW = 2.132

Table (4)
Diagnostic Test

Test statistics	LM version	F version
A | Serial Correlation	1.684 (0.194)	1.333 (0.260)
B | Functional Form	1.0790 (0.299)	0.8374 (0.369)
C | Normality	76.1896 (0.000)	Not applicable
D | Hetero Scedasticity	0.36087 [0.548]	0.3417 (0.563)

Notes:

A: Language multiplier test of residual correlation
B: Ramsegs RESET test using the square of fitted values
C: Based on a test of skewness and kurtosis of residual
D: Based on the regression of squared residuals on squared fitted values

This means that agents will come back to their equilibrium line slowly following a shock to demand for money. This coefficient is greater than that obtained by (Abdel-Rahman, 1997) and (Dowaitz and El Badawi, 1987).

The one step forecast test shows the probability values where the hypothesis of parameter constancy would not be rejected as it is seen in figure (10). Overall, the parameter constancy test reveals that short term Sudan demand for real M_2 is stable and can be used for forecasting.

In Sudan, the interest rate, as opportunity cost, is not an important determinant of money demand (see El Ghoul1977), (Dowitz and El Badawi 1987) and (Abdel-Rahman 1997). So the expected inflation and the exchange rate are the instruments, which affect money demand. The analysis confirms this observation, and suggests that, either the exchange rate or the stock of money could be used in the management of the economy. An important policy implication of our analysis is that; the broad money aggregate could be used in the process of monetary targeting for inflation control in Sudan. Exchange rate stability can be effective in controlling inflation in short- run.

6- Conclusion

This study used cointegration and error correction to estimate the money demand in Sudan over the period 1970-2003.The study utilized Johansen and Juselius maximum likelihood cointegration procedure to estimate the long –run money demand. Then used the OLS to estimate the short –run dynamic ECM for money demand. Overall, cointegration was confirmed among the key variables considered in the demand function and the study also indicates that the error correction mechanism is a good representation of money demand in Sudan over the period 1970-2003period.

The factors that determined the demand for money in the short –run was income, expected inflation, the parallel exchange rate, dummies and the error correction from the long demand for money.

The study excluded the rate of interest following the arguments porposed by AlGoul (1977) Abd El Raham (1997) and Dowitz and Elbadwi (1987),
The results of the analysis provide evidence in support of the presence of currency substitution and Cangn type of mechanism in the money demand in Sudan. Thus the monetary authority should take into account the impact of the exchange rate and expected inflation in the formulation and conduction of monetary policy in the country. An important policy implication of our analysis is that; the broad money aggregate could be used in the process of monetary targeting for inflation control in Sudan. Exchange rate stability can be effective in controlling inflation in short- run.

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FIGURES :

Figure (1)
Log narrow money 1970-2003

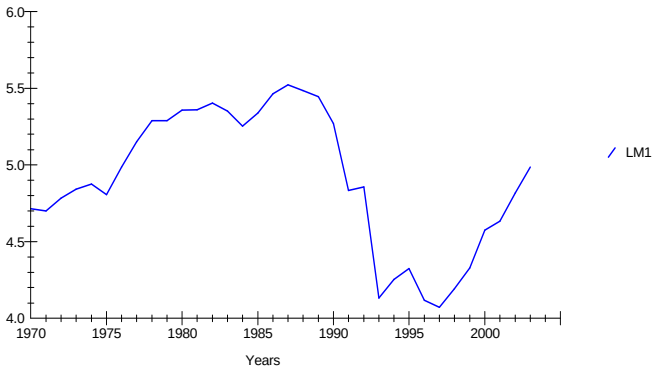


Figure (2)
expected rate of inflation, 1971-2003

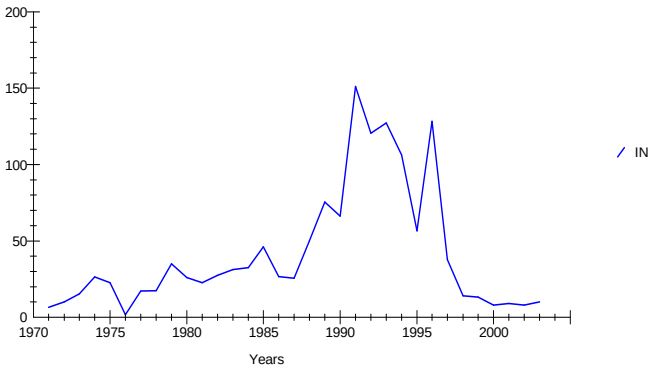


Figure (3)
Log of broad money

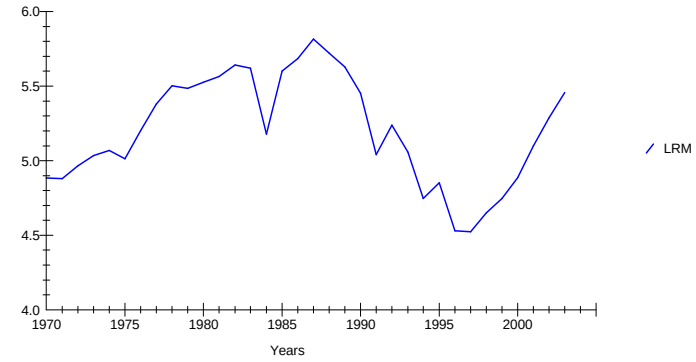


Figure (4)
log of price level

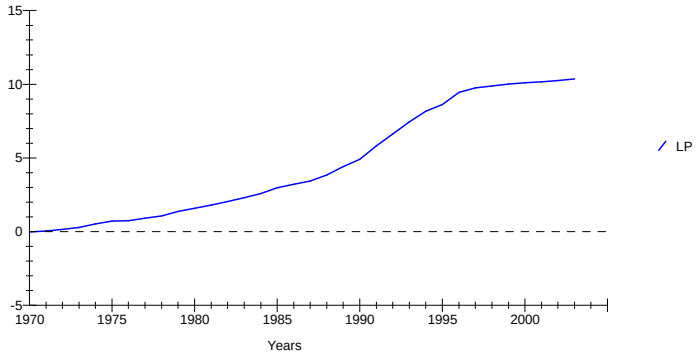


Figure (5)
Log of real broad money and real GDP

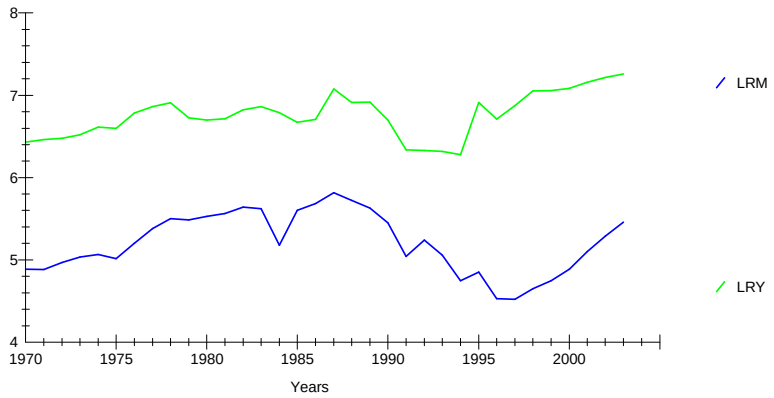


Figure (6)
log of real M1andM2, 1970-2003

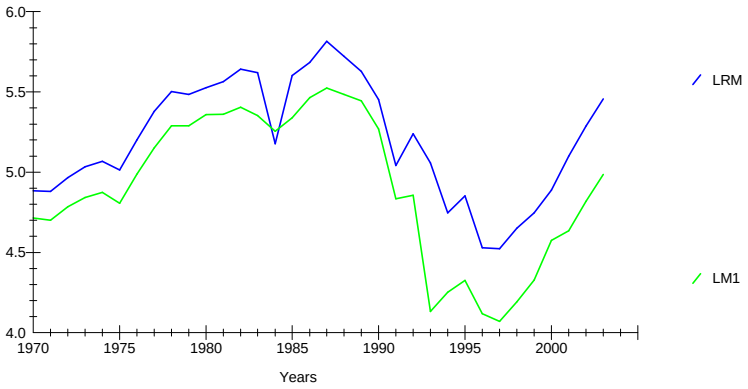


Figure (7)
Growth rate of real M1and M2, 1970-2003

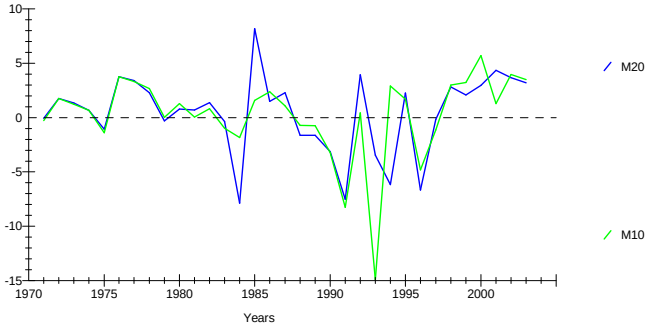


Figure (8)
Growth rate of log real broad of money and GDP1970-2002

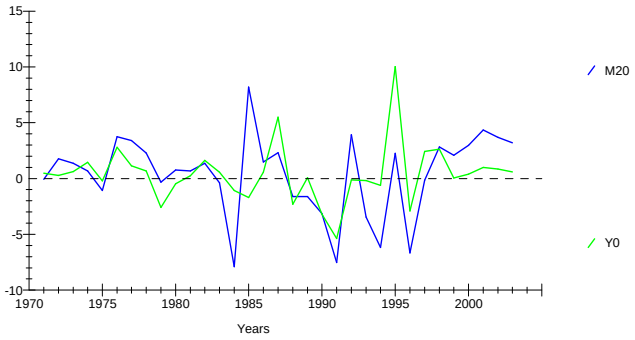


Figure (9)
The ECM term 1970-2003

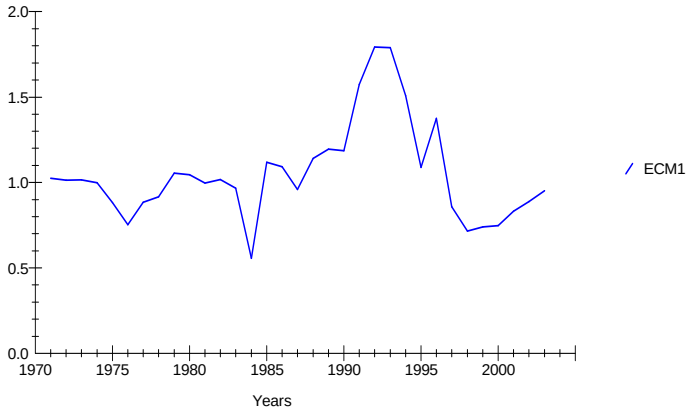
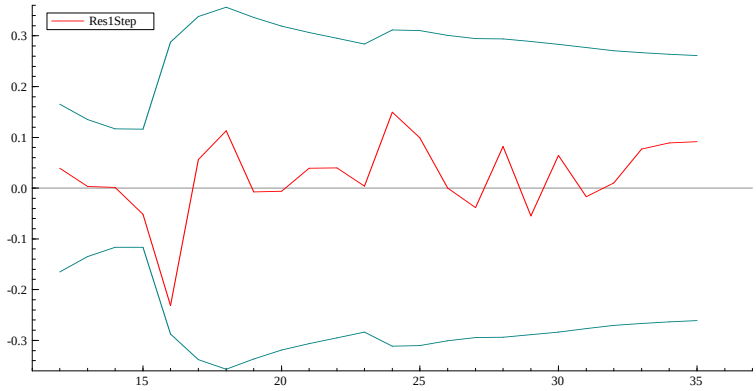


Figure (10)
RES 1-step



التضخم المتوقع ، سعر الصرف ودالة الطلب على النقود في السودان

عيسى عبد المنعم موسى الشوين*

المستخلص:

الهدف من الدراسة هو تقدير دالة الطلب على النقود في السودان مع الوضع في الاعتبار لدوركل من التضخم وسعر الصرف باستخدام بيانات السلاسل الزمنية من الفترة 1970م – 2003م مستخدمة منهجية التكامل المشترك وتصحيح الأخطاء.

أوجدت الدراسة التكامل الخطي لمفردات الطلب على النقود "التعريف الواسع" الدخل، سعر الصرف، المستوى العام للأسعار والتضخم المتوقع في الأجل الطويل المتغيرات التفسيرية التي تؤثر في الطلب على النقود في الفترة القصيرة تشمل الدخل، التضخم المتوقع، سعر الصرف ومتغير تصحيح الأخطاء. اكدت الدراسة ثبات دالة الطلب على النقود.

توصي الدراسة بان التعريف الواسع للنقود يمكن ان يستخدم في التحكم على ارتفاع مستوي الاسعار و ادارة السياسة النقدية ويعتبر استقرار سعر الصرف من العوامل المؤثره في التحكم على التضخم علي الاقل في الاجل القصير.

الكلمات الدلالية : التكا

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