

THE RELATIVE STABILITY OF THE ISLAMIC MONETARY SYSTEM : SOME EVIDENCE FROM SUDAN

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Abstrak

Proses Islamisasi yang dimulai di banyak negara Islam beberapa tahun yang lalu kini telah menjadi kenyataan, meskipun masih diperlukan pembuktian secara empirik. Dengan menggunakan data Sudan mencoba menguji hipotesis Darrat's bahwa sistem moneter Islam lebih stabil tanpa aset yang mengandung bunga.

Dalam kaitan ini empat kriteria operasional utama diuji dengan menggunakan integrasi dan kointegrasi dan model ECM. Kriteria-kriteria itu adalah sistem moneter Islam yang secara struktural menstabilkan hubungan permintaan uang; ia menunjukkan supply uang yang bisa dikontrol, juga memiliki jalur yang mandiri dengan tujuan kebijakan akhir

Kata Kunci : Stable money demand, price stability, controllable money supply, Error Correction Model

Introduction

The process of Islamisation that started in many parts of the Muslim's countries some years ago has become a fact. This process has been reflected by the Islamic banks that have opened in Muslim and non-Muslim countries as well. However, this phenomenon needs to be justified by more empirical studies. Many works have been done in terms of describing the thought and nature of the Islamic economics system based on the perception of Islam and its institutions. In addition, there is

considerable research that examines the theoretical part of this system by using the tools of economic analysis (Mohsin S. Khan 1986), (Mohsin S. Khan and Abbas Mirakhor 1987), (Habibi 1987). Despite these noticeable efforts, the empirical evaluation of the Islamic economics remains far below the needed level compared with its conventional counterparts. Without sufficient empirical research, it will be difficult for us to compare the performance of this system with traditional one in term of viability,

stability, and the behaviour of macro economic aggregates.

The main purpose of this paper is to test empirically the hypothesis that the Islamic Monetary system becomes more stable without interest-bearing assets¹. The researcher is going to take Sudanese data from 1967 to 1998 to test the stability of the Sudanese monetary aggregates, using the model by Darrat (1988). Darrat (1988) presented the only empirical attempt to test efficiency of the Islamic monetary system. He used time series data from Tunisia to evaluate four operational criteria. He argued that in contrast that in contrast to the interest-based monetary system, the Islamic monetary system displayed a well behaved velocity of money, had structurally stable money demand relationship, exhibited a controllable money supply and this money supply had a reliable link with the ultimate policy objectives (price stability)². In this study, Darrat's final conclusion was that Islamic monetary system is superior to the traditional system because it is financially more stable. This result was consistent with the

previous studies, (e.g. Khan 1986)³. The stability of Islamic financial system, he found, is due to the elimination of the speculation on financial instrument (such as bonds) that bear a fixed nominal rate of return. Adding to that the fixed rate of return in the western conventional practice prevents banks from instantaneous adjustment to potential asset shock that lead to possible financial instability, (Khan 1986).

Recently Youseffi *et al* (1997) adopted an identical methodology to that of Darrat (1988) to examine the Islamic monetary system in the case of Iran⁴. They were interested in the relative stability of the Islamic monetary system. They claimed that contrary to Tunisia, Iran is a country of some history of Islamic economics. The results of their study were mixed with some evidence both for and against the hypothesis of the velocity of money, the stability of the financial aggregates and the usefulness of policy controllability support non-interest based monetary in Iran and

¹ A.F.Darrat (1988), The Islamic interest-free banking system : some empirical evidence, Applied Economics, 1988,20,417-425

² Darrat (1988)

³ Khan, M.S. (1986) Islamic Interest-free banking: A theoretical analysis, International Monetary Fund Staff Papers, 33,231-54

⁴ Youseffi, M., Abizadeh and McCormick, K. (1997) Monetary Stability and Interest-free banking: the case of Iran, Applied Economics, 29,896-76

are consistent with Darrat (1988), the linkage of the policy objectives was not. Thus, the empirical results they report are consistent with the superiority of interest-free over interest-based system in Iran in three out of four operational criteria used.

However, Darrat (2000)⁵ has revisited the issue of the stability of Islamic monetary system in Iran using the same data and time series that were used in Youseffi *et al* (1997). He showed that Youseffi's results that appeared in conflict with the efficiency of the Islamic monetary system is in doubt due to the possibility of significant specification errors. Once he corrected these errors, the results supported the efficiency of interest-free monetary based in Iran. Having reviewed research on Tunisia and Iran, in the following paragraphs the case of the Sudan will be studied. Although the three Muslims countries, Pakistan, Iran, and Sudan have tried to implement Islamic financial system on a national scale, the later Islamic financial model represents a unique experiment. The previous studies showed that in Pakistan the Islamisation of the financial sector is still pending while in Iran after 1979, interest rates have largely been replaced with services charges

⁵ Darrat, A.F., Monetary stability and interest-free banking revisited, Applied Economics Letters, 2000,7,803-806

on loans and bonuses on deposits⁶. In his study Endre (1998) concluded that Sudan provides a unique example of a modern attempt to recreate the banking system according to Islamic principles. Based on his study, the expected result and implication of the Sudanese case seems to be very important for Islamic economists and Muslim policy makers

Integration and Cointegration Test

Before testing the empirical hypothesis that the Islamic monetary system is relatively stable without interest-bearing assets, the study will try to establish the temporal properties of the data series. This is because Sudan is country of high inflation and if the time series data is found to be non-stationary any results will be misleading. The study used the following equations to test the unit root test :

$$\Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \varepsilon_t \dots \dots \dots (1)$$

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + e_t \dots \dots \dots (2)$$

where $\Delta Y_t = Y_t - Y_{t-1}$. The series

Y_t, Y_{t-1} are the dependent and independent variables under the investigation respectively.

⁶ Endre Stiansen(1998), Islamic banking in the Sudan: the laws and the debate The Nordic Africa Institute, Uppsala

Table 1.
Integration Tests

Philips-Perron Unit Root Test		
Variable	No Trend	Trend
First Differences		
GDP	-20.50	-22.39
CPI	-3.5424*	-5.0030*
M ₁	-1.3221	-3.9902**
M ₂	-1.8514***	-5.1216*

Note : *,**,***, denotes significance at 1%, 5%, 10% level, respectively

If the estimated B_1 in equation 1 is significantly less than 0, we reject the null hypothesis of non-stationary. Likewise, if $\alpha=1$ in equation 2, then Y_t has a unit root. Testing the non-stationary is very significant in the sense that we will avoid the spurious regression problem as long as the non-stationary variables in our time series regression are cointegrated (Mansor 2000). Moreover, based on Granger's theorem, the existence of cointegration among the variables justifies the use of the error correction model.

Hence the integration and cointegration tests need to be implemented. Table 1 reports the PP test for a unit root in the series. The test suggest that these

variables are stationary in first differences. However, after the integration results, we need to run a cointegration test to determine the long-run relationship between the variables. The Johansen (1990) MLE approach was used to test the presence of this relationship. The results of Johansen and Juselius tests are reported in Table 2. Looking at the table, we find evidence for the presence of long-run relationship (i.e., cointegration) between (a) CPI and M₁, (b) CPI and M₂, (c) M₁ and GDP and M₂ and GDP. For all CPI, M₁, M₂ and GDP the null hypothesis for zero cointegrating vectors is rejected at the 1% or 5% level by the trace test

Table 2.
 Cointegration Tests

A. Null Hypothesis	Trace	Eigenvalue	Critical Values (Trace)	
			5%	1%
(A) $CPI M_1$				
$r = 0$	48.1916	0.3785	25.32	30.45
$r \leq 1$	5.8661	0.0638	12.25	16.26
(B) $CPI M_2$				
$r = 0$	48.5897	0.3727	25.32	30.45
$r \leq 1$	7.0838	0.0765	12.25	16.26
(C) $M_1 GDP$				
$r = 0$	48.5897	0.3727	25.32	30.45
$r \leq 1$	7.0838	0.0765	12.25	16.26
(D) $M_1 GDP$				
$r = 0$	48.5897	0.3727	25.32	30.45
$r \leq 1$	7.0838	0.0765	12.25	16.26

Note: r us the number of cointegrating vectors. Critical values for the test statistics are from Johansen and Juselius (1990)

Velocity⁷

The velocity of money plays a fundamental role in macroeconomics analysis and has serious implications for general economic stability⁸. Following Darrat (1988) and Youseffi *et al.* (1997) this section will begin with the equation of exchange :

$$MV = PQ \dots \dots \dots (3)$$

where M is money supply (however defined), V is the income velocity of money, Q is the economy's real GDP and P is the price level. Hence, PQ is the economy's nominal output (i.e. nominal GDP- the quantity of goods valued at whatever price level exists at the time). If the velocity remains constant, the money supply can be used the predict how much nominal GDP will grow if we know how much the money supply grows. This means that if the monetary authorities know how much money supply grows. This can be used to stabilise the nominal income. This means that if the velocity of money

⁷ The researcher used quarterly data on all variables. However, only GDP quarterly data was not available which has been a generated according to Diz's (1974) specification. The data for the period that covered from 1967 to 1998 was obtained from the IMF reports and Sudan Center of Statistic reports

⁸ Darrat (1988), Youseffi *et al.* (1997) and the references cited therein

is temporarily stable and money supply is under the control by the monetary authorities, the monetary policy action effectively influences aggregate economic activity. If the velocity is not well behaved, the link between policy actions and the aggregate economy activity will be weakened.

The instability of the velocity (Darrat 1988) could further lead to overall financial economic instability. This velocity can be defined by rearranging equation 3 to:

$$V_1 = PQ/M_1 \dots \dots \dots (4)$$

$$V_2 = PQ/M_2 \dots \dots \dots (5)$$

Where,

V_1 = non-interest bearing velocity

V_2 = interest bearing velocity

Having defined and explained the necessity of the velocity's stability of money, we are going to study the implications of the velocity of interest-bearing (V_2) and non-interest-bearing (V_1) money supply⁹ in Sudan over the period from 1967 to 1998. Tables 3.a and 3.b show the behaviour of the velocity in

⁹ Two standard definitions of money are used, M_1 and M_2 is the "the sum of currency outside banks plus demand deposits other than those of the central banks. M_2 is the sum of M_1 and quasi money. M_1 and M_2 indicate non-interest-bearing and interest-bearing money supply in Darrat (1988,2000) Youseffi et al. (1997)

Sudan from 1967 to 1998. These tables reveal that the historical movement of the Sudanese velocity of both interest bearing and non-interest-bearing money stock has undergone a dramatically volatility over the period examined

Table 3.a
Velocity of Money (V_2)

Period	Min	Max	Mean	Std. Dev.	CV ¹⁰
1967-1998	1.8	3.12	2.18	0.3168	14.6%

Table 3.b

Velocity of Money (V_1)

Period	Min	Max	Mean	Std. Dev.	CV
1967-1998	4.5	7.5	6.13	0.8528	14%

From Table 3.a. we see that V_2 fell from a high of 3.12 in 1967 to about 1.8 in 1998, during the period of investigation. This may be due to institutional factors such as organisational structures and inefficiency of the banking and credit system in the country. The periodical changes in the velocity of interest bearing money (V_2) from year to year were 0.3168 as shown by its standard deviation.

In contrast, the behaviour of non-interest velocity of money (V_1) (see Table No.3.b) also greatly fell from 7.5 to 4.5 for the same period. The yearly changes that

¹⁰ The coefficient of variation expressed as the standard deviation as a percentage of the mean: $CV = \dots$

were evidenced by its standard deviation of 0.8528 were high compared to V_2 . Despite these changes the velocity of interest bearing money showed more volatility than non-interest bearing money velocity. That is because the coefficient of variation (CV) of (V_2) is relatively higher than the comparable measure for non-interest-bearing money supply, 14.6% as opposed to 14%.

The relative stability of money demand

Based on Darrat (1988) and Youseffi et.al. (1997), the stability of demand for desired money balances for Sudan is estimated. The money demand function is one of the most enduring analytical devices in macroeconomics. Due to the theoretical and empirical studies of a new monetarism through the 1970s, most countries devote more attention to movements in monetary aggregates¹¹. Although economists no longer hold in high esteem Keynes' tripartite specification of motives for holding money balances (transactions, precautionary, and speculative), the modern theory of the demand for money does identify three important determinants, the real

income level, the real interest rate, and the price level. Hence, assuming that agents do not suffer from money illusion, the demand for money is a demand for real balances and this is conventionally expressed as a function of real income and the nominal interest rate. Thus this section will consider the following real money demand functions¹²:

$$(M_d / P)_t = f(Y_t, R_t) \dots \dots \dots (6)$$

where M_d is the demand for nominal money balances, Y_t is the real aggregate income or output and R_t is the interest rate or yields on real assets. P is the price level and t stands for time. By applying the logarithmic functional form, equation 6 becomes:

$$\text{Log } (M_d / P)_t = \alpha_0 + \alpha_1 \log Y_t + \alpha_2 R_t + \varepsilon \dots \dots (7)$$

ε is the structural disturbance term. Since the rate of interest is officially ruled out under the Islamic monetary system, the following version of general money demand functions will be estimated, (Darrat (1988) and Youseffi et.al. (1997)):

¹¹ Gordon de Brover, Irene Ng and Robert Subbaraman, The demand for money in Australia : New Tests on Old Topic (1993), Reserve Bank of Australia

¹² See Darrat (1988), Youseffi et al. and the references therein

$$\text{Log } (M_d / P)_t = \alpha_0 + \alpha_1 \log Y_t + \alpha_2 P^e_t + \log (M_d / P)_{t-1} + \varepsilon \dots \dots \dots (8)$$

where M/P and P^e are the desired real money balances and the expected rate of inflation respectively. Following Darrat (1988) and Youseffi et.al. (1997), two modification must take place in order to make equation 8 estimable. P^e_t is not observable and by assuming static expectations, the CPI will be used instead of it. Additionally the unobservable desired real money (M_d/P) in equation 8 also will be replaced with an observable variable.

Since a Koyck Partial adjustment procedure assumes that the adjustment of actual real money holdings to desired level in the current period (t) and the actual level in the previous period ($t-1$)¹³, equation 8 may be rewritten as:

$$\text{Log } (M_1 / P)_t = \alpha_0 + \alpha_1 \log Y_t + \alpha_2 \text{CPI} + \alpha_3 \log (M_1 / P)_{t-1} + \alpha_4 \text{EC1} + \varepsilon \dots \dots \dots (8.1)$$

$$\text{Log } (M_2 / P)_t = \alpha_0 + \alpha_1 \log Y_t + \alpha_2 \text{CPI} + \alpha_3 \log (M_2 / P)_{t-1} + \alpha_4 \text{EC2} + \varepsilon \dots \dots \dots (8.2)$$

where $((M_2 / P)_t$ and $(M_1 / P)_t$ are interest rate and non-interest real money balances respectively. Y_t is real GDP and CPI refers to the consumer price index. Equations 8.1 and 8.2 were estimated using OLS method for the period 1967 to 1998, and the empirical results were follows:

¹³ See Darrat (1988), p. 421 and Youseffi et al. (1997), p. 872

Interest-free Money demand function $(M_1/P)_t$

Periods	α_0	$\alpha_1 \log Y_t$	$\alpha_2 \text{CPI}$	$\alpha_3 \log (M_1/P)_{t-1}$	$\alpha_4 \text{EC1}$	R^2	LM-test	Chow
1967-1998	-0.568	0.497	-0.11	0.112	-0.007	98%	1.9	3.002
t-ratios	(-22.96)	(22.17)	(-18.9)	(20.58)	(-5.56)			

Interest-based Money demand function $(M_2/P)_t$

Periods	α_0	$\alpha_1 \log Y_t$	$\alpha_2 \text{CPI}$	$\alpha_3 \log (M_2/P)_{t-1}$	$\alpha_4 \text{EC2}$	R^2	LM-test	Chow
1967-1998	0.285	-0.371	-0.18	-0.747	-0.002	56%	1.68	1.027
t-ratios	(9.163)	(-3.30)	(-3.087)	(8.871)	(3.099)			

where EC represent the error-correction term and numbers in parentheses under the coefficients estimated are t-ratios. R^2 is the coefficient of the determinant, and the LM-test is the Breusch-Godfrey Serial Correlation LM test. All equations reported above fit the Sudanese data from 1967 to 1998 quite well as indicated by the values of R^2 . None of the equations reported suffers from significant serial correlation as indicated by the LM-test. Since the coefficients of the EC term in both equations are significant, we can say both the two system under investigation exhibit long-run relationship in Sudan. The regression results for real M_1 balances reveal a good statistical fit for the period reported above. The coefficient of real GDP carries the expected positive sign and is statistically significant. The coefficient of the CPI is negative and statistically significant. This negative sign is expected as it implies that the rate of inflation is a good proxy for the expected yields

on real assets¹⁴. The regression results for real M_2 money balances reveal a good statistical fit as well. The coefficient of real GDP carries an unexpected negative sign which does not conform to the theory. The coefficients of lagged real balances do not carry the expected positive signs in equation 8.4 and statistically significant in both the equations. In order to test the structural stability hypothesis, the Chow (1960) test was used. The sample period was divided in two sub-periods. Using equations 8.3 and 8.4 and thus $(M_1/P)_t$ and $(M_2/P)_t$ as the dependent variables, we obtain a Chow statistics of 3.002 and -1.0271 respectively. The critical p -values for two tests are 0.0211, 1.00, respectively. The p -value implies that the structural stability hypothesis of demand only for interest-free real balances can not be rejected at the 5% level of significance. Hence, the statistical testing of the stability of the real

¹⁴ Youseffi *et al.* (1997)

money demand function, suggests that the demand for real money is relatively stable under the assumption of non-interest bearing assets only. The coefficient of determinant of M_1/P is also higher than M_2/P . Hence, we can conclude that the demand for real balance in Sudanese case for the whole period from 1967 to 1998 is more stable when the interest rate is absent. These results are in conformity with Darrat (1988) and Youseffi et.al.(1997). Both claim that the Islamic monetary system yields stability.

Policy efficiency

Darrat (1988) and Youseffi et.al.(1997) identify two prerequisites that can be used to assess the relative superiority of the interest-based versus the interest-free monetary system. According to Darrat (1988) and his sources, any monetary aggregate becomes useful for policy purposes only if the aggregate is effectively under the control of the central bank without being influenced by non-policy factors. If this is not the case, the financial aggregate cannot provide a reliable indicator of policy moves. The other prerequisite is that there should be a strong link between that aggregate and the main goal of policy makers. Failure to mention this link will make the policy useless even if it is controllable.

a. The controllability

Based on Darrat (1988) and Youseffi et.al.(1997), we will examine the degree of controllability over M_2 and M_1 , which represent the interest and non-interest based money stock for Sudanese case from 1967 to 1998 respectively. Due to financial liberalization and innovation, the range of the bank deposits and their substitutes has expanded rapidly, and the distinctions between monetary and non-monetary financial assets have become even less clear than before. Thus despite the initial theoretical aspects of the monetary policy, experience with the use of monetary aggregates as a target or an even indicator, proved disappointing¹⁵. This is because the financial innovation and regulatory changes often severely distorted the monetary outcome. Hence, to measure the degree of controllability between the two financial (interest and non-interest) aggregate, we tested the following model:

$$GM_1 = \beta_0 + \beta_1 GMB + \mu \dots (9.1)$$

¹⁵ Gordon de Brover, Irene Ng and Robert Subbaraman, *The demand for money in Australia : New Tests on Old Topic*,(1993), Reserve Bank of Australia

$$GM_2 = \beta_0 + \beta_1 GMB + \mu \dots (9.2)$$

where is GMB is the growth of the money base, which comprises the currency held by

the public and banks plus reserve deposits of bank held at the central bank. The empirical results of the above equations are as follows:

Periods	β_0	β_1	R ²	F	DW	Chow	N
1967-1998	-0.137	0.037	35%	33	1.9	0.049	132
t-ratios		(5.19)					

Periods	β_0	β_1	R ²	F	DW	Chow	N
1967-1998	0.099	0.026	30%	27	1.5	4.47	132
t-ratios		(6.10)					

The results of the above equations strongly suggest that the growth movement of both interest and non-interest based aggregates adheres more closely to the movements in the monetary base. Consistent with the previous findings, this result suggests that non-interest-bearing aggregates moved more closely than interest-bearing aggregates. This evidence came from the fact that changes in the money base can be explained by 0.35% of variations in the growth of M₁, but and only 0.30% of M₂. the degree of responsiveness of the two monetary aggregates to changes in the monetary base is also different.

This finding showed that the interest monetary aggregate

is less elastic than M₁ in the Sudanese case during the period of the study. This is explained by the fact that every percentage-point change in the growth rate of the monetary base results in about a 0.037 percentage-point change in the growth rate of M₁. Similar changes in the monetary base will only lead to 0.026 percentage-changes in the growth rate of M₂. Both the changes in M₂ and M₁ are statistically different from zero.

Thus, it may be concluded that, the relationship between monetary base and the financial aggregate of M₁ which represents the non-interest charging money are more controllable than M₂ in the Sudanese case. This result is consistent with Darrat (1988)

and Youseffi et.al.(1997) for both claim that M_1 is more controllable than M_2 in both Tunisia and Iran.

b. The price stability

In order to determine the superiority of either the interest or interest-free monetary system in Sudan, in terms of the linkage between monetary aggregates and the policy objective, the following two inflationary models will be estimated:

$$GCPI = \gamma_0 + \gamma_1 GM_{1-1} + \gamma_2 GM_{1-2} + \gamma_3 GM_{1-3} + \gamma_4 EC1 + \mu_1 \dots \dots \dots (11.1)$$

$$GCPI = \gamma_0 + \gamma_1 GM_{2-1} + \gamma_2 GM_{2-2} + \gamma_3 GM_{2-3} + \gamma_4 EC2 + \mu_2 \dots \dots \dots (11.2)$$

where GCPI is the growth rate of the CPI inflation rate, GM_1 is the growth rate of M_1 (the narrow money stock) representing the interest-free banks, GM_2 is the growth rate of M_2 (the broad money stock) representing the interest based banking system, and μ_1 and μ_2 , are the associated error terms. In order to ensure a relative stability of the regime over the estimated period (1967-1998), the Chow test was implemented.

Darrat (2000) identified two potential problems regarding equations 11.1 and 11.2. Firstly, he said that the

inclusion of the contemporaneous values of the independence variables (GM_1 and GM_2) in both equations could cause them to suffer from simultaneity bias. Secondly, given money supply influencing prices, feedback is also possible if the central banks are sensitive to price movements. In order to avoid the simultaneity bias, the contemporaneous values will be omitted from the right-hand-side of both equations 11.1 and 11.2. Hence, the lagged independent variables are statistically exogenous and OLS estimates can be considered reasonable.

As explained previously in Table 1 the report of the PP test suggest that the variables M_1 , M_2 , and CPI are stationary in first differences. The test of cointegration result also suggests that there is a long-run relationship between the prices (CPI) and both M_1 and M_2 over the long-term. This finding supports Darrat (2000). In his study, Darrat found a reliable long-term relationship between M_1 and prices. For more explanations consider the following regression result¹⁶ :

¹⁶ OLS

M_1

Periods	γ_0	γ_1 GM ₁₋₁	γ_2 GM ₁₋₂	γ_3 GM ₁₋₃	γ_4 EC1	R ²	F	DW	Chow
1967-1998	4.254	0.003	-0.004	0.001	-1.936	52%	15	2.4	5.4
t-ratios		(2.850)	(-2.47)	(1.089)	(-1.7)				

M_2

Periods	γ_0	γ_1 GM ₂₋₁	γ_2 GM ₂₋₂	γ_3 GM ₂₋₃	γ_4 EC2	R ²	F	DW	Chow
1967-1998	-11	1.061	-0.038	0.287	1.29	50%	14.8	2.2	1.6
t-ratios		(3.424)	(1.588)	(0.848)	(-3.46)				

where EC represent the error correction term and figures in parentheses below their respective coefficients are the absolute values of t-statistics. The F-statistic is the test of the null hypothesis, that all explanatory variables (except the constant) have zero coefficients. DW is the Durbin Watson test.

This results for the investigated period from 1967 to 1998 show that both equations 12.1 and 12.2 are statistically reasonable. Since statistical reliability by the size and the coefficients of the EC in both equations are significant, one can argue that both the interest-bearing and non-interest monetary bearing system are linked to the policy maker's goal of price stability in the short-run and in the long-run in the Sudanese case. Based

on chow test neither interest-free nor interest-based regime in the Sudanese case reject the hypothesis of the no structural changes over the estimated period.

Consistent with Darrat's (1988), (2000) and the contrary to Youseffi's et.al (1997) conclusions, the above regressions result suggests that M_1 , which represents the interest-free monetary system in Sudan, exhibits a higher explanatory power (R²) than that of M_2 , which represents the interest-based monetary system for the period from 1967 to 1998. the negative coefficients of some independent variables do not conform to the theory. Despite these signs, the results seem to be in line with Darrat's (1998,2000) findings that changes in the non-interest-bearing monetary aggregate

have a stronger and more reliable relationship with the policy maker's goal of price stability than do changes in interest-bearing monetary aggregates.

Summary and Conclusion:

This paper reviews the issue of the stability and reliability of the interest-free monetary aggregate using Darrat's (1988) innovated and Youseffi's et.al (1997) identical models. Darrat (1988) took Tunisia as a case study concluding that the relative efficiency and stability of the interest-free based monetary system over the alternative interest-based system prevailed. He derived his conclusion from four operational criteria. By referring to both systems Darrat found that the interest-free system exhibits a well-behaved and smooth velocity of money, has structurally stable public demand for financial assets, and has a reliable link with the ultimate policy objectives. The alleged superiority of Islamic banking has been empirically verified by Youseffi et.al (1997). They claimed that the efficiency of the interest-free monetary system in Tunisia was suspect. Their point was that Tunisia has no history of Islamic banking. Hence, they replicated Darrat's model for Iran. With the exception of achieving the ultimate policy objectives, their

results were consistent with Darrat (1988). Based on the explanatory power of the models, Youseffi et.al believed that the issue of the price stability did not support the efficiency of the interest-free system in Iran. Hence Youseffi et.al's final conclusion was that, the superiority of the interest-free system did not hold.

Darrat (1988) re-examined the issue of the stability of the interest-free monetary system by reviewing Youseffi et.al's case study. He countered Youseffi et.al's results arguing that their result suffer from simultaneity bias and specification errors. Once he corrected these two problems, the results obtained for Iran using similar data, suggested the superiority of the interest-free system.

In this study, the efficiency and superiority of the interest-free system has been investigated. Apart from Pakistan and Iran, Sudan has tried to implement Islamic banking on a national scale. Evidence from the previous studies shows that in Pakistan the Islamisation of the financial sector is still pending while in Iran the interest rates have largely been replaced with services charges on loans and bonuses on deposits. Hence, despite the present of the Islamisation process, the payment of interest on borrowed funds still exists in Iran.

Therefore, we replicated Darrat's (1988) model for the Sudanese case because Sudan provides a unique example of a modern attempt to recreate an economic system according to Islamic principles. The empirical results from Sudan tentatively suggest the superiority of an interest-free monetary system over the interest charging monetary system in all the four criteria. The velocity of non-interest based money was found to be well

behaved and less volatile in Sudan than its comparable interest-based monetary system. Likewise, the structural stability of the demand for financial aggregates, the degree of the controllability and the ultimate policy objectives operational criteria showed the superiority of the non-interest-based monetary system. This conclusion is consistent with Darrat (1988,2000) and contradicted Youseffi et.al (1997) in the case of the monetary objectives criteria.

REFERENCES

- Darrat, A.F., *Monetary stability and interest-free banking revisited*, Applied Economics Letters, 2000, 7, 803-806.
- Darrat, A.F. (1988), *The Islamic interest-free banking system: some empirical evidence*, Applied Economics, 1988, Vol. No. 20
- Endre Stiansen (1988), *Islamic banking in the Sudan: the laws and the debate*, The Nordic Africa Institute, Uppsala, Unpublished working paper
- Gordon de Brover, Irene Ng and Robert Subbaraman, *The demand for money in Australia: New Tests on Old Topic (1993)*, Reserve Bank of Australia
- International Monetary Funds (IMF). 1967-2000. *Financial Statistics Years books*
- Ibrahim, M. Mean Reversion, *Error Correction Modeling, and the Purchasing Power Parity: Evidence from South Asian Countries*. Journal of Foreign Exchange and International Finance, Vol. XII, No. 1
- Khan, M.S. and Abas M. 1990. *Islamic Banking : Experience in the Islamic republic of Iran and Pakistan*. Economic Development and Cultural Change. Vol. No. 38
- Sudanese Central bank Annual Reports (Sundries issues)
- Sudan Ministry of Finance, Economic Report, Sundries Issues from 1984-1996
- Sudan Ministry of Trade, Sundries report
- Supplement to Civil Transactions Act. 1984. Sections 82, 281, 285(1), Sudan
- Youseffi, M., Abizadeh and McCormick, K. (1997). *Monetary Stability and Interest-free banking: the case of Iran*, Applied Economics, Vol. No. 29