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Towards Abolishing the Rate of Interest in Contemporary Islamic Societies

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ABSTRACT. Demand for money and investment function in contemporary Islamic societies is measured through an econometric model to demonstrate that the rate of interest does not play any significant role in their determination. The same technique shows the rate of interest to be a significant determinant of these variables in non-Islamic countries with similar economies. It follows that prohibition of interest in Islam has influenced behaviour in Muslim countries. and that abolishing interest is not going to pose serious problems for them.

Introduction

The aim of this paper is to assess the role played by the rate of interest in contemporary Islamic economies.

The paper develops and tests a number of static and dynamic econometric models which explain the relationship between the rate of interest and other economic variables in the money and commodity markets of contemporary Islamic societies. The regression results are used in assessing the role of interest in these societies.

The paper is divided into four sections. Section one summarises very briefly Islamic rules on interest or "*Riba*".

Sections two and three develop and test econometric models to measure demand for money and investment functions in contemporary Muslim societies to determine the importance of the rate of interest in their economies. These two sections also offer a comparative study between Muslim and non-Muslim countries of similar economic structure and in similar stages of development.

Finally, section four offers some suggestions and recommendations regarding the performance of interest-free Islamic economics.

I

Islam prohibits the payment of interest on all types of loans (personal, commercial, agricultural. industrial etc.) whether these loans are made to friends, private or public companies, government or any other identity. The relevant verses of the Holy Qur'an are clear and unambiguous. We may mention:

> "Those who devour usury will not stand except as stands one whom The Evil One by his touch hath driven to madness that is because they say: "Trade is like usury" But Allah hath permitted trade and forbidden usury..." (II. 275)

> "Allah will deprive Usury of all blessing. but will give increase for deeds of charity: For He loveth not creatures ungrateful and wicked" (II. 276)

> "0 Ye who believe. Fear Allah and give op what remains of your demand for usury, if Ye are Indeed believers". If Ye do it not, take notice of war from Allah and his Apostle: But if Ye turn back. Ye shall have your capital sums: Deal not unjustly and Ye shall not be dealt with on unjustly". (II. 278-279)

> "0 Ye who believe! Devour not Usury. doubled and multiplied; but fear Allah that Ye may (really) prosper. Fear the Fire, which Is prepared. for those who reject Faith". (III. 130-131)

> "That which Ye give in usury in order that it may increase on (other) people's property hath no in crease with Allah: but that which Ye give in charity. seeking Allah's Countenance. hath increased manifold". (XXX. 39)

The Prophet has condemned both the receiver and the giver of usury. Islam was not alone or even first in prohibiting the payment of interest. Many ancient thinkers regarded the payment of interest unjust. Lending money at interest was forbidden by the ancient Greeks. Aristotle, whose influence extended over centuries, strongly condemned the taking of interest. According to him, the sole object of the uses of money was to facilitate exchange. A piece of money can not beget another piece, said Aristotle (1905, Book I, ch. x). Surprisingly, Plato, too, condemned interest (1921, Book V). In its early stages, the Roman Empire prohibited the charging of interest but gradually, with the extension of the Empire and the rise of the trading classes, interest appeared. However, severe restrictions were imposed on rates of interest. These laws were strictly policed. The Romans were the first to enact laws for protection of debtors (Henry 1920). Payment of interest on money loans was prohibited by Common Law in the Middle Ages.

II
The Effect of Interest on the Demand for Money in Contemporary Islamic Countries

Strictly speaking, none of the contemporary Muslim countries can be labelled an "Islamic economy" in the sense of applying the Islamic Shari'ah in all facets of economic life. However, principles of Islam do dominate much of the behaviour of Muslims in these countries. This behaviour extends, in most cases, to economic transactions. Thus many Muslims would not accept payment of interest, although charging interest may not be forbidden by current laws. Also many Muslims would not speculate although the opportunity may exist. And so on.

This section uses econometric analysis in evaluating the role of the rate of interest in contemporary Islamic societies.

Modern macroeconomic theories view one of the principal role of the rate of interest to be equilibriating the supply and demand of money. The study of the money demand function is, therefore, appropriate.

Keynes argues that the demand for money for transactions (and precautionary motives) is a function of income while the speculative demand for money is a function of the rate of interest. Thus the liquidity preference function can be expressed as

$$M_d = m_d (r, Y) \quad (1)$$

Where :
M_d = total demand for money
r = the rate of interest
Y = income

To test the above function, we used the following two econometric models:

$$\text{In } (M_d / P)_t = a_0 + a_1 \text{In} \overline{Y}_t + a_2 \text{In} r_t + a_3 \text{In}(M_d / P)_{t-1} + u \quad (2)$$

$$\text{In } (M'_d / P)_t = b_0 + b_1 \text{In} \overline{Y}_t + b_2 \text{In} r_t + b_3 \text{In}(M'_d / P)_{t-1} + v \quad (3)$$

Where :

M_d = the demand for narrow money (M_1)
M'_d = the demand for broad money (M_2)
P = the price level
$\overline{Y}$ = real national income
r = the rate of interest
u , v = error terms
t = time

We assumed that there is an equilibrium in the money market, i.e. the quantity of money demanded equals the quantity supplied.

The introduction of the Koyck transactions $(M_d / P)_t$ and $(M'_d / P)_{t-1}$ gives the two models a dynamic character and reflects the partial adjustment process which maybe inherited in the functional relationships.[1]

The coefficients a_2 and b_2 measure the short-term elasticity of the demand for money with respect to the rate of interest, i.e.

$$a_2 = \partial \text{In}(M_d / P)_t / \partial \text{In} r_t \quad (4)$$

$$b_2 = \partial \text{In}(M'_d / P)_t / \partial \text{In} r_t \quad (5)$$

We expect the coefficients of the two models to have the following signs :

$a_1 > 0$; $a_2 < 0$; $0 < a_3 < 1$
$b_1 > 0$; $b_2 < 0$; $0 < b_3 < 1$

The statistical analysis was applied to all Islamic countries for which data were available. We considered an Islamic country any country whose Muslim population exceeded 70 percent of its total population.

We used GDP at constant prices to represent the variable Y and we used the discount rate to represent the variable r. This rate is defined as "the rate at which the monetary authority lends or discounts eligible paper for deposit money banks". Un fortunately, data on other rates (e.g. short-term money market rates or long-term bond rates) were not available. However, the use of these other rates should not upset the conclusions since the different interest rates are strongly and positively correlated with one another.

The variable P is represented by the Consumer Price Index (C.P.I.) while the variables M_d and M'_d represent the narrow and broad demand for money as mentioned before.

Table 1 gives the regression results for 12 Islamic countries for which data were available. The values in brackets under each coefficient represent its estimated "t" value. We marked those coefficients which were significant at at least 5 per cent level of significance by * and those which were significant at at least 10 per cent level of significance by **.

In those cases where the introduction of the Koyck transformation resulted in a problem of multicollinearity, we used the two models:

$$\ln (M_d / P)_t = k_0 + k_1 \ln \overline{Y}_t + k_2 \ln r_t + e_1 \quad (6)$$

$$\ln (M'_d / P)_t = q_0 + q_1 \ln \overline{Y}_t + q_2 \ln r_t + e_2 \quad (7)$$

TABLE 1. Regression Results for the Demand for Money in Specific Islamic Countries

Jordan (1970-82)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-10.093)}{-4.513^{*}} + \underset{(4.514)}{0.892}\ln(\bar{Y})^{*}_t + \underset{(0.121)}{0.076}\ln(r)_t$$

$n = 13$; S.E. = 0.069; $\bar{R}^2 = 0.943$; F = 99.6; D.W. = 1.629

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-13.779)}{-7.107^{*}} + \underset{(6.196)}{1.411}\ln(\bar{Y})^{*}_t - \underset{(-0.249)}{0.181}\ln(r)_t$$

$n = 13$; S.E. = 0.079; $\bar{R}^2 = 0.964$; F = 163.3; D.W. = 1.726

Morocco (1959-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-17.984)}{-3.451^{*}} + \underset{(18.484)}{1.712}\ln(\bar{Y})^{*}_t - \underset{(-1.708)}{0.307}\ln(r)_t$$

$n = 22$; S.E. = 0.064; $\bar{R}^2 = 0.980$; F = 526.7; D.W. = 1.629

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-17.904)}{-3.627^{*}} + \underset{(47.522)}{1.714}\ln(\bar{Y})^{*}_t - \underset{(-0.622)}{0.116}\ln(r)_t$$

$n = 22$; S.E. = 0.068; $\bar{R}^2 = 0.981$; F = 524.7; D.W. = 1.707

TABLE 1. (continued)

Iran (1968-77)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-4.229)}{-2.987^{*}} + \underset{(13.892)}{1.701}\ln(\bar{Y})^{*}_t - \underset{(-0.926)}{0.374}\ln(r)_t$$

$n = 10$; S.E. = .088; $\bar{R}^2 = 0.965$; F = 126.4; D.W. = 1.771

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-3.489)}{-3.138^{*}} + \underset{(13.012)}{2.029}\ln(\bar{Y})^{*}_t - \underset{(-0.954)}{0.490}\ln(r)_t$$

$n = 10$; S.E. = 0.112; $\bar{R}^2 = 0.960$; F = 110.1; D.W. = 1.676

Pakistan (1970-82)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-0.752)}{-0.712} + \underset{(2.069)}{0.653}\ln(\bar{Y})^{**}_t - \underset{(-1.438)}{0.288}\ln(r)_t + \underset{(1.977)}{0.478}\ln\left(\frac{M_d}{P}\right)^{**}_{t-1}$$

$n = 13$; S.E. = 0.095; $\bar{R}^2 = 0.682$; F = 8.85; "h" = 0.989

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-1.087)}{-0.973} + \underset{(2.389)}{0.775}\ln(\bar{Y})^{*}_t - \underset{(-1.664)}{0.332}\ln(r)_t + \underset{(1.991)}{0.456}\ln\left(\frac{M'_d}{P}\right)^{**}_{t-1}$$

$n = 13$; S.E. = 0.090; $\bar{R}^2 = 0.759$; F = 12.53; "h" = 0.970

TABLE 1. (continued)

Bangladesh (1975-82)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-4.037)}{-8.423^{*}} + \underset{(4.080)}{2.369}\ln(\bar{Y})_t^{*} - \underset{(-0.707)}{0.329}\ln(r)_t$$

$n = 8$; S.E. = 0.077; $\bar{R}^2 = 0.904$; F = 34.0; D.W. = 1.091

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(-6.847)}{-9.138^{*}} + \underset{(7.081)}{2.639}\ln(\bar{Y})_t^{*} - \underset{(-1.088)}{0.324}\ln(r)_t$$

$n = 8$; S.E. = 0.049; $\bar{R}^2 = 0.968$; F = 106.7; D.W. = 1.240

Tunisia (1961-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-2.074)}{-0.570^{**}} + \underset{(4.427)}{1.321}\ln(\bar{Y})_t^{*} + \underset{(0.556)}{0.80}\ln(r)_t + \underset{(1.759)}{0.444}\ln\left(\frac{M_d'}{P}\right)_{t-1}^{**}$$

$n = 21$; S.E. = 0.075; $\bar{R}^2 = 0.991$; F = 708.6; "h" = 0.163

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(3.290)}{0.475^{*}} + \underset{(3.894)}{0.833}\ln(\bar{Y})_t^{*} + \underset{(0.403)}{0.039}\ln(r)_t + \underset{(2.764)}{0.427}\ln\left(\frac{M_d'}{P}\right)_{t-1}^{*}$$

$n = 21$; S.E. = 0.047; $\bar{R}^2 = 0.994$; F = 1122.6; "h" = 0.807

TABLE 1. (continued)

Syria (1958-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-8.557)}{-2.727^{*}} + \underset{(20.506)}{1.429}\ln(\bar{Y})_t^{*} - \underset{(-0.239)}{0.061}\ln(r)_t$$

$n = 24$; S.E. = 0.133; $\bar{R}^2 = 0.966$; F = 325.7; D.W. = 2.781

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(-8.593)}{-2.674^{*}} + \underset{(21.323)}{1.495}\ln(\bar{Y})_t^{*} - \underset{(-0.360)}{0.090}\ln(r)_t$$

$n = 24$; S.E. = 0.130; $\bar{R}^2 = 0.968$; F = 350.0; D.W. = 2.227

Libya (1965-77)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(0.275)}{5.108} + \underset{(9.447)}{2.061}\ln(\bar{Y})_t^{*} - \underset{(-0.318)}{3.643}\ln(r)_t$$

$n = 13$; S.E. = 0.272; $\bar{R}^2 = 0.898$; F = 53.7; D.W. = 2.370

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(0.191)}{4.438} + \underset{(8.125)}{2.218}\ln(\bar{Y})_t^{*} - \underset{(-0.217)}{3.112}\ln(r)_t$$

$n = 13$; S.E. = 0.341; $\bar{R}^2 = 0.865$; F = 39.5; D.W. = 2.583

TABLE 1. (continued)

Malaysia (1970-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-8.577)}{-1.894^*} + \underset{(25.507)}{1.092}\ln(\bar{Y})_t^* - \underset{(-0.892)}{0.077}\ln(r)_t$$

$n = 12$; S.E. = 0.038; $\bar{R}^2 = 0.984$; F = 347.4; D.W. = 2.438

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(-8.921)}{-2.682^*} + \underset{(26.178)}{1.527}\ln(\bar{Y})_t^* - \underset{(-0.231)}{0.028}\ln(r)_t$$

$n = 12$; S.E. = 0.052; $\bar{R}^2 = 0.985$; F = 361.4; D.W. = 2.344

Egypt (1965-77)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(3.465)}{0.889^*} + \underset{(8.794)}{2.144}\ln(\bar{Y})_t^* - \underset{(-1.530)}{0.450}\ln(r)_t$$

$n = 13$; S.E. = 0.078; $\bar{R}^2 = 0.951$; F = 116.6; D.W. = 1.374

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(2.848)}{0.772^*} + \underset{(8.246)}{2.125}\ln(\bar{Y})_t^* - \underset{(-0.628)}{0.195}\ln(r)_t$$

$n = 13$; S.E. = 0.083; $\bar{R}^2 = 0.953$; F = 123.0; D.W. = 1.425

TABLE 1. (continued)

Mauritania (1973-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-1.000)}{-4.056} + \underset{(2.855)}{2.068}\ln(\bar{Y})_t^* - \underset{(-0.188)}{0.275}\ln(r)_t$$

$n = 8$; S.E. = 0.827; $\bar{R}^2 = 0.826$; F = 17.6; D.W. = 1.886

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(-0.318)}{-1.040} + \underset{(2.831)}{1.653}\ln(\bar{Y})_t^* - \underset{(-1.146)}{1.352}\ln(r)_t$$

$n = 8$; S.E. = 0.070; $\bar{R}^2 = 0.888$; F = 28.8; D.W. = 1.948

Nigeria (1961-77)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(0.246)}{0.358} + \underset{(4.685)}{0.733}\ln(\bar{Y})_t^* - \underset{(-1.527)}{1.115}\ln(r)_t$$

$n = 17$; S.E. = 0.268; $\bar{R}^2 = 0.783$; F = 29.9; D.W. = 1.967

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(0.201)}{0.262} + \underset{(5.996)}{0.838}\ln(\bar{Y})_t^* - \underset{(-1.542)}{1.006}\ln(r)_t$$

$n = 17$; S.E. = 0.239; $\bar{R}^2 = 0.846$; F = 44.8; D.W. = 1.937

The estimated values of R^2 and F suggest that the tested models are good fit. Also the values of D.W. and "h" indicate that, in general, there are no serious problems of autocorrelation. However, we should bear in mind that these statistics are not appropriate for small samples. Moreover, all the statistically significant variables carry the right signs. Furthermore, the values of the Koyck variable are, in all cases, within the expected limits.

The regression results in Table 1 suggest that:

(1) The demand for money in contemporary Islamic countries is determined mainly by the level of income. This would seem to suggest that the transactions and precautionary motives dominate the behaviour of the Muslim inhabitants of these countries regarding their liquidity preference.

(2) The statistical significance of the variables $(M_d/P)_{t-1}$ and $(M'_d/P)_{t-1}$ suggest that wealth is an important determinant of the demand for money in some contemporary Islamic countries.

(3) The regression results of Table 1 suggest that the demand for narrow as well as broad money in contemporary Islamic countries is not determined by the rate of interest. The coefficients of the variable r_t were not statistically significant in any demand equation of any Islamic country covered by this study; not even at the 10 percent level of significant. This is a very important conclusion and has two main implications:

(a) The behaviour of Muslims regarding their liquidity preference differs significantly from the Keynesian model. The regression results would seem to suggest that the rate of interest does not play a significant role in determining their demand for money. Hence the Keynesian speculative motive does not seem to prevail in contemporary Islamic countries.

(b) The complete abolishment of the rate of interest in Islamic countries should not result in any serious problems regarding the effectiveness of the monetary policy in these countries, since their demand for money is completely interest inelastic. Two main questions may be raised against the above (serious) implications:

(i) Is it not possible that the weak role of interest rate in the studied Islamic countries revealed by the regression analysis could be due mainly to their relatively back ward stage of development and particularly to their underdeveloped money and capital markets and not necessarily due to the Islamic beliefs and deeds of their population?

(ii) Would the same conclusions regarding the role of the rate of interest in contemporary Islamic countries hold if different regression models were used?

To answer these questions we tested the same econometric models using data for an equal number of non-Islamic countries which are in very similar stages of development and have very similar economic structures as those Islamic countries tested before.

Table 2 gives some information about these non-Islamic countries.

TABLE 2. Basic Economic Indicators of Islamic and Non-Islamic Sample Countries

Country	Religion	Income per head $	Structure of Production (%)			Structure of Demand (%)			
			Agriculture	Industry	Services	Private Consumption	Public Consumption	Gross Investment	Exports
Bangladesh	Islamic	140	54	14	32	90	8	17	7
Pakistan	Islamic	350	30	26	44	82	11	17	12
Ghana	Non-Islamic	400	60	12	28	73	11	6	28
Mauritania	Islamic	460	28	24	48	62	29	28	49
Bolivia	Non-Islamic	600	18	27	55	86	10	13	13
Egypt	Islamic	650	21	38	41	64	19	30	34
Thailand	Non-Islamic	770	24	28	48	76	12	28	25
Morocco	Islamic	860	20	33	47	92	21	23	21
Guatemala	Non-Islamic	1140	–	–	–	84	8	17	17
Peru	Non-Islamic	1285	9	41	50	64	13	19	17
Columbia	Non-Islamic	1380	27	31	42	68	8	28	12
Tunisia	Islamic	1420	16	37	47	62	15	31	42
Syria	Islamic	1570	19	31	50	69	22	24	18
Jordan	Islamic	1620	8	30	62	86	30	41	54
Korea(s)	Non-Islamic	1700	17	39	44	66	12	26	39
Iran*	Islamic	–	9	43	48	40	20	34	..
Malaysia	Islamic	1840	23	36	41	53	21	32	53
Algeria	Islamic	2240	6	55	39	45	16	37	34
Brazil	Non-Islamic	2220	13	34	53	81	12	20	9
Portugal	Non-Islamic	2520	12	44	44	77	16	27	27
Greece	Non-Islamic	4420	17	31	52	66	18	25	20
Trinidad & Tobago	Non-Islamic	5670	2	52	46	60	9	30	45
Libya	Islamic	8450	2	71	27	26	26	34	60

The data in Table 2 show that there is a high degree of similarity between per capita incomes, the structure of production and the structure of demand in the Islamic and non-Islamic countries covered by the econometric analysis. It can easily be seen from these data that for each Islamic country studied there is a non-Islamic counterpart which has a similar economic structure and experiences a similar stage of development. Thus the economy of Thailand does not differ much from the Egyptian or the Moroccan economy and the economy of Columbia resembles in many respects that of Tunisia. The same thing can be said about the economies of S. Korea and Malaysia and so on.

Applying the same econometric techniques to the data of the non-Islamic countries listed above, we obtained the regression results in Table 3.

* The figures for Iran relate to 1977.
Source*: World Development Report, world Bank, 1983*

The values of R^2 and F suggests that the *same* econometric models give good fit when applied to non-Islamic countries of similar economic structures and at similar stages of development as the Islamic countries studied before.

Also, the values of D.W. and "h" statistics suggest that, in general there is no serious problems of autocorrelation. Moreover, all statistically significant coefficients have the right signs and the values of the Koyck variables are as expected. Thus the goodness of fit experienced in the case of Islamic countries is also experienced in the case of non-Islamic countries.

The regression results in Table 3 suggest that:

TABLE 3. Regression Results for the Demand for Money in Specific Non-Islamic Countries

Ghana (1965-79)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-1.704)}{-7.819} + \underset{(2.223)}{1.239}\ln(\bar{Y})^*_t - \underset{(-2.461)}{0.251}\ln(r)^*_t$$

$n = 15$; S.E. = 0.102; $\bar{R}^2 = 0.880$; F = 25.37; D.W. = 1.812

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-2.268)}{-11.029^*} + \underset{(2.842)}{1.676}\ln(\bar{Y})^*_t - \underset{(-2.832)}{0.370}\ln(r)^*_t$$

$n = 15$; S.E. = 0.103; $\bar{R}^2 = 0.817$; F = 14.2; D.W. = 1.721

Guinea (1966-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-2.383)}{-3.791^*} + \underset{(2.940)}{0.593}\ln(\bar{Y})^*_t - \underset{(-2.446)}{0.188}\ln(r)^*_t + \underset{(9.646)}{0.846}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 16$; S.E. = 0.080; $\bar{R}^2 = 0.959$; F = 109.6; "h" = – 0.248

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-2.546)}{-3.301^*} + \underset{(2.953)}{0.508}\ln(\bar{Y})^*_t - \underset{(-2.451)}{0.017}\ln(r)^*_t + \underset{(8.971)}{0.774}\ln\left(\frac{M'_d}{P}\right)^*_{t-1}$$

$n = 16$; S.E. = 0.064; $\bar{R}^2 = 0.964$; F = 124.4; "h" = 0.722

TABLE 3. (continued)

Bolivia (1960-70)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(0.829)}{1.108} + \underset{(3.891)}{0.597}\ln(\bar{Y})^*_t - \underset{(-2.196)}{0.604}\ln(r)^*_t$$

$n = 16$; S.E. = 0.099; $\bar{R}^2 = 0.888$; F = 52.3; D.W. = 1.745

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-1.195)}{-0.250} + \underset{(6.255)}{0.924}\ln(\bar{Y})^*_t - \underset{(-2.223)}{0.562}\ln(r)^*_t$$

$n = 16$; S.E. = 0.096; $\bar{R}^2 = 0.939$; F = 108.2; D.W. = 1.928

Greece (1960-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-4.428)}{-5.080^*} + \underset{(4.597)}{0.837}\ln(\bar{Y})^*_t - \underset{(-4.580)}{0.137}\ln(r)^*_t + \underset{(2.593)}{0.345}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 21$; S.E. = 0.027; $\bar{R}^2 = -0.996$; F = 1471.5; "h" = 0.541

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-2.820)}{-7.272^*} + \underset{(2.918)}{1.255}\ln(\bar{Y})^*_t - \underset{(-2.306)}{0.090}\ln(r)^*_t + \underset{(2.524)}{0.253}\ln\left(\frac{M'_d}{P}\right)_{t-1}$$

$n = 21$; S.E. = 0.041; $\bar{R}^2 = 0.995$; F = 1237; "h" = 1.108

TABLE 3. (continued)

Guatemala (1960-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-2.837)}{-3.356^*} + \underset{(2.209)}{0.499}\ln(\bar{Y})^*_t - \underset{(-2.703)}{0.142}\ln(r)^*_t + \underset{(2.442)}{0.599}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 22$; S.E. = 0.058; $\bar{R}^2 = 0.975$; F = 259.2; "h" = 0.909

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-2.940)}{-7.571^*} + \underset{(3.021)}{1.098}\ln(\bar{Y})^*_t - \underset{(-3.472)}{0.212}\ln(r)^*_t + \underset{(1.752)}{0.375}\ln\left(\frac{M'_d}{P}\right)^{**}_{t-1}$$

$n = 22$; S.E. = 0.049; $\bar{R}^2 = 0.992$; F = 785.8; "h" = 1.170

Portugal (1960-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-2.748)}{-1.955^*} + \underset{(3.367)}{0.473}\ln(\bar{Y})^*_t - \underset{(-3.604)}{0.161}\ln(r)^*_t + \underset{(2.816)}{0.435}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 21$; S.E. = 0.059; $\bar{R}^2 = 0.783$; F = 23.8; "h" = 1.066

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-6.111)}{-5.306^*} + \underset{(6.313)}{1.081}\ln(\bar{Y})^*_t - \underset{(-6.296)}{0.203}\ln(r)^*_t + \underset{(2.344)}{0.273}\ln\left(\frac{M'_d}{P}\right)^*_{t-1}$$

$n = 21$; S.E. = 0.035; $\bar{R}^2 = 0.0986$; F = 449.5; "h" = 1.040

TABLE 3. (continued)

Peru (1960-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-1.776)}{-5.204^{**}} + \underset{(2.914)}{0.782}\ln(\bar{Y})^*_t - \underset{(-2.788)}{0.209}\ln(r)^*_t + \underset{(3.008)}{0.599}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 22$; S.E. = 0.112; $\bar{R}^2 = 0.937$; F = 99.8; "h" = 0.158

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-2.198)}{-5.093^{*}} + \underset{(2.288)}{0.788}\ln(\bar{Y})^*_t - \underset{(-2.357)}{0.012}\ln(r)^*_t + \underset{(2.433)}{0.356}\ln\left(\frac{M'_d}{P}\right)^*_{t-1}$$

$n = 22$; S.E. = 0.085; $\bar{R}^2 = 0.935$; F = 96.3; "h" = 0.165

Brazil (1971-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(2.776)}{0.618^{*}} + \underset{(7.792)}{1.346}\ln(\bar{Y})^*_t - \underset{(-4.265)}{0.385}\ln(r)^*_t$$

$n = 11$; S.E. = 0.072; $\bar{R}^2 = 0.882$; F = 38.4; D.W. = 1.463

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(1.999)}{0.439^{**}} + \underset{(7.982)}{1.359}\ln(\bar{Y})^*_t - \underset{(-3.405)}{0.303}\ln(r)^*_t$$

$n = 11$; S.E. = 0.071; $\bar{R}^2 = 0.906$; F = 49.0; D.W. = 1.962

TABLE 3. (continued)

S. Korea (1966-80)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(0.064)}{0.024} + \underset{(20.367)}{1.241}\ln(\bar{Y})^*_t - \underset{(-3.235)}{0.273}\ln(r)^*_t$$

$n = 17$; S.E. = 0.070; $\bar{R}^2 = 0.983$; F = 380.4; D.W. = 1.682

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(1.149)}{0.632} + \underset{(15.629)}{1.401}\ln(\bar{Y})^*_t - \underset{(-2.449)}{0.304}\ln(r)^*_t$$

$n = 17$; S.E. = 0.104; $\bar{R}^2 = 0.972$; F = 223.4; D.W. = 1.514

Columbia (1961-81)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-2.759)}{-5.022^{*}} + \underset{(2.872)}{0.864}\ln(\bar{Y})^*_t - \underset{(-2.283)}{0.281}\ln(r)^*_t + \underset{(2.527)}{0.501}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 21$; S.E. = 0.072; $\bar{R}^2 = 0.945$; F = 110.0; "h" = 1.414

$$\ln\left(\frac{M'_d}{P}\right)_t = \underset{(-4.373)}{-7.383^{*}} + \underset{(4.401)}{1.217}\ln(\bar{Y})^*_t - \underset{(-2.618)}{0.185}\ln(r)^*_t + \underset{(1.772)}{0.167}\ln\left(\frac{M'_d}{P}\right)^{**}_{t-1}$$

$n = 21$; S.E. = 0.072; $\bar{R}^2 = 0.964$; F = 124.4; "h" = 1.022

TABLE 3. (continued)

Thailand (1960-82)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(-0.174)}{-0.041} + \underset{(2.840)}{0.374}\ln(\bar{Y})^*_t - \underset{(-2.707)}{0.339}\ln(r)^*_t + \underset{(3.641)}{0.641}\ln\left(\frac{M_d}{P}\right)^*_{t-1}$$

$n = 23$; S.E. = 0.079; $\bar{R}^2 = 0.934$; F = 100.7; "h" = 0.416

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(-2.141)}{-1.148^*} + \underset{(2.564)}{0.529}\ln(\bar{Y})^*_t - \underset{(-2.407)}{0.171}\ln(r)^*_t + \underset{(4.796)}{0.677}\ln\left(\frac{M_d'}{P}\right)^*_{t-1}$$

$n = 23$; S.E. = 0.045; $\bar{R}^2 = 0.995$; F = 1463.5; "h" = 0.477

Trinidad & Tobago (1967-78)

$$\ln\left(\frac{M_d}{P}\right)_t = \underset{(1.464)}{8.246} + \underset{(6.496)}{0.609}\ln(\bar{Y})^*_t - \underset{(-2.535)}{4.221}\ln(r)^*_t$$

$n = 12$; S.E. = 0.151; $\bar{R}^2 = 0.803$; F = 21.4; D.W. = 1.961

$$\ln\left(\frac{M_d'}{P}\right)_t = \underset{(0.870)}{4.728} + \underset{(6.950)}{0.626}\ln(\bar{Y})^*_t - \underset{(-2.757)}{2.007}\ln(r)^*_t$$

$n = 12$; S.E. = 0.145; $\bar{R}^2 = 0.831$; F = 25.6; D.W. = 2.182

(1) Income is an important determinant of the demand for money in non-Islamic countries. The estimated "t" values of the Y variable were statistically significant in all cases at at least the 5 percent level of significance. This suggests that the transactions and precautionary motives play an important role in determining the liquidity preference of the people of non-Islamic countries. The same conclusion was reached regarding Islamic countries.

(2) The statistical significance of the Koyck variables suggest that wealth is an important determinant of the demand for money in the non-Islamic countries and that permanent income is more relevant in determining this demand. The same conclusions were reached when applying the econometric models to Islamic countries.

(3) The regression results in Table 3 would suggest that the rate of interest is an important determinant of the demand for money in non-Islamic countries. Thus the estimated "t" values of the variable (r) were significant at at least 5 percent level of significance in all non-Islamic countries covered by the study and for the narrow as well as the broad demand for money.

This is a remarkable conclusion and a radical departure from the results obtained when applying the same regression models to Islamic countries in similar stages of development and with similar economic structures.

The econometric analysis suggests that the rate of interest plays an important role in determining the demand for money in non-Islamic countries but is not a significant factor in determining the demand for money in Islamic countries of similar economic structures.[2]

The above conclusion could only suggest that most Muslims observe in their economic behaviour the Islamic views on interest (or Riba). Therefore, their liquidity preference would not be affected by the rate of interest, although the opportunity may exist to deal with interest and the current laws may not prohibit such dealings Thus Islamic values would seem to be very powerful in determining the economic behaviour of individuals in contemporary Islamic countries.

III
The Effect of Interest on the Demand for Investment in Contemporary Islamic Countries

Modern macroeconomic theory suggests that the rate of interest affects the commodity market through its impact on the demand for investment. The potential investors compare the (market) rate of interest with the (expected) net rate of return on the investment before they make their investment decisions. And since investment is an important determinant of income and employment it follows that changes in the rate of interest would play an important role in determining these variables. This section attempts to econometrically test the effect of the rate of interest on the demand for investment in contemporary Islamic countries. The results would then be compared with those obtained for non-Islamic countries in similar stages of development and with similar economic structures. This should help in determining the effect of Islamic religious values currently prevailing in Islamic countries on the economic behaviour related to the role of the rate of interest in these countries.

We tested the following regression model:

$$\text{In } I_t = a_0 + a_1 \text{ In } I_{t-1} + a_2 \text{ In } g_t + a_3 \text{ ln } r_t + u \qquad (8)$$

Where
I = Investment expenditure (at constant prices) in period t
g_t = The change in (real) GDP i.e. $g_t = Y_t/Y_{t-1}$
r_t = The rate of interest in period
u = The error term

The introduction of the variable g_0 represents a form of the acceleration principle while the introduction of the Koyck variable (I_{t-1})) gives the relationship a dynamic character and reflects the partial adjustment process in response to the effects of other variables and investment; and in particular economic expectations and political factors (Koyck, 1954).

However, since published statistics do not sometimes distinguish between fixed in vestment and changes in stocks, we used a weighted rate of growth; the weights being the levels of (real) GDP in period t, In other words we used the variable $(gY)_t$ instead of g_t.

When data on investment at constant prices were not available, we deflated the current values using the GDP deflator.

Unfortunately, due to lack of data, we applied our economic analysis to only 10 Islamic countries. The regression results are given in Table 4. The figures in parenthesis under each coefficient represent the estimated "t" value of that coefficient. Those values which were statistically significant at at least 5 per cent level of significance were marked* while those which were significant at at least 10 percent level of significance were marked**.

TABLE 4. Regression Results for the Demand for Investment in Specific Islamic Countries

Jordan (1969-82)

$$\ln (\bar{I})_t = \underset{(-0.399)}{-0.460} + \underset{(4.495)}{0.864} \ln (\bar{I})^*_{t-1} + \underset{(1.916)}{1.153} \ln (\bar{g})^{**}_t + \underset{(0.620)}{0.714} \ln (r)_t$$

n = 13; S.E. = 0.152; $\bar{R}^2$ = 0.949; F = 74.7; "h" = 0.755

Morocco (1957-80)

$$\ln (\bar{I})_t = \underset{(-2.790)}{-2.401^*} + \underset{(4.058)}{0.596} \ln (\bar{I})^*_{t-1} + \underset{(2.807)}{0.841} \ln (g\bar{Y})^*_t + \underset{(0.018)}{0.007} \ln (r)_t$$

n = 24; S.E. = 0.145; $\bar{R}^2$ = 0.950; F = 140.2; "h" = 0.702

Iran (1959-79)

$$\ln (\bar{I})_t = \underset{(-3.645)}{-5.951^*} + \underset{(2.353)}{0.402} \ln (\bar{I})^*_{t-1} + \underset{(4.036)}{0.924} \ln (g\bar{Y})^*_t - \underset{(-0.587)}{0.137} \ln (r)_t$$

n = 21; S.E. = 0.154; $\bar{R}^2$ = 0.986; F = 179.3; "h" = 0.816

TABLE 4. (continued)

Pakistan (1970-82)

$$\ln (\bar{I})_t = \underset{(0.677)}{0.232} + \underset{(5.643)}{0.783} \ln (\bar{I})^*_{t-1} + \underset{(2.215)}{0.561} \ln (\bar{g})^*_t + \underset{(1.358)}{0.238} \ln (r)_t$$

n = 13; S.E. = 0.090; $\bar{R}^2$ = 0.894; F = 31.8; "h" = 0.954

Tunisia (1968-82)

$$\ln (\bar{I})_t = \underset{(-2.263)}{-2.885^*} + \underset{(5.493)}{0.726} \ln (\bar{I})^*_{t-1} + \underset{(3.100)}{0.543} \ln (g\bar{Y})^*_t - \underset{(-1.579)}{0.502} \ln (r)_t$$

n = 14; S.E. = 0.071; $\bar{R}^2$ = 0.977; F = 181.8; "h" = 0.618

Syria (1963-81)

$$\ln (\bar{I})_t = \underset{(1.153)}{8.776} + \underset{(20.471)}{0.958} \ln (\bar{I})^*_{t-1} + \underset{(3.791)}{1.529} \ln (g)^*_t - \underset{(-1.145)}{5.406} \ln (r)_t$$

n = 19; S.E. = 0.146; $\bar{R}^2$ = 0.964; F = 150.4; "h" = 1.293

Libya (1960-77)

$$\ln (\bar{I})_t = \underset{(0.270)}{2.476} + \underset{(12.718)}{0.987} \ln (\bar{I})^*_{t-1} + \underset{(1.839)}{0.655} \ln (g)^{**}_t - \underset{(-0.262)}{1.485} \ln (r)_t$$

n = 18; S.E. = 0.174; $\bar{R}^2$ = 0.922; F = 63.4; "h" = 0.981

TABLE 4. (continued)

Malaysia (1970-81)

$$\ln (\bar{I})_t = \underset{(6.080)}{0.024^*} + \underset{(6.081)}{0.954} \ln (\bar{I})^*_{t-1} + \underset{(2.314)}{2.274} \ln (g)^*_t + \underset{(0.007)}{0.002} \ln (r)_t$$

n = 12; S.E. = 0.121; $\bar{R}^2$ = 0.813; F = 12.6; "h" = 0.622

Egypt (1965-79)

$$\ln (\bar{I})_t = \underset{(0.470)}{0.221} + \underset{(4.120)}{0.832} \ln (\bar{I})^*_{t-1} + \underset{(4.623)}{4.756} \ln (g)^*_t - \underset{(-0.069)}{0.031} \ln (r)_t$$

n = 15; S.E. = 0.128; $\bar{R}^2$ = 0.945; F = 75.5; "h" = 0.685

Nigeria (1960-82)

$$\ln (\bar{I})_t = \underset{(-0.511)}{-0.413} + \underset{(9.991)}{0.921} \ln (\bar{I})^*_{t-1} + \underset{(1.918)}{0.223} \ln (g\bar{Y})^{**}_t - \underset{(-0.157)}{0.062} \ln (r)_t$$

n = 23; S.E. = 0.293; $\bar{R}^2$ = 0.915; F = 72.6; "h" = 1.149

The estimated values of R2 and F suggest that the tested models are good fit.

Also, the values of the "h" statistics indicate that, in general, there are no serious problems of autocorrelation, although we must stress that the "h" statistic is a large-sample statistic and is reported here for "indicative" purposes only. Moreover, all the statistically significant variables carry the right signs. Furthermore, the values of the Koyck variable are, in all cases, within the expected limits.

The regression results of Table 4 suggest that:

1. Output growth is an important determinant of the demand for investment in Islamic countries. The ^t" values of the variables g_t and $(gY)_t$ were statistically significant in all cases.

2 The Koyck variable (I_{t-1}) was statistically significant in all cases. This suggests the suitability of dynamic models in explaining the behaviour of investment analysis.

3. The rate of interest is not a significant determinant on the demand for investment in Islamic countries. The "t" values of the variable (r) were not statistically sigtiificant in any Islamic country studied.

The above important regression result would seem to suggest that the prevailing market rate of interest in contemporary Islamic societies does not play an important role in determining the investment decisions of their Muslim investors. To test whether the main reason for this is the religious beliefs or the economic structure (or stage of development) of the Islamic countries studied, we applied the sarne cconometric models to an equal number of non-Islamic countries in similar stage of development and with similar economic structures. The regression results are given in Table 5.

The same econometric models, when applied to th^ non-Islamic countries give good statistical results, as indicated by the estimated values of R and F. Also the values of "h" statistic given no due concern for problems of serial correlation. Moreover, the coefficients of statistically significant variables carry the right signs and fall within the expected values.

The regression results in Table 5 suggest that the effect of output growth on the demand for investment in non-Islamic countries is similar to that found in the case of Islamic countries. Also similar is the effect of the Koyck transformation variable.

However, the effect of interest rate on the demand for investment in non-Islamic countries is ^ery different from that found in the case of Islamic countries in similar stage of development and with similar economic studies. The .t" values of the (r) variable are statistically significant at, at least, the 5 per cent level of significance in all non-Islamic countries studied. We may recall that these ^t" values were not statis tically significant, not even at the to per cent level of significance, in any Islamic country studied.

This conclusion suggests, in the face of economic similarity between the Islamic and non-Islamic countries covered by the study, that there are *no-economic* variables at work which render interest rates ineffective in the first kind of countries.

These seem to be religious factors. The Muslim investors in the contemporary Islamic countries would seem to hold to Islamic values and views regarding the "rate of interest" and do not favour dealings involving "Riba" despite the fact that local laws in their countries may not explicitly prohibit the payment of interest.

The above conclusion should not be surprising. Many studies have shown that the rate of interest is not highly effective in determining the demand for investment in a large number of developed and developing non-Islamic countries.[3] These studies argued that interest is only a small proportion of production costs and that future profit expectations and government policies towards encouraging investment are by far more important than changes in interest rates in making investment decisions. If this was true for non-Islamic countries whose religious values, (if there are any) do not prohibit interest, it should definitely be much more true of Islamic countries where interest or "Riba" is regarded as an evil.

TABLE 5. Regression Results for the Demand for Investment in Specific Non-Islamic Countries

Columbia (1961-81)

$$\ln (\bar{I})_t = \underset{(-2.041)}{-0.501^{**}} + \underset{(3.616)}{0.644} \ln (\bar{I})^*_{t-1} + \underset{(2.130)}{0.279} \ln (g)^*_t - \underset{(-2.596)}{0.697} \ln (r)^*_t$$

$n = 21$; S.E. = 0.085; $\bar{R}^2 = 0.956$; F = 138.9; "h" = 0.945

S. Korea (1962-82)

$$\ln (\bar{I})_t = \underset{(0.352)}{0.182} + \underset{(13.825)}{0.967} \ln (\bar{I})^*_{t-1} + \underset{(2.019)}{1.629} \ln (g)^{**}_t - \underset{(-2.400)}{0.026} \ln (r)_t$$

$n = 16$; S.E. = 0.138; $\bar{R}^2 = 0.955$; F = 106.6; "h" = 1.491

Guatemala (1968-81)

$$\ln (\bar{I})_t = \underset{(2.417)}{8.983^{*}} + \underset{(2.488)}{0.440} \ln (\bar{I})^*_t + \underset{(2.477)}{1.213} \ln (g\bar{Y})^*_t - \underset{(-2.575)}{0.200} \ln (r)^*_t$$

$n = 14$; S.E. = 0.080; $\bar{R}^2 = 0.946$; F = 71.2; "h" = 0.906

TABLE 5. (continued)

Bolivia (1965-80)

$$\ln (\bar{I})_t = \underset{(0.009)}{0.011} + \underset{(3.821)}{0.611} \ln (\bar{I})^*_{t-1} + \underset{(1.878)}{0.510} \ln (g\bar{Y})^{**}_t - \underset{(-2.535)}{0.496} \ln (r)^*_t$$

$n = 16$; S.E. = 0.120; $\bar{R}^2 = 0.931$; F = 68.8; "h" = 1.386

Brazil (1971-81)

$$\ln (\bar{I})_t = \underset{(0.173)}{0.037} + \underset{(5.105)}{0.803} \ln (\bar{I})^*_{t-1} + \underset{(3.148)}{0.591} \ln (g\bar{Y})^*_t$$

Conclusions

This study used econometric analysis to determine the role played by the rate of interest in contemporary Islamic countries.

The regression results indicate that the rate of interest does not have any significant role in determining the demand for money or the demand for investment in the Islamic countries studied. However the same regression models suggest that the rate of interest is a significant determinant of these variables in non-Islamic countries with similar economic structures and in comparable stages of development.

These important statistical results suggest that the economic behaviour of Muslims in contemporary Islamic countries must be affected by their religious values which denounce interest or "Riba". And that is probably why the rate of interest does not play a significant role in the economies of these countries as it does in the comparable non-Islamic countries.

The regression results suggest that it would not be too difficult to abolish interst completely from the economies of Islamic countries as a major step towards transforming their economies into Islamic economies which follow Islamic values.

Notes

1 - We also tested the following two models:
$(M_d/P)_t = C_0 + c_1 Y_1 = C_2 r_1 + C_3 (M_d/P)_{t-1} = w$
$(M_d/PY)_t = g_0 + g_1 (I/r)_t + Z$
but obtained inferior regression results. The data used were derived from the I.M.F. *International Financial*, 1984 Yearbook.

2 - Many previous studies reached the conclusion that the rate of interest is an important factor in deter mining the demand for money in developing and developed non-Islamic economies. See for example: W. J. Baumol, "The Transactions Demand For Cash: An Inventory Approach", *The Quarterly Journal of Economics*. (66), Nov., pp. 545-556.
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3 - See:
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نحو إلغاء معدل الفائدة في المجتمعات الإسلامية المعاصرة

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المركز الدولي لبحوث الإدارة والاقتصاد للشرق الأوسط – أستراليا

المستخلص : يستخدم البحث نموذجًا اقتصاديًا قياسيًا ليقدر دالة الطلب على النقود ودالة الاستثمار في عدد من المجتمعات الإسلامية المعاصرة . ويستنتج (إحصائيًا) أنه لا يظهر لمعدل الفائدة أي دور مهم في تلكما الدالتين . ويطبق البحث الطريقة السابقة نفسها على بلدان غير إسلامية تشابه في اقتصاداتها البلدان الإسلامية، فيجد أن معدل الفائدة له دور معنوي (إحصائيًا) في دوالهما المقابلة.

ويخلص البحث إلى أن تحريم الفائدة في الإسلام قد أثر على السلوك في البلدان المسلمة، وأن إلغاء الفائدة في تلك البلدان لن يؤدي إلى مشكلات صعبة .