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Stabilization and Growth in an Open Islamic Economy 1/

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Abstract

Islam proposes the replacement of an interest-based financial system with one which operates on the basis of risk and profit sharing. Using a general equilibrium model, this paper investigates some open-economy implications of the adoption of Islamic banking for growth and stabilization of the economy. It analyzes the long-run effects of Islamic banking on international capital flows and on the economy's capacity to adjust to disturbances. It concludes that monetary policy can be used effectively for stabilization purposes and that disturbances to asset positions are absorbed efficiently in an Islamic financial system.

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Summary

A number of studies have shown that monetary policy can be used to stabilize an economy that adopts an Islamic financial system. Until now this conclusion has been based on a closed economy model. This paper expands and extends the consideration of stabilization and growth questions to an open economy whose banking system operates on the basis of risk and profit sharing.

A simple general equilibrium model is developed to illustrate how and through what channels monetary policy alters rates of return on financial and real assets, thereby affecting investment, output, and the balance of payments. This exercise shows that although the authorities lose the ability to set directly financial rates of return, and monetary policy is constrained both by substitution possibilities among domestic assets and by offsetting international capital flows, the authorities can alter the rate of return on physical capital, thereby affecting investment and output.

The paper also investigates the long-run implications of the adoption of Islamic banking for international capital flows and sheds some light on the capacity of an Islamic economy to adjust to certain macroeconomic disturbances. It concludes that, to the extent that borrowed external resources (through risk- and profit-sharing modes) are channeled into productive investments, such investments can be expected to generate a stream of returns at least sufficient to repay the foreign loans. Furthermore, an Islamic financial system has the capacity for better adjustment to macroeconomic disturbances that require the shifting of resources from the traded to the nontraded sector than does the conventional interest-based system.



1. Introduction

There has been a great deal of interest in recent years in the analysis of an Islamic economy. The purpose of this paper is to integrate and to expand upon the results of certain of the approaches which have been adopted to study the effects of stabilization policies in an Islamic economy. The possibility that monetary policy could be used to stabilize such an economy, characterized specifically by the strict prohibition against charging of interest, has been demonstrated by Khan and Mirakhor (1987). Employing a short-run macro-economic model of a closed economy, they show that there is apparently no fundamental change in the way monetary policy affects economic variables in an Islamic economy. The authorities can achieve the same results through controlling the supply of profit-based bank lending as they can through variations in the total money supply. ^{1/} The present paper extends the analysis to an open economy. This endeavor besides being of interest in itself, also serves to clarify the relationship between the financial and real sectors in an open Islamic economy. More specifically, the analysis pinpoints the principal channels through which monetary policy alters rates of return on financial and real assets, thereby affecting investment spending, output, and the balance of payments.

The plan of the paper is as follows. In the second section, certain institutional and accounting features of an Islamic banking system are discussed. The intention is to demonstrate the similarities as well as the differences between interest-based banking and Islamic banking. Section III discusses the general equilibrium approach to monetary theory and the "q" theory of investment, developed by Tobin and Brainard. The purpose is to analyze systematically, by way of introduction, the implications of the general equilibrium model, both in explaining the effectiveness of monetary policy when financial intermediaries are uncontrolled, and in providing a foundation for the analysis of monetary policy in an open economy without interest. Section IV presents a simple general equilibrium model for an open Islamic economy. The model is designed to illustrate how changes in government holdings of bank equities affect the various rates of return, and how the possibility of substitution amongst assets affects the outcome of monetary policy. Section V concentrates on the relationship in an Islamic economy between total investment and saving on the one hand and the current account deficit on the other. The purpose is to shed some light on the issues of sustainable level of external borrowing and whether the adoption of an Islamic banking system will tend to increase or reduce the current account deficit. Finally, Section VI contains some concluding remarks.

^{1/} See also Mohsin Khan, "Principles of Monetary Theory and Policy in an Islamic Framework," paper presented at the International Institute of Islamic Economics, Islamabad, Pakistan, September 1987.

At the risk of oversimplification of the analysis contained in this paper, the main results that emerge can be summarized as follows. Since the transformation of banking from an interest-based system to one that relies on profit- and loss-sharing makes an Islamic banking system essentially an equity-based system, in the process the authorities lose the ability to set directly financial rates of return. ^{1/} Although monetary policy is constrained by both substitution possibilities among domestic assets and by offsetting international capital flows, the authorities can alter the rate of return on physical capital, thereby affecting investment and output. Furthermore, it will be argued that replacing an interest-based system with Islamic banking will not necessarily lead to a reduction in savings and investment. If both savings and investment should increase, then the effect on the current account position is ambiguous. But even if the current account deficit is increased because of a larger increase in investment, it can be shown that given that certain conditions are met, the ensuing growth of output would make it feasible ultimately to close the gap between domestic saving and investment. The Islamic financial system also has advantages over the conventional interest-based system in terms of adjustment to certain types of macroeconomic disturbances. ^{2/}

II. Islamic Financial System

In an Islamic financial system, banks perform the same essential functions as they do in the traditional banking system but are constrained to carry out their transactions in accordance with the rules of the Islamic law--Shariah. They act as administrators of the economy's payments system and as financial intermediaries, and the need for them in the Islamic system arises for the same reason as that in the traditional system, which is to satisfy simultaneously the portfolio preferences of two types of individuals or firms. On one side are the deficit financial units, who wish to expand their holdings of real assets beyond the limits of their own net worth. On the other side are the surplus financial units, who wish to hold part of their net worth in liquid assets with small risk of default. The reason that banks can accomplish these transformations are: (1) administrative economy and expertise in negotiating, accounting, appraising, and collecting; (2) reduction of risk by the pooling of independent risks, with respect both to returns on assets and to deposit withdrawal; and (3) government regulations and provisions designed to assure the solvency and liquidity of the institutions. Banks exploit the imperfections in the financial

^{1/} In most of the highly-developed countries in fact such rates are set indirectly through central bank actions, e.g., open market operations, reserve requirement changes, variations in discount rates, etc.

^{2/} See also Khan (1986) for similar conclusion derived from the analysis of a closed-economy model.

markets, including inter alia, imperfect divisibility of financial claims, and transactions costs of search in the acquisition and diversification of these claims by the surplus and deficit units. Just as their counterparts do in the traditional system, banks in the Islamic system can be expected to exhibit economies of scale in monitoring financial transactions. Because of these economies of scale and the banks specialized expertise, banks possess the ability to minimize the cost of transactions that convert current income into optimal consumption and investment bundles. Banks alter yield relationships between surplus and deficit units, and provide lower costs to the deficit units and higher returns to the surplus units than would be possible with direct finance. As in interest-based banking, the Islamic banks transform the liabilities of firms into a variety of obligations to suit the tastes and circumstances of the surplus units. Their liabilities consist of shares, which serve as the medium of exchange, and their assets consist mainly of primary financial securities in the capital market.

In disallowing interest but permitting profits, the Shariah has developed two specific forms of business arrangements, as means of earning profits without resorting to interest charges namely, Mudarabah (Commenda) and Musharakah (partnership). ^{1/} In the case of Mudarabah, one party provides the necessary financial capital and the other party provides the human capital that is needed for the economic activity to be undertaken. Musharakah is a form of business arrangement in which a number of partners pool their financial capital to undertake a commercial-industrial enterprise. These profit-sharing arrangements may be applied either to the whole enterprise where each partner takes an equity position, or to a particular line of activity within an enterprise, i.e., they can have either whole-firm or project-specific orientation. Mudarabah is traditionally applied to commercial activities of short duration, whereas Musharakah is applicable to production or commercial activities of long duration.

The expectation is that in the Islamic system, projects would be selected for funding through partnerships primarily on the basis of their expected profitability. This factor, together with the predominance of equity markets and the absence of debt markets, has led Muslim scholars to conclude that, potentially, in an Islamic system, there would be: (a) a greater number and variety of investment projects that would be seeking financing; (b) a more cautious, selective, and perhaps more efficient project selection by the savers and investors; and (c) a greater involvement by the public in investment and entrepreneurial activities, particularly as private equity markets develop, than in the traditional fixed-interest-based system. In the Islamic profit-sharing arrangement, while the profit is shared on the basis of a predetermined share parameter between the

^{1/} See Khan and Mirakhor (1987) for other forms of Islamic transactions.

agent-entrepreneur and the financial-capital owner, the loss is only borne by the owners of the funds and not the entrepreneur. This affords human capital, which is representative of present work and effort, a status on par with financial capital, which is representative of monetized past labor and work. In this respect, the owner of financial capital risks the loss of his funds, whereas the agent-entrepreneur is recognized as risking his time, effort, and labor.

The efforts of Muslim scholars and economists in developing models of banking within the framework of Islamic requirements has led to a variety of proposals that can be categorized into two principal models. The first model, relying on the concept of profit-sharing, integrates the asset and liability sides of the financial sector on the basis of a principle called Two-Tier Mudarabah. 1/ This model envisages depositors entering into a contract with a banking firm to share the profits accruing to the bank. The bank, on its asset side, enters into another contract with an agent-entrepreneur, who is searching for investable funds and agrees to share his profit with the bank in accordance with a predetermined percentage that is stipulated in the contract. The bank's earnings from all its activities are pooled and then shared with its depositors and shareholders according to the terms of their contract. The profits earned by the depositors are a percentage of the total banking profits. According to this model, the banks are allowed to accept demand deposits that would not earn profits and instead may be subjected to a service charge. This model requires that demand deposits must be paid to the depositors on demand, and has no specific reserve requirement.

The second model divides the liability side of the bank balance sheet into two windows, one for demand deposits, which serve as transactions balances and the other for investment balances. 2/ The choice of which window to use is left to the depositors. This model stipulates a 100 percent reserve requirement for the demand deposits but there is no reserve requirement for investment balances. Proponents of this model argue that demand deposits are placed as Amanah (safe keeping) and must be backed by 100 percent reserve, because these balances belong to the depositors and do not carry with them the right for the bank to use them as the basis for lending and money creation through fractional reserves. Money deposited in investment accounts, on the other hand, is placed with the depositor's full knowledge that the deposits will be invested in risk-bearing projects, therefore no guarantee is justified. In this model, too, the depositors may be charged a service fee for the provision of the safekeeping services performed by the bank.

1/ Iqbal and Mirakhor (1987).

2/ Khan (1986).

III. Monetary Policy, Investment, and the Balance of Payments

The effectiveness of using monetary policy to influence macroeconomic conditions is a controversial and widely debated topic. On the one hand, some economists contend that if domestic labor and product markets respond slowly to shifts in the economic environment, giving rise to disequilibrium situations in which supply and demand are not always equal, there is scope for monetary policy to stabilize the economy. On the other hand, other economists argue that countercyclical monetary policy cannot be effective in influencing employment and output, based on models in which economic agents are rational and do not make systematic errors in anticipating the behavior of the monetary authorities. A key issue in this debate is whether or not prices are free to adjust rapidly so that markets clear continuously as economic participants respond to whatever changes in monetary policies they come to anticipate.

In addition to focusing on the effectiveness of monetary policy in the context of rational expectations, developments in monetary theory have also focused on the issue of international capital mobility and its implications for active monetary policy. One common result in this literature is that the greater is the openness of the economy, the more difficult it is to affect the real sector through active monetary policy. The effectiveness of monetary policy depends crucially on whether money "spills out" directly and rapidly through the capital account of the balance of payments, and on the strength of the effects on the current account of changes in the relative price of traded and nontraded goods, and changes in aggregate domestic demand.

In the analysis of the open-economy aspects of monetary policy, exchange rates and the balance of payments are sometimes discussed as a separate compartment of monetary policy. "International" financial policy is taken to be concerned with capital flows in the balance of payments, with official intervention in exchange markets, with holdings by the government of international reserve assets, and with the choice between a fixed or flexible exchange rate regime. "Domestic" monetary policy is considered independently of international complications and is taken to be concerned with, for example, interest rate changes, open-market operations, and the supply of commercial bank reserves. However, as the monetary approach to the balance of payments has emphasized, there is no valid way to segregate the "external" and "domestic" aspects of national monetary policy for separate analysis.

The monetary approach to the balance of payments (MABP) uses the money-supply process and the money-demand function as the central theoretical relationships around which to organize the analysis of the balance

of payments. ^{1/} In the framework of the monetary approach, the balance of payments position of a country is considered to be a reflection of decisions by the residents to accumulate or to run down their stocks of money balances. For a small country, in which income is exogeneous, which has prices given from abroad and which adheres to a fixed exchange rate, the money supply is endogeneous; increases in the domestic supply of money beyond the level demanded will leak out in the balance of payments. In essence, MABP argues that international money flows are a consequence of stock disequilibria--differences between desired and actual stocks of international money--and as such are inherently transitory and self-correcting. A non-zero official settlements balance allows the money stock to change until the demand for and supply of money are equalized and when the money market is in equilibrium, the official settlements balance returns to zero.

Another important subject that has been emphasized in recent years in macroeconomic theory has been the variation in the pace of capital accumulation and the sensitivity of investment to rates of return in financial markets. Tobin (1969), Tobin and Brainard (1968, 1977), and others, have attributed much of this variation in investment to changes in the relative attractions for wealth-owners to hold physical capital, on the one hand, and money or obligations to pay money, on the other hand. In this approach, monetary assets are part of a list of assets, and the commercial banking system is one sector, but not the only one, whose balance sheet behavior must be specified. The Tobin-Brainard model of the capital account of the economy specifies the assets (and liabilities) that appear in portfolios and balance sheets, the factors that determine the demands and supplies of the various assets, and the conditions under which asset prices and rates of return clear these interrelated markets. Equilibrium in these models is an equilibrium of stocks and balance sheets, that is, a situation in which both the private sector and the financial institutions are content with their portfolios of assets and liabilities, and the demand to hold each asset is equal to the stock supply. Proponents of this general equilibrium approach to monetary theory argue that the monetary operations of a central bank can bring about changes in the "q" ratio--the ratio of the market value of firms to the replacement cost of their physical capital--and that this ratio is the principal link between the financial and real sectors of the economy.

A change in the quantity of money disturbs asset market equilibrium and sets off a chain of portfolio substitutions. Currency, deposits in banks and other financial intermediaries, equities, etc., are important

^{1/} Two useful anthologies of the monetary approach to the balance of payments are Frenkel and Johnson (1976) and the International Monetary Fund (1977).

substitutes for each other and other assets in the portfolios of investors. The central bank operates in the first instance on the rate of return of some financial instrument that it holds in its portfolio by buying or selling it in the market. The monetary operations are then transmitted to equity yields as portfolio substitutions are affected by the current levels of the rates of return and expectations of their future paths. Thus, changes in the stock of money alter q and thereby alter private investment expenditures, real output, and prices. The rate of investment is a positive function of q , and an increase in the money stock increases q . In a competitive economy with constant returns to scale, the equilibrium value of q sustains capital replacement and expansion at the natural growth rate of the economy. If there are no adjustment costs, the firm will continue to increase or decrease the capital stock until q is equal to unity. In the short-run, disturbances, expectations, and policy changes cause movements in q , which in turn changes incentives for real investment.

Tobin and Brainard (1963) address the question whether the existence of uncontrolled financial intermediaries diminishes the effectiveness of monetary control. Their method is to set up models of general equilibrium in financial and capital markets and to trace in these models the effects of monetary controls when structural changes occur, such as abolishing ceilings on rates which commercial banks pay on deposits. Tobin and Brainard note that introducing nonbank financial intermediaries, uncontrolled or controlled, into a system in which banks are under effective monetary control presents essentially the same issues as introducing commercial banks as an intermediary, controlled or uncontrolled, into a system in which the government's control is the supply of its own currency. Their analysis, therefore, focuses on the effects of financial intermediation by banks, the consequences of leaving their operations unregulated, and the effects of regulating them in various ways. In their model, a monetary action is considered expansionary if it lowers the rate of return on the ownership of real capital that the community requires to induce it to hold a given stock of capital, and deflationary if it raises that rate of return. In equilibrium, this rate of return equals the expected marginal productivity of the capital stock, which in turn depends on the size of the capital stock relative to expected levels of output. If a monetary action lowers the rate of return on capital at which owners of wealth are content to absorb the given stock of capital into their portfolios or balance sheets along with other assets and liabilities, then it becomes easier for the economy to accumulate capital.

The Tobin-Brainard analysis shows that the presence of an uncontrolled financial intermediary does not imply the ineffectiveness of monetary policy to alter the required rate of return on physical capital. Although a reduction in the supply of currency will raise the financial intermediary's rates, the substitution of the intermediary's liabilities

for currency will not offset the monetary contraction completely so long as the intermediary's liabilities are an imperfect substitute for currency. Substitutions of this kind imply that a given change in the supply of currency and bank reserves would have more effect on the economy if such substitutions were prevented, but this does not imply a one-for-one offset to enforced reductions in the supply of controlled monetary assets.

"Whether it is important that monetary controls be more effective in this sense is another question... When a given remedial effect can be achieved either by a small dose of strong medicine or a large dose of weak medicine, it is not obvious that the small dose is preferable. Increasing the responsiveness of the system to instruments of control may also increase its sensitivity to random exogenous shocks. Furthermore, extension of controls over financial intermediaries and markets involves considerations beyond those of economic stabilization; it raises also questions of equity, allocative efficiency, and the scope of governmental authority." 1/

IV. A Model of Monetary Policy in an Open Islamic Economy

The key insights from the general equilibrium approach to monetary theory and the q theory of investment, as they bear on the subject of Islamic banking, are that the principal way in which monetary policy affects aggregate demand is by changing the valuations of physical assets relative to their replacement costs, and that monetary policy can accomplish such changes even in the presence of uncontrolled financial intermediaries. The transformation of banking from an interest-based system to one that relies on profit- and loss-sharing makes an Islamic banking system essentially an equity-based system. The authorities cannot set directly financial rates of return, so that the financial system is more marketoriented in an Islamic economy than in an economy with fixed interest rates. In this respect, the Tobin-Brainard models, particularly the model for analyzing the effect of an uncontrolled financial intermediary on the effectiveness of monetary control, are relevant. In this section, we present a variant of the Tobin-Brainard model for the purpose of studying monetary policy in an open Islamic economy. As the model is for an open economy, monetary policy is constrained by substitution possibilities among domestic assets and by offsetting international capital flows. The

1/ Tobin and Brainard (1963).

model below bears a close resemblance to models developed by Branson (1976, 1979), Miller (1973), and Tobin and de Macedo (1980). The purpose is to develop the simplest possible fundamental model which yields the basic behavior of the general equilibrium approach to monetary theory in an open Islamic economy, particularly the movements in the rate of return on physical capital and offsetting international capital flows following shifts in monetary policy.

The model consists of the following assumptions. There are three financial assets and one real asset, and the set of excess demand equations for these assets determines the rates on the assets, given the values of the various exogenous variables. Table 1 gives definitions of the symbols used. The domestic private sector allocates its wealth between currency, bank deposits, bank equities, and physical capital. The banking sector holds currency, bank equities, and loans. The foreign sector holds deposits in the domestic banking sector and also holds equity capital.

The model represented by equations (1) through (7) is presented in Table 2. The first four equations are the excess demand equations for bank equity, bank loans, physical capital, and currency, respectively. The asset-holders demand functions for the four imperfectly substitutable assets are functions of the rates of return that are relevant for the particular sector. It is assumed that the assets are all gross substitutes in the portfolios of each sector, which implies that a rise in the rate on any asset will lead to substitution into that asset out of other assets in the portfolio. In other words, the partial derivative of the asset demand function with respect to the own rate is positive, while with respect to an alternative rate, it is negative or zero. Equation (5) describes the private sector's demand function for bank deposits, whereas equation (6) is the foreign sector's demand for domestic bank deposits. Equation (7) describes the relationship between the bank loan rate and the deposit rate.

Commercial banks offer investment deposits to the private sector, D , and to the foreign sector, D^* , which are not guaranteed by the banks and do not yield a predetermined rate of return. The banks are assumed to pay depositors a rate of return, r_d , that is based on profits from their operations, as postulated in equation (7). These deposits are shared between the depositors and the banks in some mutually-agreed proportions determined prior to the transaction, so that should the banks incur losses, the rate of return to the depositor would be negative and the nominal value of the deposits would be reduced accordingly. ^{1/} Unlike in the case of the interest-based banking system, commercial banks in the Islamic system

^{1/} See Khan and Mirakhor (1987)

Table 1. Symbols Used

Symbol	Definition
D	bank's liabilities to domestic residents (as a fraction of private sector wealth)
D*	bank's liabilities to foreign sector (as a fraction of private sector wealth)
H	supply of bank equities (as a fraction of private sector wealth)
G	government holdings of bank equities (as a fraction of private sector wealth)
K	physical capital (as a fraction of private sector wealth)
C	currency (as a fraction of private sector wealth)
c	required reserve ratio for banks
\hat{e}	the rate of change of the exchange rate, where the exchange rate is expressed as the domestic currency price of a unit of foreign currency
rd	rate on bank deposits
rl	rate on bank loans
rh	rate on bank equities
rk	return on physical capital
rf	return on foreign assets

Table 2. Islamic Financial System Model

Equation Number	Equation
(1)	$b^h(rh, r\ell)(1-c)(D+D^*)+p^h(rh, rd, rk)+G-H=0$
(2)	$b^l(rh, r\ell)(1-c)(D+D^*)-p^l(rk, r\ell)=0$
(3)	$p^k(rh, rd, rk, r\ell)+f^k(rk-rf-e)-K=0; \quad f^{k'}>0$
(4)	$cb^d(rh, rd)+p^c(rh, rd, rk)-C=0$
(5)	$D=p^d(rh, rd, rk);$
(6)	$D^*=f^d(rd-rf-\hat{e}); \quad f^{d'}>0$
(7)	$rd=r(r\ell); \quad r'>0$

cannot borrow from the central bank through the customary mechanism of rediscounting at a given official discount rate. It is assumed that banks can borrow from the central bank only on an equity-participation basis, and the central bank purchases equity in the banks when it wishes to expand reserves in the system, and vice versa. Therefore, an additional source of funds for the commercial banks is the rate of equity shares to the central bank, and the public also participates in this market. As in the case of investment deposits, the rate of return on equity shares, r_h , depends on the overall profit position of banks, so that in contrast to the official discount rate, it is not determined directly by the central bank.

On the lending side, banks engage in only risk-return sharing Mudarabah arrangements with the private sector. Mudarabah financing in this case is assumed to subsume all other types of similar arrangements, such as Musharakah financing. As in the case of investment deposits, the profits earned from the projects financed by the banks are shared between the bank and the entrepreneur on a prearranged basis specified in the contract between the two before the financing is provided. Banks are also required to hold a certain proportion, c , of their liabilities to the private and foreign sectors in the form of reserves with the central bank.

The foreign sector holds investment deposits in the banking system and physical capital. The foreign demand for investment deposits, f^d , is a function of the rate of return on investment deposits, r_d , less foreign or world interest rate, r_f , and the expected depreciation of the domestic currency, \hat{e} . The derivative of f^d , denoted $f^{d'}$, is positive.

The central bank's liabilities consist of reserves of commercial banks and currency held by the public. As mentioned earlier, the central bank holds equity shares of commercial banks, and the rate of return on these is market determined. The supply of reserves is changed by the central bank through variations in its stock of bank equity shares, dG , which in turn alters the cost of borrowing for the banks.

The four excess demand equations for the assets are constrained by the balance sheet, so they contain three independent equations determining r_h , r_l , and r_k , for given values of the exogenous variables. Dropping equation (4) and substituting for D , D^* , and r_d , leaves three equations to determine the three endogenous rates of return. To derive result for the direction of movement of one of the rates, we can take the total differentials of the three excess demand equations. Total differentiation of equations (1)-(3) after suitable substitution yields equation (8), which determines dr_h , dr_l and dr_k as functions of changes in G , c , H , K , r_f , and \hat{e} .

$$(8) \quad AdY + BdX = 0 \quad \text{or} \quad AdY = -BdX$$

with

$$dY = \begin{bmatrix} drh \\ dr\lambda \\ drk \end{bmatrix}, \quad dX = \begin{bmatrix} dG \\ dc \\ dH \\ dK \\ drf \\ d\hat{e} \end{bmatrix}$$

and the coefficient of the matrices A and -B are given in the Appendix. The solution is

$$(9) \quad dY = -A^{-1}BdX$$

The matrix A, with elements a_{ij} , is a matrix of partial derivatives of the excess demand functions with respect to the endogenous rates of return, and B is defined analogously with respect to the exogenous variables. The assumption of gross substitutability ensures that

- (i) $a_{ii} > 0$ for all i
- (ii) $a_{ij} < 0$ for all i, j, $i \neq j$
- (iii) $\sum_i a_{ij} > 0$ for all j
- (iv) $\det A > 0$

The determinant of matrix is positive because condition (iii) implies that A has dominant diagonals by column, which is sufficient for the characteristic roots to have positive real parts. An important result for matrices of this kind is that all cofactors are nonnegative and the inverse of A is composed entirely of nonnegative elements.

We discuss the effect of changes in central bank holdings of commercial bank equities, dG, on the endogenous rates of return. From equation

(9) the entries for changes in government holdings of bank equities on the endogenous rates of return are:

$$(10) \quad drh/dG = (1/|A|) [(-a_{22}a_{33})+(a_{23}a_{32})]$$

$$(11) \quad drl/dG = (1/|A|) [-(a_{23}a_{31})+(a_{21}a_{33})]$$

$$(12) \quad drk/dG = (1/|A|) [(-a_{21}a_{32})+(a_{22}a_{31})]$$

Given the assumptions on matrix A, all three endogenous rates decline in response to an increase in central bank's holding of bank equities. Intuitively, the results can be explained by noting that the increase in central bank's holding of bank equities adds immediately to the supply of funds banks have for lending purposes. As banks seek out more projects for Mudarabah financing, they accept projects with lower expected rates of return than previously. The lower earnings on Mudarabah financing will be reflected in lower returns on Mudarabah deposits. Given the decline in Mudarabah deposit rates, there is substitution into the market for physical capital, and the increased demand for capital lowers the required rate of return on capital. As discussed earlier in terms of the q theory of investment, this monetary action is expansionary because it lowers the required rate of return on capital and makes it easier for the economy to accumulate physical capital.

It needs to be mentioned, however, that because deposit rates are flexible and not controlled by the central bank in Islamic banking, there will be partial offsets to the monetary action. As returns on Mudarabah deposits decline, the private sector will not only substitute into physical capital but also into currency, thereby dampening the expansion of bank intermediation. Furthermore, the foreign sector will reduce its holdings of domestic assets, both Mudarabah deposits and physical capital, because their rates of return decline. These offsetting international capital flows will depend on the elasticities of the foreign asset demand functions with respect to the rates of return. Thus, the move to greater flexibility in the setting of deposit rates is likely to increase the extent to which capital flows offset monetary policy. But as long as the assets are imperfect substitutes, the offset is only partial. Although the greater flexibility in the rates of return increases the short-run international capital flows offset to monetary policy, this does not at all mean that the adoption of Islamic banking will lead to sustained medium- or long-term capital outflows. The model is presented for the purpose of analyzing short-run effects of monetary policy. To study the long-run implications of Islamic banking for international capital flows, one needs to look at the likely effects that interest-free banking would have on domestic saving and investment. This issue is discussed in the next section.

V. Saving, Investment, Growth and External Borrowing

The foregoing discussion has concentrated on the relationship between monetary policy and the rates of return in an Islamic economy and how changes in the rates of return affect investment spending. This section focuses on the relationship between domestic saving and investment, on the one hand, and the current account deficit, on the other, in order to shed some light on the external debt servicing capacity issue for an Islamic economy. In the national income accounts identity, gross national product (GNP) is measured both by expenditure on final product and by the way in which the income that is generated in production is used.

$$(13) \quad C + I_p + I_g + G + (X-M) = GNP = C + S + T + R_f$$

The left hand side of the identity indicates that expenditure on GNP is divided among private consumption (C); gross private sector investment (I_p); gross government investment (I_g); government spending for consumption-type goods and services (G); and net exports (X-M). The right hand side of the equation indicates that the income earned in production is used up in private consumption (C); saving by consumers and businesses (S); net tax payments (T); and transfer payments to foreigners by private citizens (R_f). Subtracting private consumption (C) from both sides of the identity, and rearranging, we have:

$$(14) \quad (M - X) + R_f = (I_p - S) + (I_g + G - T)$$

In other words, the current account deficit equals the sum of the excess of private sector investment over private sector saving and the budget deficit of government. This implies that the current account deficit will be higher the greater is the accumulation of capital, the smaller is the accumulation of private wealth, and the larger is the budget deficit. But a deficit in the current account means a transfer of resources to the country in that some of the goods and services brought into the country are not paid for by an equivalent claims on the country. In total, the current account deficit must be reflected by changes in the net asset position, irrespective of whether these take place through a reduction in foreign assets (including international reserves) or through borrowing. If a current account deficit results from increased investment, then the economy is trading one asset, the debt instrument, for another, the claim to physical capital. To the extent that borrowed resources have been channeled into productive investments, such investments could be expected--given prudent management of the economy and maintenance of the competitiveness of the external sector--to generate a stream of returns at least sufficient to repay the associated loans. If, on the other hand, the resources

were used, directly or indirectly, to sustain consumption, repayment of the indebtedness must be, at least to some extent, at the expense of future levels of consumption, a far more onerous prospect. It is therefore, of considerable interest to know whether the adoption of an Islamic banking system would lead to increased investment or increased consumption, i.e., whether a stream of real resources is likely to be generated which will permit the eventual repayment of the foreign liabilities.

It could be argued that in an Islamic economic system, particularly with its emphasis upon work and moderation in consumption, saving would be enhanced. Nevertheless, concerns have been expressed that the adoption of Islamic financial system may lead to a reduction of savings and retardation of financial intermediation and development. One argument suggests that since savings receive no reward (i.e., interest rate is zero) there is no incentive for individuals to save. Another argument asserts that savings will decrease because of increased uncertainty of future prospects in the Islamic system.

The first argument stems from a misunderstanding regarding Islam's prohibition against interest. Those advancing this argument consider the prohibition against interest to be tantamount to an imposition of a zero rate of return on investment and capital. This view reflects a confusion between rate of return and rate of interest. While the latter is forbidden in Islam, the former is not only permitted but is, in fact, encouraged. The second argument is based on the proposition that increased uncertainty in the rate of return affects savings adversely. Recently this issue has been subjected to rigorous theoretical analysis with conflicting results. The few studies that have considered this question within the context of Islamic framework have tended to neglect the risk return tradeoff aspects of the question. ^{1/} That is, the effects on savings of a fixed and certain rate of return are compared with effects on savings when only uncertainty is taken into account, and the obvious result is a reduction in savings in the latter case. If the expected value of return is kept constant while its variance is increased, i.e. when increased risk is not compensated by higher returns, savings will be adversely effected. This conclusion, however, is far from obvious when both risk and return are allowed to vary. Theoretical conclusion of an analysis in which risk and return variability have both been taken into account depends on assumptions regarding the form of the utility function and its risk properties, e.g., the degree and the extent of risk aversion, the presence and the degree to which the future is discounted, whether or not increased risk is compensated by higher return, and finally the income and substitution effects of increased uncertainty.

^{1/} See Haque and Mirakhor (1987).

Haque and Mirakhor (1987) have argued that the structural changes accompanying the adoption and implementation of an Islamic financial system may produce favorable effects on the rate of return on savings. The increased rate of return could compensate for the increased level of uncertainty that may result from the elimination of the risk-free asset, thereby leaving the overall level of savings unchanged or perhaps even leading to an increase in savings. They also note that the move to an Islamic banking system cannot be analyzed as an a priori increase in uncertainty in the environment in which the consumer is operating. Theoretically, any asset whose return is not ex ante fixed and tied to the amount of money invested can be admitted into the menu of assets available in an Islamic financial system. Given the availability of assets with a variety of risk characteristics, the saver can organize a diversified asset portfolio which can enable him to minimize risk in the Islamic financial system as in its counterpart.

In the companion paper to the one just mentioned, Haque and Mirakhor (1987) analyze investment behavior in an interest-free Islamic economy, and their analysis indicates that there is no strong theoretical reason to support the assertion that investment levels would decline if an Islamic profit-sharing system were adopted. Their analysis demonstrates that in the case of perfect certainty and full information, whether investment decisions are based on profit sharing or on a fixed rate of return does not have any real consequences for the economy. But when uncertainty is introduced, the level of investment may actually increase under certain conditions. Intuitively, this result can be explained by noting that when a fixed interest rate is replaced by profit sharing, both the owners of the firm and the lenders to the firm would be residual income earners and a fixed cost for capital would not be required as part of the firm's profit calculations. Therefore, the marginal product of capital could be taken up to the point where maximum profits would be obtained, as the firm does not face the constraint of meeting a fixed cost of capital.

The question of what will happen to the level of savings and investment following the adoption of Islamic banking will ultimately be an empirical one. However, some insights regarding the effect on the current account deficit can be obtained from examining the various possibilities with regards to the movements in savings and investment.

The propositions that follow from the above discussion are that savings and investment are unlikely to decline in an Islamic economy. If both savings and investments rise, then the effect on the current account deficit is ambiguous. Other things being equal, if the increase in saving is greater than the increase in investment, then the current account deficit will be lower. But even if the current account deficit is increased because of a larger increase in investment, the ensuing growth of output would make it feasible ultimately to close the gap between domestic saving and investment to repay the external loans. This statement needs

to be somewhat qualified to allow for the fact that high saving and investment rates by themselves do not imply immunity against difficulties in managing the external debt. For example, a number of developing countries that apparently devoted the proceeds of external borrowing to investment have nevertheless encountered serious debt-servicing problems. The reasons for this are complex, and include both global economic developments--weakness of international trade, protectionist practices in industrial countries, high international interest rates--and policies in developing countries, especially with regards to fiscal deficits, exchange rates and pricing policies, that lowered the efficiency of investment. While a full analysis of these issues is beyond the scope of this paper, two aspects of investment spending in a capital importing economy may be discussed insofar as the discussion serves to show that disturbances to asset positions are absorbed efficiently in an Islamic financial system and that capital inflows are less likely to be affected by sudden and uniform shifts in the perception of the country's creditworthiness in Islamic banking than in the traditional form of international bank lending.

The first point we discuss is the well-known result that a high level of capital inflows into a country, which reflects not only a strong demand for external capital ^{1/} but also the absence of substantial credit-rationing constraints on its supply, will lead to an appreciation of the real exchange rate. The increased inflows cause an increase in domestic expenditures relative to output. The supply of traded goods required by the increased demand will be met by some combination of increased imports and decreased exports, with the resulting increase in the current account deficit equal to the capital inflow. However, the increased demand for nontraded goods can only be met from domestic supply, and if the supply of nontraded goods is unchanged, their relative price will rise. If one makes the small country assumption that the foreign currency price of traded goods is not affected by developments in the domestic economy, then the rise in the relative price of nontraded goods occurs through either a rise in the domestic currency price of nontraded goods or an appreciation of the nominal exchange rate. The rise in the relative price of nontraded goods results in the drawing of labor out of the traded goods sector because the real wage rate in terms of nontraded goods declines. However, the wage rate measured in terms of traded goods and the real wage rate (that is, in terms of all goods consumed) both rise because of the resource movement effect. This increase in the cost of labor has an adverse effect on external competitiveness. A sudden reduction in the level of capital inflows--either because borrowers are frozen out of the markets by the credit-rationing phenomenon or because they cease borrowing voluntarily in the face of high interest rates in world financial markets--will require a fall in the real exchange rate to restore equilibrium and

^{1/} It must be pointed out that external borrowing in an Islamic economy will also have to be based on profit-and-risk-sharing basis.

may involve substantial short-run adjustment costs, in terms of foregone output and underemployed resources, if resources cannot be shifted back quickly to the traded goods sector.

These types of adjustment problems will be less severe in an Islamic financial system, both because the fluctuations in capital inflows are dampened and because the transfer of resources from the nontraded goods sector to the traded goods sector is facilitated by Islamic banking. Muslim scholars have little doubt that a financial system based on an Islamic framework of profit sharing would be more efficient in allocating resources and more stable as compared to a traditional interest-based system. ^{1/} It is argued that allocational improvements would occur because investment alternatives are compared to one another based strictly on their productivity and rates of return, and better quality investment projects will be undertaken because the saver becomes an entrepreneur sharing in the profits earned. As payment commitments of firms and financial institutions are mostly dividends that will have to be paid only if profits are received, the decline in the profitability in the nontraded goods sector of the sort discussed above will be reflected quickly in the returns earned by investors on the nontraded goods sector, thereby encouraging the investors to switch their resources to firms or financial institutions that are active in the traded goods sector.

The second aspect of financial intermediation and investment spending in a capital importing country that we discuss is the case where existing debt constrains the flow of new credits and domestic investment. The argument as presented in Dooley (1987) is that when a country experiences an exogenous reversal in its economic prospects, a wedge can become established between the contractual and market value of debt. The contractual value of debt can be defined as the present value of the stream of payments set out in the initial contract between the debtor and the creditor on the assumption that such payments will be made with certainty. The market valuation of that contract is the present value of the market's expectation of the stream of payments that will actually be made under the contract. Whereas the contractual value is generally above the market valuation to cover the possibility that the contractual obligations may not be carried out, circumstances can arise where uncertainty among new investors as to whether or not they will be forced to share an expected loss on existing unprofitable investments through increased taxation, exchange rate depreciation, and other means that the government may employ, causes a sharp slowdown of new investment in the capital-importing country.

^{1/} See Khan (1986) and Mirakhor (1986).

In this regard, an important difference between interest-based international bank lending and Islamic modes of financing is that whereas in the former interest payments are due irrespective of the uses to which original borrowing had been put, payments in the latter are closely linked to the returns on the underlying investment. ^{1/} Due to the prohibition against the charging of interest and the fact that the banks will have to rely primarily on profit-sharing, the Islamic banks will have to offer their asset portfolios of primary securities in the form of risky, open-ended, mutual-fund type of packages for sale to the investor-depositors, as opposed to the traditional practice of banks keeping title to the portfolios they originate. In the Islamic system, there will also be greater interdependence and closer relationship between investment and deposit yields because banks can primarily accept investment deposits on the basis of profit-sharing and can provide funds to the enterprises on the same basis. Due to the fact that the return to liabilities will be a direct function of the return to asset portfolios and also because assets are created in response to investment opportunities in the real sector, the return to financing is removed from the cost side and relegated to the profit side, thereby allowing the rate of return to financing to be determined by productivity in the real sector. It will be the real sector that determines the rate of return to the financial sector in the Islamic financial system rather than the other way around. For these reasons, Islamic banking tends to reduce the vulnerability of the capital importing country to fluctuations in the level of capital inflows and sharp slowdown of new investment due to uncertainty among investors.

This can be further explained in terms of the q theory of investment that was discussed in Section III. One way to look at q is that it represents the comparison between the marginal efficiency of capital and the financial cost of capital. The marginal efficiency of capital is the internal rate of return on investment at its cost in the commodity markets, whereas the financial cost of capital is the rate at which investors discount future returns from investment. The reason why new investment does

^{1/} There was a marked shift from non-debt-creating flows--official transfers and private direct investment--to debt-creating and interest-sensitive borrowing by developing countries in world capital markets. During the 1960s, the main form of international bank lending was short-term trade credit. During the 1970s, however, institutional developments in the domestic banking systems of the industrial countries lowered the risk on deposit liabilities of the money-center banks, which enabled the major banks to become the largest recipients of international loanable funds. Furthermore, financial innovations--notably the growth of syndicated loans and the increased use of cross-default clauses--reduced perceived levels of risk in lending to developing country borrowers, resulting in a significant rise in the volume of private bank lending.

not take place when a wedge becomes established between the contractual and market value of debt is not primarily because marginal productivity of capital is reduced but, more importantly, because investors discount future returns from new investment on the basis of a very high discount rate, which reflects their expectations that proceeds from their investments will be used to service the existing large external debt. The problems of the high discount rate on new investments will not arise in the Islamic financial system, because the liabilities of each economic unit are composed of equities, are fully amortized with an underlying future income flow, and no debt refinancing can take place (if there is any refinancing, it must be based on the sharing of future income expected from assets).

VI. Concluding Remarks

The aim of this paper has been to extend the analysis of monetary policy to the case of an open Islamic economy. A general equilibrium model for analyzing investment and external balance was presented. The model should not be taken too literally; rather, it should be regarded as an exploration of monetary policy in an Islamic economy when there are offsetting international capital flows. While the strong qualitative results that emerge from this paper hinge on the specific assumptions used, the basic conclusions are of general interest. Without denying the constraint imposed upon monetary policy by substitution possibilities among domestic and foreign assets, the paper argues that monetary policy can be used to affect output in an open Islamic economy. The rate of return on equity shares of commercial banks is market determined, but the supply of reserves is changed by the central bank through variations in its stock of bank equity shares, which in turn alters the cost of borrowing for the banks. While an increase in the supply of bank reserves will lower the deposit rates, the substitution of currency and foreign assets for domestic bank deposits will not offset the monetary expansion completely so long as the assets are imperfect substitutes.

Although the move to greater flexibility in the setting of deposit rates is likely to increase the extent to which international capital flows offset monetary policy, this does not imply that Islamic banking will lead to sustained medium- or long-term capital outflows. To study the long-run implications of Islamic banking for international capital flows, the paper discussed the effects that interest-free banking would have on domestic saving and investment. It was argued that savings and investment are likely to increase in an Islamic economy so that the effect on the current account position is ambiguous. However, to the extent that borrowed resources are channeled into productive investments, such investments could be expected to generate a stream of returns at least sufficient to repay the associated loans. Furthermore, the Islamic system has some advantages over the conventional interest-based system in terms of adjustment to certain types of macroeconomic disturbances because the liabilities of each economic unit are composed of equities and fluctuations in international capital flows on domestic investment are dampened.

Coefficient Matrices

$$A = \begin{bmatrix} b_{Rh}^h(1-c)(D+D^*)+b_{Rh}^d(1-c)p_{Rh}^d & b_{Rl}^h(1-c)(D+D^*)+b_{Rl}^h(1-c)(p_{Rd}^d+f^d) & r'+r'p_{Rd}^h & b^h(1-c)p_{Rk}^d+p_{Rk}^h \\ b_{Rh}^l(1-c)(D+D^*)+b_{Rh}^l(1-c)p_{Rh}^d & b_{Rl}^l(1-c)(D+D^*)+b_{Rl}^l(1-c)(p_{Rd}^d+f^d) & r'-p_{Rl}^l & b^l(1-c)p_{Rk}^d-p_{Rk}^l \\ p_{Rh}^k & p_{Rl}^k+p_{Rd}^k & r' & f_{Rk}^k+p_{Rk}^k \end{bmatrix}$$

$$-B = \begin{bmatrix} -1 & b^h(D+D^*) & 1 & 0 & b^h(1-c)fd' & b^h(1-c)fd' \\ 0 & b^l(D+D^*) & 0 & 0 & b^l(1-c)fd' & b^l(1-c)fd' \\ 0 & 0 & 0 & 1 & fk' & fk' \end{bmatrix}$$

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