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Macro Consumption Function in an Islamic Framework

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Introduction

Consumer behaviour, i.e., how the consumers allocate their income between different heads and how they decide how much to consume now and how much to save for future is a key topic in modern economic theory. The study of consumer behaviour bears implications for macro economic policies. Many modern economic theories conclude that savings are essential for economic growth. The more people save in a country, the more rapidly it will grow. With this background, modern economists conclude that the level of savings in an Islamic economy will be lower if people have to pay *zakah* on their savings. While presenting this argument, these modern economists consider *zakah* as a tax on savings that switches allocation of resources from savings (i.e., future consumption) to present consumption. Also, if we take part of the savings of the rich and give it to the poor, who will obviously consume it all, aggregate savings level in the economy, *ceteris paribus*, will naturally decline. The conclusion, therefore, follows that Islamization of an economy as it will result in lesser savings will adversely affect its growth.

Are savings really essential for economic growth? Only those will answer yes to this question who believe that capital accumulation is the engine of growth. Some economists, particularly Islamic economists (Khurshid Ahmed 1981) may not believe so. We will, however, keep this question aside. Within the popular view that savings are essential for economic growth, we will raise only the following question: "Is it really true that savings in an Islamic economy will be lower than if the same economy was operating on a non-Islamic basis?

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Our answer to this is no. We have developed two arguments to support this answer. One argument describes the Islamic premises within which a Muslim will determine his consumption. It is argued that these premises are such that the aggregate consumption level will be lower than if the Muslim were consuming under un-Islamic premises. The second argument is built upon the basis of a macro economic model that includes the dynamic effect of *zakah* in an Islamic economy. Through this model, it is shown that even if there is any chance of a short run decline in the aggregate savings level due to the Islamization of the economy (i.e., imposition of such injunctions as *zakah*), this adverse effect will soon be wiped out and the long term savings and growth path will be higher than if it were a non-Islamic economy. This results from the income distribution effects of *zakah* which causes the poor to ultimately enter into the group of savers as their economic conditions improve.

Section I builds up the first argument i.e., of the Islamic premises within which consumption of Muslims will be determined. Sections II and III give a macro model for an Islamic economy. Section IV derives mathematical comparison of savings propensities between Islamic and non-Islamic economies. The numerical results of simulation under various parameteric assumptions and policy conclusions there from have been left for a later exercise.

Islamic Premises within which a Muslim's Consumer Behaviour is Determined

Before I explain the Islamic premises within which consumer behaviour is determined, I will briefly describe the premises within which modern economists believe that a consumer decides his consumption pattern. Modern economic theory studies consumer behaviour under the following premises.

i) It is assumed that a consumer will decide what to consume and how much to consume only to gain the material benefits and satisfaction.
ii) It is generally assumed that all his consumption is geared to satisfy his own needs. He is not bothered to satisfy any one else's needs.
iii) It is assumed that a consumer behaves rationally. This, among other things, means:
   a) the consumer will neither be a miser nor an unnecessarily spend thrift.
   b) he will not hoard his wealth.

Within these premises, modern economists then explain what and how much a consumer will consume and how much he will save to invest for future earnings/consumption. These premises are described as axioms i.e. they are assumed to be given in human nature. In other words, no logic is given to explain why a consumer would operate under these premises.

It can easily be imagined that these consumption premises can be valid only if a consumer has been brought up in a particular cultural environment and has been taught a particular philosophy of life. This may not be true for all societies in the world. In fact, very few societies in the world may have such a cultural environment or such a philosophy of life. Take, for example, the assumption of rationality. The type of rationality that is required by modern economic theory is something that may not exist

in many societies due to their particular ethical, social and cultural norms and customs. For example, who can stop an individual from spending for other than worldly gains? (even in Western materialistic societies, people like to spend for non-material gains). Or, who can stop an individual from spending for not his own but other's material welfare also (the social and cultural structure of societies like India and Pakistan and many other developing countries necessitates such spending by the individuals which are meant to satisfy not their own needs but others' need as well?). Or who can stop an individual from becoming unnecessarily spend-thrift (a problem of many western societies) or from hoarding his wealth (a problem of many underdeveloped societies)?

Islam, having its own distinct ethical, sociological and cultural framework provides completely different premises for analysis of consumer behaviour. The analysis of consumer behaviour under these premises will obviously be different from the theories that secular economists propound.

A Muslim consumer in an Islamic economy is supposed to make two types of spending*.

a) To meet his (or his family's) material needs (let us denote this type of spending by E_1)
b) To meet the need of others (for the sake of Allah) (let us denote this by E_2)

The total spending E, therefore, can be written as

$$E = E_1 + E_2$$

It is left to human discretion to allocate income between these two types of spending. Human behaviour, however, is guided behaviour for a Muslim - a person who is advised to be God-conscious or God-fearing. Thus allocation between E_1 and E_2 will be determined by

i) some of the parameters that determine the consumption pattern of a rational consumer (as outlined by economics), and
ii) degree of God-fearingness or God- consciousness (*Taqwa*).

The role of God-fearingness in the spending of Muslims is clear from various verses of the Qur'an.

Muslims are required to be God-conscious (God-fearing)

> *o Ye who believe; Fear Allah as He should be feared. 3:102*

The more a person is God-fearing i.e. God-conscious the better Muslim he is

> *Verily the most honoured of you in the sight of Allah is (he who is) the most righteous of you. 49:13*

Who are the God-conscious? One of the definitions is those

> *Who believe in the unseen, are steadfast in prayer and spend out of what we have provided for them. 2:3*

Thus, to spend in the way of Allah is one of the requirements for a good Muslim.

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* "Spending" is used to include not only what is called "Consumption" in economics hut also the investment expenditures, transfers, lending and savings in the form of hoardings or otherwise.

The Qur'an does not exactly specify how much a person should spend in the way of Allah. At two places, the Qur'an answered the question (posed by the companions of Prophet) what should they (Muslims) spend. (2:215, 2:219).

At one place the answer was simply "Say *Al-`Afw*" (2:219) That is one should spend what is left over after meeting ones needs. At another place the same question was answered as

> *They ask thee what they should spend (in Charity). Say: Whatever ye spend that is good; is for parents and kindred and orphans and those in want and for wayfarers. And whatever Ye do that is good - Allah knoweth it well. 2:215*

[(It is reported that this refers to the following question from the companions of Prophet (peace be upon him).

What should we spend from our wealth and where should we spend it).]

Again the emphasis in the answer has been laid on *where* money should be spent; for parents, relatives, needy and wayfarers. The answer to how much should be spent has again been left unspecified by saying

> *And whatever Ye do that is good - Allah knoweth it well. 2:215*

i.e. there is no upper limit. "Whatever you can afford you should spend" is the guidance.*

Without specifying how much of one's income should be spent for others in the way of Allah, great emphasis has been placed on such spendings. The more one spends for others (for the sake of Allah) the better for him in this world and the hereafter. This emphasis is apparent from many verses from the Qur'an.

> *And spend of your substance in the cause of Allah and make not your own hands contribute to your destruction; But do good. For Allah loveth those who do good. 2:195*

The reference of some other verses emphasising the same are (2:177); (4:92); (9:34); (2:254); (2:262); (2:245); (8:60).

This spending in the way of Allah is entirely different from the first type of spending (E_1) which is for worldly needs. From the second type of spending, no worldly advantage is intended to be obtained. It has to be for the sake of Allah with no worldly motives at all as is apparent from several verses. For example

> *o Ye who believe; cancel not your charity by reminders of your generosity or by injury - like those who spend their substance to be seen of men, but believe neither in Allah nor in the last day. They are in parable like a hard barren rock on which is a little soil; on it falls heavy rain, which leaves it (just) a bare stone. They will be able to do nothing with what they have earned. And Allah guideth not those who reject faith. 2:264*

The same sense is repeated in verse (4:38).

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* It is agreed among companions of the Prophet, the generation succeeding the companions and *Fuqaha*, that one should spend from what is left after meeting ones needs and not that one should spend all that is spare.

Thus the second type of spending (E_2) is entirely different from the first type of spending (E_1).

Though no exact amount or any upper limit has been specified in the Qur'an or *Sunnah* for the E_2 (or for E_1) we do find that there is a lower limit for the amount of E_2 to be spent by those who are eligible. This lower limit is the amount of *zakah* which is mandatory. But this is only a minimum. To acquire a higher degree of Islamic credit, a Muslim has to make as much E_2-type spending as possible (See the Qur'an 2:3 quoted above).

The stress on E_2 should not be taken to assume that E_1 is less important. We find specific guidance in the Qur'an and *Sunnah* emphasizing the importance of E_1 (e.g., the Qur'an 7:32).

All good things of this world have been created for man. Muslims are not asked to abstain from them. The Prophet (Peace be upon him) says that when Allah bestows good things of the world upon one of His servants He likes to see them reflected in his appearance (of course without any intention of personal pride). The Prophet (Peace be upon him) is also reported to have objected to the act of abstention from the lawful enjoyment of material things. He is also reported assaying: "You don't really possess of your wealth but only what you eat and use up, what you dress and wear up or what you spend on charity and preserve (for the life hereafter)". At another place, in the Qur'an, we find

> *Eat of their fruits in their season, but render the dues that are proper on the day that the harvest is gathered. But waste not by excess: for Allah loveth not the wasters.* *6:141*
> *Of the cattle are some for burden and some for meat: Eat what Allah hath provided for you, and follow not the footsteps of Satan: For he is to you an avowed enemy.* *6:142*

Here, Allah gives two commands: One is to spend for one's own needs and the other is to spend for others in the way of Allah. The command "waste not" refers to rationality in both types of consumption. Some other verses stressing E_2-type spending are (7:31) and (2:168).

Another aspect of a Muslim consumer behaviour is that he has to be rational in all his spending. This point of rationality is something that is unique to the Islamic economic system. The theory of consumer behaviour of secular economics assumes a rational consumer who takes *rational* decisions. But how would rationality practically be achieved in an economy? Secular economics by-passes this question and that is why its theories lose practical relevance for most of the societies. Secular economists treat rationality as an axiom relating to human behaviour, whereas the type of rationality that is assumed by them is something that would require "proper" education. Developing or applying economic theories without imparting this `proper' education will simply be an exercise in futility.

The axiom of rationality required for Islamic economic theories of consumer behaviour is not simply an assumption which may or may not be true. It is something that a Muslim has to learn and acquire. Islam teaches rationality with the same emphasis with which it teaches how to spend and where to spend. The verse (6:141) quoted above indicates the emphasis on rationality in spending. The same point is made in the verse

> *Make not thy hand tied (like niggard's) to thy neck, nor stretch it forth to its utmost reach; So that you become blame-worthy and destitute. 17:29*

This lesson of rationality in spending is not only for worldly spending (E_1) but is also for the spending in the way of Allah (E_2) as is clear from the following verses

> *And render to the kindred their due rights, as (also) to those in want, and to the wayfarer: But squander not (your wealth) in the manner of spend-thrift. 17:26*

> *Those who, when they spend, are not extravagant and not niggardly, but hold a just (balance) between those (extremes). 25:67.*

In all the commands that allow E_1, the only limit that has been imposed is that "do not consume prohibited goods and consume only permitted goods". This reduces, *ceteris paribus*, the consumption basket of a Muslim consumer compared to a secular consumer (the possibility of a larger basket as a Muslim though exists but is not likely to be true in general).

So far, nothing has been said about saving for future consumption or investment to improve the quality of life in future. This is actually a part of E_1 type of spendings. It is a legitimate spending in Islam. There is evidence available from the Qur'an and *Sunnah* that justifies savings/investment.

> *To those weak of understanding make not over your property', which Allah hath made a means of support for you. 4:5*

In the explanation of this verse, commentators state that wealth is the capital of life and its preservation by rational spending is obligatory on Muslims. The Prophet (peace be upon him) is reported to have said that poverty is likely to lead to disbelief. This implies that Muslims should try to improve their economic condition. This, in turn, justifies investment and hence savings.

A saying of the Prophet (peace be upon him) that to leave one's inheritors better off is desirable compared to leaving them poor also signifies the importance of savings.

Unlike the secular economic system that does not penalize hoardings (savings that are not invested) Islamic economic system puts a specific penalty in the form of *zakah* on hoarding that will ultimately eat up all savings if they are not productively used to yield at least a 2½ percent return per annum. Thus a Muslim has the following options with respect to this savings:

a) Hoard it and pay at least 2½ percent of it every year in the way of Allah.
b) Lend it as *Qard-i-Hasan* (loan without interest) and earn reward in the world hereafter.
c) Invest it to earn at least 2½ percent return per year.

A rational consumer, obviously, has no alternative but not to hoard all his savings. If he decides to be irrational he will ultimately lose all what he hoarded. Thus, savings have to be channelized towards investment. (This property of Islamic economic system also reduces the chances of planned investment lagging behind or ahead of savings, to create deflationary or inflationary pressures, in the Keynesian framework. (See also Kahf, 1980). A Muslim will try to make investment with the following motives:

a) to acquire permissible comforts of this world
b) to be able to have more to spend in the way of Allah and more reward in the hereafter.

To recapitulate, the main elements of a Muslim consumer behaviour are:

1. A Muslim consumer's total spending can be classified into the following major categories:
   a) Spending to achieve satisfaction in this world (E_1). This includes:
      i) Present (immediate) consumption (let us denote it by C_1)
      ii) Savings/investment for consumption in future (let us denote it by S_1).
   b) Spending for others with a view to earn reward in the hereafter (E_2). This includes:
      i) what is immediately consumed by the recipients (let this be C_2).
      ii) what is invested for social purposes or community benefits or what is saved by the recipients for their own investment (S_2).
2. The consumption basket of a Muslim is likely to be smaller than that of a secular consumer as it includes only permissible things and excludes prohibited things.
3. The allocation between E_1 and E_2 and between C_1 and S_1 within E_1 or between C_2 and S_2 within E_2 has been left to rational consumer behaviour which should be dominated by God- fearingness.
4. The degree of God-fearingness is an essential parameter in determining consumer behaviour of a Muslim.
5. The only limit that has been specified is the minimum limit of E_2 for those who are obliged to make these types of spendings.
6. A Muslim is allowed to save, a major part of which will have to be invested in order to earn at least a return that would prevent his savings from being depleted by *zakah*.

With the description of these premises, it is not very difficult to see that an Islamic economy will have a lower consumption propensity than if it were a secular economy. The most important basis for this argument is:

a) that Islamic consumer is likely to face a smaller basket of consumption to pick up from than if he were a secular consumer.
b) from within this basket he has to pick without crossing the limits of prodigality.

This is an immediate perspective. In a longer term perspective we can visualize that the spending that is done for the others will help the "others" to improve their economic condition. Islam does not encourage people to keep receiving *zakah*. They have to improve themselves to come into the *zakah*-payers category or at least in the not-*zakah*-receiver category.

Able-bodied poor people are allowed to receive *zakah* only as a stopgap arrangement to find an opportunity for them to improve their economic condition. In a dynamic economy, these people who are presently poor and cannot save anything are likely to be able to save as *zakah* helps them to improve their economic status. Thus even if in the short run, there is any reason to believe that savings propensity and hence economic growth in the economy are likely to be lower, there is no reason to believe that it will be so in the long run. This argument is further developed in the framework of a macro model discussed in the next section.

II. Deriving Consumption Function for an Islamic Economy

A. Micro Consumption Function

Consumer derives utility from both types of spending E_1 and E_2. We may write the utility function as

$$U = F(E_1, E_2)$$

With the income constraint $Y = E_1 + E_2$

This utility function has the following properties.

$F_1 = \frac{\partial U}{\partial E_1} > o$ i.e. marginal utility of E_1 is positive.

$F_{11} = \frac{\partial F_1}{\partial E_1} < o$ i.e. marginal utility of E_1 goes on declining as its volume is increased.

$F_2 = \frac{\partial U}{\partial E_2} = a > o$ and is a constant.

This implies that the marginal utility of E_2 is a positive constant for an individual with a specific level of God-consciousness. A declining marginal utility of E_2 is out of question because the want for reward in the hereafter is insatiable and unlimited. Increasing marginal utility of E_2 is also not possible as the reward of E_2 in hereafter is unknown. A person's evaluation of the reward will thus remain constant for each additional unit of E_2 spending*. With this type of utility function, a consumer will go on

* It was argued by a commentator that the assumption $\frac{\partial U}{\partial E_2}$ = constant would not allow the indifference curve to be convex and would rather make it concave leading to a corner solution which is not a desirable Islamic solution. Without going into the implication of constant marginal utility of E_2 on convexity, I express my gratitude to Dr. Anas Zarqa for pointing out that the assumption of constant marginal utility of E_2 is not necessarily required. Instead it can be safe to assume a declining marginal utility of E_2. His argument, in brief, is as follows:
E_2 has a utility just as E_1 has. Even a secular consumer likes to spend E_2 to feel some satisfaction that he is not selfish and is nice to others. For a secular consumer this utility of E_2, however, will be too small leading to a too small level of E_2. For an Islamic consumer E_2 will be larger because he feels more satisfaction in E_2 due to his different objectives of life and belief in the reward of hereafter. E_2 will have a declining marginal utility as E_1 has. This is because a Muslim has been asked to be moderate in his spending even on E_2 as has already been discussed above. It can be safely argued that E_2 in nature is same as E_1 thus having diminishing marginal utility. The analysis in this paper, however, continues on the assumption of constant marginal utility of E_2. The assumption of declining marginal utility of E_2 being supposed to have no effect on the conclusions.

consuming E_1 as long as its marginal utility is above 'a'. The more a person is God-fearing the more will be the `a' value and more of the total spending will go to E_2. Thus:

$$E_2 = F(a, Y); \frac{\partial E_2}{\partial a} > 0; \frac{\partial E_2}{\partial Y} > 0$$

$$a = F(T) \frac{\partial a}{\partial T} > 0$$

where T (the level of God-fearingness) is parameterically given.

E_2 type consumption generates from that class of population that can afford it. In Islamic terminology, E_2 will be spent only by the Owner of *Nisab* consumer. Let us define Owner of *Nisab* as a person whose income exceeds a certain level say Y*

Thus: $E_2 = F(a, Y) > 0$ when $Y > Y^*$
$= O$ otherwise

For a Owner of *Nisab*, E_2 is not "consumption" as defined in secular economics. In secular economic terminology E_2 is a transfer from the Owner of *Nisab* to the poor class of the population. E_2 may go entirely into the consumption of poor class or part of it may go to building up of their capital (physical or human). Let us use subscripts U and L to denote the values for Owner of *Nisab* (i.e., rich) and not Owner of *Nisab* (i.e., poor) consumer respectively. We can write the following equation for the two types of consumers in the society.

$$E_L = Y_L + E_2 \quad \text{when} \quad Y < Y^*$$

This means, consumption of the lower income consumer is equal to his total income plus the transfers from the upper income groups. (It has been assumed that all transfers are consumed by the lower income consumer. The possibility of the transfers being used to build up capital of the lower income consumer can be taken up later).

$$\left.\begin{aligned} E_2 &= F(a, Y) \\ E_1 &= Y_U - E_2 \\ a &= F(T) \end{aligned}\right\} \quad \text{When} Y > Y^*$$

E_1 includes spending to build up durable consumer goods or to build up productive capital. This may also include hoardings in the form of jewelry, gold, silver, diamonds etc. For the sake of simplicity let us classify the components of E_1 into the following.

a) All such spendings that are termed as consumption in secular economic terminology (C_U)
b) Savings (S).

i.e. $E_1 = C_U + S$ Where C_U = Consumption of the upper income group.
and S = Savings of upper income group.

How would the total amount of E_1, already determined by the parameter, T, be allocated between C_U and S? As already discussed, the allocation has been left to normal consumer behaviour except that Muslims have been categorically advised not to be extravagant.

This constraint on a Muslim will keep the level of "C_u" lower than the level of "C_u" of a secular consumer. How much lower the level will be, will depend on how God-conscious a person is*. Thus we may define C_U in case of a Muslim as

$\frac{1}{1-\beta} C_U = C_U^*$ Where C_u = level of consumption of a secular consumer.

Where $\beta = G(T)$ i.e. β is a function of the level of God-fearingness with $\frac{d\beta}{dT} > o$

C^*_u for a normal secular consumer is generally determined by the level of income i.e. $C^*_u = F(Y_u)$ where Y_u = Income. Thus

$$C_u = (1-\beta)\ F\ (Y_u)$$

For a Muslim Consumer, it is not Y_u that is allocated between consumption and savings. It is E_1 left with the Muslim consumer (after spending E_2) to be allocated between consumption and savings. Hence,

$$C_u = (1-\beta)\ F\ (E_u)$$

The above discussion is summarized below:

Let us assume that there is no borrowing so that spending (including savings) is equal to income in case of upper income consumer and equal to income + transfers, in case of lower income consumer.

Thus, the following equations describe the elements of consumption pattern in an Islamic economy.

C_L	$= Y_L + E_2$	
E_2	$= F(a, Y_u)$	$a = F(T)$
Y_u	$= E_1 + E_2$	
E_1	$= C_u + S$	
C_u	$= (1 - \beta)\ F\ (E_1)$	$\beta = G(T)$

B. Aggregation for a Macro Framework

i. *Lower Income Group Consumption Function*: Consumption of a lower income consumer depends on

(a) His own income.
(b) Income of all the persons in the upper income group living in his neighbourhood.
(c) Level of God-fearingness of the individuals (particularly of the upper income group) in the community.

If we want to aggregate, the aggregation of the consumption of lower income group will simply be the additions of the individual consumptions in the group. Aggregation is assumed to be a simple (unweighted) addition of the variables for all the individuals.

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* The constraints requiring the Muslims to be moderate may imply a higher level of C_U if the secular behaviour in the society is that of a niggard. This is, however, very unlikely particularly keeping in view the consumption pattern of existing societies in Muslim countries.

ii. Upper Income Group Consumption Function: Consumption of consumer in the upper income group depends on

(a) his income
(b) level of God-fearingness

Ignoring the effect of income distribution and of variation in (God- consciousness) on consumption, the form of aggregate consumption function will require simple addition of the consumptions and income of the individuals in the group. The level of God-fearingness is assumed to be the same at an average level for all individuals.

C. Dynamics of the Consumption Pattern

Dynamism in the consumption pattern of an Islamic economy rises as the people of lower income group move into the upper income group over time (or vice versa). The possibility of movement from lower to upper group arises because of the improvement in the economic condition of lower group. This will require:

a) a desire to increase income, and
b) an opportunity to attain to this desire.

The desire to increase income is strong for a Muslim consumer because he would like to spend in the way of Allah and earn a reward in the hereafter. Also, it is a Muslim's religious obligation to improve his economic condition so that he becomes a *zakah* payer rather than a *zakah* receiver.

The opportunity to increase his income arises from the consumption relief that he gets from the transfer from the upper income group. This transfer taking care of his and his family's consumption gives him the opportunity to look for a better job or to build up his capital for the expansion of his work opportunities.

The growth in income at some point in time will shift the consumer from *zakah* receiver to *zakah* payer. In aggregate terms this means that the growth in income of the lower income group will shift some proportion of the population to the upper group. We can make this shift a function of per capita consumption in the lower income group. Thus, we can write:

$$\frac{N_L}{N} = F\left\{\frac{C_L}{N_L}\right\}_{-1} \; ; \quad F < O$$

where $\frac{N_L}{N}$ = Proportion of population in the lower income group

and $\frac{C_L}{N_L}$ = Per Capita consumption in the lower income group

i.e. the proportion of the population of the lower income group will decline as the per capita consumption in the group increases.

D. Aggregate Consumption Function of an Islamic Economy

With the above, we can now describe a consumption function in the economy as below:

$$C_u = (1-\beta)\, F(E_1)$$
$$E_1 = Y_u + E_2$$
$$E_2 = F(a, Y_u)$$
$$C_L = Y_L + E_2$$
$$\frac{N_L}{N} = F\left(C_L / N_L\right)_{-1}$$
$$S = E_1 - C_u = Y_u - C_u - E_2$$
$$C = C_L + C_u$$
$$Y = Y_u + Y_L$$

III. Macro Economic Model to Trace the Savings, Growth and Income Distribution Effects of the Consumption Function Described Above

A very simple macro model with the above consumption function is described below:

1. $C_u = (1 - \beta)\{a_0 + a_1 E_1\}$
2. $E_1 = Y_u + E_2$
3. $E_2 = d_0 - d_1 S_{-1}$
4. $C_L = Y_L + E_2$
5. $C = C_L + C_u$
6. $S = E_1 - C_u = Y - E_2 - C_u$
7. $Y_L = \{(Y_L)_{-1}\} \times (1 + g_L) + \gamma E_2$
8. $\Delta Y_u = I/K$
9. $Y_u = \{(Y_u)_{-1}\} + \Delta Y_u$
10. $Y = Y_L + Y_u$
11. $I = S$
12. $M = \frac{N_L}{N} = (M_{-1}) + \gamma_1 \frac{\{C_L\}}{\{N_L\}} + \gamma_2 \frac{\{C_u\}}{\{N_u\}}$

    Where $\gamma_1 < o$ if $\frac{\{C_L\}}{\{N_L\}} > \frac{\{C_L\}}{\{N_L\}_{-1}}$

    = O otherwise

    and $\gamma_2 > o$ if $\frac{\{C_u\}}{\{N_u\}} < \frac{\{C_u\}}{\{N_u\}_{-1}}$

    = O otherwise
13. $N = (N)_{-1}(1 + gn)$
14. $N_L = M.N.$
15. $N_u = (1 - M).\, N$

These equations are explained below:

1. $C_u = (1 - \beta)\{a_0 + a_1 E_1\}$

This equation determines the consumption level of the class that does not receive *zakah*. We have already shown that the consumption function of this class can be written as

$$C_u = (1 - \beta)\, F(E_1)$$

We know that $F(E_1)$ is the consumption function that will prevail in a secular economy. A conventional form of this is

$$C = a_0 + a_1 Y$$

Where C = Consumption
Y = Disposable Income

We have E_1 instead of Y. E_1, in fact, is the disposable income of a Muslim consumer that he can spend to satisfy his material needs. Thus we can write

$$C_u = (1 - \beta)\, (a_0 + a_1 E_1)$$

2. $E_1 = Y_u - E_2$

This is an identity which says that the amount at the disposal of the upper income group consumer for his spending is the difference of his income (Y_u) and what he decides to spend in the way of Allah (E_2)

3. $E_2 = Z + Z_1 (Y_u)$

or 3. $E_2 = d_0 + d_1 S_1\, d_1\, 0.025$

This question determines the amount to be spent in the way of Allah. We have already shown that the function for E_2 can be written as

$E_2 = F(a, Y_u)$: This specifically can be written as $E_2 = Z_1 (Y_u)$ where Z_1 is a parameter that will depend on God-consciousness. We know there is a minimum of spending (i.e., *zakah*) that is obligatory upon the upper income group (though it may spend more out of its income). The level of God-consciousness will determine how much more will be spent out of its income Y_u. A more appropriate form, therefore, will be $E_2 = Z + Z_1 (Y_u)$ where both Z & Z_1 are the parameters. For the purpose of simulation, some simple manipulations are done as below:

The amount of *zakah* $Z = 0.025 (A_{-1} + S)$
Where A_{-1} = Assets in the last year
S = Savings

Also $Y_u = (Y_u)_{-1} + \Delta Y_u = (Y_u)_{-1} + \frac{1}{K} S$

Thus $E_2 = 0.025\, A_{-1} + 0.025S + Z_1\{(Y_u)_{-1} + \frac{1}{K} S\}$

$= \{0.025\, A_{-1} + Z_1\{(Y_u)_{-1}\} + \{0.025 + \frac{Z_1}{K}\} S$

Since all values in the first part are pre-determined, we can denote this as d_0. Also the values $(0.025 + \frac{Z_1}{K})$ are all parameterically given.

Therefore, we denote them as d_1.

Thus $$E_2 = d_0 + d_1 S$$

It will not be unreasonable to assume that the *zakah* and other E_2 type spending are calculated by individuals on the basis of the past year's figures of assets, savings, income etc. Therefore, we can finally write the equation for E_2 as

$$E_2 = d_0 + d_1 S_{-1}$$

All these manipulations have been done to enable the simulations to be simple and easy. These manipulations will not be necessary and only the equation ($E_2 = Z + Z_1 (Y_u)$ can be used if a complex simulation programme can be afforded or if only mathematical analysis is done as is shown in part IV.

In the equation $E_2 = d_0 + d_1 S_{-1}$ it can be easily seen that d_1 cannot be less than zero. It will be equal to 0.025. If $Z_1 = 0$ and d_1 will be greater than 0.025 the higher will be the value of Z_1 i.e., the higher is the level of God-consciousness.

4. $C_L = Y_L + E_2$

This determines the consumption level of those who are in the lower income group. Their consumption level has been assumed to be their own income (Y_L) plus transfers from the upper income group (E_2). It is assumed that all E_2 is consumed. An alternative variant of this equation could be to include only a part of E_2 as going to C_L and the rest of E_2 going to savings (building up capital stock of those who are in the lower income group). To avoid complexities in the analysis, this variant is not being considered presently but its effect can be considered later on.

5. $C = C_L + C_u$

This is an identity indicating that consumption in the economy is the sum of two classes of population in the economy.

6. $S = E_1 - C_u = Y - E_2 - C_u$

This identity indicates that savings will be done by the upper income group and that savings will simply be its income minus what it consumes or spends in the way of Allah.

7. $Y_L = \{(Y_L)_{-1} (1 + gL)\} + \gamma E_2$

This equation determines income for the population that is in the lower income group. The first part of their income i.e. $(Y_L)_{-1} (1 + gL)$ has been assumed to be increasing at some exogenous growth rate (gL). This population obviously does not have capital stock. But this population knows that to be always in the receiving class of *zakah* and charities is not encouraged in Islam and that he has to improve his economic condition. Also, he wants to earn reward by spending in the way of Allah as the upper income group are doing. So he will make efforts to increase his income.

Note that Y_L has been kept independent of Y_u In fact, in an Islamic economy, Y_u may positively affect Y_L at least for those who are employed by the upper income group. In an Islamic economy, the wage pattern will be different from that in capitalist society. The "Fair Wage" theory or an employer's patternalistic considerations will be more relevant in an Islamic economy. This dependence in Y_L and Y_u is presently ignored to keep the analysis simple.

Apart from this exogenous growth some increase in the income of this class will be contributed by the transfers from the upper income group. The transfers, even if they do not contribute to the savings of lower income group, will contribute to their efficiency. The use of *zakah* on health and education will improve their human capital and hence will contribute to their income. The second part yE_2 represents this contribution.

8. $\Delta Y_u = 1/K$
9. $Y_u = \{(Y_u)_{-1}\} + \Delta Y_u$

These two equations determine income for the upper income group. The change in the income of this population is determined by the investment that they make and the incremental capital output ratio - K (a parameter) of the economy. This assumes a fixed coefficient production function for simplicity. Any other form of the function can also be used.

The change in Y_u is thus $\Delta Y_u = 1/K$. The current year's Y_u, therefore, is simply the sum of the past year's Y_u and current year's change in Y_U.

10. $Y = Y_u + Y_L$

This identity determines national income as a sum of the incomes of the two groups of population.

11. $I = S$

The assumption of absence of borrowing (external or internal) leads to this identity between savings and investments in the economy.

12. $M = \frac{N_L}{N} = (M_{-1}) + \gamma_1 \frac{\{C_L\}}{\{N_L\}} + \gamma_2 \frac{\{C_u\}}{\{N_u\}}$

This equation determines the percentage of population that will be the lower income (*zakah* receiving) group.

In a dynamic economy where the income of both classes is increasing, where there is a mechanism for transfer of incomes and where there are motivations and opportunities to move to higher groups, the percentage of population in the two groups cannot remain constant. The percentage will be a function of population in the lower group and will decline as the consumption in this class increases for some part of this population will move in a position to pay *zakah* and, not remain in *zakah* receiving group. γ_1 (a parameter) will determine how much decline in M will be brought about by a certain increase in the per capita consumption of this class. If $\frac{\{C_L\}}{\{N_L\}}$ does not increase or rather declines then γ_1 will be zero and M will remain same as in the past year.

Also it is possible that due to decline in the income of the upper income group some part of this population may enter into the *zakah* receiving group. γ_2 (a parameter) will determine how much increase in M will be brought about by a certain decline in the per capita consumption of this class. If $\frac{\{C_u\}}{\{N_u\}}$ does not decline or increases then

M will remain same as of last year (i.e. γ_2 will be zero)

$$M = (M_{-1}) + \gamma_1 \frac{\{C_L\}}{\{N_L\}} + \gamma_2 \frac{\{C_u\}}{\{N_u\}}$$

$$\text{Where } \gamma_1 < o \text{ if } \frac{\{C_L\}}{\{N_L\}} > \frac{\{C_L\}}{\{N_L\}_{-1}}$$

$$= o \text{ otherwise}$$

$$\text{and } \gamma_2 > o \text{ if } \frac{\{C_u\}}{\{N_u\}} < \frac{\{C_u\}}{\{N_u\}_{-1}}$$

$$= o \text{ otherwise}$$

13. $N = N_{-1} (1 + gn)$

Population in the economy is assumed to grow at a constant rate (gn) per annum.

14. $N_L = M.N.$
15. $N_u = (1 - M) N$

These two equations determine the population in the two classes.

IV. Implications of Islamic Consumption Function

1. Savings - Short Term

The savings function in an Islamic economy will be of the type

$$S = F_0 + F_1 \ WY$$

where $$F_1 = \frac{1 - Z_1}{1.025 - 0.025\ a.(1 - \beta)} \{1 - (1 - \beta)a_1\}$$

The implication for savings under different situations is discussed below.

C*ase I: Zakah treated as tax so that only zakah is paid and there is no God-consciousness*

This means no other spending is made in the way of Allah and no restraints on self consumption are exercised and a Muslim behaves as a secular consumer.

This means:

$$\beta = o \quad \text{and} \quad Z_1 = o$$

$$F_1 = \frac{1}{1.025 - 0.025\ a_1} (1 - a_1)$$

For a secular consumer in a secular economy, the savings function is:

$$S = a_0 + (1 - a_1) WY$$

Since the denominator in F_1 is greater than unity because a_1 is less than unity, hence

$$F_1 < 1 - a_1$$

Thus the propensity to save is reduced with *zakah* in this case.

The difference, however, will be very low at high levels of propensities to consume and will be marginally higher at lower propensities to consume. In an economy that has a marginal propensity to consume equal to 0.80 (a reasonable figure for a developing country) the introduction of *zakah* as a tax will reduce marginal propensity to save by 0.5 percent i.e. instead of 0.20 it would be 0.199 (see Table below).

TABLE I
Effects of Introduction of *zakah* as a Tax on Short-Run Savings at Different Levels of Marginal Propensity to Consume

Marginal Propensity to consume before introduction of zakah (a_1)	*Value of F_1(Marginal Propensity to save after zakah)*	*Value of $(1 - a_1)$ Marginal Propensity to save without zakah*	*F_1 as % of $(1 - a_1)$*	*Percentage Decline in Marginal Propensity to save as a result of zakah*
1.00	0.000	0.00	0.00	0.0
0.90	0.1998	0.10	99.8	0.2
0.80	0.1990	0.20	99.5	0.5
0.70	0.2977	0.30	99.2	0.8
0.60	0.3960	0.40	99.0	1.0
0.50	0.4938	0.50	98.8	1.2
0.40	0.591	0.60	98.5	1.5
0.30	0.688	0.70	98.3	1.7
0.20	0.784	0.80	98.0	2.0
0.10	0.8802	0.90	97.8	2.2
0.00	0.9756	0.00	97.0	2.5

The maximum effect will be a 2.5 percent decline when the marginal propensity do consume is zero.

This simply means that whatever they save from their additional income will be reduced by the amount of *zakah* at the rate of 2.5 percent. If they were saving all of their additional income, then this saving will be reduced by 2.5 percent and if they were saving only 20 percent then this will be reduced by 0.5% of 20 percent by *zakah*.

Case II. *Muslims understand the importance of spending in the way of Allah but their own consumption patterns are the same as of secular consumers*

This means $\beta = 0$ but Z_1 is positive*. In this case

$$F_1 = \frac{1 - Z_1}{1.025 - 0.025\, a_1 (1 - \beta)} \{1 - a_1\}$$

F_1 in this case is less than that in case I. That is savings in the short run are further reduced. The reduction will be more, the higher is the value of Z_1.

* Note that Z is spending in the way of Allah beyond *zakah*. This is the proportion of annual income that is spent by a God- fearing person in the way of Allah in addition to spending 2½ percent *zakah* from his wealth.

Case III. *Muslims are not inclined to spend in the way of Allah more than the minimum required. They, however, rationalize their own consumption pattern as taught by the Qur'an and Sunnah*

This means Z_1 is zero but β is positive. In this case Marginal Propensity to save, MPS = F_1W

where $$F_1 = \frac{1-(1-\beta)a_1}{1.025-0.025a_1(1-\beta)}$$

Let us compare this with the secular marginal propensity to save

$$MPS = (1 - a_1)\ W$$

W is common in both so we compare F_1 and $(1 - a_1)$

The numerator of F_1 is greater than $(1 - a_1)$. The numerator of F_1 is, however, reduced by the denominator being larger than unity. Whether $\frac{1-(1-\beta)a_1}{1.025-0.025a_1(1-\beta)}$ is greater than $(1 - a_1)$ will depend on the values of β and a_1.

The restraint on self consumption reduced the overall consumption by a certain factor. But reduced consumption means more *zakah*. The net effect is shown in the following table. The table shows MPS* (i.e., MPS of an economy that has some positive values of B). The values of MPS* have been shown for different values of β at two alternative levels of MPS (which is the propensity to save in the absence of Islamic injunctions). The two alternative values have been assumed to be 0.20 and 0.10 which is a range generally observed for the present Muslim countries.

TABLE II

Values of MPS* for Different Values of b **When Z1 = 0**

b	*When MPS=0.20 i.e. when a_1 =0.80*	*When MPS =0.10 i.e. when a_1 =0.90*
0.01	0.209	0.100
0.02	0.217	0.118
0.05	0.241	0.150
0.10	0.282	0.191
0.20	0.363	0.282
0.30	0.445	0.373
0.40	0.527	0.465
0.50	0.609	0.558

The MPS* will be higher than MPS for higher values of β.

Cases II and III are also unlikely in an Islamic economy. Both β and Z_1 depend on the level of God- fearingness. It is very unlikely that one of them is zero and the other positive.

In comparing case III with case II, we find that one parameter of an Islamic economy (Z_1) will have a negative effect on saving propensity whereas the other parameter (β) will have a positive effect. Their combined effect is considered in case IV.

Case IV. *Muslims not only spend in the way of Allah but also rationalize their own consumption as taught by the Qur'an and Sunnah - A likely reflection of an Islamic economy*

In this case: Marginal Propensity to save is MPS* = F_1 W

$$F_1 = \frac{1 - Z_1}{1.025 - 0.025\ a_1(1-\beta)}\{1 - (1-\beta)a_1\}$$

Let us compare this with secular marginal propensity to save, MPS = $(1 - a_1)$ W

MPS* (i.e., marginal propensity to save of an Islamic economy) will be greater than MPS if

$$F_1 = \frac{1 - Z_1\{1-(1-\beta)a_1\}}{1.025 - 0.025a_1(1-\beta)} > (1 - a_1)$$

MPS* has two components

i) $1 - (1 - \beta)\ a_1$

ii) $\dfrac{1 - Z_1}{1.025 - 0.025\ a_1(1-\beta)}$

It is obvious that the first component is greater than $(1 - a_1)$ as $0 < P < 1$. But the second part is clearly less than unity because $Z_1 > 0$ and

$$\{\ 1.025 - 0.025\ a_1\ (1 - B)\}\ > 1 \text{ as } a_1, \beta > 0 \text{ and } < 1$$

The outcome, whether MPS* will be greater than MPS, will therefore, depend on the empirical values of Z_1 and β (which in turn will depend on the level of God-fearingness in the society).

Let us assume $Z_1 = 0.025$. It should be remembered that this is a proportion of his annual income that a God-fearing man will spend in the way of Allah, in addition to 2½ percent *zakah* that he is obliged to pay on his wealth. Also let us assume MPS in the economy before Islamization to be 0.20 (i.e., $a_1 = 0.80$). Now, assuming different hypothetical values for β that may be observed after Islamization, the impact on the marginal propensity to save is shown in the following table:

TABLE III

Values of MPS* for Different Values of b **when Z = 0.025**

β	*MPS**	*MPS* - MPS*
0.000	0.194	- 0.006
0.005	0.198	- 0.002
0.008	0.200	0.000
0.01	0.202	+ 0.002
0.02	0.209	+ 0.009
0.05	0.233	+ 0.033

It can be seen that when $\beta = 0$ (which is same as case II discussed earlier), there will be an immediate negative effect on the marginal propensity to save. But a very small value of β would make the marginal propensity to save higher even in the short run. This means that if people are willing to slightly change their life style to reduce what Islam calls *Israf* (prodigality), *zakah* cannot have a negative effect on the (macro) marginal propensity to save in the economy. As is evident from the table, even as low a β as 0.008 would not allow any negative effect on the propensity to save. A β value equal to 0.008 would mean that if a person was having propensity to consume 0.80 when operating in an Un- Islamic environment, the Islamic environment and Islamic values would cause him to reduce this to at least 0.794 which is not an unreasonable assumption. The injunction to avoid prodigality can have a much stronger effect on consumption particularly in the modern environment of developing countries where consumption patterns are substantially dominated by conspicuous consumption. The higher the value of β, the more the positive effect on the propensity to save.

If Z_1 value is greater than 0.025 (i.e., people like to spend more in the way of Allah), a higher value of β will be required to avoid the negative effect on the propensity to save. Since both Z_1 and β depend on the level of God-fearingness, β is expected to move with Z_1, hence reducing the negative impact on the propensity to save.

Thus, in an Islamic society, the marginal propensity to save is likely to increase even in the short run.

Long Run Savings

This part can be written only after simulations for future can be made by assigning different values to the parameter to see the growth path of savings. Since transfers from upper income groups contribute to the income growth of the lower class, savings will ultimately be higher in all the four scenarios compared to the scenario of a secular economy.

Growth and Income Distribution Effects

This part also can be written only after simulations are done.

Theoretically, it is easy to visualize within the framework of the above model that growth and income distribution implications of Islamic consumption pattern will be favourable i.e., growth will be higher and income distribution will be more egalitarian.

V. Conclusions and Policy Recommendations

Comparison of savings, growth and income distribution effects by simulating the model under different scenarios can highlight various implications and trade - offs. The following general conclusions can be drawn on the basis of the above analysis even without running the simulations.

For developing Muslim countries striving for resource mobilization for development, Islamization provides a new hope for the economy. The motivation to consume less and save more to improve one's own economic conditions as well as economic conditions of the lesser privileged in the community comes from one's

conscience i.e., from one's religion. It cannot be denied that all policies of development and resource mobilization of developing countries fail because they lack motivation on the part of the individuals and because their policies are hardly in harmony with the social and religious norms of the individuals. Muslim countries, thus, have nothing to fear from the process of Islamization on macro- economic front.

The process of Islamization that would bring favourable results as indicated in the earlier sections assumes that Muslims practice Islamic values. The process of Islamization, therefore, should aim at inculcating Islamic values in the life of Muslims. Improving Islamic economic injunctions through legislation, though, may still be beneficial in the long run. It can be shown from the simulation model that if we impose *zakah* through legislation without inculcating Islamic values (particularly economic values), there is a likelihood of immediate adverse effect on savings. The speed of achieving favourable effect on growth and income distribution in the long-run will be extremely slow compared to the situation where people understand and practice Islamic economic values. Priorities in the Islamization of economy should be on bringing about Islamic values in the society through mass education using mass media as well as educational institutions.

Comparison of cases I to IV discussed earlier suggest that if the government wants to implement the *zakah* system by legislation it should simultaneously launch an educational and moral suasion programme to reduce *israf* (prodigality) in consumption. Reforms in Import policies and the tax structure can help in achieving this objective. In short, the starting point for any government should be the one suggested by case III i.e. impose *zakah* at the rate of 2.5 percent along with policies to reduce *israf* in consumption both in the public and private sectors.

Appendix

$C_u = (1 - \beta)\, a_0 + (1 - \beta)\, a_1 E_1$
$= (1 - \beta)\, a_0 + (1 - \beta)\, a_1 (Y_u - E_2)$
$C_u + E_2 = (1 - \beta)\, a_0 + (1 - \beta)\, a_1 Y_u - (1 - \beta)\, a_1 E_2$
$= (1 - \beta)\, a_0 + (1 - \beta)\, a_1 Y_u - \{1 - (1 - \beta)\, a_1\} E_2$
$= (1 - \beta)\, a_0 + (1 - \beta)\, a_1 Y_u - \{1 - (1 - \beta)\, a_1\} \{Z + Z_1 Y_u\}$
$= (1 - \beta)\, a_0 + (1 - \beta)\, a_1 Y_u + Z + Z_1 Y_u - (1 - \beta)\, a_1 Z - \{(1 - \beta)\, a_1\} Z_1 Y_u$

Let $(1 - \beta) = A$; $(1 - \beta)(1 - Z_1) = B$

$C_u + E_2 = (A\, a_0 + (B\, a_1 + Z_1) Y_u + (1 - A\, a_1) Z$
$= A\, a_0 + (B\, a_1 + Z_1) Y_u + 0.025 (1 - A\, a_1) A_{-1} + 0.025 (1 - A\, a_1) S$
Since $Z = 0.025 (A_{-1} + S)$

$S = Y_u - C_u - E_2 = A\, a_0 + \{1 - (Ba_1 + Z_1)\} Y_u - 0.025 (1 - Aa_1) A_{-1} - 0.025 (1 - Aa_1) S$
$\{1 + 0.025 (1 - A\, a_1)\} S = - \{A\, a_0 + 0.025 (1 - Aa_1) A_{-1}\} + \{1 + (Ba_1 + Z_1)\} Y_u$

Let $1.025 - 0.025\, a_1 A = E$ and $- \{A\, a_0 + 0.025 (1 - Aa_1) A_{-1}\} = F$

$ES = F + \{1 - (Ba_1 + Z_1)\} Y_u$

or $= \dfrac{F}{E} + \dfrac{\{1 - (Ba_1 + Z_1)\} Yu}{E}$

Let $\dfrac{F}{E} = F_0$; $F_1 = \{1 - (Ba_1 + Z_1)\} / E$

and Let $\dfrac{Y_u}{Y}$ = Wi.e. share of upper income group in the national income

$S = F_0 + F_1 WY$

This is savings function for an Islamic economy.
Savings function for a secular economy in similar conditions will be:

$S^* = Y_u - C_u = Y_u - a_0 - a_1 Y_u$
$= - a_0 + (1 - a_1) Y_u$
$= - a_0 + (1 - a_1) WY$

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