

AN APPROACH TO INVESTMENT DECISION: TOWARDS AN ISLAMIC ANALYSIS

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Abstract

The controversy among Islamic economists concerning investment decision criteria for the project evaluation principally centres around the issue of discounting factor. This closely associates with the interest that Islam prohibits. Various papers have been published, either due to publication in journals or seminars and symposia, providing sophisticated analysis for seeking any solution to the problem. Unfortunately, this issue has remained unsettled, rather seemingly become more complicated.

This paper attempts to analyze the issue from the fundamental ideas of criteria determination. Generally speaking, a project is undertaken after the evaluation of its feasibility. Neoclassical economics has developed the standard of valuation from the point of view of profitability. This lies on the concept of inter-temporal choices and therefore time preference consumption on the one hand, with Fisherian approach that makes the indifference curves interplay with its constraint, production possibility, and individuals income. This process is simultaneously determined by the rate of interest. The problem is of dealing with this established concept by eliminating its fundamental instrument, interest rate. Keynesian analysis comes up in the discussion to consider an extension to such an approach in dealing with macro concept of investment decision criteria. However the road towards superiority of Islam is not supposed to be merely in its ethical precept, but also theoretically and empirically verified. This effort with its limitations provides the answer.

Keywords : *The Theory of Interest, Riba, Marginal Rate of Transformation, The Circular Flow*

INTRODUCTION

Investment decision is one of the significant stages of project cycle, determining whether or not a project shall be undertaken, after evaluation of its feasibility study. The Theory of Investment decision at the beginning, as widely known, is addressed to have been satisfactorily developed in the great

work of Irving Fisher in 1930s, *The Theory of Interest*.¹ It has obtained a wider attention through a number of prominent writings by Galenson

¹ See J. Hishliefer, "Investment Decision Under Uncertainty: Choice-Theoretic Approaches", *Quarterly Journal of Economics*, vol. LXXIX, No.4, 1965, p. 509.

and Leibenstein, Hishliefer, Arrow, and so on. Islamic perspective of such an issue has not widely and satisfactorily been discussed. Naqvi² and Zarqa³ are among the first proponents of the issue,

followed by Choudhury,⁴ Azhar, and Fahim Khan.⁵

"Interest", that is associated to the concepts of "time value of money"; "time preference"; and "discounting system", on which the most criteria of project selection have been developed⁶ is, in fact, the core subject of the discussion. The main reason why the problem arises is that Islam prohibits interest, since interest is considered an institution of exploitation. As unanimously believed it is the only translation of the Arabic (Islamic) term *riba*.⁷

² The Writings of Syed Nawab Heidar Naqvi, particularly on the issue of time preference, have appeared, in conjunction with abolition of interest and its Islamic alternative, in various articles. One of them is "Interest Rate and Intertemporal Allocative Efficiency in an Islamic Economy" in Mohammad Ariff, *Monetary and Fiscal Economics of Islam*, (Jeddah: International Centre for Research in Islamic Economics, KAAU, 1403/1982), pp. 75-95. It is also supplemented by comments and discussion in p. 96-106.

³ Muhammad Anas Zarqa, "An Islamic Perspective on the Economics of Discounting in Project Evaluation", in Ziauddin Ahmed et al., *Fiscal Policy and Resource Allocation in Islam*, (Jeddah: International Centre for Research in Islamic Economics, KAAU University, and Islamabad: Institute of Policy Studies, 1983), p. 203-244. This proceeding paper was followed by comments and discussion in response to Zubair Hasan's presentation during the Seminar on "Monetary and Fiscal Economics of Islam". See, p.ix-x and 235-251

⁴ Masudul Alam Choudhry, "The Rate of Capitalisation in Valuation Models in an Islamic Economics", including its comments and discussion in Ziauddin Ahmed et al. p. 287-313.

⁵ Muhammad Fahim Khan prepared one chapter concerning this issue in his new book, *Essays in Islamic Economics*, (Leicester: The Islamic Foundation, 1995), p. 159-169. In this chapter he mentions two other names, al-Masri and Azhar, as other proponents of this issue.

⁶ Analysis from the standpoint of the firm is introduced by Development Centre of the Organisation for Economic Co-operation and Development (OECD), *Manual of Industrial Project Analysis in Developing Countries: Methodology and Case Studies*, (Paris, 1972), p. 105-149. While from the government point of view can be seen in the UNIDO, *Manual for Evaluation of Industrial Projects* (New York, 1980), p. 37-139.

⁷ For the discussion on the *riba*, see M. Umer Chapra, *Towards a Just*

Here is what the paper is going to emphasize in the present discussion.

The paper, after its literature review of Islamic economics on this field, begins its pages to discuss microeconomic foundation particularly on time preference and discounting concept, extended to a macro perspective concentrating on intertemporal choices and production/income possibilities; and prevailing criteria of investment decision. Neoclassical division and reconciliation on micro and macro theories are of great importance, and thus be emphasized hereby. From the Islamic viewpoint the paper provides, the alternatives of profit rate and possible criteria may appear in the discussion.

It comes to the conclusion that despite the similarities, Islamic and conventional economics of investment decision have different concepts, by which an Islamic economist is faced with an uneasy *ummatic* problem, and challenged to provide any solution. The controversy in Islamic economics on this issue has appeared first in 1978 in the centre of Islamic activities, Makkah as outlined below. It is however evident from this effort, although in a very simple analysis with its limitations, that interest-free Islamic financing

system is capable of providing the solution to such a problem.

REVIEW OF ISLAMIC ECONOMIC LITERATURE

It is interesting to involve in, or at least to learn from, such a controversy among Islamic economists, which is seemingly still far from real conclusion. The debate is basically rooted in the abolition of interest and its alternative for productive purposes, profit-loss sharing (PLS) system.

In the earlier discussion, in Makkah Seminar on "Monetary and Fiscal Economics of Islam", 1978, Naqvi⁸ discussed the "Interest Rate and the Inter-Temporal Allocative Efficiency". In his debate-provoking proposition, he introduced the "superiority" of interest over PLS system, which places the PLS system as only the "second best" after one based on interest.⁹

He is actually in agreement that *riba* must be abolished, as what the Qur'an says.¹⁰ But it does not necessarily imply abolition of interest, in the absence of "successful" alternative.¹¹ This

⁸ SNH Naqvi, *Op.cit.*

⁹ This term is explicitly stated in his *Ethics and Economics: An Islamic Synthesis*, (Leicester, UK: The Islamic Foundation, 1981/1401), p. 15 (foreword by Khurshid Ahmad) and p. 97-141 (chp. 6-8).

¹⁰ *Ibid.*, p. 109.

¹¹ *Ibid.*, p. 114.

Monetary System, (London: The Islamic Foundation, 1416/1995), p. 55-66.

position accordingly affects the whole construe of his analysis in, or rather in his all writings, on related issues, such as the "legitimate positive time preference; zero interest rate that implies zero gross saving; undesirability of Islamic PLS system, etc. The comments by al-Jarhi and Anas Zarqa and discussion following his paper seems to acrimoniously attack against his view.

The more zarqa's "complete answer" appears in the next seminar on the same issues in Islamabad.¹² After introducing some secular economists' view, he comes to the conclusion that positive interest rate is nothing more than one of three alternatives of inter-temporal choices. However, he also views that discounting is permissible in Islam and suggests the rate of return on investment to be the discount rate, from the viewpoint of stochastic productivity.

Again, the rationale behind the latter is said to be remains somewhat blurred and open to critics.¹³ On other occasion, Azhar¹⁴ also discusses the Fisherian equilibrium as well as Naqvi and Zarqa. He differs from two previous writers in the logical conclusion that interest rate must be completely replaced by the rate of profit.

The failure of those economists in drawing the conclusion, following Fahim Khan,¹⁵ is in the assumption underlying their analysis. The conventional assumptions of perfect foresight and lack of uncertainty are carried out. To him, the conclusions drawn from those analysis are thus lose Islamic perspective.

Khan's effort to seek the solution considers the concept of time value of money. He is of the opinion that the discount rate is tolerable in Islam, provided there is no predetermined factor to the rate as the interest.

INTEREST AND DISCOUNTING ISSUES

"Interest" as a price¹⁶ paid by the borrower for the right to use an amount of money over a given period, is a percentage premium that he pays in exchange a future claim denominated in the unit of account for a present claim also denominated in the unit of

¹⁵ Muhammad Fahim Khan, *Ibid*, p. 160.

¹⁶ The equality of interest to price is widely known in economics. However, the remark of the paper on it refers to Rauf Azhar, "A Theory of Optimal Investment Decision in an Islamic Economy", in Ausaf Ahmad and Kazim Raza Awan, *Lectures in Islamic Economics*, (Jeddah: Islamic Research and Training Institute, Islamic Development Bank, 1412/1992), p. 217.

¹² See note 3.

¹³ See Rauf Ahmed Azhar, *Ibid*, p. 217.

¹⁴ *Ibid*, p. 217-240.

account.¹⁷ Interest seems to have played an important role in an economy. Its rate determines the rate of investment relative to the gross national income and thereby the rate of economic growth. The lower interest rate, the higher level of investment and therefore the rate of economic growth. As a matter of fact, the investible resources of the projects are also influenced by the rate of interest.

In conjunction with investment criteria, interest is closely related to discounting value and time preference concepts, which in fact have become the basis of evaluation. The discount rate reflects people's preference for present consumption rather than future,¹⁸ although the difference is conceptually only one week.¹⁹ Furthermore, determination of social discount rate, it is argued, must be laid down on the basis of interest and associated with the positive time preference.²⁰

The decision of undertaking projects is not a simple matter, as it involves some commitment about the use of resources and of promises of returns with respect to the function of time, present and future as well.

FISHERIAN-MICRO FOUNDATION

In order to account for benefits and costs of a project, that will occur over time, as commonly discussed, it is necessary to take into account time dimension. Consider a project with a constant rate over n years, the rule is formulated that the project is worthwhile if the benefits are greater than costs.

$$B_0 + B_1 + \dots + B_n > C_0 + C_1 + \dots + C_n \quad \text{or} \\ \sum_{t=0}^n B_t > \sum_{t=0}^n C_t, \quad t = 0, 1, 2, \dots, n \quad (1)$$

Having Considered the time dimension, by which the discounting factor plays the role in differentiating future from current preferences, and by assuming a positive time preference occurs in the evaluation, the formulation becomes:

$$\sum_{t=0}^n \frac{B_t}{(1+\delta)^t} > \sum_{t=0}^n \frac{C_t}{(1+\delta)^t}, \quad t=1, 2, 3, \dots, n \quad (2)$$

where, δ is the rate of discount, and t the year of reference.

With the assumption of a positive interest rate existing in the economy, it is not legitimate to engage in the straight forwards

¹⁷ This definition is introduced by Fiona C. MacLachlan, *Keynes General Theory of Interest: A Reconsideration*. (London and New York: Routledge, 1993), p. 28.

¹⁸ Heng-Kang Sang *Ibid*, p. 34-35.

¹⁹ As an example given by Don Patinkin, *Money, Interest and Prices: In integration of Monetary and Value Theory*, 2nd ed. (New York: Harper & Row Publishers, 1965), p. 60-64.

²⁰ The UNIDO, *Ibid*, provides three systematical steps for such determination in p. 111-114.

summation as in equation (1), which implies that the society is indifference to "time preference" in treating their income. But, in the absence of interest rate, will the individuals in the society, in general, still have positive time preference?. Will they prefer now to later?

It is clearly argued, in secular economy, that regardless of the existence of the interest rate the behaviour of the people indicates as such. People prefer to take benefits now than that of later, they simply be impatient.²¹ Elaborating Rae's and Bohm-Bawerk's introductions to time preference analysis, Fisher completed the model by expressing the interplay of time preference and production possibilities, and their relationship with income in terms of general equilibrium framework.²² See Figure 1. There are two basic foundations of neoclassical theory, that are accused of being the originating causes of the existence of interest rate, and on which discounting factor lies. *First*, time preference that defines the objectives of individuals inter-temporal preferences. *Second*, production function which defines the

constraint, transformation possibilities.

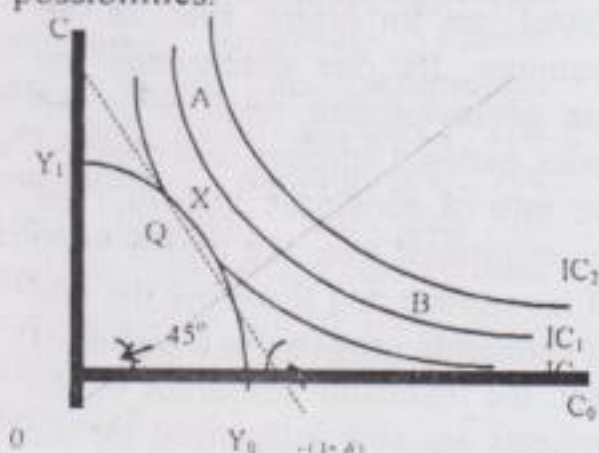


FIGURE 1:
Time Preference and Transformation
Possibilities

Let the paper takes a two-period case as usual in neoclassical analysis, indifference curves represent present and future consumption, C_0 and C_1 respectively. Here, the assumptions of perfect foresight; maximizing behaviour of both individuals and firms; free of government interference and externalities; and lack of uncertainty may also underlie this analysis. The slope, reflecting the marginal rate of time preference (MRTP), measures the rate of time preference, which is influenced by two factors. *First*, Available amounts of present and future consumption. If expected future income is higher than current income, as at point A, the individual will tend to give up a larger amount of C_0 , than that of at the point B. The 45° line illustrates the equality amount of present and future consumption. Along the line, the individual still gives up more than one unit of C_1 for an additional

²¹ See, *Loc.cit.*

²² Fisher's view can be seen in various publications, one of which is by Jurg Niehans, "Irving Fisher", *A History of Economic Theory: Classic Contributions, 1720-1980*, (Baltimore and London: John Hopkins University Press, 1990), p. 267-279.

unit of C_0 , as indicated by the asymmetrical indifference curves.

The *second* factor is income. If the present individual's income to be entirely spent for C_0 , the situation is represented by point Y_0 , he does not save his income for the future. Y_1 , on the other hand, represents another extreme for saving all income and not to consume today. The law of diminishing returns in this context tends to make the curve, which stands for the transformation possibilities, concave.

The equilibrium condition leads to the point at which production frontier is tangent to the, say initial, indifference curve, IC_0 . The slope of this point then, as commonly treated, being the rate of interest, represents the *marginal rate of transformation* (MRT).

It is thought that intertemporal efficiency conditions are stipulated in a general equilibrium, which are simultaneously determined by all agents. It is also to note here that individuals consumption-investment decisions can be undertaken, provided the available information of interest rate. On the other hand, it is sometimes hardly understood, interest rate is known after the aggregate consumption-investment have been made by occupying market mechanism of loanable funds. The Walrasian *auctioneer* is hence used to determine the interest rate. Therefore the individuals, as in

Figure 1, decide to produce Q and to consume X amounts of goods, and the difference between them is considered to be invested (saved). In this situation, MRT is equal to $MRTP^{23}$. In order to satisfy the Pareto Optimality in general equilibrium, the aggregate lending must equal the aggregate borrowing. Thus, the equality of MRT and $MRTP$ to all individuals of which interest rate takes place is also attained.

KEYNESIAN-MACRO EXTENSION

The criticism addressed to the above model has in particular stemmed from its assumption of perfect foresight by which each individual, and obviously also each firm, either: knows all future prices, including interest rate, obtaining in the economy; or knows all individuals' preference orderings and firms production possibilities frontier. Temptation of relaxing this assumption, following Dougherty,²⁴ takes into three different forms, two of which are less relevant to take parts in this study that are: *contingency markets* that assumption of a finite number of alternative events in the future disturbs the perfect foresight one;

²³ Compared to William H. Branson, *Macroeconomic Theory and Policy*, 3rd edition (Singapore: Harper and Row, Publisher, 1989), p. 288.

²⁴ See Christopher Dougherty, *Interest and Profit*, (London: Methuen & Co. Ltd, 1980), p. 100-104.

and *temporary equilibrium*, establishing a current and future markets, abandons that individuals and firms co-ordinate their plans for the future at a single moment in time. These two first, in fact, have been attempts to extend and modify the framework of general equilibrium by themselves.

The third form that is *the circular flow* approach being more relevant hereby is said to simply assert that perfect foresight assumption is convenient for expounding Fisherian theory but misleading impression in practice concerning both the information required and its collection difficulty. A Schumpeterian circular flow that characterizes the economy acts as a computing machine with a built-in flywheel. Its current structure, particularly prices, enduring habits and existing long-term contracts and commitments, that provide a good approximation to its future structure.²⁵ Therefore, future prediction incorporates forecasting of marginal changes provided by such information of which the accuracy for looking ahead is questionable. Uncertainty is of the plausible aspect that may appear in the economy. Keynes' version of secular flow admits the importance of uncertainty that leads to violating the fulfilment of expectation, but suppose that the long run model may be unbiased.

Fluctuations may obscure the Fisherian trend. Once such a trend is argued to be irrelevant in the short run, which is typically regarded as the province of Keynesian analysis, it will thus consequently be irrelevant in the long run as well, since the long run is a succession of short runs, as neoclassical believes. However, Keynes also suggests that, despite admitting that uncertainty is important factor, individuals act as if it were not. Therefore, to some extent, fluctuations are also argued to neatly reconcile Keynes' and Fisher's theories.

With the support of Ando-Modigliani's life cycle hypothesis and Friedman's permanent income hypothesis, Keynes' consumption function could explicitly be viewed as an extension of the Fisherian model.²⁶ The function may be illustrated in a simple two-period case as in Figure 2.

Suppose A' represents the behaviour of an individual with two years income streams, Y_0 and Y_1 , and B' stands for the optimal consumption stream, combining C_0 and C_1 . The slope $P'Q'$, occupying Fisher's terminology,²⁷ describes a "market line" where the optimum points can be attained, having slope $-(1-i)$, and i is the market interest rate.

²⁵ *Loc.cit.*

²⁶ See, *Ibid.*, p. 110.

²⁷ *Ibid.*, p. 27.

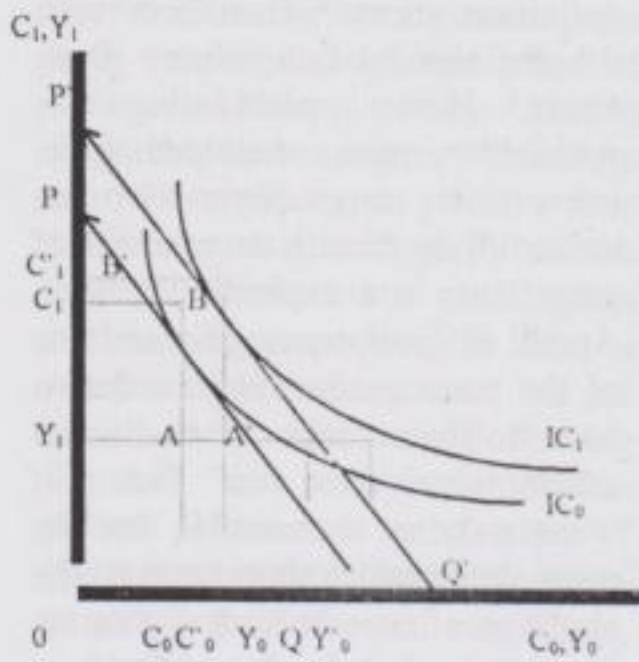


Figure 2:
The Link between Keynes' and Fisherian
Model

Consider that his income in the year 0 increases to Y'_0 , and thus the new income stream, (Y'_0, Y'_1) reaches the point A' at the new market line $P'Q'$, with the new optimal consumption stream C'_0, C'_1 when it is tangent to the indifference curve I_1 . As usually considered, if the indifference curves do not alter in the relevant range, the link of changes in income and consumption in the year 0 and year 1 may be written as:

$$(C'_0 - C_0) = b_0(Y'_0 - Y_0)$$

$$C'_0 = (C_0 - b_0 Y_0) + b_0 Y'_0 \quad (3)$$

Reformulating $(C_0 - b_0 Y_0)$ as a , one gets:

$$C'_0 = a + b_0 Y'_0 \quad (4)$$

showing Keynes' consumption function, where: a is intercept; and b_0 is the slope, representing a coefficient in which the relevant Fisherian factors being

encapsulated.²⁸ The Fisherian theory determines the optimal consumption stream that may change due to the changes in income, as drawn by Keynes.

The investment link between their theories, as confessed by Keynes himself, is strongly attributable to the equality of Keynes' *marginal efficiency of capital* (MEC) and Fisher's *rate of return over cost*, despite the fact that the latter is considered a more general concept. Keynes said:

Although he does not call it the "marginal efficiency of capital," Professor Irving Fisher has given in his Theory of Interest (1930) a definition of what he calls "the rate of return over cost" which is identical with my definition.

"The rate of return over cost," he writes, "is that rate which, employed in computing the present worth of all costs and present worth of all returns, will make these two equal." ... "the rate of return over cost must exceed the rate of interest." ... Thus Professor Fisher uses his "the rate of return over cost" in the same sense and precisely the same purpose as I employ "the marginal efficiency of capital."²⁹

²⁸ *Ibid*, P. 111.

²⁹ See J.M. Keynes, "The General Theory of Employment Interest and Money", in Mortimer J. Adler (ed. In

This notion of investment will largely be accommodated in the section "Further Analysis on Marginal Efficiency of Investment" later.

TOWARDS ISLAMIC CONSIDERATION

Equilibration of investment to saving is a part, and even, resulting proposition of Keynes' extension to Fisherian model. In this process, therefore, introducing the notions of Islamic teaching, especially the notion of interest prohibition is of great importance. In relation to that, let the paper, before pursuing the discussion, quotes the notion of *riba*.

It is stated in the Qur'an that "*riba* is prohibited." Different emphases of four (group of) verses concerning it were revealed from the period of Makkah to Madinah in order of the level of acceptance of the Prophet's companions to Islam. It is literally means increase; addition; expansion; or growth, however technically does not include all types of such meanings, but "refers to the 'premium' that must be paid by the borrower to the lender along with the principal as a condition for the loan or for the extension in its maturity."³⁰ This

chief), *Great Books of the Western World*, vol. 57, (Chicago: Encyclopaedia Britannica Inc), p. 330.
³⁰ Muhammad Umar Chapara 'Towards a Just Monetary System, (Leicester: The Islamic Foundation, 1985/1405 H) is considered one of the

definition seems to conform with the definition of "interest" given above. Hasan³¹ elaborating this prohibition opines that lending on interest in any form is thus unlawful, as there is an element of uncertainty and exploitation, or in Arabic original term, *gharar*. One of the consequence may be drawn here that the traditional assumptions that is lack of uncertainty is reasonable. But the most important thing is that the abolition of interest from an Islamic economy, being imperative, is among the paper's assumption.

On the other hand, Islam does encourage people to save for a plan of their future³² and avoid extravagance,³³ meaning that the consumption level is decreasing to increase the saving. Therefore, as the paper observes, Muslims behaviour does not necessarily follow the Western's attitude towards consumption, which may lead to nearly always positive time preference. However, Zarqa

distinguished Islamic economic work consisting this notion. See chapter 2, p. 55-66 and Appendix I, p. 235-246.

³¹ See, for instance, Zubair Hasan's "Distributional Equity *Ibid*, p. 46-47.

³² The verse of al-Hashr(59): 3, "... and let every soul looks to what (provision) he has senth forth for the morrow...". Saving is postponed consumption for preparation of future needs. Hence, it is considered a part of the purpose of this verse, although the verse's ultimate objective is the life in the Hereafter.

³³ Al-Isra' (17): 27.

provides a sufficient argument from both secular and Islamic point of views, and is supported by Azhar in their respective papers. Therefore an over-emphases on positive time preference as the majority of the textbook treatments is meaningless in Islamic perspective. In fact, a number of Western economists are of such opinion. Following Pigou,³⁴ "that everybody prefers present pleasures or satisfactions of given magnitude to future pleasures or satisfaction of equal magnitude, ... implies only that our telescopic faculty is defective."

slope which represents the equality of MRT, MRTP and interest rate.

Consider the expression of the slope is $\Delta Y_1/\Delta Y_0 = \Delta C_1/\Delta C_0$. It also represents $MRT = MRTP$ that are defined as:

$$MRT = \frac{\Delta Y_1 - \Delta Y_0}{\Delta Y_0} = \frac{\Delta Y_1}{\Delta Y_0} - 1 \quad (5)$$

$$\text{If } \frac{\Delta Y_1}{\Delta Y_0} > 1, \quad MRT > 0$$

$$\text{If } \frac{\Delta Y_1}{\Delta Y_0} < 1, \quad MRT < 0$$

$$\text{If } \frac{\Delta Y_1}{\Delta Y_0} = 1, \quad MRT = 0$$

On the other hand,

$$MRTP = \frac{\Delta C_1 - \Delta C_0}{\Delta C_0} = \frac{\Delta C_1}{\Delta C_0} - 1 \quad (6)$$

$$\text{If } \frac{\Delta C_1}{\Delta C_0} > 1, \quad MRTP > 0$$

$$\text{If } \frac{\Delta C_1}{\Delta C_0} < 1, \quad MRTP < 0$$

$$\text{If } \frac{\Delta C_1}{\Delta C_0} = 1, \quad MRTP = 0$$

It is seen that MRTP and MRT as well can either be positive, negative or zero depending on decision of individuals concerning their saving (investment). Moving along the $-(1 + \delta)$ slope, shown by combination of changes in points corresponding indifference curves and production possibilities frontiers, the amount of

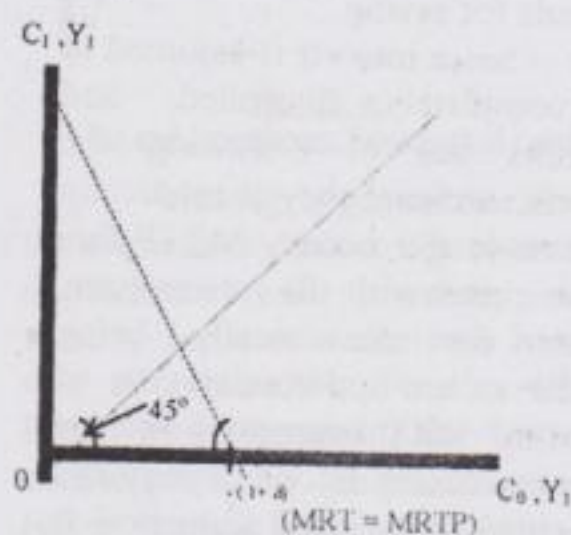


FIGURE 3:
Intertemporal Saving-Investment

Nevertheless, in line with those verses, time preference concept will be meaningful, if, following Azhar,³⁵ it is reformulated in terms of saving-investment relationship rather than consumption. For facilitating this feature, as preceded by Keynes. Let Figure 1. be modified to get the

³⁴ See, Dougherty, *Ibid*, p. 23-24.

³⁵ Rauf A. Azhar, *Ibid*, p. 232

consumption, and therefore saving, with a given level of income and interest rate, can be determined.

After certain level of income for the use of fulfilling basic needs, that is of five necessities: faith (*al-din*); life (*al-nafs*); property (*al-mal*); intellect (*al-'aql*); and posterity (*al-nasl*),³⁶ Muslims are to expend their income less on consumption, thus in general terms, more on saving. The purpose of saving may partly be to maximize their future benefits; and partly for "final spending"³⁷ including *zakah* of which is used for production purposes as the majority's view, despite disagreement of its uses. It is unfortunate that this paper is not entertained to pursue the discussion on these issues, due to its limitations. However, returning to saving, consideration to such issues

³⁶ These necessities are widely discussed in Islamic jurisprudence, and therefore in the discussion of Islamic economics concerning with consumption, both micro or macro level. Hasim Kamali's *Principles of Islamic Jurisprudence*, (Petaling Jaya, Malaysia: Pelanduk Publications, 1989), p. 338-358. Is among them. He includes these in type of *Maslahah* in page 345.

³⁷ See Monzer Kahf, "A Contribution to the theory of Consumer Behaviour in an Islamic Society", in Sayyid Taher, et.al. (eds.), *Readings in Microeconomics: An Islamic Perspective*, (Kuala Lumpur: Longman Malaysia, Sdn. Bhd., 1992), pp.90-104.

leads to conclusion that saving in this Islamic behaviour, being contrasted to consumption, is positively related to MRTTP as illustrated in Figure 4.

Having simplified the model excluding government interference as the above assumption, the paper in general, following Keynes, comes to equilibration of saving and investment as of following:³⁸

$$Y = C + I \quad (7)$$

$$S = Y - C \quad (8)$$

Therefore,

$$S = I \quad (9)$$

where, I represents investment, and S stands for saving.

Since interest is assumed to be completely abolished, and Muslims are of following the Islamic teaching, they theoretically must no longer occupy MRTTP that is associated with the interest rate, except for conveniently being treated as an opportunity cost of choosing MRT (*marginal rate of transformation*), by which they can determine their capital formation. It means that they must also shift from interest-base system to PLS scheme. Again, being more convenient, the paper does not use the term MRT, rather *marginal rate of return (on investment)* or MRR.

Suppose the return on investment rate (MRR), or say r , is determined in the real sector of the economy, for a given state of technology. MRTTP (say i)

³⁸ See Keynes, *Ibid*, p. 288-305.

represents the opportunity cost of funds invested (that is not used for consumption). Figure 4.³⁹ Also shows how these rates are associated with the transformation possibilities and the indifference curves

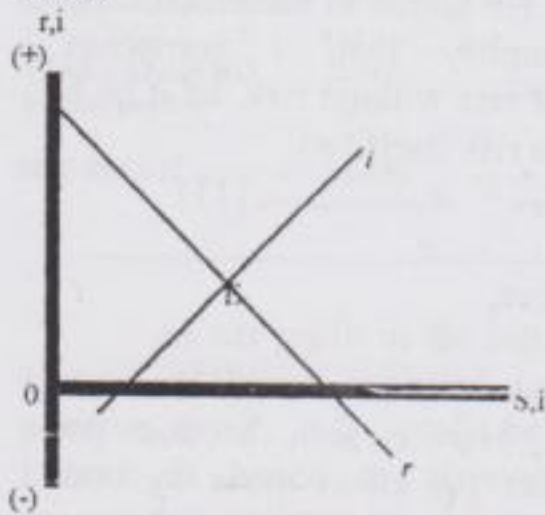


FIGURE 4:

Saving and Investment: Functions of r and i

Moving rightwards along transformation curve, investment expenditure will increase, thus steadily leads to a decrease in the rate of return (r). On the other hand, a decrease in the current consumption by means of saving (given income is constant) leads to the increase in rate of time preference (i). Theoretically, the negative quadrant expressing negative rates can not be ruled out, though for the sake of simplicity the positive segment is always considered.

GENERALIZATION AND EXTENSION OF THE ANALYSIS

The two-period analysis may be generalized and extended to

many periods of time, say n , by replacing two-dimensional diagram by n -dimensional ones, giving the consumption stream (C_0, \dots, C_n) . This accommodates the $(n-1)$ -dimensional indifference curves and $(n-1)$ -dimensional production possibilities frontiers, with the hyperplane $(n-1)$ -dimensional market lines on which the process of borrowing and lending or saving and investing respectively takes place through the points of their tangencies. It is obviously not easy to draw such a process into a graphical illustration. However, relationship between S , I , δ and i may be expounded in Figure 5. Assuming the same yearly income and consumption with the fixed prices,⁴⁰ indifference curve will shift to the right and up being tangent with a new possibility frontier at a new equilibrium, and hence, providing the shift of both δ and i to the right. If indifference curves are *homothetic*, that are *monotonically* increasing function of homogenous class of any degree,⁴¹ with respect to the origin,

⁴⁰ Since in Islamic economy the interest rate is assumed not to exist of which the Muslims' time preference consumption is not a function, the prices are thus assumed to be somewhat remain constant over time.

⁴¹ For reconfirmation of this remark, refer to James M. Henderson and Richard E. Quandt, *Microeconomic Theory: A Mathematical Approach*, 3rd ed., (Singapore: McGraw-Hill Book

³⁹ For further explanation, see Azhar, *Op.cit.*

the new equilibrium will be horizontally occur at the same rate.

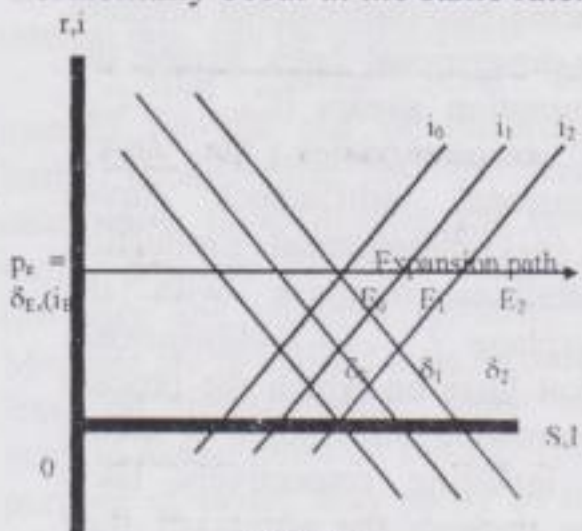


FIGURE 5:
Saving-Investment: An Extended Analysis

The conclusion is drawn here that the linear constant rate implies a single unique and unchanging rate over time. Broadly speaking, as aggregate functions is a horizontal summation of individual functions, δ_E and i_E , through the market mechanism, becomes an acceptable rate of Islamic profit, say p_e , explaining possibility of replacing interest rate by profit rate.

INTEREST VERSUS PROFIT

Is, from the prior explanation, then interest rate and profit rate equivalent?

Prof. Naqvi⁴² suggests that in steady-state situation both are formally equivalent. He argues that in the absence of Islamic ethical constraints, interest rate in a risk situation equals profit rate in the situation of risk. Therefore,

employing the above notations, he comes to:

$$p = i + \epsilon \quad (10)$$

where p is profit rate, i stands for interest rate in a risk situation and ϵ represents a stochastic function of time corresponding to the risk factor. He seems to mathematically oversimplify that, i comprises interest rate without risk, let it be i_0 and the risk itself (ϵ),

$$i = i_0 + \epsilon \quad (11)$$

$$i_0 = i - \epsilon$$

therefore,

$$p = i_0 + \epsilon + \epsilon$$

$$p = i_0 \quad (12)$$

Here is seen, he does not consider the effort made by both *entrepreneurs* and their employees. Profit, either in Islam or in secular point of view, is a result of combined efforts of labour (L) and capital (K) that Naqvi also previously formulated,⁴³

$$Y = f(L, K) \quad (13)$$

One of the fundamental aspect by which the business entities are going concerned is that they will always expect to earn their business' profit. This periodical profit will always be relatively greater than interest they periodically spend. However, it does not reflect that profit rate is greater than interest rate, since there is no information of capital. A hypothetical profit-loss statement of a firm shows this fact:

Company, 1980), p. 16, 40 and 106-107.

⁴² See SNH Naqvi, *Ibid*, p. 86-87.

⁴³ See his equation (i) and entire explanation of this section in *Ibid*, p. 77-81.

"ABC" COMPANY (TELKOM BHD Malaysia)
Comparative Hypothetical Profit-Loss Statement
Dec 31 1999
(M\$ million)

ITEMS	CASE I INTEREST-BASED	CASE II INTEREST-FREE	INTEREST-BASED	INTEREST-FREE
TURNOVER	5,000	5,000	5,000	5,000
GENERAL EXPENSES	3,600	3,600	4,900	4,900
	-----	-----	-----	-----
TRADING PROFIT	1,400	1,400	100	100
Interest payable	(200)	-	(200)	-
	-----	-----	-----	-----
NET PROFIT	1,200	1,400	(100)	100
	=====	=====	=====	=====

As net profit in the interest system is always expected to be positive, say $P_i > 0$, profit before interest is hence to always be greater than interest payable to the outside financiers, say $P > iL$, as in Case I, where L represents the loanable funds obtained from the outside financiers. Case II gives another feature of an unexpected business result that business entities will rarely suffer in the long-run. However, these cases show that it could not be the case for profit rate to equal interest rate.

In the macro context, aggregating the number of labour being employed in the economy as a whole, L is replaced by N denotes employment level, therefore equation (13) can be rewritten for aggregate production function as:

$$Y = f(N, K) \quad (14)$$

giving the feature that national product or income in an economy consists of two factors of production from which the profit rate may be determined, given other

other components as below. Neoclassical version of profit rate is then determined by *marginal product of capital* (MPK) of the function (14):⁴⁴

$$p = \frac{\partial Y}{\partial K} = \frac{\partial f}{\partial Y} \quad (15)$$

In the empirical field, one of the definition is, following Dumenil and Levy:⁴⁵

$$p = \frac{\text{NNP} - \text{Labour income}}{\text{NK} + \text{Inventories}} \quad (16a)$$

or, relaxing the assumption of no government interference that implies to no imposition of tax,

$$p = \frac{\text{NNP} - \text{Labour income} - t}{\text{NK} + \text{Inventories}} \quad (16b)$$

⁴⁴ See Dougherty, *Ibid*, p. 14.

⁴⁵ See Gerard Dumenil and Dominique Levy, *The Economics of the Profit Rate: Competition, Crises and Historical Tendencies in Capitalism*, Edward Elgar, p. 19-49, particularly p 41.

where NNP is net national product; t is indirect business tax; and NK net stock of fixed capital. The empirical findings on four manufacturing industries in the U.S. during 1945-1980 shows that the yearly average profit rates due to definition (16b) lie between 15% and 30%. If the definition excludes indirect business tax, equation (16a), the rates lie between 25% and 45%. Every thing being constant, the rate of profit will vary inversely with the rate of wage at any moment of time.

In fact, the most important aspect is not only the inequality between interest and profit rates and their magnitude, except for the purpose of explanation as above, rather individual and social implication resulted from those two different systems. As the business entities are growing up, they tend to be greater in line with their objective of maximising profit, that is also lawful in Islam.⁴⁶ Even though under monopolistic competition, profit maximisation of PLS system may still lead to a lower commodity price, greater volume of output, and greater net profit than in secular economy.⁴⁷

SELECTION AMONG THE PREVAILING CRITERIA

The assessment of a project in which the decision of

investment needs for certain criteria. There are two broad categories of what the UNIDO calls "profitability", namely *commercial* and *national profitability*, which are mainly for private and public projects respectively. However, in assessing a public project, the first category is usually used for "starting point" to deal with the latter. The commercial profitability provides investment profitability analysis and financial analysis.

Investment profitability measures profitability of resources put into a project, namely return on capital, regardless of the sources of financing.⁴⁸ The well-known methods considered as basic criteria and associated with discounting factor, that are *present value or net present value* (PV or NPV) and *internal rate of return* (IRR) come under this sub-category. The main different of these criteria is that in the former case, the discount rate is exogenously given by the market interest rate, whereas in the latter, the discount rate is endogenous and therefore determined in the system.

PV criterion of a project is the difference of net cash flows, which are discounted at a pre-determined rate. From equation (1) and (2), supposing that investment is carried out for $t = 1, 2, \dots, n$ periods with costs being paid in the initial period, PV criterion gives:⁴⁹

⁴⁶ See Hasan, *Op.cit.*, p.

⁴⁷ He has theoretically proved it in *Ibid.*, p. 248-251.

⁴⁸ The UNIDO, *Ibid.*, p. 37.

⁴⁹ See for example William H. Branson, *Ibid.*, p. 289.

$$PV = -C_0 + \frac{B_1}{(1+r)^1} + \dots + \frac{B_n}{(1+r)^n} \quad \text{or}$$

$$PV = -C + \sum_{t=0}^n \frac{B_t}{(1+r)^t} \quad (17)$$

This criterion sets a predetermined rate of discount, r , which should be the interest rate in the capital market,⁵⁰ reflecting the correct of society's time preference,⁵¹ as to calculate streams of costs and benefits of the project. A project is undertaken if PV or NPV is greater than zero.

While IRR, or in Keynesian perspective is called *marginal efficiency of investment* (MEI), is the discount rate at which the present value of the streams of costs and benefits are equal, PV is deducted to zero by its internal rate of return on investment. The discount rate here is represented by δ which is defined by:

$$0 = -C_0 + \frac{B_1}{(1+\delta)^1} + \dots + \frac{B_n}{(1+\delta)^n} \quad \text{or}$$

$$0 = -C + \sum_{t=0}^n \frac{B_t}{(1+\delta)^t} \quad (18)$$

Given the level of benefits and costs stream, δ may be determined to discount the PV of the investment project back to zero.

Therefore, δ can be plotted against predetermined rate, r , of the formulae (17), and PV remains essential to select an (or even some) acceptable δ s). The projects will only be considered if $\delta > r$, as $NPV > 0$, and they will be ranked in order of which may give the greater δ given the same level of r .

There is a number of difficulties in considering which criteria can be best used to determine the project. Most conventional development economists, in the existence of the market interest rate, suggest to consider PV criterion for several reasons, against the IRR/MEI, partly because IRR/MEI can provide more than a single or unique rate of return. Dasgupta and Pearce enumerate the such reasons for dissatisfaction with the use of IRR/MEI that are: 1) *Sensitivity to economic life*; 2) *Sensitivity to time-phasing of benefits*; 3) *Mutual exclusivity*; 4) *Administrative acceptability*; 5) *Multiple roots*; 6) *Changes in the discount rate*; and 7) *Non-uniqueness of Fisher Rule*.⁵²

However, IRR/MEI has been recommended in some certain circumstances, particularly as a method of allocation of a given capital budget among a number of potential investment projects.⁵³ The

⁵⁰ See The UNIDO, *Ibid.*, p. 43.

⁵¹ See for instance E.J. Mishan, *Cost-Benefit Analysis*, 3rd ed. (London: Geoge Allen & Unwin (Publisher) Ltd., 1982), p. 213-220.

⁵² Ajit K. Dasgupta and D.W. Pearce, *Cost-Benefit Analysis: Theory and Practice*, (Hampshire and London: The MacMillan Press Ltd., 1992).

⁵³ See Mishan, *Ibid.*, p. 228.

very important merit of this method, following the UNIDO, is that, despite limitations of its use, it "determines the return on the capital invested and therefore signals the maximum rate of interest on loans this project can pay without getting any difficulties. No other method will supply such information"⁵⁴ Again, the latter seems to be in harmony with Islam, since the rate is not pre-determined. Other advantages of this method are that, first, its flexibility is capable of comparing to any other rate available in the economy, including interest rate. Secondly, being a pure number, it permits comparison of different size of projects.

So far, as the paper concerns according to its perception of Islamic view, IRR/MEI may be selected using different framework of analysis as noted above (see Figure 4 and 5). The UNIDO suggests: "Also, it may be very convenient to use this method if for some reason the evaluator wants to escape determining the explicit discount rate which has to be done in computing the net present value of a project."⁵⁵

Further Analysis on Marginal Efficiency of Investment

Given Keynes's consumption function (5), b or *marginal propensity to consume*

(MPC), as he confessed,⁵⁶ is nothing but similar as time preference consumption, which is influenced by various motives. Having considered Muslims' behaviour that they should plan their future by decreasing consumption after their basic necessities to increase saving, and as stated in (8) that $S = Y - C$ and $MPC + MPS = 1$, the paper may attain to the view that *marginal propensity to save* (MPS), as a temporary means for investment, in the Muslim society theoretically tends to be greater than MPC (b), as income increases. This means that "time preference for investment" using PLS system, incorporating the equality of saving and investment (9), $S = I$, tends to be positive, leading the possibility of increasing aggregate income through the increase in aggregate production. This is a mechanism of what so-called, in this paper, "investment time preference", where the process of changes from interest-based to profit-base system occurs, incorporating consumption-saving-investment relationship. Therefore, the Muslims' time preference choices are not about consumption, but rather, to the greater extent, choices between today's and tomorrow's (return on) investment, and partly saving in terms of *zakah* for consumption purposes.

⁵⁴ See The UNIDO, *Ibid.*, p. 48.

⁵⁵ *Loc.cit.*

⁵⁶ See Keynes, *Ibid.*, p. 344.

Being clearer, Figure 6 depicts such a mechanism, modified from Fisherian models as captured in figure 1,2 and 3. Assume there is a process in the Muslim economy towards Islamic economy, where the shift from borrowing-lending mechanism of which interest plays, to profit-sharing-base economy by which the majority of the people have thought about future (return on) investment. Suppose an individual at the period 0 produces Q and consume X , as explanation of Figure 1 has told, moving along the market line PQ_0 , he saves some amount of income, QX , for future income through the expected return on investment in the future, period 1. This conversion of saving to investment is depicted by the shift of production, then being income, possibilities curve and its constraints. Therefore, the amount of XQ'_0 represents the expected return on new investment.

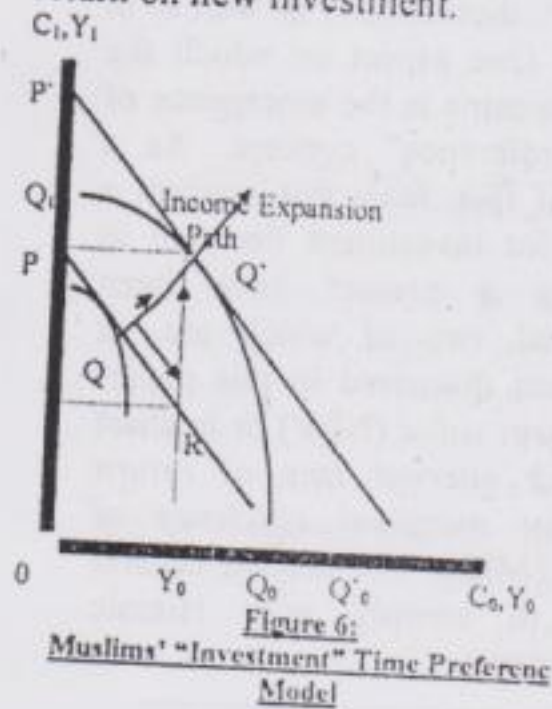


Figure 6:

Muslims' "Investment" Time Preference Model

Here, the notion of profit rate may take a proper place in relation to *marginal efficiency of investment* (MEI) than that of interest rate, despite the historical fact that MEI has been closely associated with the latter as illustrated in Figure 7,⁵⁷ counterpart of Figure 4.

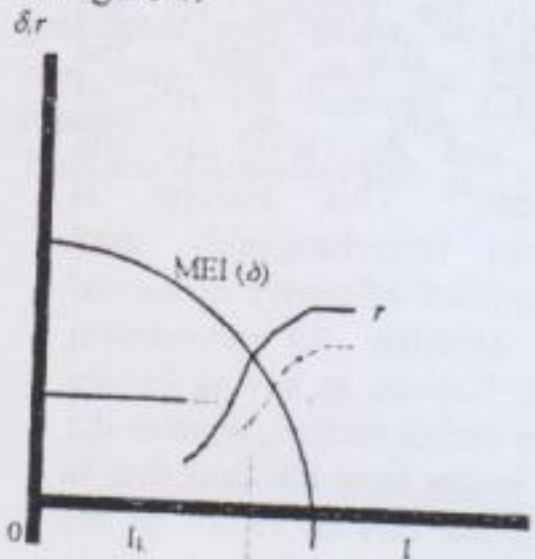


FIGURE 7:
Marginal Efficiency of Investment

Generally speaking, the change from interest- to profit-base system obtained the rational ground supporting the Qur'anic notion of prohibition of *riba*. This such a change, as Toutouchian⁵⁸ views with regards to banking system, illustrates the shift from the system in which the aspect in question (interest) plays a passive role, to

⁵⁷ This diagram appears in Branson's *Macroeconomic (Ibid)*, p. 291.

⁵⁸ Iraj Toutouchian, "Comparative Analysis of Investment in Capital and Islamic Banking System under certainty and Risk Condition", *Humanomics*, (vol. 12, No. 1, 1996), pp. 91-122.

another system where profit rate plays an active role. For this he calls the former a parasitic, whereas profit rate is to him an integral part of Islamic economic system.

On the other hand, the MEI, as originally defined above, represents the demand for net investment that shows the relationship between the rate of interest and the level of net investment.⁵⁹ This concept is sometimes interchangeably used with *marginal efficiency of capital* (MEC) criterion for investment decision. Keynes, as having known from the earlier section, equates the rate of return over the cost that is also internal rate of return to his MEC. Keynes' notion here is confusing concept, he seemed, following Nagatani,⁶⁰ not able to differentiate between stocks and flows. He defined MEC as "rate of discount which would make the present value of the series of annuities given by the returns expected from the capital-assets during its life just equal to its supply price."⁶¹ Though he did not clearly explain what the particular type of capital-assets he meant. Thus MEC does not clearly refers to marginal returns to be expected

in the next period stemming from investment or additional unit of capital (flow concept per unit time), whereas capital is a stock concept. Their relationship is that the MEC is associated with the initial capital stock, if it is not optimal, it thus needs an incremental stream of capital to reach the optimal level to which the MEI involves. Lerner⁶² was among the proponent of strong criticism to Keynes' notion of the MEC schedule resulting the MEI one.

Concluding Remarks

It is sufficient to conclude that interest plays a significant role in secular, mostly in neo-classical economics. It gives birth a set of instruments of -- in fact *gharar* and *zulm* from the point of view of Islam, otherwise -- legitimate and important aspects of economic behaviour in the Western material paradigm, theoretically as well as in practice. One aspect on which the paper concerns is the emergence of "time preference" concept. As a matter of fact, from this concept a criteria for investment decision in assessing a project have been developed, two of which are, as have been discussed in this paper: *net present value* (NPV) or in short PV; and *internal rate of return* (IRR) or *marginal efficiency of capital* (MEI). The second criteria seems to comply with Islamic requirements.

⁶² Refer to Keizo Nagatani *Ibid*, especially p. 97-98.

⁵⁹ See Glahe, Fred R., *Macroeconomics: Theory and Policy*, (San Diego: Harcourt Brace Jovanovich, Publishers, 1985), p. 114.

⁶⁰ See Keizo Nagatani, *Macroeconomic Dynamics*, (Cambridge: Cambridge Univ. Press, 1981), p.94-109.

⁶¹ Keynes, *Ibid*, p. 329.

This creates a dispute among Muslim economists because interest, the English translation of *riba*, is prohibited in Islam. The problem comes as there is element of time value concept that is hardly distinguished from the involvement of interest rate. Its removal must be accompanied by its alternative.

It is the rate of profit of Islamic PLS system, at which the debate, concerning appropriateness of profit rate play as interest's role in determining the rate of return has

occured. The paper concludes that time preference concept may still exist in Islamic economy, as Islam respects to it. The different is that it is no longer associated with consumption but rather with investment. Thus, there in an Islamic economy, as the paper has found, "investment" time preference may exists, and profit rate may take over the role of interest to play in. *Wallahu 'a' lambissawab.*

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