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Discounting And Money's Time Value;
How to use NPV and other valuation methods to weigh investment potentials in an Islamic environment?

Part 1

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Modern banking and finance are based on the concept of money's time value; the main parameter in the formula delivering the discounted cash value is that of the interest rate of the investment / and or loan in question. Introducing an interest rate component to any equation would jeopardize the view that Islamic economists hold. A question to be answered in this respect would be why the time value of money is denied in case of interest and what would be the appropriate determinant of the time value of money (and hence of the discount rate) in an Islamic economy. Although the discounted cash value is considered a basic investment concept and also a basic element of conventional financial theory and, in return, is fully compatible with the conceptual system of economic science; the question is: is it compatible with an Islamic view of accounting or appraisal of projects?

A key concept of TVM is that a single sum of money or a series of equal, evenly-spaced payments or receipts promised in the future can be converted to an equivalent value today. Conversely, you can determine the value to which a single sum or a series of future payments will grow to at some future date.

You can calculate the fifth value if you are given any four of: Interest Rate, Number of Periods, Payments, Present Value, and Future Value. Each of these factors is very briefly defined in the right-hand column below. The left column has references to more detailed explanations, formulas, and examples.

Interest • Simple • Compound	Interest is a charge for borrowing money, usually stated as a percentage of the amount borrowed over a specific period of time. Simple interest is computed only on the original amount borrowed. It is the return on that principal for one time period. In contrast, compound interest is calculated each period on the original amount borrowed plus all unpaid interest accumulated to date. Compound interest is always assumed in TVM problems.
Number of Periods	Periods are evenly-spaced intervals of time. They are intentionally not stated in years since each interval must correspond to a compounding period for a single amount or a payment period for an annuity.
Payments	Payments are a series of equal, evenly-spaced cash flows. In TVM applications, payments must represent all outflows (negative amount) or all inflows (positive amount).
Present Value • Single Amount • Annuity	Present Value is an amount today that is equivalent to a future payment, or series of payments, that has been discounted by an appropriate interest rate. The future amount can be a single sum that will be received at the end of the last period, as a series of equally-spaced payments (an annuity), or both. Since money has time value, the present value of a promised future amount is worth less the longer you have to wait to receive it.

I will examine different evaluating techniques used in financial management. The Net Present Value concept is the most contended case in point; NPV use in modern finance implies a simulation on those values which will be amplified by time and interest rates. At a point t0 it would be beneficial for the investor to get an idea of their cash value worth between two time values. That is what NPV dedicates itself to show. The Net present value (NPV) is a sophisticated capital budgeting technique; found by subtracting a project's initial investment from the present value of its cash inflows discounted at a rate equal to the firm's cost of capital.

I will try to answer how to use NPV and other valuation methods to weigh investment potentials in an Islamic environment? I will conclude with defining the concept of opportunity cost in evaluating investments and will try to place it in an Islamic environment.

Literature review

To my knowledge little has been written on the specific subject of relating NPV and DCF to an Islamic environment. However significant research has focused on financial evaluation techniques. I will underline the valuable The Professional Accountants in Business International Good Practice Guidance Project and Investment Appraisal for Sustainable Value Creation Exposure Draft November 2012 published by the International Federation of Accountants.

Achieving sustainable value creation aligns directly with IFAC's vision: Recognition of the global accountancy profession as a valued leader in the development of strong and sustainable organizations, financial markets, and economies. In advocating fundamental principles, this IGPG establishes a benchmark that can help professional accountants deal with the complexities of practice and ensure that their organization's approach and processes are aligned with widely accepted and emerging practices .

In an Islamic context a first attempt was made by Anas Zarqa (1983) who concluded that discounting is permissible in Islam and the rate of return in the projects of comparable riskiness already in operation should be used as the rate of discount. However, he did not discuss the Islamic position on the time value of money and also questioned the relevance of time preference in determining the discount rate. Rafiq al-Masri (1986) discussed the question of the time value of money in detail and argued that Islam allows the time value of money.

Rauf Azhar (1986) discussed the consumer's time preference as well as productivity of investment and concluded that the rate of profit, and not the rate of interest, would be the appropriate rate of discount in an Islamic economy. But since, he kept the conventional assumption of perfect foresight and lack of uncertainty, his conclusion loses Islamic perspective. Also, issues like, the concept and nature of time value of money and the principles under which time value of money is to be distinguished in a loan contract from an investment contract were not discussed by him.

Though several good attempts have been made in this area, the issue is far from settled. The first attempt was made by Anas Zarqa (1983) who concluded that discounting is permissible in Islam and the rate of return in the projects of comparable riskiness already in operation should be used as the rate of discount.

Rafiq al-Masri (1986) discussed the question of the time value of money in detail and argued that Islam allows the time value of money. However, he did not discuss a number of important issues; such as, why the time value of money is denied in case of interest and what would be the appropriate determinant of the time value of money (and hence of the discount rate) in an Islamic economy.

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Forecasting, economic or accounting term?

To my understanding the real divergence between classical and Islamic economics is the equating of the time value of money.

Therefore any analysis scenario would have simply to deduct the time value of money devoid of interest rate and henceforth creating a viable capital budgeting and forecasting scenario with the use of time component- hence interest rate- in the methodology. As Islamic economic requires to disregard interest rates as it leads to usury; their capital budgeting to free the concept of NPV from its interest rate component; and I will propose henceforth to touch upon Economic Value Added (or EVA).

The EVA method begins the same way that NPV does—by calculating a project's net cash flows. However, the EVA approach subtracts from those cash flows a charge that is designed to capture the return that the firm's investors demand on the project. The EVA determines whether a project earns a pure economic profit–a profit above and beyond the normal competitive rate of return in a line of business. I feel more at ease with this jargon as it does not involve a discount over a specific interest rate value.

However it seems to me that the real problem lies in the conceptual understanding of the concept of time value between economists and accountants. In The Role of Central Banks in Islamic Banking Dr. Iraj Toutounchian highlights J. M. Keynes' criticism on the classical economists inability to recognize the speculative demand for money in the presence of interest (rate), it can easily be shown that interest is both necessary and sufficient condition for speculation. In other words, there is a two-way relationship between interest and speculation. Speculation,

which necessarily entails artificial risk in any market, be it in money, bond, gold, commodities and the like, is not permissible in an Islamic setting; he states.

A corollary to the above assertion is that with the disappearance of bond market stocks are expected to be exchanged in an Islamic stock market based upon their book values; Toutounchian asserts. In terms of Tobin's Q this quotient is supposed to be close to unity (one). It is because in a world with perfect markets, economic value (EV) and replacement cost (RC), will coincide. This brings the quotient to unity. An implication of this is that in a world with perfect markets valuing the firm would be easy; i.e. we could read the economic value of the firm off the current balance sheet.

Toutounchian conclude discussing about this assertion by citing two statements correctly made by Prof. Gardner Ackley:

- "Speculation - if mistaken - tends ultimately to be self -correcting in any commodity market."
- "...the real cause of unemployment is speculative demand for money".

Therefore this contains the fact of a contagion effect between speculation and unemployment on one hand and speculation and demand for money. Let me start by looking over different capital budgeting techniques and investment analysis scenarios.

What does the NPV contends?

NPV is an indicator of how much value an investment or project adds to the firm. With a particular project, if is a positive value, the project is in the status of positive cash inflow in the time of t. If is a negative value, the project is in the status of discounted cash outflow in the time of t. Appropriately risked projects with a positive NPV could be accepted. This does not necessarily mean that they should be undertaken since NPV at the cost of capital may not account for opportunity cost, i.e., compared with other available investments. In financial theory, if there is a choice between two mutually exclusive alternatives, the one yielding the higher NPV should be selected. To illustrate this:

$$\boxed{\text{NPV} = \text{Present value of cash inflows} - \text{Initial investment}}$$

Each cash inflow/outflow is discounted back to its present value (PV). Then they are summed. Therefore NPV is the sum of all terms, $\dfrac{R_t}{(1+i)^t}$

where

- t the time of the cash flow
- i the discount rate (the rate of return that could be earned on an investment in the financial markets with similar risk.); the opportunity cost of capital
- R_t the net cash flow i.e. cash inflow – cash outflow, at time t . For educational purposes, is commonly placed to the left of the sum to emphasize its role as (minus) the investment.

The result of this formula is multiplied with the Annual Net cash inflows and reduced by Initial Cash outlay the present value but in cases where the cash flows are not equal in amount, then the previous formula will be used to determine the present value of each cash flow separately. Any cash flow within 12 months will not be discounted for NPV purpose, nevertheless the usual initial investments during the first year R0 are summed up a negative cash flow.

Given the (period, cash flow) pairs (t, R_t) where N is the total number of periods, the net present value NPV is given by:

$$\text{NPV}(i, N) = \sum_{t=0}^{N} \frac{R_t}{(1+i)^t}$$

...If	...Then	...It means
NPV > 0	the project may be accepted	the investment would add value to the firm
NPV < 0	the project should be rejected	the investment would subtract value from the firm
NPV = 0	We should be indifferent in the decision whether to accept or reject the project. This project adds no monetary value. A decision should be based on other criteria, e.g., strategic positioning or other factors not explicitly included in the calculation.	the investment would neither gain nor lose value for the firm

The discount rate, which is the rate used to discount future cash flows to the present value is a key variable of this process.

Other methods to equate time value
IRR
According to Grame Pietersz, (© 2005-2012) rate of return on the invested amount is called IRR. A little investment with more rate of return would have higher IRR, a shareholder's wealth will increase when he makes heavy investment with lower rate of return and obtain gains in more volume (Grame Pietersz, 2005-2012). If a project's IRR is more than the project required rate of return, it is accepted and if the required rate of return exceeds the IRR, the investment in this project is refused

In another aspect, IRR base on discounted cash flows that empower the investor to observe the timing of cash outflow and inflows and the risk involve in the project (Van Horne and Wachowicz, p.321 12th edition). Horne and Wachowicz (p.321 12th edition) defines IRR is the discount rate of an investment proposal that makes the difference between cash inflows and outflow equal to zero (Van Horne and Wachowicz, p. 322 12th edition).

IRR is the discount rate that maintains break-even point between the present worth of cash outflows and cash inflows

NPV and IRR are closely related as both have almost similar mathematical formula and measure investment profitability with respect to time (corporate finance fine622 p.29). In the case, where the presence of one project does not preclude the presence of other, IRR and NPV give the same results and the decision criteria for the acceptance or rejection of the project will be same and where the presence of one project influence the presence of other the rejection and acceptance criteria for the IRR and NPV will vary (corporate finance fine622 p. 29). This is the shortcomings of IRR that it may lead to wrong decisions in two conditions.

- First, when there is an unconventional trend in cash inflows in both mutually exclusive and independent that fuel to multiple IRRs.
- Second, when investment is done in mutually exclusive projects the time and scale differences direct to the inappropriate investment decision and this problem is connected with the assumption of reinvestment

MIRR
MIRR was introduced to cope with the constraints of multiple IRRs with the consistence of NPV (Suzette Vivers, Howard Cohen, 2011).When it is applied in initially invested outlay, accrues terminal value and also called terminal rate of return (Suzette Vivers, Howard Cohen, 2011). MIRR is also known compound rate of return and terminal rate of return. It is the discount rate that equates the NPV to zero and present value of investment to future cash flows (Kierulff, 2008, p. 326). MIRR has prominent differences from IRR as MIRR bases on the project cost of capital and IRR accounts for project's IRR (Suzette Vivers, Howard Cohen, 2011).

Therefore, reinvestment on the cost of capital is most reliable method to calculate the project profitability (Chang and Swales, 1999, p. 133).

PI Profitability index

The PI Profitability index is also known as benefit-cost ratio of a project (Van Horne and Wachowicz, p.325, 12th edition).PI is calculated by dividing net future cash inflows to the startup cost of project (Van Horne and Wachowicz, p. 325, 12th edition).

When profitability index is greater than 1 or equal to one, we will accept the project otherwise when it is less than 1, project will be rejected (Van Horne and Wachowicz, p. 326, 12th edition). In the case of independent project NPV also produces the same results as profitability index and accepting/ rejecting criteria also remains same (Suzette Vivers, Howard Cohen, 2011).

PB The payback period

PB The payback period is the simplest and widely used method (Suzette Vivers, Howard Cohen, 2011). It is the required time period to recover the original cost of investment. The payback period of a project is the duration of time to get original cash back. Although discounted cash flow does not encompass the in payback period still it is mostly practiced method (Pike, 1996, p. 82).

Advantages

- Sometimes a payback period may be preferred on NPV because it considers the time frame of incoming cash flow when the total invested amount will be gained and helps to select the project that least recovery period in the case when projects are mutually exclusive (Suzette Vivers, Howard Cohen, 2011). The payback method is widely used by large firms to evaluate small projects and by small firms to evaluate most projects.

- Its popularity results from its computational simplicity and intuitive appeal.

- By measuring how quickly the firm recovers its initial investment, the payback period also gives implicit consideration to the timing of cash flows and therefore to the time value of money.

- Because it can be viewed as a measure of risk exposure, many firms use the payback period as a decision criterion or as a supplement to other decision techniques.

- Disadvantages

- The major weakness of the payback period is that the appropriate payback period is merely a subjectively determined number. It cannot be specified in the light of wealth maximization goal because it is not based on discounting cash flows to determine whether they add to the firm's value.

- A second weakness is that this approach fails to take fully into account the time factor in the value of money.

- A third weakness of payback is its failure to recognize cash flows that occur after the payback period.

- While easy to compute and easy to understand, the payback period simplicity brings with it some drawbacks.

- Whatever the weaknesses of the payback period method of evaluating capital projects, the simplicity of the method does allow it to be used in conjunction with other, more sophisticated measures.

- In your view, if the payback period method is used in conjunction with the NPV method, should it be used before or after the NPV evaluation?

DPB

DPB (discounted payback period) is the method of calculating the recovery time of present cash outflows using the discounting technique Hirsch (1994, p. 536 and Peterson and Fabozzi 2002, p. 64). It takes into account the philosophy of the changing value of money with the passage of time to provide more sophisticated results (Bierman and Smidt, 2007, p. 58; Northcott, 1992, p. 16).

Instead of measuring the time period to recover the initial investment, some investors computes the length of time required, when negative present value will convert into positive (Bierman and Smidt 2007, p. 58). If an asset works more than it's DPB, the asset has positive NPV and if its lifetime is less than DPB the asset has negative NPV. DPB is more considered in investment decisions because if DPB is less than asset life, then it will bring required returns on investment (Suzette Vivers, Howard Cohen, 2011).

When DCF techniques are used to make capital budgeting, the analyst must also account for the hurdle rate (Suzette Vivers, Howard Cohen, 2011).

DCF techniques are very helpful to rank value-enhanced capital outlays and to find required rate by using NPV and IRR (Suzette Vivers, Howard Cohen, 2011). NPV and IRR are best to practice while evaluating a project for investment because they highlight the required rate of return (Shapiro, 2005, p. 165; Horngren et al., 2003; McWatters et al., 2001; Garrison and Noreen, 2000; Maher et al., 1997; Weetman, 1996). Many finance books instruct that should be used as NPV for investment

References:
1. This International Good Practice Guidance (IGPG) applies to professional accountants in business evaluating investments to support long-term decision making focused on sustainable value creation.
2. A registered trademark of the consulting firm. Stern Stewart & Co.. is another close cousin of the NPV method.
3. http://www.islamic-banking.com/iarticle__1.aspx
4. (http://www.investinganswers.com/financialdictionary/investing/internal-rate-return-irr2130).
5. (Corporate finance fine622 p.29).
6. (Brigham and Ehrhardt. 2005. p. 353).

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Part 2

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Treatment of Time in Conventional Economics

It is worth noting that almost all economists consider the use of "discounting" as a method of appraisal, as the only possible way to choose between different investments. There are essentially two methods generally used by economists, namely Net Present Value (NPV) and extended Internal Rate of Return (IRR). The term Internal Rate of Return (IRR) was termed by J.M. Keynes which is perhaps more familiar to the reader as the marginal efficiency of capital (MEC) schedule; sometimes referred to as the marginal efficiency of investment (MEI).

It is defined as the rate, which makes the present value of the future income streams exactly equal to the market price of the project. In other words, it is the rate of return that is being earned on the capital tied up. That is, while it is tied up it allows for recoupment of the project. NPV of a project is defined formally as the value today of the surplus that the firm makes over and above what it could make by investing at its marginal rate.

The basis of the extended IRR is that the negative cash flows are discounted back at the firm's cost of capital until they are offset by positive cash flows. Both of these methods (extended IRR and NVP) have their own common shortcomings; e.g., neither NVP nor IRR can be applied in the normal way to give the correct ranking of projects in situations where the rationing of an input is involved. Nevertheless, there are ways of removing these shortcomings and rendering them to be suitable methods of investment appraisal.

Walras' theory of general equilibrium constitutes the common source from which flow all theoretical propositions of the dominant trend in modern economics. As is known, this theory, in essence, was built on static analysis. It is extremely complex and it is difficult to extend it to take into account the time dimension with all its implications, while maintaining enough ability to explain the actual economic movement. This, in fact, would mean that such a theory should meet the following requirements:

- that it can explain the full chain of interrelated economic events extending throughout the period that bear on the decisions of economic units;
- that it takes into account the limited nature of information available to these units, hence renouncing the assumption of perfect foresight on which the general equilibrium theory is based; and
- that it provides for the possibility of errors in projections, thus renouncing the assumption of absolute certainty.
- At present, the inter-temporal equilibrium may be considered the most advanced stage towards the formulation of an integral economic theory that takes the factor of time into consideration.
- Yet, it only meets the first requirement mentioned above. Examination of time in a situation of uncertainty has also been attempted, but a general theory that meets all of the above requirements remains elusive.
- The model of inter-temporal equilibrium may be summed up in the following points:
- All goods and services, even of the same quantity and quality, are considered differently depending on the point of time at which they exist.
- All agents involved are assumed to have perfect foresight with respect to future prices, production techniques, etc.
- It is assumed that markets exist for future goods and services.

- Consumers and producers are assumed to formulate demand or supply plans covering both present and future, and maximizing utility in each unit.
- It is assumed that competitive markets exist for all present and future goods and services thus permitting equilibrium throughout all time periods both at present and in the future.

It may be noted that by varying the prices of present and future goods, this temporal frame entails that the value of money will be variable at present and in the future, since the value of money in this general equilibrium model is determined by the value of goods and services that can be bought with money. In dealing with the question of time, conventional economics does not separate a loan from a sale, since it considers an installment sale as a dual operation of sale-cum-loan. Economic units decide their current and future borrowing and lending by comparing the subjective interest rate and the market interest rate.

Time component in Islamic economics

If Islam does not recognize the time value of money, then there would be no need for discounting or compounding for time value of money in project evaluation and feasibility studies. But if Islam recognizes the time value of money, then we need to know the principles under which such a value is to be determined, the rationale for discounting and the discount rate to be used in project evaluation. Prevention of simultaneous coexistence of stable prices and full employment is part of the social cost of introducing interest (rate) to the system. Additionally, inflation and unemployment which are both consequences of such introduction hurt the general public at the expense of a very low percentage of the population enjoying the benefits through interest incomes. This simple explanation may be key to the locked-in position which is being able to overcome most of the capitalistic deficiencies.

The established techniques of cash-flow analysis, as well as the cost of capital and valuation of assets, constitute the modus operandi of modern finance, as well as of such financial institutions as the stock exchanges, central banks, commercial banks, non-bank financial institutions, and the world of trade.

My question is how does Islamic finance account for this? Moreover can we equate those ratios without taking into account the interest rate of a project?

Removal of interest and all its derivatives (i.e. lending on interest, money market and speculation) from an economy will lead Islamic banks to finance investment projects through PLS. The criteria to be used by such banks are both profitability and feasibility of the projects. Hence, projects compete with each other on the bases of their Internal Rates of Return (IRR). However, the criterion used by a potential investor is IRR of a specific project. The role of the central bank in determining arrays of IRRs for different sectors and various activities is highly valuable in channeling resources into proper projects.

Ranking IRRs in descending order, an investor would first choose the project with the highest IRR. However, the rule, which seems appropriate in choosing the amount to be invested, is "cutoff rate". The maximum amount one investor is willing to invest in a project is determined by the IRR of the next project whose value is almost equivalent to the chosen project, without it being "the opportunity cost" of capital.

Cutoff rate, seems to me, has long been mistakenly interpreted as opportunity cost. In investment decision making most of the times we are ~ dealing with the cutoff rate concept (even in an interest based economic system) but very rarely with opportunity cost. In capitalistic system, the rate of interest is justifiably used as the opportunity cost of capital. It is well justified that the interest rate is essentially determined independently from the rate of return in the real sector of the economy. However in the absence of interest, projects compete with each other to obtain finance from Islamic bank on the basis of their IRR because there is no other alternative. Comparison among various IRRs brings about the role of cutoff rate without anyone of them becomes an opportunity cost of another project. Cutoff rate functions as a signal to show an investor up to what point he should invest and where to stop and select another project. Interdependence among various investment projects produce a cutoff rate the special character and function of which differ from those of interest rate.

Several options might be advanced in this respect:
The reinvestment rate

Another approach to choosing the discount rate factor is to decide the rate which the capital needed for the project could return if invested in an alternative venture. If, for example, the capital required for Project A can earn 5% elsewhere, use this discount rate in the NPV calculation to allow a direct comparison to be made between Project A and the alternative. Related to this concept is to use the firm's reinvestment rate. Reinvestment rate can be defined as the rate of return for the firm's investments on average. When analyzing projects in a capital constrained environment, it may be appropriate to use the reinvestment rate rather than the firm's weighted average cost of capital as the discount factor. It reflects the opportunity cost of investment, rather than the possibly lower cost of capital.

For some professional investors, their investment funds are committed to targeting a specified rate of return. In such cases, that rate of return should be selected as the discount rate for the NPV calculation. In this way, a direct comparison can be made between the profitability of the project and the desired rate of return. To some extent, the selection of the discount rate is dependent on the use to which it will be put. If the intent is simply to determine whether a project will add value to the company, using the firm's weighted average cost of capital may be appropriate. If trying to decide between alternative investments in order to maximize the value of the firm, the corporate reinvestment rate would probably be a better choice.

Inflation rate

Now our focus to make NPV reliable to Islamic finance is to conceptualize a rate of return not based on interest rates. In the sense that investors need to benchmark their investment on a concept of time value of money different from conventional banking. As Islamic finance affirms that the future value of money has to be made on the profits expectation or deducted from inflation rate subjected to by the investment itself. I am not implying that Islamic finance does not rule out time's monetary valuation, for the Shari`ah (Islamic law) does not prohibit increment in loans in the price of a commodity in any sale contract to be paid at a future date. What the Shari`ah does prohibit is making money's time value an element of a lending relationship where it is claimed as a predetermined value. Here, the Shari`ah requires that a loan be paid back in the same currency by which it was given. The value (i.e., the purchasing power) of paper currencies varies with changes in many variables over which the two parties of a loan contract usually have no control.

Islam acknowledges an increment in a commodity's price in any sale contract to be paid at a future date, as long as the money's time value is not claimed as a predetermined value. In other words, any conditional increase in the loan's principal in return for a deferred repayment due to an expected depreciation in the value of the money, asset, or other factors (e.g., inflation and commercial losses) is prohibited.

There is near consensus among Islamic jurists that in a credit sale contract where repayment is deferred, a commodity's price may be increased. Although this juristic opinion seems to be inconsistent, since it views time differently in the case of loans and credit sales, on closer scrutiny of Islam's actual perception of time's economic role, one may conclude that this matter is not as people assume. From an Islamic legal financial perspective, this issue remains unresolved. This study attempts to resolve, in general, some of the relevant questions and, in particular, to examine the possible modus operandi of time valuation according to the Shari`ah's precepts vis-à-vis the concept of money as to whether any value can be attributed to time while considering the money's value. For this purpose, it investigates the juristic views on such relevant issues as the permissibility of difference between a commodity's cash and credit prices and an increase or a reduction in the loan's amount in return for early repayment.

One of the familiar examples of that are two forms of Islamic contracts: bay' mu'ajjal and bay ' salam both permitted in Islam. In these contracts of sale, the price of a commodity is allowed to be different from its spot price, if time element is involved in the process of exchange. This can be considered as sort of a recognition of time value of money. Rents and wages also include a fixed reward for the time element. Rent of a house, for example includes a part which is beyond depreciation. This part of the rent can be regarded as time value of money. Thus, while Bay' mu'ajjal, rent and wages include a fixed and predetermined element as compensation for time, prohibition of interest specifically denies any recognition for time value of money. Therefore, a legitimate question arises as to what is the correct position of Islam on the issue of time value of money.

The answer to this question is of primary importance in the context of project evaluation where the cost of capital must be defined clearly, keeping in view the time value of capital. If Islam does not recognize the time value of money, then there would be no need for discounting or compounding for time value of money in project evaluation and feasibility studies. But if Islam recognizes the time value of money, then we need to know the principles under which such a value is to be determined, the rationale for discounting and the discount rate to be used in project evaluation.

Zero Cost of Capital

In Competing IRRs in Islamic Banking and Zero Cost of Capital Published in: New Horizon, February 2003 Iraj Toutounchian A distinction has to be made between opportunity cost of capital and cutoff rate. It should be clear by now that although in an Islamic state the opportunity cost of capital is zero, but a lower IRR in an array of IRR's can be used as a cutoff rate of the project under consideration. An entrepreneur is expected to be keen about this point. Diversity in capital investments made by an entrepreneur can be taken as an obvious explanation that he/she cares and is cautious about the above point. In general, the opportunity cost of capital is both cost and cutoff rate but the reverse is not true. It seems that in an almost all occasions we are concerned with cutoff rate and rarely with opportunity cost, despite the common belief. Opportunity cost of capital being nil in an Islamic framework has numerous positive economic implications and consequences; to name a few, among other, cet. par.

- it raises the profits enjoyed by firms which have signed partnership contract with an Islamic bank which is by itself a powerful stimulant to further investment,
- if such high profit rates are distributed among depositors (in an Islamic bank) effective demand will go up,
- 3) if 1 and 2 are combined it would make possible to expand the size of the firm and hire more labor which , makes full employment an accessible goal of the economy,
- more taxes will be collected and budget deficit, if any, would tend to decrease over time,
- (5) if part of the reduction in production cost is reflected in the prices of the commodities produced, the whole community will enjoy lower prices, higher income and boost in aggregate demand.

1.   Competing IRRs in Islamic Banking and Zero Cost of Capital Published in: New Horizon, February 2003 Iraj Toutounchian