

# An Economic Explication of the Prohibition of *Ribā* in Classical Islamic Jurisprudence

Mahmoud A. El-Gamal\*

©May 2, 2001

## Abstract

This paper presents an economic argument that the prohibition of *Ribā* in classical Islamic Jurisprudence can be explained by appealing to precommitment and economic efficiency considerations. Our starting point is an argument provided by 'Ibn Ruṣḥd in *Bidāyat al-Mujtahid wa Nihāyat al-Muqtaṣid*. 'Ibn Ruṣḥd provides a juristic explication of the “Objectives of The Law” (*Maqāṣid al-Sharī'a*) in the prohibition of *Ribā*, which is of a highly economic nature. It is shown that this rare instance of economically sophisticated discussion of the *Maqāṣid* anticipates not only neo-classical economic notions of efficiency, but also recent studies of “Law and Economics”. Building on the intuition provided by 'Ibn Ruṣḥd, mainly with respect to the prohibition of *Ribā al-faḍl*, I argue that various legal methods of avoiding *Ribā al-faḍl* are in essence pre-commitment mechanisms which ensure economic efficiency through “marking to market”. I extend the analysis to *Ribā al-nasī'ah*, utilizing recent experimental results on individual discounting anomalies. The assumptions of the model are simultaneously supported by verses from the Revealed Qur'ān, as well as recent experimental evidence. Given those assumptions, individuals are known to exhibit dynamically inconsistent behavior. The logic of the prohibition of *Ribā al-nasī'ah* is shown in this context to endorse the use of pre-commitment mechanisms inherent in equity-based financing, which are efficiency enhancing in the presence of dynamically inconsistent agents.

---

\*Chaired Professor of Islamic Economics, Finance, and Management, and Professor of Economics and Statistics, Rice University, MS-22, 6100 Main Street, Houston, TX 77005. [elgamal@rice.edu](mailto:elgamal@rice.edu), <http://www.ruf.rice.edu/~elgamal>

# 1 Introduction

The prohibition of *Ribā* in Islām is perhaps the topic most studied in Islamic Economics and Jurisprudence of financial transactions. Therefore, any attempt to provide a fresh perspective on this issue must seem initially to be futile. At the very least, such an attempt would require more motivation than papers on newer issues. I shall try to give multiple motivations for this paper, hopefully scanning the range of potential readers. Each of the motivations provided here will seem obvious to some of the readers, but I hope that each reader will find some convincing arguments to read-on.

## 1.1 The prohibition of *Ribā* is *not* only about exploitation

This is not to say that the potential for rich creditors exploiting poor debtors is not one of the purposes being served by this prohibition. However, we must all have witnessed crass replies to the “exploitation explanation” such as “how can I be exploiting the U.S. government by buying its T-bills?”, or “am I exploiting IBM if I buy its bonds?”. While such dismissive replies do not merit much attention, they certainly point to the fact that the prohibition of *Ribā* cannot be fully explained by a simple appeal to exploitation of the poor.<sup>1</sup>

At the other extreme, some have used this incomplete understanding of the prohibition of *Ribā* to argue that interest charged and paid by banks today is not the prohibited *Ribā*. They have argued (e.g. the controversial *fatwās* of Sheikh Dr. Tantawi (*Al-Ahram*, 1989), the past *Mufti* of Egypt and current *Shaikh-ul-Azhar*, and similar fatwas by Sheikh Wasil (*Al-'Ittihad*, 1997), the current *Mufti* of Egypt) that conventional banking interest is a share in the profits of growth-inducing investments, and not the forbidden *Ribā*. Not only is this argument built on a partial understanding of the prohibition of *Ribā* based on exploitation, it is also deficient in ignoring the fact that much of the *Ribā* which was used in pre-Islamic Arabia was indeed for commercial and business financing (c.f. Al-Sālūs (1998, vol.1, p.29)). This is in contrast to the European view of “usury” (a common but faulty translation of the term *Ribā*), which evokes the mental image of exploitative consumption loans.

The issue is sometimes complicated by negligent interpretations of the verses of prohibition of *Ribā* in the Qur’ān. For instance, one of the most popular translations of the meaning of the Qur’ān, Yusuf ‘Ali (1991), translates the meaning of verses [2:278-279] thus:

278. O ye who believe! Fear Allah, and give up what remains of your demand for usury, if ye are Indeed believers.

---

<sup>1</sup>The opinion of ‘Ibn Kaysān that “the reason (*al-maqṣūd*) for the prohibition of *Ribā* is kindness towards people” (i.e. by not charging an increase) was reported and debunked in Al-Nawawī (n.d., vol.9: “*far‘ fī madhāhib al-‘ulamā’ fī bayān ‘illat al-ribā fī al-‘ajnas al-‘arba‘ah*”), since this logic would extend incorrectly to profit-making and the explicit permission of trading different genuses in different quantities, as well as trading non-fungibles (e.g. camels) in different quantities.

279. If ye do not, take notice of war from Allah and His Messenger: but if ye turn back, ye shall have your capital sums; Deal not unjustly, and ye shall not be dealt with unjustly.

Thus, the English reader who is not familiar with the end of verse 279 “*lā tazlimūna wa lā tuẓlamūn*”, reads this translation as a proof that the (sole?) objective served by the prohibition of *Ribā* is the avoidance of injustice (in the sense of exploitation of the poor debtor by the rich creditor). However, the meaning of the ending of the verse – as explained by ‘Abū Ja‘far, ‘Ibn ‘Abbās, and others (c.f. Al-‘Imām Al-Ṭabarī (1992, vol.2, pp.109-110)) – is much closer to: “if you turn back, then you should collect your principal, without inflicting or receiving injustice”. The exegetes (ibid.) then explain “without inflicting or receiving injustice” as “without increase or diminution”, where both an increase or a decrease of the amount returned relative to the amount lent would be considered injustice.

If we ponder this standard explanation, we see that “injustice” here is a symmetric relation, which depends only on the lent sum and *not* on the relative wealth of the parties, or their respective positions as creditor and debtor. In other words, the “injustice” mentioned here is economical: there is no valid justification for any given increase or diminution, thus such increase or diminution lends itself to injustice. We shall see in Section 2 that ‘Ibn Ruṣḥd provided a more detailed analysis of this notion of inequity or injustice as the rationale for the prohibition of *Ribā*. Moreover, while many jurists have argued that *Ribā al-faḍl* (forbidden in the Ḥadīth) was prohibited due to the fact that it may lead to *Ribā al-nasī‘ah* (prohibited in the Qur‘ān) (c.f. the many references in Al-Jazīrī (1986), Al-Zuḥaylī (1997)), ‘Ibn Ruṣḥd will provide a much more direct economic argument for why both types of *Ribā* contain the same type of injustice. We shall discuss the implications of ‘Ibn Ruṣḥd’s analysis later in the paper, but for now, we need to make a few more points clear.

## 1.2 Not all interest is the forbidden *Ribā*

Of course, nobody can correctly deny that interest on loans is the forbidden *Ribā al-nasī‘ah*. However, the term “interest”, as used in today’s economic and practical language, extends beyond fixed rates of return on loans in-kind. To some extent, many Islamic Economists recognized that the term “interest” is much more general, leading them to claim that Islam does not accept the notion of a “time value of money”. There is a very large number of papers in Islamic Economics which addressed the question whether or not Islam recognizes a time value of money, many of which come to the negative answer. Those assertions by later Islamic Economists stem from two notable early denials of time preference and time value of money (c.f. Al-Mawḍūdī (1979, pp.20-21), and Al-Ṣadr (1980, p.639)).

Those denials contradict numerous statements by classical jurists of all major schools that “time has a share in the price” (*līl-zamāni ḥaẓẓun fī al-thaman*; c.f. Al-Miṣrī (1997, pp.39-48) for full references and quotations). Indeed, the

Juristic rulings on the basis of which all Islamic financial institutions have thrived in recent years are based on cost-plus sales (*murābaḥah*) with deferred receipt of the price, or leasing *ʿijārah*. This increase is fully justified as a compensation to the trader or financial commercial intermediary for the opportunity cost of deferring the receipt of his compensation. Thus, the fact that the same financial firm would sell one item for one price on a cash-and-carry basis, and for a higher price on a deferred basis, is not un-Islamic, provided that certain conditions are met. Whether or not we call that increase “interest” is sophistry unworthy of serious academic discourse, and conducive to the type of skepticism about Islamic finance witnessed in recent years.

### 1.3 Not all *Ribā* is interest

While proving the previous point – that interest payments in the general sense are not necessarily part of the forbidden *Ribā* – required references to Islamic Jurisprudence, this point requires nothing more than quoting a well-known Ḥadīth. This Ḥadīth is narrated in numerous sources, of which we list one (c.f. Sakhr (1995)). Muslim narrated on the authority of ʿAbū Saʿīd Al-Kh̄udriy; The Messenger of God (pbuh) said (my translation):

“Gold for gold, silver for silver, wheat for wheat, barley for barley, dates for dates, and salt for salt; like for like, hand to hand, in equal amounts; and any increase is *Ribā*.”

This is the famous Ḥadīth prohibiting *Ribā al-faḍl*. Clearly, the transactions being prohibited here need not involve a temporal element, and therefore, the prohibition of this *Ribā* is not necessarily related to debts, deferral, or time.

Another Ḥadīth which further illustrates this fact – that prohibited *Ribā* and “interest” are not necessarily related – is the following famous story (c.f. Sakhr (1995)). Muslim narrated on the authority of ʿAbū Saʿīd Al-Kh̄udriy (my translation):

Bilāl visited the Messenger of God (pbuh) with some high quality dates, and the Prophet (pbuh) inquired about their source. Bilāl explained that he traded two volumes of lower quality dates for one volume of higher quality. The Messenger of God (pbuh) said: “this is precisely the forbidden *Ribā*! Do not do this. Instead, sell the first type of dates, and use the proceeds to buy the other.”

The process of selling one type of dates in the market only to use the proceeds to buy the other type may seem to some to be obsessively ritualistic, or – God forbid – a nominal circumvention of the law. However, we shall see in Section 3 that it makes perfect sense in light of the analysis of ʿIbn Ruṣhd and a direct economic elaboration on that analysis.

## 2 'Ibn Ruṣhd on the Objective served by the prohibition of *Ribā*

We are now ready to set the stage for the argument of 'Ibn Ruṣhd (1997, vol.3, pp.183-184). This argument was provided in the context of *tarjīh*, a choice of one juristic opinion over another, regarding the set of goods to which the prohibition of *Ribā al-faḍl* applies. The Zāhirī opinion, not surprisingly, disallowed any reasoning by analogy (*qiyās*) beyond the goods mentioned in the Ḥadīth cited above. The Shāfi'īs and Mālikīs, on the other hand, restricted such an inference by analogy to gold and silver (for their use to denominate prices; *thamaniyyah*), and foodstuffs, with a further restriction by the Mālikīs to non-perishable foodstuffs. The Ḥanafīs went to the extreme in reasoning by analogy, generalizing the prohibition in the Ḥadīth to all items measured by volume or weight.

'Ibn Ruṣhd – despite being of the Mālikī school – found the reasoning of the Ḥanafīs to be most compelling. While some contemporary jurists found the logic of 'Ibn Ruṣhd to be objectionable due to its dramatic enlarging of the scope of *Ribā* (c.f. Al-Zuḥaylī (1997, vol.5, pp.3724-3725)), understanding the economic content of that logic can help us enhance our understanding of the Law, and its economic, as well as its juristic implications.<sup>2</sup> As justification for his siding with the Ḥanafī generalization of the scope of *Ribā*, 'Ibn Ruṣhd (1997, vol.3, p.184) said (my translation):

“It is thus apparent from the law that what is intended by the prohibition of *Ribā* is what it contains of excessive injustice (*ghubn fāḥish*). In this regard, justice in transactions is achieved by approaching equality. Since the attainment of such equality in items of different kinds is difficult, their values are determined instead in monetary terms (*with the Dirham and the Dīnār*). For things which are not measured by weight and volume, justice can be determined by means of proportionality. I mean, the ratio between the value of one item to its kind should be equal to the ratio of the value of the other item to its kind. For example, if a person sells a horse in exchange for clothes, justice is attained by making the ratio of the price of the horse to other horses the same as the ratio of the price of the clothes [for which it is traded, tr.] to other clothes. Thus, if the value of the horse is fifty, the value of the clothes should be

---

<sup>2</sup>The same text which appears in 'Ibn Ruṣhd (1997, vol.3, pp.183-184), appears verbatim in Al-Qarāfī (n.d., vol.3, pp.258-9 (footnote on “*al-farq al-tis'ūna wa al-mi'ah bayna qā'idat mā yadkḥulhu ribā al-faḍl wa bayna qā'idat mā lā yadkḥulhu ribā al-faḍl*”). In fact stronger economic arguments for enlarging the scope of *ribā* were made elsewhere by Al-Ḥasan, and 'Ibn Jubayr, as reported in Al-Nawawī (n.d., ibid.), and rejected due to disagreement with the texts permitting trading in different quantities for different genres. In this regard, Al-Ḥasan's reported opinion equates the reason for prohibiting *Ribā* when trading in different quantities to trading items of different value, while 'Ibn Jubayr went as far as requiring equality of [marginal?] utilities (*manfa'ah*) of traded goods. Those arguments are indeed juristically stronger versions of the argument of 'Ibn Ruṣhd on which this paper is based, but they share the same economic logic, as discussed below.

fifty. [If each piece of clothing's value is five], then the horse should be exchanged for 10 pieces of clothing.

"As for [fungible] goods measured by volume or weight, they are relatively homogenous, and thus have similar benefits [utilities]. Since it is not necessary for a person owning one type of those goods to exchange it for the exact same type, justice in this case is achieved by equating volume or weight since the benefits [utilities] are very similar..."

### 3 Understanding the prohibition of *Ribā al-fadl* in economic terms: efficiency and precommitment

We can now understand the economic logic of 'Ibn Rushd by converting his language to contemporary Economic terminology. In the first translated paragraph, he proclaimed that justice is obtained if and only if the ratio at which non-fungible goods are traded for one another (e.g. clothes for a horse) is the reciprocal of the ratio of their prices. Thus, a horse worth 50 on the market is to be traded for 10 dresses each worth 5 on the market. Justice in this context is simply "marking to market". In the context of very heterogeneous items (e.g. clothes for a horse), 'Ibn Rushd implicitly argues that it is obvious that the parties to such a transaction would make sure that the ratio at which they trade is close to the ratio of market prices. Moreover, since non-fungibles vary widely in prices (the ratio of the price of this horse to other horses, etc.), such a ratio can only be determined approximately in any case.

The second translated paragraph talks mainly about fungibles, but sheds significant light on the equality of ratios of barter trading and market prices and its relationship to economic efficiency. In the second paragraph, the discussion centers around the ratio of barter trading and the ratio of utilities (benefits) derived by the traders. Combining the two equalities which "justice" requires in the two paragraphs, we get: ratio of barter trade = ratio of prices = ratio of [?]-utilities. In what follows, I cannot resist the temptation of replacing the mystery square [?] with the term "marginal". Clearly, this is the notion which 'Ibn Rushd meant when discussing the benefits derived from various goods. However, he obviously lacked the proper language to express it in terms of marginal benefit or utility, writing as he did centuries before the invention of differential calculus.

Considering benefit/utility in the marginal sense, then it would stand to reason that the ratio at which a barter trade takes place would roughly equate the two parties' ratios of marginal utilities of the traded objects (with perfect equality if the goods were perfectly divisible), provided that they have access to many other trading partners. The trade will be conducive to economic efficiency if the trading ratio was equal to the ratio of marginal utilities over the entire economy. The latter is ensured – in turn – by equating the ratio of marginal

utilities to the ratio of market prices. This is the condition for Pareto Efficiency in the market. We can now appeal to the first and second welfare theorems of Economics, and conclude that “justice” dictates that the “just” prices and trading ratios are those which maximize allocative efficiency. This does not mean that equality considerations are ignored, for they can be easily addressed ex post through Islamic re-allocative mechanisms such as *Zakah* (thus, the common conjunction of the verses of *Zakah* and *ṣadaqah* with the verses of *Ribā* in *Al-Rūm*, *’Al-’Imrān*, and *Al-Baqarah*, can be understood in this light, in addition to the direct contrast between the two terms “*Ribā*” and “*Zakāh*”, both of which lexically mean “increase”).

Now, we can also understand the Prophet’s (pbuh) order to Bilāl not to trade dates of low quality for dates of high quality at a mutually agreeable ratio. The second paragraph from ’Ibn Ruṣḥd translated above clearly states that “it is not necessary for a person” (in this case Bilāl) to engage in this exchange. Thus, if he does engage in trading dates for dates, the Ḥadīth says, he should trade in the same quantities. Otherwise, if he considers them sufficiently different to warrant a trading ratio other than one, then he should be forced to “mark to market” what this ratio should be. Thus, he should sell the one type of dates, and collect its price, presumably getting the fair market price for his goods. At this point, he is not obliged to buy from any particular seller, and thus if he engages in the activity of using the proceeds to buy the other type of dates, he will also get the fair market price in the second trade. The net result is, again, the equality of the ratio of [marginal] utilities of the traders to the ratio of market prices, Pareto efficiency, and the maximization of a certain notion of social welfare. Ex-post re-allocations of wealth can then address other notions of social welfare (especially, equality) outside the marketplace.

Before we move to *Ribā al-nasī’ah*, it is useful to highlight the two conclusions we derived from the analysis of ’Ibn Ruṣḥd:

1. The objective served by the prohibition of *Ribā* – justice – is obtained by fairly compensating each party for the value of its goods as determined by the marketplace. This fair compensation is equivalent to the notion of Pareto efficiency familiar to students of welfare economics. Issues of “fairness” which incorporate equality are not ignored in this context, they are only excluded from the marketplace and handled ex post by re-allocative mechanisms.

Further proof for this conclusion is the well-known prohibition in the following Ḥadīth, narrated by Muslim and others (c.f. Sakhr (1995)) on the authority of Jābir (my translation):

The messenger of Allāh (pbuh) said: “Let not a city-dweller sell on behalf of an incoming bedouin. Leave the people so that Allāh may make them benefit from one another”.

The explanation of this Ḥadīth is thus (c.f. Al-Shawkānī (n.d., vol.5, p.164)): A bedouin coming to the market may not know the current market conditions. The prohibition here applies to a city-dweller who knows

the market conditions, and asks the bedouin to allow him to sell on his behalf (thus helping the bedouin to earn a higher profit). While most discussions of this Ḥadīth refer to the case of a shortage in the market, and the city-dweller helping the incoming bedouin to keep supply low and prices high, the Ḥadīth in itself is quite symmetric, and “benefiting from one another” is a fixed-sum game in which one person’s relative loss is another’s gain. The Ḥadīth, indeed, forbids interventions into market conditions which may reduce efficiency (by fostering monopoly as indicated by commentators, or in any other way).

2. The second point we take out of this section is the precommitment mechanism recommended in the Ḥadīth of Bilāl and its link to the analysis of ‘Ibn Ruṣhd. For fungibles, the rule is that if the same item is to be traded, it should be in equal quantities; otherwise, the prohibition of *Ribā al-faḍl* forces the traders physically to “mark to market” the ratio at which they trade. The need for such a precommitment mechanism avoids inefficient trades due to lack of complete information about the fair market prices of the two exchanged goods. We shall see in the next section that a similar argument illustrates the efficiency-enhancing role of precommitment mechanisms which allow economic agents to avoid *Ribā al-nasī’ah*.

#### 4 Efficiency gains from the prohibition of *Ribā*, and the precommitment mechanisms inherent in Islamic financial contracts

The informational argument which applied to *Ribā al-faḍl* applies by extension to *Ribā al-nasī’ah*. However, the dimension of time adds at least another source of inefficiency in the market: the tendency for humans to be dynamically inconsistent. We shall shortly review some of the experimental evidence on so-called “discounting anomalies” exhibited by humans (as well as animals), and which result in such dynamic inconsistency. Before we do that, however, it is productive to reference a few of the verses of the Qur’ān which assert that “man” – generally speaking – does indeed exhibit such dynamic inconsistency and asymmetric treatment of potential gains and losses (all translations from Yusuf ‘Ali (1991)):

If Allāh were to hasten for men the ill (they have earned) as they would fain hasten on the good, then would their respite be settled at once. [10:11]

When trouble toucheth a man, he crieth unto us, ... But when we have solved his trouble, he passeth on his way as if he had never cried to us for a trouble that touched him. Thus do the deeds of transgressors seem fair in their eyes. [10:12]

They ask thee to hasten on the evil in preference to the good: ... [13:6]



(Inevitably) cometh (to pass) the Command of Allāh: seek ye not then to hasten it:... [16:1]

The prayer that man should make for good, he maketh for evil; for man is given to haste. [17:11]

When distress seizes you at sea, those that ye call upon – besides himself – leave you in the lurch. But when He brings you back safe to land, ye turn away [from Him]. Most ungrateful is man. [17:67]

Man is a creature of haste: soon [enough] will I show you My Signs; then ye will not ask Me to hasten them. [21:37]

He said: “Oh my people! why ask ye to hasten on the evil in preference to the good?...”. [27:46]

They ask thee to hasten on the Punishment (for them): ... [29:53]  
They ask thee to hasten on the Punishment... [29:54]

When trouble touches men, they cry to their Lord, turning back to Him in repentance: but when He gives them a taste of Mercy as from Himself. Behold, some of them pay part-worship to other gods besides their Lord... [30:33]

Do they wish (indeed) to hurry our Punishment? [37:176]

They say: “Our Lord! hasten to us our sentence (even) before the Day of Account” [38:16]

When some trouble toucheth man, he crieth unto his Lord, turning to Him in repentance: but when He bestoweth a favour upon him from Himself, [man] doth forget what he cried and prayed for before,... [39:8]

Now, when trouble touches man, he cries to Us; but when We bestow a favour upon him as from Ourselves, he says, “This has been given to me because of a certain knowledge [I have]!” ... [39:49]

“Taste ye your trial! This is what ye used to ask to be hastened!” [51:14]

Truly, man was created very impatient. [70:19] Fretful when evil touches him; [70:20] and niggardly when good reaches him. [70:21]

Nay, (ye men!) But ye love the fleeting life [literally: that which is sooner] [75:20]

Woe to those that deal in fraud. [83:1] Those who, when they Have to receive by measure from men exact full measure, [83:2] but when they have to give by measure or weight to men, give less than due. [83:3]

Those verses assert four aspects of human behavior: (1) they are impatient, i.e. they discount the near future too heavily, (2) they treat potential gains and losses asymmetrically, (3) they do not follow through with their plans (to

repent or otherwise), and – most surprising of all – (3) they wish to “hasten the evil”. While this set of irrational dispositions of mankind may strike economists accustomed to working with models of perfectly rational agents as irrelevant, another body of research in Economics and Psychology independently reached the same conclusions under the banner of so-called “discounting anomalies”.

#### 4.1 Experimental evidence of hyperbolic discounting and dynamic inconsistency

Perhaps the most comprehensive analysis of discounting anomalies to-date is that of Loewenstein and Prelec (1992). They classified anomalous experimental findings on discounting of future benefits and losses into four categories, and then offered a unifying model which accounts for all four anomalies. We now state the four anomalies which they consider, and show that they are in accordance with the positive behavioral assumptions we cited above:

1. **Common difference effects:** Individuals have been observed to determine their “time preference” based not only on the period of time between two choices, but also on the distance between the time a choice is made and the time of the two options. For example, Thaler (1981) found that a person may prefer one apple today to two apples tomorrow, while preferring two apples in 51 days to one apple in 50.
  - This observation is in agreement with the behavioral implication of the Qur’ānic verses cited above. In the religious domain, humans are criticized for their preference to enjoy material goods immediately, and postponing costly righteous deeds into the future. When young, they see the advantages of righteous deeds in their old age, but are unwilling to undertake them now, even though the rewards of righteous deeds when they are young are higher. Thus, events deferred one year in the immediate future is discounted much more heavily than ones deferred one year in the distant future. This is the common difference effect.
2. **Absolute magnitude effects:** Large benefits suffer less discounting than smaller ones. Thus, Thaler (1981) found individuals may on average be indifferent between \$15 immediately and \$60 in a year; and be on average indifferent between \$3000 immediately and \$4000 in a year. This result was replicated with different designs.
  - The verses [75:20, 21] assert: “Nay, (ye men!) but ye love the fleeting life [that which is sooner] and leave alone the hereafter”. Similarly, the verse [76:27] asserts: “as to these, they love the fleeting life [the one that is sooner] and put away behind them a day (that will be) hard”. The behavior depicted in these verses is consistent with high discounting for lower benefits (of this fleeting life), but low discounting for higher benefits associated with higher pursuits. Other things

being equal, such behavioral distortions would make the individuals invest an excessive amount of effort to obtain material benefits as soon as possible, but delay working for the higher payoffs and pursuits to later times.

3. **Asymmetry between gains and losses:** Individuals were observed to discount losses less severely than they discounted gains. An extreme case was found in Thaler (1981), where several subjects exhibited negative discounting of losses, preferring an immediate loss to a later loss of equal value.

- This “anomaly” is in perfect agreement with Qur’anic assertions about irrational human behavior quoted above. The verse [10:11] explicitly disparages humans for different treatment of gains and losses. The extreme form of this anomaly, where individuals prefer immediate loss to later loss of equal value corresponds to the verses which refer to “hastening the evil” and “hastening the punishment” [13:6, 27:46, 29:53, 29:54, 37:176, 38:16, 51:14]. Such behavior gives rise to dynamically inconsistent behavior, which is precisely the implication that the cited verses carry. Implicit, thus, is an understanding that dynamic consistency is normatively desirable, as contrasted with the positively verifiable dynamically inconsistent behavior.

4. **Asymmetry of delays and speedups:** Subjects were found in Loewenstein (1988) to discount delays more heavily than they discount speedups. Thus, the compensation they demanded to accept a delay of consumption was two to four times the amount they were willing to sacrifice in order to speed-up consumption over the same period.

- This asymmetry to be similar to many preference reversals (c.f. Tversky et al. (1990)) where the individual demands more compensation for an object if he owns it than he is willing to pay for it if he doesn’t. This is the behavior depicted in verse [83:3] as well as others. When an individual is in possession of an object, even the infinite ‘Treasures of the Mercy of God’, he would ‘hold back for fear of spending them’ [17:100]. Thus, an individual will always demand more for what he holds than he truly thinks it is worth. On the other hand, when he does not possess an object, and when asked how much of what he has he is willing to exchange for the object, he will always be willing to pay less of what he has to get it. The two attitudes are opposite sides of the same coin characterized by fear of not being sufficiently compensated for one’s possessions. When applied to delays and speedups, one may interpret a delay as giving up the time value of the goods whose delivery is being delayed, and speedups as obtaining that time value. Asymmetric pricing of that “time value” depending on whether one “has it” or not is yet another manifestation of preference reversals.

Loewenstein and Prelec (1992) then provide an objective function such that consumers who maximize it will exhibit behavior in accordance with the four “anomalies” listed above. They thus replace the standard Samuelsonian preferences over  $n + 1$  consumption bundles  $\{x_0, \dots, x_n\}$  to be consumed at time periods  $t = 0, \dots, n$ . The standard preferences would be represented by a concave function  $u(\cdot)$  and a discount factor  $\delta \in (0, 1)$ , where the consumer would maximize:

$$U(\{x_0, \dots, x_n\}) = \sum_{t=0}^n \delta^t u(x_t).$$

Instead, the value function of Loewenstein and Prelec (1992) over  $n + 1$  consumption bundles  $\{x_0, \dots, x_n\}$  to be consumed at time periods  $\{t_0, \dots, t_n\}$  will take the form:

$$U(x_0, t_0; \dots; x_n, t_n) = \sum_{i=1}^n \nu(x_i) \phi(t_i),$$

where  $\nu(x)$  is a “value function”, and  $\phi(t)$  is a “discount function”. For those preferences to admit the four sets of anomalous discounting behavior, the value and discount functions must satisfy the following five conditions, c.f. Loewenstein and Prelec (1992, pp.578,580,582-584):

- R0. All choices are defined as deviations from a “reference point”. Thus, the arguments  $x_i$  in the above objective function are interpreted as “prospects” (following Kahneman and Tversky (1979)), or deviations from some anticipated status quo plan.
- D1. The discount function is a generalized hyperbola:

$$\phi(t) = (1 + \alpha t)^{-\beta/\alpha}, \quad \alpha, \beta > 0.$$

- V1. The value function is steeper for losses than it is for gains:

$$\nu(x) < -\nu(-x).$$

- V2. The value function is more elastic for losses than for gains:

$$d \log[\nu(x)]/d \log[x] \Big|_{x=y>0} < d \log[\nu(x)]/d \log[x] \Big|_{x=-y<0}.$$

- V3. The value function is more elastic for more extreme outcomes:

$$d \log[\nu(x)]/d \log[x] \Big|_y < d \log[\nu(x)]/d \log[x] \Big|_z, \quad \text{for } 0 < y < z \text{ or } z < y < 0.$$

## 4.2 Model

Now, consider an individual who fits the description provided in the cited verses and the experimental evidence. Let this individual’s horizon be divided into three periods:  $t=1,2,3$ . In periods 1 and 2, the person receives no profits from his investment project, but in period 3, he receives profits  $A$ . Assume further

that this individual wishes to maximize a utility function in extra consumption prospects:

$$\mathcal{U}(c_1, c_2, c_3) = u(c_1) + \phi(1)u(c_2) + \phi(2)u(c_3).$$

Since the person has no profits in periods 1 and 2, he wishes to finance some of his business costs in those two periods to free-up funds for extra consumption during those two periods. In a loan-based environment, he faces a banking sector with three interest rates:

$$(A.0) \quad R^b < R^s < R^l$$

where  $R^l$  is the periodic interest rate on long term loans (2 periods),  $R^s$  is the periodic interest rate on short term loans, and  $R^b$  is the interest rate the agent would receive if he deposits savings in the bank.

The agent must first decide whether to acquire a short-term loan or a long-term loan. A short term loan taken in either period 1 or 2 will be repaid in the following period with interest at  $(1 + R^s)L_{short}$ , and a long term loan made in period 1 is due in period 3 at  $(1 + R^l)^2 L_{long}$ .

**Theorem 1** *Under (A.0), the individual will choose to take two short term loans in periods 1 and 2 rather than one long term loan in period 1.*

**Proof:**

If the agent selects the long term loan, he would solve the problem:

$$\max_{L, S_1, S_2} \left\{ u(L - S_1) + \phi(1)u((1 + R^b)S_1 - S_2) + \phi(2)u(A + (1 + R^b)S_2 - (1 + R^l)L) \right\},$$

where  $S_1$  and  $S_2$  are the amounts he saves in periods 1 and 2, respectively, and on which he earns interest rate  $R^b$ . He takes a loan  $L$  in period 1, and pays it off at compounded long-term interest  $(1 + R^l)^2 L$  in period 3.

If the agent selects instead to choose two short term loans, then he solves the problem:

$$\max_{L_1, L_2} \left\{ u(L_1) + \phi(1)u(L_2 - (1 + R^s)L_1) + \phi(2)u(A - L_2(1 + R^s)) \right\},$$

where  $L_1$  and  $L_2$  are the loans he takes in periods 1 and 2 respectively, and on each of which he pays interest rate  $R^s$ .

We now prove that the agent can do at least as well with two short term loans as he can with one long term loan. Towards that end, let  $L^*$ ,  $S_1^*$ , and  $S_2^*$  be the optimal choices the agent can make when taking a long term loan. Notice that it is quite feasible for the agent to set:

$$L_1 = L^* - S_1^*,$$

and

$$L_2 - (1 + R^s)L_1 = (1 + R^b)S_1^* - S_2^*.$$

In other words, the agent can match the first and second period consumptions that the optimal long-term-loan plan can achieve. We now show that under **(A.0)**, he will have higher consumption in the third period (and therefore higher utility in that period and overall) if he takes two short term loans.

We solve for the two levels of  $c_3$  under the scenarios of optimal long-term loan, and the feasible short-term loan which matches the first two periods of consumption, denoted  $c_3^L$  and  $c_3^S$ , respectively (by substituting for  $L_2$  and  $L_1$  from above):

$$c_3^L = A + (1 + R^b)S_2 - (1 + R^L)^2L,$$

$$c_3^S = A - (1 + R^b)(1 + R^s)S_1^* + (1 + R^s)S_2^* - (1 + R^s)^2L^* + (1 + R^s)^2S_1^*.$$

Since  $R^s > R^b$  by **(A.0)**, we get:

$$c_3^S > A + (1 + R^s)S_2^* - (1 + R^s)^2L^*.$$

By **(A.0)**,  $(1 + R^s)S_2^* > (1 + R^b)S_2^*$ , and  $(1 + R^s)^2L^* < (1 + R^L)^2L^*$ . Thus,  $c_3^S > c_3^L$ . This proves that a feasible plan of two short term loans can provide more lifetime utility to the agent, and therefore the agent can always do better under the short-term-loans scenario.  $\square$

For the next result, we shall need the following innocuous assumption:

**(A.1)** In the consumption levels chosen by the consumer under either scenario,  $u'(\cdot) > 0$  and  $u''(\cdot) < 0$  both exist. This assumption (positive but diminishing marginal utility of consumption) is standard in traditional economic analysis.

Now that we know from Theorem 1 that the agent will choose to take two short-term loans, we prove the next result:

**Theorem 2** *Under **(A.1)**, the agent's borrowing in the second period will be more (less) than originally planned, depending on whether  $\phi(2)/\phi(1) > (<)\phi(1)$ .*

**Proof:**

In period 1, the agent chooses  $L_1^*$  and  $L_2^*$  to solve the two first order conditions:

$$u'(L_1) = \phi(1)(1 + R^s)u'(L_2 - (1 + R^s)L_1), \quad (1)$$

and

$$\phi(1)u'(L_2 - (1 + R^s)L_1) = \phi(2)(1 + R^s)u'(A - L_2(1 + R^s)), \quad (2)$$

In period 1, the agent follows through with his plan, thus borrowing the amount  $L_1^*$  which solves the two above equations. However, in period 2, instead of following through with the  $L_2^*$ , he takes  $L_1^*$  as given, and chooses  $\hat{L}_2$  to solve the new first order condition:

$$u'(\hat{L}_2 - (1_R^s)L_1^*) = \phi(1)(1 + R^s)u'(A - L_2(1 + R^s)). \quad (2')$$

To compare the  $\hat{L}_2$  and  $L_2^*$  resulting from solving (2') and (2), respectively, we rewrite (2) as:

$$u'(L_2 - (1 + R^s)L_1^*) = \frac{\phi(2)}{\phi(1)}(1 + R^s)u'(A - L_2(1 + R^s)). \quad (2)$$

If  $\phi(2)/\phi(1) < \phi(1)$ , the term multiplied against  $(1 + R^s)u'(A - L_2(1 + R^s))$  on the right hand side is smaller for the re-written (2) than it is for (2'). Notice, moreover, that the derivative term on the left handside is decreasing in  $L_2$ , while the one on the right handside is increasing in  $L_2$ . Thus, to keep the equality, it follows that the  $L_2$  solving the re-written (2) is smaller than that solving (2'). In other words, the person will borrow more in period 2 (by solving (2')) than he originally planned in period 1 (by solving (1) and (2)).

Conversely, if  $\phi(2)/\phi(1) > \phi(1)$ , the person will borrow less than he had originally planned.  $\square$

**Notes:**

- If we replace **(A.1)** by an assumption that  $u(\cdot)$  is convex in the relevant range under all scenarios, we reach the mirror-image result of more borrowing than planned if  $\phi(2)/\phi(1) < \phi(1)$ , and vice versa. If we mix the concave and convex regions, we can get any combination of results. The illustration in Theorem 2 of the concave  $u$  case was motivated by the familiarity of the diminishing marginal utility / risk aversion model in mainstream economic theory.
- The usual economic discounting model  $\phi(1) = \beta$ ,  $\phi(2) = \beta^2$ , would render  $\phi(2)/\phi(1) = \phi(1)$ , and result in no dynamic inconsistency of behavior (equations (2) and (2') become identical). However, allowing for more general (and more realistic) discount functions, we get dynamically inconsistent behavior where the agent chooses to deviate in period 2 from the plan he made in period 1.

The most popular solution for dynamically inconsistent agents, who are aware of this shortcoming, is to induce some sort of precommitment mechanism to make sure that they will follow through with their plans. In the following subsection, we consider the same agent's problem if he is restricted to a class of Islamic financial instruments.

### 4.3 Islamic financial contracts and precommitment

We now consider the types of financial contracts available to our hypothetical agent, which fall in two categories:

1. **Debt-based contracts:**

Perhaps one should defend the use of "debt-based" in the title summarizing this type of contracts. The contracts considered here include cost-plus financing of purchases (*Murabahah*), leasing (*'ijarah*), etc. Such contracts

are “debt” or “liability” (*dayn*)-based in the sense that the seller or financial institution’s compensation in such transactions is established as a liability on the buyer or client (*dayn thābit fī al-dhimmah*). In this sense, while those contracts are explicitly not loans, they are debt-based since one party’s compensation is a liability on another.

While those contracts would – in principle – be able to mimic precisely the short and long-term loans the agent could obtain in the interest-based market, there is a significant difference which renders the results of Theorems 1 and 2 inapplicable: While assumption **(A.0)** is quite reasonable for standard market conditions, where the term-structure of interest rates is upward-sloping, it need not apply here. The implicit “interest” rates on short and long term *murabaha* or lease are not simply a function of time and aggregate anticipated market conditions. Instead, such implicit rates (which Islamic banks operating in the U.S. are legally forced to disclose to their clients) will be linked to the specific physical object being financed, used as a collateral.

Longer-term financing will typically be associated with more valuable assets with lower depreciation rates (e.g. buildings, machinery, etc.). Thus, it is quite conceivable that the implicit “long-term interest rate” facing our agent can be lower than its short term alternatives generated by financing smaller and more perishable items. If that is the case, then our agent will not be tempted to engage in two short-term financing contracts instead of one long-term contract, thus avoiding the potential for dynamically inconsistent behavior. However, such results are by-no-means guaranteed in this context, especially if debt-based Islamic instruments mimic conventional ones, as discussed below.

## 2. Equity-based contracts:

Since our agent will only begin to collect profits in the third period, equity-based contracts (e.g. silent partnership *mudārabah*, or full partnership *mushārahah*, etc.) only allow the agent to receive sums of money in periods 1 and 2 in exchange for a share in his profits to be realized in period 3. The agent in this case will engage in an agreement with the financial intermediary for their share in his firm’s expenses in periods 1 and 2, and the share they get in his profits in period 3.

In this context, the agent’s productive activity is viewed as a single firm, and the partner (whether silent or active) has a right to the capital of the firm and its stream of profits (in this case materializing only in period 3). Thus, the agent does not have the right freely to alter his financial flows in period 2 and obligations in period 3 without the agreement of his partners. Insofar as those partners do not suffer from the same dynamic inconsistency as the agent, this eliminates the potential for efficiency losses due to dynamic inconsistency.



#### 4.4 The choice of equity-based contracts and precommitment

An easy solution may be obtained if we can claim that the implicit interest rate in long-term equity financing is lower than both short-term and long-term interest rates. There are many theoretical and empirical justifications one can give for such an assumption. The higher control and availability of information to the partner as compared with a lender can be sufficiently large to justify such an assumption. It would then be routine to prove the converse of Theorem 1, and to conclude that equity financing will be optimal for all agents, Islamically constrained or otherwise. While such a conclusion may be ideologically pleasing, it contradicts the observed behavior of agents (Islamically constrained or otherwise) as well as Islamic financial organizations.

A more realistic assumption would be obtained by augmenting (A.0) as follows:

$$(B.0) \quad R^b \simeq R_I^b < R^s \simeq R_I^s = R_{eI}^l < R^l \simeq R_{dI}^l,$$

where  $R^b$ ,  $R^s$  and  $R^l$  are as before the deposit, short-term borrowing, and long-term borrowing interest rates. The debt-based Islamic counterparts of the above listed three interest rates, labelled here  $R_I^b$ ,  $R_I^s$ , and  $R_{dI}^l$  are obtained through different legal contracts, but tend empirically to be very close to their non-Islamic counterparts.

The only distinct new rate of return in this equation is  $R_{eI}^l$ , which is the long-term “interest rate” implicitly calculated from an equity-based Islamic financial contract. The increased control and information availability makes the rate of return required for such contracts lower than long-term interest rates on significantly riskier loans. On the other hand, the Islamic financial institution does not distinguish between the annualized equity-based rate of return it collects on short-term vs. long-term investments, thus making  $R_I^s = R_{eI}^l$ . Theorem 1 still applies in this case, with the individuals now (virtually) indifferent between seeking short-term debt-based financing (Islamically or otherwise) and a long-term equity-based financing from a financial point of view. We add to this the non-financial considerations of entrepreneurs, and we can still explain the current preference of debt-based financing by Islamic economic agents: Moore (1997) cites a recent survey of 222 companies in 6 manufacturing sectors of Saudi Arabia, where 83.4% of respondents rejected *mushārah* contracts and 78% rejected *mudārah* contracts, in preference of sole-ownership. However, as we have seen, firms thus restricting themselves to debt-based financing methods will – in general – be subject to efficiency-reducing dynamically-inconsistent behavior.

One prescriptive approach, which has been advocated in much of the Islamic economic literature, is to advocate equity-based financing methods as “more truly Islamic”, thus forcing the more devout firm owners to choose  $R_{eI}^l$ , which will be to their advantage in our model. Another solution is to allow Islamic financial institutions to endogenize the dynamically inconsistent behavior of their debt-based clients, thus charging  $R_I^s > R_{eI}^l > R^s$ . If the loss due to dynamic inconsistency outweighs the Muslim firms’ aversion to external control,

this can induce them to prefer the time-consistent plan of seeking long-term equity-based financing. However, it is understandable why Islamic banks will shy away from such a pricing scheme, in their efforts to mimic conventional banks which compete for a portion of their clientele (c.f. El-Gamal (1998)).

The first prescriptive approach would yield the socially optimal choice of  $R_{eI}^l \simeq R^s$ , which is tantamount to the optimal choice under  $R^s$  together with a precommitment mechanism which disallows agents from breaking their own plans. This prescription is often justified in the literature based on one of two assumptions:

1. Anything which is similar to conventional banking *Ribā* must be less Islamic. Juristically, such an argument can be based on the principle of *sadd al-dhārā'i* (closing potential avenues for circumvention of the law).
2. A vast portion of the Islamic economic literature is devoted to macroeconomic models which illustrate the superiority of an equity-based economy to one which is debt-based, in terms of stability, growth potential, equal access to capital markets for rich and poor entrepreneurs, etc.

In this sense, this paper can add a small contribution to the latter literature by noting that the precommitment inherent in equity-financing can also be welfare enhancing on a project-by-project basis, if entrepreneurs are feared to exhibit dynamically inconsistent behavior.

## 5 Concluding remarks

We have seen that the prohibition of *Ribā* can be explained in terms of efficiency-enhancing enforcement of economic-agents' precommitment. While the argument of 'Ibn Ruṣhd, if taken to its logical extreme, can severely enlarge the scope of forbidden *Ribā* (c.f. Al-Zuḥaylī (1997, vol.5, pp.3724-3725)), it highlights the purpose of the prohibition and encourages agents to adopt its spirit of marking the ratio at which they trade in barter to the ratio of market prices. Similarly, while it is difficult to argue on purely juristic grounds that equity-based financing is "more Islamic" than debt-based financing when the latter meets all the conditions postulated by jurists, the economic logic of precommitment can support the position long adopted by Islamic Economists that equity-based financing is preferred to its debt-based counterparts.

## References

- Al-Shawkānī. n.d. *Nayl Al-'Awṭār*. Egypt: Al-Maṭba'at Al-'Uṭhmāniyyat Al-Miṣriyyat.
- Al-Ṣadr, M. 1980. *'Iqtisādunā*. Beirut: Dār Al-Ta'āruḥ.
- Al-'Imām Al-Ṭabarī. 1992. *Jāmi' Al-Bayān fī Ta'wīl Al-Qur'ān (Tafsīr Al-Ṭabarī)*. Beirut: Dār Al-Kutub Al-'Ilmiyyah.
- Al-Jazīrī, A. 1986. *Al-Fiḥ 'alā Al-Madhāhib Al-'Arba'ah*. Cairo: DAR 'Iḥyā' Al-Turāth Al-'Arabī.
- Al-Mawḍūdī, A. 1979. *Al-Ribā*. Beirut: Mu'assasat Al-Risālah.
- Al-Miṣrī, R. 1997. *Bay' Al-Taḥqīq: Taḥlīl Fiḥī wa 'Iqtisādī*. Damascus: Dār Al-Qalam.
- Al-Nawawī, A. n.d. *Al-Majmū'*. Egypt: Maṭba'at Al-'Imām.
- Al-Qarāfī. n.d. *Al-Furūq*. Beirut: 'Ālam Al-Kutub.
- Al-Sālūs, A. 1998. *Al-'Iqtisād Al-'Islāmī wa Al-Qaḍāyā Al-Fiḥiyyah Al-Mu'āṣirah*. Al-Dawḥah: Dār Al-Thaqāfah.
- Al-Zuḥaylī, W. 1997. *Al-Fiḥ Al-'Islāmī wa 'Adillatuh*. Damascus: Dār Al-Fikr. Fourth revised edition.
- El-Gamal, M. 1998. The survival of Islamic banking: A micro-evolutionary perspective. *Islamic Economic Studies* 5(1,2):1–19.
- 'Ibn Ruṣhd, M. 1997. *Bidāyat Al-Mujtahid wa Nihāyat Al-Muḥtaṣid*. Beirut: Dār Al-Ma'rifat. verified by 'Abd Al-Majīd Ṭu'mat Ḥalabī.
- Kahmenan, D. and A. Tversky. 1979. Prospect theory: An analysis of decision under risk. *Econometrica* 47(2):263–292.
- Loewenstein, G. 1988. Frames of mind in intertemporal choice. *Management Science* XXXIV:200–214.
- Loewenstein, G. and D. Prelec. 1992. Anomalies in intertemporal choice: Evidence and an interpretation. *the Quarterly Journal of Economics* 107(2):573–597.
- Moore, P. 1997. *Islamic finance: A partnership for growth*. London: Euromoney and Abrar Group, International.
- Sakhr. 1995. *Mawsū'at al-Ḥadīth al-Sharīf, 2nd ed*. Heliopolis, Cairo: GISCO.
- Thaler, R. 1981. Some empirical evidence on dynamic inconsistency. *Economic Letters* VIII:201–207.

- Tversky, A., P. Slovic, and D. Kahneman. 1990. The causes of preference reversals. *American Economic Review* 80:204–217.
- Yusuf ‘Ali, A. 1991. *The Meaning of the Holy Qur’an*. Brentwood, MD: Amana Corporation.