

## Islamic Economics and the Islamic Subeconomy

Timur Kuran

**T**he mid-twentieth century saw the emergence of a literature characterized as Islamic economics. The declared goal of this literature has been to identify and promote an economic order that conforms to Islamic scripture and traditions. Now featuring thousands of books, articles, and pamphlets in dozens of languages,<sup>1</sup> it asserts that an Islamic economy would unite the strengths of capitalism with those of socialism, while overcoming their weaknesses.

For several decades, Islamic economics remained almost exclusively an intellectual exercise. Since the 1970s, however, steps have been taken to put its ideals into practice. Dozens of countries now have Islamic banks—financial intermediaries that claim to offer an interest-free, and thus morally superior, alternative to conventional banking. Many Islamic banks have proven profitable, and some are expanding rapidly. Several countries, notably Pakistan, have gone so far as to outlaw every form of interest, thus forcing all banks, including foreign subsidiaries, to adopt ostensibly Islamic methods of deposit and loan management. Pakistan, Saudi Arabia, Malaysia, and a few other countries have instituted official redistribution systems to collect an ancient religious tax and disburse the proceeds to causes endorsed by religious councils. And numerous economies now contain distinctly Islamic enterprises, including retailers, publishers, investment companies, factories, construction firms, and even conglomerates. Especially in the fastest growing metropolises of the Islamic world, these enterprises, along with the Islamic banks and redistribution systems, have formed vibrant subeconomies.

<sup>1</sup> For extensive bibliographies, see Siddiqi (1981) and Islamic Research and Training Institute (1993).

■ *Timur Kuran is Professor of Economics and King Faisal Professor of Islamic Thought and Culture, University of Southern California, Los Angeles, California. His e-mail address is [kuran@rcf.usc.edu](mailto:kuran@rcf.usc.edu).*

The purpose of this paper is to analyze these developments. How, I ask, does Islamic economics differ from secular economic traditions? Does it amount to a coherent body of scientific thought, and how comprehensive is it? What practical innovations has it stimulated? To what extent are the Islamic banks following the financial principles enshrined in their charters? What social groups are involved in Islamic economic activities, and what are their aims? And finally, what social benefits have flowed, and what social costs have arisen, from the economic activities undertaken in the name of Islam?

## **The Distinguishing Elements of Islamic Economics**

Islamic economics did not emerge from a drive to correct economic imbalances, injustices, or inequalities. The Indian Muslims who launched it in the 1940s were motivated by a desire to defend Islamic civilization against foreign cultural influences. For Sayyid Abul A'la Maududi, the Pakistani ideologist whose voluminous writings popularized the term "Islamic economics" and set the tone for later contributions to the literature, this new approach to economics was to be a vehicle for establishing, or reestablishing, Islamic authority in a domain where Muslims were falling increasingly under the influence of Western ideas. By replacing Western economic approaches with an Islamic one, he hoped to restore the Islamic community's self-respect and improve its cohesion.<sup>2</sup>

Because Islamic economics was developed to serve cultural and political ends, it did not have to meet scientific standards of coherence, precision, or realism. It needed only to differentiate itself from the intellectual traditions that it was aiming to displace. Accordingly, contributions to Islamic economics typically begin by identifying the distinguishing characteristics of an Islamic economy. From Maududi to the present, the most fundamental of these characteristics has been the prohibition of interest. Two others have been *zakāt*, which is an ancient redistribution system, and the requirement that economic decisions pass through an Islamic moral filter.

### **The Prohibition of Interest**

The hostility to interest is based on the belief that the Qur'an bans all interest, regardless of its rate or form. In fact, what the Qur'an bans is *ribā*, the pre-Islamic Arabian practice of doubling the debt of a borrower unable to make restitution on schedule, including both the principal and the accumulated interest. *Ribā* tended to push defaulters into enslavement, so it was an acute source of social friction. From the earliest days of Islam to the present, various interpreters of the Qur'an have held, accordingly, that the purpose of the ban on *ribā* was simply to block socially harmful

<sup>2</sup> For a compilation of his most influential economic writings, see Maududi (1975). Ahmad and Ansari (1979) have interpreted these views, and Nasr (1994) has studied the social and intellectual contexts in which they emerged.

financial practices. In particular, they have suggested that the ban was intended, like the bankruptcy laws of a modern state, to make creditors deal charitably with debtors unable to make timely payment (Rahman, 1964; Rodinson, 1973).

Nevertheless, for the past half-century, opposition to interest has been treated as the *sine qua non* of being an “Islamic” economist. To be recognized as an Islamic economist, it is not sufficient to be a learned Muslim who contributes to economic debates. One must be opposed in principle to all interest, including not only the monopolistic returns of rural moneylenders in financially underdeveloped countries, but also the competitive returns of commercial banks in the industrialized world. Thus, the focus of Islamic economics is neither on ways to keep interest rates within bounds nor on keeping financial markets competitive. Rather, it is on the eradication of interest.

There exists no example, ancient or modern, of a country that has done away with interest. Although there have always been groups hostile to interest—especially in economically primitive communities (Posner, 1980)—in no large community have interest-based financial deals ever become uncommon. Islamic economists have made great efforts, therefore, to justify a ban in terms that go beyond the simple claim that the Qur’an demands it. A common argument, found in all popular texts on Islamic economics (for instance, Afzal-ur-Rahman, 1980; Chapra, 1992) is that it is unjust to earn money without assuming risk. By the logic of this argument, it is unjust for a bank to earn interest on an industrial loan, for the arrangement places the risk of the financed venture entirely on the industrialist, allowing the bank to earn a return even if the venture fails. Likewise, it is unjust for a saver to earn interest on her savings deposits; the investments financed through her savings could go sour, in which case her bank would lose money while she, the deposit holder, still earns the predetermined return. Whatever the merits of the notion of risk-free returns, the crux of the argument is that profit is legitimate only as a reward for risk. Accordingly, banking must be based on the sharing of both risk and profit, which rules out interest. It is permissible, of course, for an individual to put money in a bank for safekeeping, provided no interest payments are involved.

The literature on Islamic banking does not specify how a depositor and his bank, or the bank and a borrower, are to apportion risk. It insists only that each of the parties to a financial contract must bear some share of the risk. In principle, one side could carry just one-twentieth of the risk, although some writers caution that the risk shares must conform to customary notions of fairness. Always left unclear is why it would be unjust for one side to accept most, or even all, of the risk if, as is commonly the case, the parties differ in their capacity to bear risk. Consider a bank and one of its 50,000 depositors, a retired widow whose sole source of income is what she earns on her modest savings. The widow is likely to be averse to putting her capital at risk, for a sufficiently large loss would leave her destitute. By contrast, the bank may easily pay her a fixed return, and thus bear the full risk of investing her savings, for it is able to minimize its overall exposure to risk through diversification.

In any modern economy, one will find bank depositors who are happy to put their capital at risk for the promise of a greater return. Also, one will find banks that are willing to earn a variable return on some, even all, of their assets in order to raise their expected earnings. So where financial intermediaries are free to choose their preferred mixes of fixed and variable earnings, and likewise for their lending commitments, competitive pressures will provide economic agents who are averse to interest opportunities to participate in deals of the kind Islamic economists characterize as “profit and loss sharing” (Cowen and Kroszner, 1990). The relative popularity of profit and loss sharing arrangements will depend on factors such as informational asymmetries between the providers and users of funds, the costs of managing variable-commitment contracts, and the efficiency of the legal system—in addition, of course, to the pattern of risk preferences.

In an unregulated economy, then, nothing would block the emergence of banks that Islamic economics defines as “Islamic.” And if banking based on profit and loss sharing is in practice not as common as one might want or expect, the reason is likely to be that the contracting options available to financial intermediaries are restricted—as they are in, for instance, the United States, where banking regulations have long limited the risks banks may accept on their investments and those they may impose on their depositors. Yet, what the Islamic economists demand is not just financial deregulation aimed at generating more profit and loss sharing. They desire to replace existing regulations with new regulations that would force all banks to limit themselves to variable earnings and commitments. The reason, once again, is that they interpret the ban on *ribā* as a condemnation of all fixed financial instruments. And they want interest-based banking outlawed, on the grounds that the recipients of interest income achieve gains without assuming any risk whatsoever.

This justification rests, as Ismail (1990) notes, on a serious misunderstanding concerning the sources of financial risk. Contrary to the perceptions of Islamic economists, a bank that earns interest on its assets is not engaged in risk-free business. It might fail to collect on some of its loans; an unanticipated economic slump might leave it with too large a workforce; and it is always possible that, after the terms of a long-term loan have been set, macroeconomic conditions will force it to raise the returns it offers depositors, thus reducing its profitability. Similarly, an interest-earning depositor carries some risk, if only because his bank may fail. It is true, of course, that as a practical matter, deposit insurance will eliminate the depositor’s risk, but most Islamic economists reject such insurance as un-Islamic. In the view that the existing economic systems suffer from too much risk avoidance, they wish to expose individuals to more risk—precisely the opposite of what deposit insurance seeks to achieve.

A system that asks economic agents to assume risks they would rather avoid is unlikely to perform as planned. In fact, the Islamic banks have been operating very differently from the idealized financial intermediaries described in textbooks on Islamic economics. But let me postpone discussing the differences between theory

and practice, for I have not yet commented on the other two distinguishing elements of an Islamic economy.

### Islamic Redistribution

According to the promoters of Islamic economics, the second identifying characteristic of an Islamic economy is its redistribution system known as *zakāt*. The system levies a tax on sufficiently wealthy Muslims to finance eight causes, including poor relief, the emancipation of slaves, and assistance to individuals serving Islam. Both collection and disbursement are matters of potent controversy (Afzal-ur-Rahman, vol. 3, 1976; Ahmed, Iqbal and Khan, 1983). With regard to collection, some Islamic economists hold that the rates and scope should be those that prevailed in the preindustrial desert economy of seventh-century Arabia. But a growing number propose modernizing the collection process, partly to ensure the coverage of assets still unknown 14 centuries ago. On the disbursement side, some want expenditures divided equally among the eight original categories; others, by now a large majority, allow the spending ratios to be varied in accordance with evolving social needs. Thus, where the former want exactly an eighth of a community's *zakāt* resources spent on freeing slaves, the latter recognize that such spending makes no sense in a society where slavery no longer exists.

Notwithstanding such disagreements over the form of *zakāt*, the Islamic economists are convinced that *zakāt* can be a more effective weapon against poverty and inequality than the redistribution instruments used by modern states. Because of its religious significance, they argue, *zakāt* would be paid willingly. Muslims who evade their tax obligations to secular governments would gladly pay *zakāt* to an Islamic government even in the absence of coercion.

### Islamic Economic Norms

The final distinguishing element of an Islamic economy, according to the Islamic economists, is that its agents act under the guidance of norms drawn from the traditional sources of Islam (Siddiqi, 1972; Naqvi, 1981; Chapra, 1992). These norms "command good" and "forbid evil." They promote the avoidance of waste, extravagance, and ostentation. They discourage activities that create harmful externalities. They stimulate generosity. They encourage individuals to work hard, charge fair prices, and pay others their due. The intended effect of the norms is to transform selfish and acquisitive *homo economicus* into a paragon of virtue, *homo Islamicus*. *Homo Islamicus* acquires property freely, but never through speculation, gambling, hoarding, or destructive competition. And although he routinely bargains for a better price, he always respects his trading partner's right to a fair deal.

The agents that populate the ideal Islamic economy thus exercise many liberties, yet they pass all their claims through a normative filter. On this basis, the Islamic economy is said to differ from both capitalism and socialism. From the standpoint of Islamic economics, economic freedoms are too broad under capitalism and too narrow under socialism. The Islamic economy constitutes a "third way" that constrains economic liberties optimally.

Many Islamic economists believe that the Islamic norms provide clear guidance in every conceivable economic arena. They are convinced, too, that the norms would be equally effective in all Muslim societies, regardless of size, history, level of development, and institutional framework. In an Islamic economy, they believe, disagreements over economic matters will be rare, for individuals will deal with one another fairly and honestly, and conceptions of economic justice will be homogeneous. These views are overly optimistic. For one thing, the proposed norms leave abundant room for individual judgment. For another, norms of altruism and responsibility are generally more effective within small networks than in large nations (Kuran, 1983).

Expositions of Islamic economics typically give the impression that the Islamic economy is a static structure consisting of fixed norms, an invariable *zakāt* system, and a financial system equipped with an unchanging set of instruments. However, the most sophisticated writers recognize that evolving opportunities generate pressures for institutional adaptation. They incorporate processes of change into their accounts of the Islamic economy by asserting that the holy laws of Islam (*Sharīʿa*) accommodate all the necessary flexibility (Sadr, 1961; Chapra, 1992). This position is based, of course, on the empirically problematic view that changing social needs are knowable centuries in advance. It also reflects undue optimism regarding an Islamic society's capacity to keep vested interests from blocking socially desirable changes.

## **The Practice of Islamic Economics**

Although efforts to restructure the entire economy according to Islamic criteria have been limited to a handful of countries, there is one domain, banking, where the influence of Islamic economics has spread widely. There now exist Islamic banks, or branches of such banks, in more than 60 countries. All claim that their operations are free of interest, and also that their decisions rest on considerations that go beyond profit maximization. As of the late 1980s, those based in the Arab world, which include the two largest groups of Islamic banks,<sup>3</sup> were capitalized at around \$2.6 billion, and they held assets worth \$22.9 billion. During the entire decade of the 1980s, the assets of these banks grew by 18.8 percent a year, although the subsequent growth has been considerably slower (Ray, 1995). In some of the countries where the Islamic banks compete with conventional banks, notably Egypt and Kuwait, the banks have managed to attract around 20 percent of all the bank deposits; in most other countries, their shares, though rising, remain much smaller (Moore, 1990; Wilson, 1990).

These banks offer accounts said to involve profit and loss sharing. The holders of these accounts receive not interest but "profit shares" that tend to fluctuate. But

<sup>3</sup> The Al-Baraka group and Dār al-Māl al-Islāmī.

*Table 1*  
**Nominal Returns on Savings Deposits at Turkish Banks**

Month	Term					
	3 months		6 months		1 year	
	Conventional banks	Islamic banks	Conventional banks	Islamic banks	Conventional banks	Islamic banks
June 1990	11.64	11.68	25.38	24.90	69.47	69.42
January 1991	12.34	12.02	25.51	24.61	56.25	57.12
June 1991	15.25	15.20	26.92	26.60	58.79	58.83
January 1992	15.68	15.58	30.51	30.46	65.11	64.30
June 1992	13.91	16.01	30.00	30.39	66.84	66.16
January 1993	14.72	15.65	29.88	30.43	66.96	64.51

*Notes:* Figures represent weighted averages of the returns to depositors over the designated periods for all banks within the category.

*Source:* Köfteoğlu (1994, p. 28).

the fluctuations closely follow the movements of ordinary interest rates, because the banks channel their deposits mostly into bonds and other interest-bearing instruments. The returns on the individual investments can vary, and they may come due at different times, which is why the “profit shares” of depositors are observed to differ from one period to the next. This point is not always appreciated, partly because the banks disguise the nature of their investment returns by characterizing them as “markups” or “service charges.” That the “profit shares” are supported by interest-based investments is evident from the fact that employees of the Islamic banks unofficially promise potential depositors returns no lower than the prevailing interest rate. In fact, in countries where Islamic banks compete with conventional banks, the ostensibly interest-free returns of the former essentially match the explicitly interest-based returns of the latter.

Some evidence from Turkey appears in Table 1. For each term to maturity running from three months to one year, the first column provides the weighted average of the returns received by the depositors of conventional banks in the form of interest. The second column shows the average returns achieved by the depositors of the country’s four Islamic banks under the rubric of “profit shares.”<sup>4</sup> Even a cursory examination of the table suggests that the average “profit shares” earned by the depositors of Islamic banks were more or less identical to the interest rates of the conventional banks. Nor were the profit shares appreciably more volatile. Though never fixed in advance, at least not officially, they rarely turned out substantially different from the average interest rate for the relevant period. In view of

<sup>4</sup> The magnitudes of the figures reflect the fact that over the period covered, Turkey’s annual inflation rate hovered around 60 percent.

the rhetoric of Islamic banks, this is quite striking. But it is hardly surprising once one recognizes that the “profit shares” are supported, like the interest payments of conventional banks, by interest-bearing assets.

Even some very prominent Islamic economists now acknowledge that the Islamic banks are avoiding the risky investments their charters require them to make. Ahmed al-Naggar, an Egyptian banker whom Islamic economists credit with founding the first Islamic bank, characterizes the existing Islamic banks as terrible failures. Their operations differ only cosmetically, he says, from those of conventional banks. Indeed, only a minuscule portion—generally well under 5 percent—of the assets of Islamic banks consists of loans based on genuine profit and loss sharing.

By far their most common financing method is *murābaha*, which is formally equivalent to the resale contracting used in various parts of the world, even in places where interest avoidance is not an issue, to take advantage of differences in tax rates. Let us say a cash-poor industrialist needs a new computer. His Islamic bank buys the computer, marks up its price, and then transfers to him the computer’s ownership; in return, our industrialist agrees to pay the bank the marked-up price in a year’s time. If the predetermined markup rate were identical to the prevailing interest rate, this *murābaha* contract would be essentially equivalent to an interest-based contract. But there would still be one difference, which Islamic economics considers critical: during the period when the computer was owned by the bank, the bank would carry all the risks of ownership, including those of theft, fire, and breakage. In practice, however, the bank’s ownership generally lasts just a few seconds, so its exposure to risk is negligible. Ordinarily, therefore, *murābaha* serves as a cumbersome form of interest.

Why have the Islamic banks been using a financing method that is equivalent to interest? Recognizing that they lack the skills to distinguish adequately among good and bad investment opportunities, they fear that if they lend on the basis of profit and loss sharing they will make many bad choices, possibly ending up with more losses than profits. They fear, moreover, that industrialists with high expected returns will borrow from conventional banks (to maximize their returns in the likely event of success), while those with low expected returns will favor profit and loss sharing (to minimize their losses in the likely event of failure).

In addition to this adverse selection problem, the Islamic banks face a serious information problem. In countries where Islamic banks have achieved the greatest prominence, firms that would be natural candidates for profit and loss sharing are ordinarily highly secretive about their costs and revenues, lest information about their actual profits reach the government’s tax department. But without access to the borrower’s true accounts, as opposed to those concocted for tax purposes, the Islamic banks fear that if they lend on the basis of profit and loss sharing they will experience unsustainably high losses. The information problem becomes all the more serious insofar as the borrowing firm pursues numerous activities within a multidivisional structure. If the division that uses the computer purchased through borrowed funds incurs heavy losses, while during the same period the firm’s other divisions enjoy huge profits, what is the bank’s appropriate return under a profit



or loss sharing contract? In principle, the method for computing the return could be negotiated in advance, but even in the absence of double bookkeeping the firm will be tempted to apportion its costs and revenues among its divisions to minimize its repayments to the bank. If the firm keeps two sets of accounts, the scope for such opportunism is all the wider.

Remarkably, the Islamic banks are shunning profit and loss sharing even in the presence of huge tax incentives. In Turkey, the government taxes interest income, including income from *murābaha*, at 48 percent. By contrast, equity income, including income from profit and loss sharing, is tax-free (Çizakça, 1993). Evidently, even such a large incentive fails to compensate for the drawbacks of profit and loss sharing.

Even though the Islamic banks pay and receive interest as a matter of course, certain ones have shown some creativity. For example, several of those located in the United States now offer interest-free mortgage opportunities. Under an interest-free mortgage contract, the homeowner pays rent to the Islamic bank that helped finance his home. As with a conventional mortgage, the rent has two components, one that transfers equity from the bank to the homeowner and another that yields the bank income. The difference is that the home's value is reassessed periodically and, if necessary, rental payments adjusted. The homeowner's rent grows when the real estate market is booming, and it shrinks when the market is depressed. Consequently, the risk of buying a home on credit gets shared by the owner and the mortgage lender, rather than falling essentially on the former. Were the owner to default on his payments, the Islamic bank would sell the home, and the proceeds would be split according to the prevailing ownership shares. The owner would thus lose none of his accumulated equity, as he might under a standard mortgage plan (Brown, 1994).

Next to Islamic banking, the most salient practical achievement of Islamic economics has been the establishment of government-run *zakāt* systems in six countries: the Yemen Arab Republic, Saudi Arabia, Malaysia, Libya, Pakistan, and the Sudan. These systems vary greatly in both collection and disbursement, even though their architects all claim to have abided by the principles of the original *zakāt* system in seventh-century Arabia. Whereas *zakāt* was levied originally only on individuals, some modern systems extend the obligation to firms. In some countries, various modern financial assets, including bank deposits, are subject to *zakāt*. Some systems allow producers to take deductions for costs, like those on synthetic fertilizers, for which classical Islamic law makes no allowance. The burden of *zakāt* falls primarily on farmers in some places, mainly on urban residents in others. A notable consequence of the various innovations is that no established system resembles any other (Kahf, 1990).

Although some Islamic economists have touted *zakāt* as an unmatched instrument for inequality reduction, none of the official *zakāt* systems has put a significant dent in poverty (Kuran, 1993). In Pakistan, for example, just 10 percent of the individuals below the country's poverty line receive between \$4 and \$8 a month, which is well under the \$22 needed for subsistence. There are three

reasons why the equalizing effect of *zakāt* has been disappointing. First, *zakāt* revenue is limited everywhere by low rates, vast loopholes, and widespread evasion. Second, the costs of administering the system, including losses due to official corruption, have been high. Finally, large shares of the raised revenue are going to finance causes other than poverty reduction, including religious education and pilgrimages to Mecca.<sup>5</sup>

*Zakāt* per se is not a novelty in the modern Islamic world. Wherever Muslims live, including places currently without an official *zakāt* system, there have always existed pious individuals making voluntary annual payments to persons, private collection agencies, or causes of their choosing. Where the above-mentioned six countries stand out is in their efforts to turn *zakāt* into a state-administered redistribution system under which the nonpoor make obligatory payments. At least in recent times, voluntary transfers have been quite limited.<sup>6</sup> And although there exist numerous examples of social services financed partly, if not mainly, through voluntary *zakāt* contributions, huge segments of the poor have been benefiting negligibly from *zakāt* transfers, if at all.<sup>7</sup> Voluntary *zakāt* has been benefiting primarily people with appropriate economic connections, tending to pass over the truly destitute and the unemployed.<sup>8</sup>

However, it is not clear that inequities are any less serious under obligatory *zakāt*. Various studies of the recently established obligatory systems show that the beneficiaries of state-sponsored *zakāt* are not always, or even mainly, the poor.<sup>9</sup> In fact, there exist places where the recipients of *zakāt* assistance tend to be wealthier than the typical contributor, and even entire impoverished regions where no one gets any support. It appears, moreover, that the essential difference between the voluntary and obligatory systems lies in the connections to which *zakāt* confers value. Where voluntary *zakāt* enhances the value of economic connections, obligatory *zakāt* benefits political connections, particularly ones related to religion. Under the voluntary system, the surest way to benefit from *zakāt* is to have a wealthy employer. Under the obligatory system, it is to live in a politically sensitive city, to work for the *zakāt* administration, or to enroll in a religious school (Kuran, 1993; Novossyolov, 1993).

<sup>5</sup> See Kuran (1993) for evidence from several countries. Novossyolov (1993) offers additional evidence from Pakistan.

<sup>6</sup> A 1978 survey of middle-class Muslims in Karachi found that fewer than a quarter made regular *zakāt* payments to the poor.

<sup>7</sup> See Sullivan (1994) for an analysis of Egyptian private associations that deliver services to the poor, including many that do so in the name of Islam.

<sup>8</sup> The motives for making *zakāt* payments have included, in addition to charity and religious duty, the encouragement of worker loyalty and the promotion of social conformity. According to one study, in parts of Malaysia it was customary for landowners to make *zakāt* payments to their workers who stayed with them in times of peak labor demand. Moreover, the landowners would vary their payments according to their workers' respectability, as measured by obedience, demeanor, and political views (Scott, 1985).

<sup>9</sup> See, for example, Mustapha (1987), Zahid (1989), and Permanent Commission of Islamisation of Economy (1989).

The obligatory *zakāt* systems established in recent decades have bred resentment, partly because of their widely recognized inequities, and partly because payers like to have some say in how their contributions are spent. This observation is borne out by findings that most *zakāt* payers would rather make their donations to private charities, if not directly to individuals of their own choice (Ghazali et al., 1990; Mohammad, 1990).

The third major objective of Islamic economics, the reader will recall, has been to inculcate Muslims with behavioral norms drawn from the classical sources of Islam. In most countries, efforts to implement this objective have been limited to publications, educational programs in the mass media, and the incorporation of Islamic economics into school curricula. Only in Iran have efforts gone much further. Following the revolution of 1978–79, Islamic councils (*shūrā*) were set up at Iranian factories and offices, partly to monitor the atmosphere for violations of Islamic morality. The councils have been promoting public prayers, enforcing gender segregation, and serving as watchdog agencies to suppress opposition to the Islamic regime. There is no evidence that such measures have brought about the behavioral changes envisioned in Islamic texts. Nor is there evidence from any other country that the emphasis on Islamic morality has altered work patterns or business relations, although variations in such factors as honesty, generosity, and work effort are notoriously difficult to measure. If the incessant complaints found in textbooks of Islamic economics provide any indication, the Islamic moral agenda has neither made business relations palpably more honest nor improved the level of trust among traders.

One reason why the moral campaign of Islamic economics appears to have been ineffective is that the practical implications of its teachings are often ambiguous. Because fairness is a relative concept, business partners committed to the Islamic principle of fairness may differ sharply over the just division of their joint profits. An equally important reason for the ineffectiveness of the moral campaign is that the fundamental sources of Islam are silent on many dimensions of a modern economy. The Qur'an contains verses that address issues such as distribution and pricing, but it is not, after all, a treatise in economics. The traditions of early Islam (*Sunna*), rich as they are in commentary concerning such matters as contracting, taxation, property rights, and inheritance, do not speak to every contemporary issue. Finally, the early Muslims whose words and deeds turned into sacred traditions were not economic theorists; they were gifted leaders trying to cope with the problems of their rapidly expanding community. A practical consequence of basing the normative framework of Islamic economics on the Qur'an and the Islamic traditions is that contemporary Muslims, even the devout, are liable to reach sharply different conclusions regarding the properly Islamic solution to an economic problem (Kuran, 1989).

Even within Islamic economics itself, there are many controversies. There exist two Islamic views on loan repayments under inflation, one that prescribes indexation and another that prohibits it. Significantly, the rival views rest on the same justification, namely, that interest is unjust. The supporters of indexation want

society to abide by what they consider the spirit of the ban on interest; the opponents want society to implement the letter of the ban. For another example, although there is near-agreement that Islamic economics stands for limited private property rights, Islamic economists differ greatly in regard to the specific limits that they favor. On the grounds that Islam prohibits extravagance, ostentation, and extreme inequality, some Islamic economists advocate measures aimed at radical equalization. Others argue that it is legitimate to accumulate great wealth, provided the requisite *zakāt* payments are made faithfully and the means of accumulation are honest and just. Yet another area of disagreement involves pricing. While many Islamic economists favor leaving the determination of prices to market forces, there exist Islamic approaches that advocate some form of bureaucratic control. For example, in the Just Order (*Adil Düzen*) advocated by Turkey's main Islamic opposition party, sellers of a product would have to charge the same price throughout the country, regardless of variations in delivery cost and local demand. Moreover, wage and profit rates would be determined "scientifically" by scholars steeped in Islamic tradition (Erbakan, 1991).

Nowhere are the divisions within Islamic economics clearer than in Iran, where advocates of Islamization have differed greatly on such matters as private property, profits, wages, labor laws, trade, and development strategy (Behdad, 1994). At one extreme, leaders of the Mojahedin Khalq Iran have advocated vast redistribution to achieve a classless society—one that would depart from Western visions of socialism only in its rejection of atheism. At the other extreme, an Islamic research center in Qum has promoted the view that all property acquired through legitimate means should enjoy the full protection of the law. One of the center's publications, *Introduction to Islamic Economics*, holds that social conflicts and inequalities are unavoidable. Notwithstanding its biting criticisms of capitalism, it proposes sharp restrictions on state activism, including limitations on workplace and child labor regulations. In a move that libertarians would applaud, the book even argues that the Islamic injunction against excessive consumption puts no limit on wealth accumulation. Citing examples of revered early Muslims who wore fine clothes and ornaments, it argues that luxurious consumption is often a sign of good economic judgment.

The fact that Islamic economics features divisions over basic economic matters like property rights and state regulation practically guarantees the existence of groups that will consider the prevailing economic structures un-Islamic. Compounding the problem is that the economic structures imposed in the name of Islam have exhibited substantial variation over both time and space. Almost two decades after the Libyan leader Muammar Qaddafi began implementing the version of "Islamic socialism" described in his *Green Book* (Qaddafi, 1980), he took measures that rescinded his most critical directives. For example, having pursued economic self-sufficiency and abolished private property, he abrogated the state monopoly on foreign trade and started privatizing state enterprises. Both the original reforms and the subsequent U-turns have been sources of popular discontent (Vandewalle, 1991).

## **The Emerging Islamic Subeconomy**

Nothing I have said so far explains why Maududi's call for economic Islamization has been heeded. His following among academics is attributable, perhaps, to the readiness with which intellectuals embrace reformist causes. But what is one to make of the practical successes of Islamic economics? It is one thing to promote the idea of an Islamic bank, another to raise the capital to implement the idea, and still another to find depositors and borrowers who will keep the bank in business. Likewise, it is one thing to propose making *zakāt* obligatory, but quite another to organize thousands of local committees to carry out a redistribution program encompassing millions of households. If the new institutions promoted by Islamic economists have not brought about major substantive changes, why have they generated so much excitement and participation?

Part of the answer is that certain Islamic reforms have been pursued by politicians eager to demonstrate a commitment to Islamic ideals. In Pakistan and Iran, among other countries, politicians known to have reservations about Islamic economics have contributed to the adoption, and then the retention, of a ban on interest. Yet Islamic banking has emerged and grown also in countries where conventional banking remains legal. What explains why the Islamic banks in such countries, too, have managed to attract deposits?

It is important to recognize that banks are not the only firms that claim an Islamic identity. Many places now feature nonfinancial enterprises that advertise their operations as Islamic. One finds, for example, Islamic grocery stores that avoid dealing in liquor; Islamic boutiques that carry neither miniskirts nor bikinis; and Islamic theaters that make a point of conforming to religious sensibilities. There also exists a huge array of other firms, including some conglomerates, that consider themselves Islamic simply on the grounds that they shun interest, abide by Islamic norms, and make conscious efforts to support and promote Islamic causes (El-Ashker, 1987). One way that such companies contribute to Islamic causes is by being partial to other Islamic firms. Thus, an Islamic manufacturer of plastics will keep accounts at an Islamic bank and turn to an Islamic builder for its remodeling needs. In addition, the manufacturer will channel some of its profits to Islamic charities, schools, and political organizations.

Linked as they are by special relationships, the Islamic enterprises collectively form a subeconomy within the broader economy of the country in which they are located. Research on the Islamic subeconomy is in its infancy. It appears, however, that its constituent firms do business much like their secular counterparts. Islamic firms seem to seek profits as aggressively as firms without a religious identity, to enjoy no advantages or disadvantages in regard to quality control, and to be as productive.

Two factors, each rooted in rapid socioeconomic change, have contributed to the emergence of an Islamic subeconomy in various predominantly Muslim countries. The first has to do with the feelings of guilt experienced by industrialists, shopkeepers, and professionals trying to get ahead in societies where the prevailing

social standards of honesty and dependability fall short of their own personal standards. The Islamic world has been urbanizing rapidly against the backdrop of inefficient legal systems that hinder the enforcement of private contracts. Explosive population growth has aggravated the enforcement problem, both by making it increasingly difficult to control official corruption and by turning traders into mutual strangers. Business relations thus suffer from widespread mistrust. Under the circumstances, it has become a growing challenge to succeed in business, industry, or the professions without bribing government officials, breaking laws, and deceiving one's business partners. To stay afloat, individuals are reluctantly making themselves part of the moral rot they find offensive. Especially for those who grew up in small communities enjoying high standards of honesty and dependability, these compromises give rise to guilt.

Various psychological experiments show that guilt-ridden people will take actions to alleviate their guilt (Rushton, 1980). In one set of experiments, randomly selected shoppers who were led to believe that they broke a camera showed a much greater eagerness than shoppers in the control group to help the victim of a staged accident. These experiments suggest that Muslims who behave in ways they consider un-Islamic will strive to rehabilitate themselves by going out of their way to bring religion into their daily routines. To such guilt-ridden Muslims, an Islamic subeconomy offers an array of opportunities for relief. By holding an Islamic bank account, shopping whenever possible at Islamic stores, and donating to Islamic causes, an industrialist can achieve the feeling that he is doing his best to live as a good Muslim, despite the unfavorable social conditions. He can alleviate his guilt also by assuming an Islamic identity for his own business.

There is nothing unique, of course, about the just-described consequences of immoral economic behavior. History is replete with examples of schools, religious buildings, and works of art financed by individuals whose wealth was acquired in ways they would have been loath to publicize. For example, the early universities of the United States benefited handsomely from fortunes amassed, partly through morally questionable means, by the builders of the early American railroads. The ongoing efforts to build an Islamic economy are partly driven, then, by the very same motives that helped construct the huge endowments of some major American universities.

The second factor that has fueled economic Islamization is that an Islamic subeconomy helps its participants cope with the prevailing adversities by fostering interpersonal trust. Insofar as individuals do business within networks of people who know and trust each other, they reduce their costs of negotiating, drafting, monitoring, and enforcing agreements; relative to people who must constantly guard against being cheated, they incur lower transaction costs (Williamson, 1985). Yet newcomers to a growing and increasingly impersonal metropolis like Cairo or Istanbul do not have access, at least not immediately, to the most lucrative of the existing networks, if only because they lack the requisite education, connections, and social etiquette. They have access only to networks built on ties of kinship and regional origin—networks whose members tend to be poor, inexperienced, and

politically powerless. The Islamic subeconomy enables these newcomers to establish business relationships with a diverse pool of ambitious, hard-working, but culturally handicapped people who, like themselves, are excluded from the economic mainstream. Their shared commitment to Islam, even if partly feigned, keeps many of their activities within social circles in which information about dishonest behavior spreads quickly, thus providing a basis for mutual trust. Their costs of doing business are lower, therefore, than they might have been, and their opportunities for economic advancement correspondingly greater.

To sum up, the prevailing standards of interpersonal trust provide a constituency for Islamic economic institutions through two channels, one psychological and the other economic. They create a need for guilt relief, and they make the economically insecure seek a vehicle for forming networks based on trust. These observations imply that until the conditions for greater trust in business relations get restored and traders regain efficient means for dispute resolution, there will be a continuing demand for the services provided by the Islamic subeconomy (Kuran, 1996).

## **The Significance of Islamic Economics**

This brings me, finally, to the matter of evaluating the impact of the economic activities undertaken in the name of Islam.

From a narrowly economic standpoint, the Islamic subeconomy is not a source of inefficiency. On the contrary, it is providing palpable benefits that secular economic agencies and institutions are failing to provide. Although its constituent enterprises have hardly revolutionized economic relations, they are delivering meaningful services to groups with special needs, including individuals wishing to borrow or lend in accordance with their religious values, those in need of guilt relief, and those seeking to establish economic networks.

If Islamic economic activities are also a source of social harm, the reason lies in their political effects, including their possible effects on future economic policies. Islamic enterprises provide financial support to fundamentalist political parties and organizations that seek to restrict social, economic, and cultural interactions between Muslims and non-Muslims. They enhance the perceived strength of Islamic fundamentalism, thus discouraging resistance from antifundamentalists and inviting religious activists to press new demands. Finally, they support the claims and promises of Islamic fundamentalism, because successful Islamization in one domain lends credibility to Islamization efforts in other domains. Such effects are alarming, of course, only insofar as one considers Islamic fundamentalism a threat.

The significance of the concrete steps taken to give economies an Islamic character lies only partly, then, in their economic content. Much of their importance lies in their symbolism, in their implications for the distribution of political power, and in their cultural meaning. Remember in this connection that Maududi's aim was not to galvanize a radical shift in economic thought or to unleash a revolution

in economic practices. His aim was to reassert Islam's importance as a source of guidance and inspiration, and to reaffirm its relevance to modern life. From the standpoint of these objectives, the ongoing economic activities represent a remarkable accomplishment. They defy the common separation between economics and religion. They invoke Islamic authority in a domain that modern civilization has secularized. And by promoting the distinctness of Islamic economic behavior, they help counter foreign social influences.

Like the practical economic steps that are identified as Islamic, the discipline of Islamic economics has contributed to the advancement of Maududi's objectives. But its influence has stemmed less from its substance than from the cultural statement that it delivers. Islamic economics does not offer a comprehensive framework for a modern economy; for all its grand claims, it presents a package of loosely connected policies rather than a complete blueprint for reform. Its proponents support many of their positions through selective quotations from scripture, leaving it open to the charge that an Islamic justification may be found for a wide variety of mutually inconsistent policies.<sup>10</sup> Yet another problem is that it fails to provide a well-defined and operational method of analysis. Islamic economics is mostly prescriptive, and where efforts are made to give it analytical power, it loses much of its Islamic character. As a case in point, the studies that explore the operation of an interest-free economy tend to rely on a standard general equilibrium model featuring no Islamic motif except a restriction on interest (Khan and Mirakhor, 1987). Most strikingly, the agents that populate these models are replicas of *homo economicus*, the *bête noire* of every general treatise on Islamic economics. The analytical weaknesses of Islamic economics also show up in its comparisons of alternative systems. The Islamic economists tend to contrast the *actual practices* of the systems they want to discredit with the *ideal operation* of their favored alternative.

Even though the practical and intellectual developments discussed here have contributed to Maududi's objectives, they have not flowed from an integrated agenda. The forces responsible for the Islamic subeconomy include needs that played no role in the growth of Islamic economics. These needs could have been met through policies and institutions without religious significance. If religion did enter the picture, this is largely because in countries where Islamic economic structures have become conspicuous, Islam provides a readily available, widely meaningful, and historically important source of moral justification. Insofar as this observation is correct, Islamic economics must matter to participants in the Islamic subeconomy less because of its economics than because of its Islamic character.

<sup>10</sup> A few Islamic economists, notably Naqvi (1981), are sympathetic to this criticism. Characterizing the prevalent methodology as seriously flawed, they wish to reconstruct Islamic economics on the basis of axioms drawn from the Qur'an. The axiomatic approach enjoys little acceptance, however, partly because the diversity of opinion within Islamic economics allows both theoreticians and policymakers to adapt to virtually any exigency without stepping outside Islamic discourse. The diversity did indeed prove useful to the wider Islamic movement when, prior to the Iranian Revolution, economic controversies within the Iranian wing of Islamic thought allowed the Ayatollah Khomeini to appear at once as an egalitarian redistributionist to the poor and as a defender of property rights to the rich (Behdad, 1994).



There are observers, however, for whom the significance of Islamic economics has everything to do with the substance of its economics. Murat Çizakça, a Turkish professor of economics, believes that a major factor in the Islamic world's economic backwardness has been the inadequacy of credit opportunities for entrepreneurs. The development of the Islamic world will thus require, he argues, the establishment of vast numbers of venture capital firms—firms that will provide funds to promising companies in return for some of their shares (Çizakça, 1993). He maintains, moreover, that the stated principles of Islamic banking are precisely those of venture capitalism. Like venture financiers, Islamic banks are supposed to participate in the risks of the firms they finance. As one might expect, Çizakça is highly critical of the current practices of Islamic banks. Instead of trying to differentiate themselves from conventional banks through symbolism, he says, the Islamic banks should be in the vanguard of genuine venture capitalism. Çizakça makes clear that his argument is grounded in economic facts and logic rather than in religion. Significantly, some of his supporters have invited the Islamic banks to stop characterizing their operations as “Islamic” and to get on with the business of genuine financial innovation.

Coming a half-century after Maududi launched Islamic economics, Çizakça's agenda amounts to the secularization of Islamic banking. Recent years have also witnessed calls to reform the established obligatory *zakāt* systems and to reformulate the economic ethics of Islam in the light of contemporary economic realities, needs, and knowledge. Certain influential Islamic economists have acknowledged that efforts to extract a new economic paradigm from religious scripture are liable to end in failure, as are efforts to develop economic institutions unique to Islamic civilization. Muhammad Nejatullah Siddiqi (1994), one of the most prolific and most widely read Islamic economists, has written: “The craving for a *de novo* discipline of Islamic economics is ill-conceived. No such thing is possible. The key to Islamic economics lies in positioning the Islamic vision in place of the Anglo-Saxon economic vision. But the Islamic economic vision has to be universal and contemporary, not chauvinistic and medieval.”

It remains to be seen whether the most significant legacy of Islamic economics will be the impetus that it gives to overcoming Muslim suspicions of ideas and institutions associated with the West; or its contribution to the political agenda of Islamic fundamentalism; or the comfort it gives to individuals trying to fit into the modern urban economy; or its revitalization of the goal, taken for granted by leading Muslim thinkers during much of the twentieth century, of keeping economic ideas, practices, policies, and institutions outside the realm of religion.

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## References

- Afzal-ur-Rahman, *Economic Doctrines of Islam*. 2nd ed., 3 vols. Lahore, Pak.: Islamic Publications, 1980.
- Ahmad, Khurshid, and Zafar Ishaq Ansari, "Mawlana Sayyid Abul A'la Mawdudi: An Introduction to His Vision of Islam and Islamic Revival." In Ahmad, K., and Z. Ansari, eds., *Islamic Perspectives: Studies in Honour of Mawlana Sayyid Abul A'la Mawdudi*. Leicester, U.K.: Islamic Foundation, 1979, pp. 359–84.
- Ahmed, Ziauddin, Munawar Iqbal, and M. Fahim Khan, eds., *Fiscal Policy and Resource Allocation in Islam*. Islamabad: Institute of Policy Studies, 1983.
- Behdad, Sohrab, "Property Rights in Contemporary Islamic Economic Thought: A Critical Perspective," *Review of Social Economy*, Summer 1989, 47, 185–211.
- Behdad, Sohrab, "A Disputed Utopia: Islamic Economics in Revolutionary Iran," *Comparative Studies in Society and History*, October 1994, 36, 775–813.
- Brown, Ken, "Islamic Banking: Faith and Creativity," *Los Angeles Times*, April 8, 1994, C1, C6.
- Chapra, M. Umer, *Islam and the Economic Challenge*. Leicester, U.K.: Islamic Foundation, 1992.
- Çizakça, Murat, *Risk Sermayesi, Özel Finans Kurumları, ve Para Vakıfları*. Istanbul: İlmî Neşriyat, 1993.
- Cowen, Tyler, and Randall Kroszner, "Mutual Fund Banking: A Market Approach," *Cato Journal*, Spring/Summer 1990, 10, 223–37.
- El-Ashker, Ahmed Abdel-Fattah, *The Islamic Business Enterprise*. London: Croom Helm, 1987.
- Erbakan, Necmettin, *Adil Ekonomik Düzen*. Ankara, Turk.: Refah Partisi, 1991.
- Ghazali, Aidit bin, et al., "Zakāt: A Case Study of Malaysia," paper presented at the Third International Zakāt Conference, Kuala Lumpur, May 1990.
- Islamic Research and Training Institute, *A Bibliography of Islamic Economics*. Jeddah, Saudi Arabia: Islamic Development Bank, 1993.
- Ismail, Abdul Halim, "The Teaching of Islamic Economics: The Practitioner's Point of View," paper presented at the Workshop on the Teaching of Islamic Economics, International Islamic University, Malaysia, July 1990.
- Kahf, Monzer, "Applied Institutional Models for Zakāt Collection and Distribution in Islamic Countries and Communities," paper presented at the Third International Zakāt Conference, Kuala Lumpur, May 1990.
- Khan, Mohsin S., and Abbas Mirakhor, eds., *Theoretical Studies in Islamic Banking and Finance*. Houston: Institute for Research and Islamic Studies, 1987.
- Köfteoğlu, Fehmi, "Kapitalist Sistemde Ahlaki Kilit: İslam Ekonomisi," *İktisat Dergisi*, July 1994, 30, 26–35.
- Kuran, Timur, "Behavioral Norms in the Islamic Doctrine of Economics: A Critique," *Journal of Economic Behavior and Organization*, December 1983, 4, 353–79.
- Kuran, Timur, "On the Notion of Economic Justice in Contemporary Islamic Thought," *International Journal of Middle East Studies*, May 1989, 21, 171–191.
- Kuran, Timur, "The Economic Impact of Islamic Fundamentalism." In Marty, Martin, and R. Scott Appleby, eds., *Fundamentalisms and the State: Remaking Politics, Economies, and Militance*. Chicago: University of Chicago Press, 1993, pp. 302–41.
- Kuran, Timur, "Fundamentalist Economics and the Economic Roots of Fundamentalism: Policy Prescriptions for a Liberal Society." In Marty, Martin, and R. Scott Appleby, eds., *Fundamentalisms and Public Policy*. Chicago: University of Chicago Press, forthcoming 1996.
- Maududi, Sayyid Abul A'la, *The Economic Problem of Man and Its Islamic Solution*. Lahore, Pak.: Islamic Publications, 1975; original Urdu edition, 1947.
- Mohammad, Faiz, "Relationship Between Official Zakāt Collections and Voluntary Payments to Charitable Organizations," paper presented at the Third International Zakāt Conference, Kuala Lumpur, May 1990.
- Moore, Clement Henry, "Islamic Banks and Competitive Politics in the Arab World and Turkey," *Middle East Journal*, Spring 1990, 44, 234–55.
- Mustapha, Nik, Bin Hj. Nik Hasan, "Zakāt in Malaysia—Present and Future Status," *Journal of Islamic Economics*, August–September 1987, 1, 47–75.
- Naqvi, Syed Nawab Haider, *Ethics and Economics: An Islamic Synthesis*. Leicester, U.K.: Islamic Foundation, 1981.
- Nasr, Seyyed Vali Reza, *The Vanguard of the Islamic Revolution: The Jama'at-i Islami of Pakistan*. Berkeley: University of California Press, 1994.
- Novossyolov, Dimitri B., "The Islamization of Welfare in Pakistan." In Eickelman, Dale F., ed., *Russia's Muslim Frontiers: New Directions in Cross-Cultural Analysis*. Bloomington: Indiana University Press, 1993, pp. 160–74.

**Permanent Commission of Islamisation of Economy (Pakistan)**, "Improvement in the Nizam-e Zakāt and Ushr for Achieving Its Declared Objectives of Removing Abject Poverty and Eradication of Beggary from the Country," February 1989.

**Posner, Richard A.**, "A Theory of Primitive Society with Special Reference to Law," *Journal of Law and Economics*, April 1980, 23, 1–53.

**Qaddafi, Muammar**, *The Green Book*. Tripoli, Libya: The Green Book World Center for Research and Study, 1980; original Arabic edition, 1976–79.

**Rahman, Fazlur**, "Ribā and Interest," *Islamic Studies*, March 1964, 3, 1–43.

**Ray, Nicholas D.**, *Arab Islamic Banking and the Renewal of Islamic Law*. London: Graham and Trotman, 1995.

**Rodinson, Maxime**, *Islam and Capitalism*. New York: Pantheon, 1973; original French edition, 1966.

**Rushton, J. Philippe**, *Altruism, Socialization, and Society*. Englewood Cliffs, N.J.: Prentice-Hall, 1980.

**Sadr, Muhammad Baqir**, *Iqtisaduna: Our Economics*. 4 vols. Tehran: World Organization for Islamic Services, 1982–84; first Arabic edition, 1961.

**Scott, James C.**, *Weapons of the Weak: Everyday*

*Forms of Peasant Resistance*. New Haven: Yale University Press, 1985.

**Siddiqi, Muhammad Nejatullah**, *The Economic Enterprise in Islam*. Lahore, Pak.: Islamic Publications, 1972.

**Siddiqi, Muhammad Nejatullah**, *Muslim Economic Thinking: A Survey of Contemporary Literature*. Leicester, U.K.: Islamic Foundation, 1981.

**Siddiqi, Muhammad Nejatullah**, "Nature and Methodology of Islamic Political Economy," paper presented at the International Workshop on Islamic Political Economy in Capitalist Globalization, Universiti Sains Malaysia, December 1994.

**Sullivan, Denis**, *Private Voluntary Organizations in Egypt: Islamic Development, Private Initiative, and State Control*. Gainesville: University Press of Florida, 1994.

**Vandewalle, Dirk**, "Qadhafi's 'Perestroika': Economic and Political Liberalization in Libya," *Middle East Journal*, Spring 1991, 45, 216–31.

**Williamson, Oliver E.**, *The Economic Institutions of Capitalism*. New York: Free Press, 1985.

**Wilson, Rodney**, "Retail Development and Wholesale Possibilities." In Wilson, Rodney, ed., *Islamic Financial Markets*. London: Routledge, 1990, pp. 7–18.

**Zahid, Shahid N.**, "The Zakāt and Ushr System in Pakistan," report prepared for the World Bank, Karachi, August 1989.



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