

# Epistemology of Finance

*Whether it be the question of philosophy of science, epistemology, ethics, philosophy of language or the relation between man and God, free will and determinism, causality or other philosophical questions with which various European and American philosophers have been struggling during the last few centuries, the vast intellectual tradition of Islam has provided answers of enduring validity.*

—Seyyed Hossein Nasr (1993)

**A**s with natural science, which refers to the branch of knowledge that concerns itself with the material world, finance is the discipline that deals with the properties of the financial system. The contents of Islamic finance may be better understood with respect to epistemological questions that arise also with respect to conventional finance: what is known, how this knowledge is acquired, and what determines its accumulation in this discipline. This chapter argues that there are fundamental differences in the sources of knowledge, and that there are some common epistemological threads between conventional finance and Islamic finance. It is essential to consider the notion of rationality in the behavior of economic agents, but it is also important to understand the full complexion of finance in relation to morality and justice. It is indeed the concepts of “general rules of morality,” a “sense of justice,” “natural justice,” and “natural equity” that underlie Adam Smith’s theses about competitive economy. Additionally, Islamic finance derives its moral and ethical standards from the teachings of Islam, which provide a code of conduct for the behavior of financial

markets and institutions. The conventional financial system is derived from the economic system, which is the product of the socio-political-economic system. The ideal conventional system can be traced back to the treatises of Adam Smith, which go beyond the ideas contained in *The Wealth of Nations* (which is widely regarded as marking the beginning of modern economics). These epistemological roots can be traced back to his earlier work, *The Theory of Moral Sentiments*. The Arrow-Debreu model of general equilibrium that embodies Adam Smith's vision of a competitive economy also provides a theoretical framework for risk sharing. The ideal Islamic finance system also proposes a set of risk-sharing instruments that cover the full spectrum of risk–return profiles, which facilitate the optimal risk allocation function of the financial sector within an Islamic economy. This economy is characterized by an institutional structure that is derived, epistemologically, from Islamic teachings as operationalized by the Noble Messenger (*saws*) and includes also a code of behavior for market participants. This institutional framework ensures, among other things, property rights protection, good governance, and contract enforcement. Islamic finance allows for an optimal allocation of risk through risk-sharing mechanisms, where the rewards on financial transactions are derived from the real economy and where risk and return cannot be divorced.

It can be thus argued that there are three central threads running through the ideal Islamic finance and ideal conventional finance: (1) consistency with human nature, (2) existence of a moral and justice system essential to long-term social and economic sustainability, and (3) optimal allocation of resources based on the risk-sharing mechanism. The rethinking of financial architecture following the onset of financial crises, as well as the emergence or re-emergence of Islamic finance may be better understood against their epistemological backgrounds. It can be argued that the inception of the Islamic finance industry over the past few decades has been in response to a “market failure” to meet the demand for *Sharīa'h*-compliant ways of financing. The development of Islamic finance reflects, in part, the need expressed over the years by Muslim scholars not only for the elimination of interest-based contracts, but also for their substitution with risk-sharing instruments. The Kuala Lumpur Declaration of October 2012 by participants at the Second Strategic Roundtable Discussion, including prominent scholars in *Sharīa'h* and Islamic economics, indeed considers risk sharing as the essence of Islamic finance. The resurgence of Islamic finance was rather the result of efforts by practitioners to develop financing instruments with the dual purpose of meeting *Sharīa'h* requirements and remaining familiar to market players in the conventional finance. Whereas Islamic finance emphasizes the completeness of contracts, in the sense that parties to the contract should share expected profits as well as potential losses, conventional finance is more oriented toward risk transfer and risk-shifting

transactions. It can thus be argued that conventional finance provided the platform for the emergence of Islamic finance, and it is the incompleteness of markets and contracts for risk allocation that may in part explain this development.

This chapter addresses the main issues related to the epistemology of finance, drawing in part from earlier work by Mirakhor (2011), Mirakhor and Smolo (2011), and Mirakhor and Bao (2013). It includes also new perspectives about the rethinking of conventional economics, the institutional structure, the essence of risk sharing, and the role of government in the promotion of risk sharing. This chapter examines, first, the epistemology of an ideal conventional financial system based on the body of knowledge derived from the seminal work by Smith and Arrow. The inherent risks of the conventional financial system in its present architecture, and attempts to converge toward an ideal structure, are also explored. The ideal Islamic financial system is considered in the second part of the chapter. The discussion centers on the institutional structure, which emphasizes the role of contracts of exchange, trust, and markets. The argument is then made that at the foundation of this ideal system lies the risk-sharing mechanism, which allows for an optimal allocation of risk in the society depending on idiosyncratic levels of risk tolerance. Finally, the chapter considers the essential role of equity and stock markets as the ideal instrument and platform for risk sharing and long-term financing of real investment.

## **EPISTEMOLOGY OF AN IDEAL CONVENTIONAL FINANCIAL SYSTEM**

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This section discusses in brief the epistemological roots of the conventional financial system based on the insights of Adam Smith and presents the Arrow-Debreu model of general equilibrium as an analytical conceptualization of Adam Smith's vision of competitive economy. It then considers the potential explanations for the observed divide between the ideal exchange economy and reality. Finally, it provides an account of the ongoing attempts at rethinking the future course and contents of conventional economics and finance.

### **Adam Smith and the System of Morality and Justice**

From the epistemological perspective, the conventional economic system is usually regarded as being founded on the economic principles set forward by the work of Adam Smith. The rules of behavior derived from moral and ethical values, which constitute the foundation of the economic system, are not however described in the revered treatise *The Wealth of Nations* (1776),

but Smith's earlier treatise on ethics *The Theory of Moral Sentiments* (1759). The failure to integrate economics as a moral science, a mathematical science, and a behavioral science in the formal study of economics may explain to some extent the significance of this path divergence. The general rules of morality discussed in *The Theory of Moral Sentiments* constitute the ethical foundations for the economic system envisaged by *The Wealth of Nations*. The foundations of the economic system on the general rules of justice may not lend themselves to exactness and accurate precision, but the role of morality and ethics in the process of development of social organization remains important. Smith (1759) argues that irrespective of the assumptions made regarding the foundations of moral faculties, whether in certain modification of reason, in original instinct, or in other principle of our nature, these moral faculties are certainly given for the purposes of direction of conduct in this life. It is also argued that the rules of morality are also sanctioned by religion before the arrival of the age of artificial reasoning and philosophy. These moral and ethical guiding principles provide the basis for the economic arguments in *The Wealth of Nations* that commerce ought to be a bond of union and friendship between nations and between individuals.

It is argued, as in Fleischacker (2004), among others, that scholars have persistently misread *The Wealth of Nations*. The theory of natural liberty that derives from these treatises is that one is naturally at liberty to pursue one's self interest as long as this conduct does not constitute a violation of the laws of justice. Thus, Fleischacker (2004, 252) argues that Smith "directs practically his entire economic doctrine against the maxims by which 'nations have been taught that their interest consist[s] in beggaring their neighbours.'" This assertion is based on Smith's (1776) arguments in the two opening chapters of *The Wealth of Nations*. It is further noted that, in the discussion of exchange, and implicitly in the explanation of wealth as the outcome of labor division rather than competition over natural resources, "the pursuit of wealth is not a zero-sum game, not a competition in which the success of some must come at the cost of the failure of others, and we are taught throughout that the wealth of one nation, by providing a market for others nation's goods, promotes, rather than obstructs, the wealth of all others nations" (2004, 252).

The conventional wisdom from Adam Smith's notion of "an invisible hand" is that the outcome of the independent pursuance of individual interests is the maximization of the general interests of the society. At the foundation of free market economics is the argument that *laissez-faire* capitalism, in which private actions are guided by private interests, is conducive to the promotion of the social good. This argument is usually regarded as the basis for a moral justification for the pursuit of profit and self-interest. The economic dimension of Adam Smith's thinking, however, cannot be divorced from his jurisprudential, ethical, and moral arguments.

At the conclusion of the sixth part of *The Theory of Moral Sentiments*, Smith (1759, 239) states that “concern for our own happiness recommends to us the virtue of prudence: concern for that of other people, the virtues of justice and beneficence; of which, the one restrains us from hurting, the other prompts us to promote that happiness.” This is indicative of the role of ethical and moral values in the generation of the economic harmony leading to the maximization of social interests. It is important to note that the Arrow-Debreu-Hahn model of general equilibrium, which embodies Smith’s vision of competitive economy, did not ignore or discard the institutional structure of moral sentiments, but it was rather taken for granted. As argued also by Friedman (2005), economic growth does not just rest on moral impetus; it has also moral consequences, as rising living standards affect the moral character of a society, by fostering positive changes in terms of openness, tolerance, and democracy.

In fact, Friedman (2011, 166) contends that despite its solid empirical foundations, “economics from its inception has also been a moral science.” This concept of economics as “a moral inquiry with religious origins” is consistent with Smith’s writings from the perspective of moral philosophy based on religious beliefs that the rules of morality are the commands and laws of the Deity. As argued by Evensky (1993), the essential arguments by Smith, which echo those of Isaac Newton about the principles behind natural order, are based on invisible connecting principles of the human order. This human order is the design of the Law Giver who endowed all humans with the virtues of prudence, justice, and beneficence. These connecting principles are arranged by the benevolent designer, the “Author of nature” (Smith 1759), such that private actions, arguably motivated by a concern for happiness, result in the efficient allocation of resources and increase in the wealth of the nation. The reference to a system of morality and justice in the conception of a social system driven by private interests yet promotive of social interests implies that the notion of order through design is inherent to all human enterprise. There is also recognition of limitations in the degree of self-command, and the ungovernable passions of human nature, but the principal result remains that social order can ideally be achieved through the individual commitment to a coherent system of moral and ethical values based on the virtues of prudence, justice, and benevolence.

### **Arrow-Debreu-Hahn Model of General Equilibrium**

The discussion of an ideal conventional financial system also centers on the concept of general equilibrium in neoclassical economics, which can be regarded as an attempt to provide a rigorous analytical conceptualization of Adam Smith’s vision of competitive economy. The theoretical work by Kenneth Arrow, Gérard Debreu and Frank Hahn, including Arrow (1951, 1953), Arrow and Debreu (1954), Debreu (1959), and Arrow and Hahn (1971)

elaborates the economy–finance nexus for risk sharing in an ideal market economy. The Arrow-Debreu-Hahn competitive equilibrium is derived from the concept of general equilibrium, which was formally rendered by Léon Walras (1874, 1877) with a mathematical modeling of competitive markets for individual commodities. Assuming that consumers and producers participate simultaneously in these commodities markets as price-takers, the price of a commodity in one market contributes to price determination in other markets. The model assumptions imply the existence of a set of prices that allows demand to equal supply for all markets. This equilibrium can be efficient under the conditions that economic agents maximize the utility derived from the purchase of commodities.

It is possible to extend the analysis of market equilibrium as proposed by John Hicks (1939) to the trading of commodities for future delivery. The optimal allocation remains conditional upon the existence of markets for future delivery for all individual commodities and on the formation of price expectations by economic agents. The existence of a pricing kernel that equalizes demand and supply in different markets for future delivery depends, however, on the conditions of homogeneous expectations, where all economic agents hold the same expectations about forward prices. This calls for the strong assumption of perfect foresight, which implies in turn that economic agents are endowed with information about each others' utility and production functions. As noted by Arrow (2013), the realization that resources allocation is driven by forward-looking expectations leaves an important role for uncertainty to play in modeling competitive equilibrium. Uncertainty affects the trade-offs and relative prices that ensure that demand and supply are equal across all markets. Apart from its impact on current markets, uncertainty can also explain the limited availability of futures markets for future delivery, which are characterized by possible changes in tastes, which influence consumption and changes in technology as factor of production.

The incorporation of uncertainty into the general equilibrium model puts into perspective the importance of markets for risk sharing and risk allocation. The neoclassical or Walrasian model, advanced by the work of Arrow, Debreu, and Hahn, provides a *competitive paradigm* based on the interaction between profit-maximizing firms and utility-maximizing consumers. The Arrow-Debreu economy is characterized by the existence of a complete set of competitive markets. The completeness of markets implies the possibility of trading securities that span all goods under all states of nature. The price system allocates risk among economic agents based on payoffs that are contingent on different states of world. The concept of complete markets applies only to an environment of uncertainty, and should not be confused with imperfect or frictionless markets, which apply

invariably under certainty or uncertainty. The completeness of markets under uncertainty implies that there is a market for insurance against risk associated with every contingency.<sup>1</sup> The complete set of markets does not assume or presume that markets are also perfect and frictionless.

The efficient allocation of risk can be achieved theoretically through two approaches, as noted by Allen and Gale (2009). First, it is possible to ensure efficient risk allocation through a complete set of markets for contingent commodities, which are defined by the date and state of nature in which they are delivered. The complete markets allow each consumer to trade the optimal amounts of state-contingent commodities at prevailing prices subject to individual budget constraints. This approach assumes the existence of markets for an unlimited number of contingent commodities for delivery at different dates under different states of nature. The second approach to efficient allocation relies on the existence of Arrow securities, which provide payoffs of one unit of real wealth conditional on the realization of a particular state of nature, and zero in all remaining mutually exclusive states. The existence of Arrow-Debreu securities for all states of nature provides insurance against all contingencies, which implies in turn the possibility of smoothing consumption under all states of nature.

The rigorous analysis by Arrow, Hahn, and Debreu presents a conception of the decentralized competitive economy that Adam Smith envisioned based on the natural liberty to pursue individual interests. The morality and justice system is integral to Adam Smith's thinking, as it renders private actions interdependent. In his reflections on the limits of organization, Arrow (1974) himself acknowledges the importance of institutional structure to promote exchange, which is essential to the optimal allocation of risks and resources. It is argued that given the inevitable tension between the society and the individual due to competing claims, there remains a crucial role for interpersonal relations in the organization of society to (a) regulate the competition for resources and (b) achieve specialization of function. Arrow further argued that trust serves as an "important lubricant of a social system," (1974, 23) but as with other similar values such as truthfulness and loyalty, trade of such a commodity on open markets is neither technically possible nor meaningful. More generally, Arrow (1975, 15) considers the significant role of virtues, including truth, trust, loyalty, and justice, in the operation of the economic system. Several values may be deemed indeed as the requisite or facilitator of the process of exchange. Thus, it may be

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<sup>1</sup>The concepts of uncertainty and risk are used interchangeably in some parts of this chapter, but the important distinction is discussed in Chapter 3 about the analytics of finance.



further argued that these conditions also constitute the basis for complete contract. If both parties trust each other completely, it is possible to enter into a simple contract stipulating that parties “renegotiate” the terms and conditions of the contract should unforeseen contingencies arise.<sup>2</sup> Even in the absence of a “complete contract” that stipulates all states of nature *a priori*, it is the institution of trust and similar virtues that has the potential of preserving the crucial property of state-contingent claims *ex post* basis.

The Pareto optimality conditions achieved under an Arrow-Hahn-Debreu economy with complete markets, under which every individual feels better according to one’s own values, have two fundamental implications. First, the possibility arises for the resolution of uncertainty. It can be shown that uncertainty does not affect the equilibrium pricing of risky assets under certain conditions consistent with Arrow-Debreu economy. Following Ross (1987), these conditions are also consistent with the no-arbitrage arguments that underlie the Modigliani-Miller theorems about the irrelevance of the debt–equity ratio and dividend policy for the firm valuation. Second, given the absence of equilibrium under incomplete markets, it is also possible to improve Pareto optimality through the inception of markets for the trading of new financial securities. The development of markets for derivatives securities, which represent state-contingent claims, can thus be regarded as an attempt to gradually approach and converge toward the completeness of markets.

The theoretical advances in the analysis of general equilibrium by Arrow, Debreu, and Hahn provided the central argument that optimal risk allocation can be achieved through risk sharing. The subsequent development of finance theory provided useful insights into various areas of finance, including investment and financing decisions, portfolio risk diversification, equilibrium asset pricing, and derivatives pricing. But finance theory developed in the footsteps of the general equilibrium analysis relies also, to a large extent, on the assumption of the existence of a risk-free asset, which is arguably not included in the Arrow-Debreu model. The cornerstones of conventional finance are represented by modern portfolio theory by Markowitz (1952 and 1959), the Modigliani-Miller irrelevance theorems about the firm’s capital structure, by Modigliani and Miller (1958a and 1958b), the capital asset pricing model by Sharpe (1964), Lintner (1965),

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<sup>2</sup>It is noted that from the perspective of Islamic finance, which is discussed in following sections, there is also a clear command (*al-Qur’an*, chapter 5 verse 1) that believers must be faithful to the terms and conditions of contracts. This seems to imply faithfulness to the letter and spirit of agreements that could well serve as the first-best approximation of complete contracts.



and Mossin (1966), efficient markets hypothesis by Fama (1970), option pricing theory by Black and Scholes (1973), and arbitrage pricing theory by Ross (1976), among other theoretical propositions.

### **The Divide between an Ideal Image and the Reality**

The optimal mechanism for risk allocation suggested by the Arrow-Hahn-Debreu model of general equilibrium is based on the concept of risk sharing, where predetermined interest rates are not explicitly included in the analysis. The existence of a risk-free asset in the competing theories of asset pricing results in an artificial floor for the equilibrium pricing structures across the financial sector and real economy. Also, the tax-deductibility of interest payments allows debt to change the complexion of the firm valuation. The neutrality of debt-equity financing for firm valuation rests on the restrictive assumptions of perfect and complete markets, but corporate taxes and interest tax-deductibility imply a preference of debt over equity. The Modigliani-Miller theorem about the irrelevance of debt-equity policy bears indeed some resemblance to the Ricardian equivalence theorem that financing government expenditure through tax levies or sovereign bonds does not affect household consumption and capital formation. Whereas Ricardo cautioned against the use of the irrelevance proposition to increase government borrowing to finance spending, debt preference under interest tax-deductibility undermines the Modigliani-Miller neutrality proposition and provides rather strong incentives for firms to maximize valuation through debt issuance. These developments point toward a financial system based on risk transfer.

**The Morality and Justice System** The classical school of political economy based on the writings of Adam Smith and David Ricardo developed the free-market economics. Building upon the writings of other economists, including Thomas Malthus and James Mill among others, this doctrine developed into an influential school of economic thought shaping free trade, economic institutions, and public policies. Apart from the drive toward financial deregulation based on the idea that free markets have the capacity to regulate themselves, this economic orthodoxy continues to exert its influence on other areas of legislation and public policy. The formal study of economics has distanced itself from the moral-ethical system to the extent that financial crises are usually explained by *excessive* risk-taking and *excessive* leverage, with little reference not only to a rigorous theory of interest rate on which the very concept of leverage depends, but with no regard also to morality. Despite the drive toward a reconciliation between economics and ethics by Sen (1987), among others, economics

remains a discipline practiced in an ethical and moral vacuum, as argued by Sfeir-Younis (2001). There is indeed an emphasis on the concept of self-interest with little regard to the laws of justice to which Smith makes reference, as noted above.

Sen argues in particular about the importance of the “established rules of behavior” in Smith’s analysis of human behaviour, but also notes that “there is no suggestion in Smith’s writings that people in general systematically fail to be influenced by moral considerations in choosing their behaviour” (2009, 187). Thus, it may be argued that had conventional finance undertaken the development path defined by Adam Smith’s framework for the economy based on institutional infrastructure and rules of behavior, and followed the same path of competitive equilibrium by the seminal work of Arrow-Debreu and Arrow-Hahn on the completeness of markets and completeness of contracts, the financial system would have been intrinsically different from its present status. It can be further argued that had conventional finance undertaken a balanced approach that integrates the *competitive paradigm*, which considers efficient resource allocation through risk-sharing mechanisms, and the *information paradigm*, which considers the distortive effects of imperfect and asymmetric information on optimal resource allocation, the financial landscape would have been different. The foundations of the financial system would have been laid on the important notions of state-contingent claims, information sharing, and risk-sharing finance. The divergence from this ideal path is, in part, due to a neglect on the part of mainstream economics of Adam Smith’s conception of an economy based on a moral and justice system.

**Contingent and Noncontingent Claims** The Arrow-Debreu-Hahn equilibrium models recognize the impact of uncertainty on economic equilibrium and provide a general setting for the optimal allocation of risks and resources. However, it is also important to understand the difference between contingent and noncontingent claims in the market allocation of risk. It can be argued that the presence of *ex ante* predetermined rates of return, or rates of interest, changes the complexion of the risk allocation mechanism. The extant literature on general equilibrium and asset pricing models tends to coalesce around theoretical settings that assume the existence of risk-free assets and give an important role for interest rates. Despite the absence of a rigorous theoretical explanation for interest rates, the focus of monetary policy, for instance, is still made on short-term nominal interest rates, which affect the term structure of interest rates and asset pricing as well. As noted by Thornton (2013), there is a greater focus on interest rates and financial markets’ expectations about future policy rates as channels for monetary policy transmission, to the extent that money is becoming

irrelevant to monetary policy.<sup>3</sup> The theoretical literature is also inclusive of some studies that challenge the existence of predetermined rates of return in general equilibrium models. Tyler Cowen (1983), for instance, argued that Arrow-Debreu-Hahn models of general equilibrium (GE) cannot accommodate predetermined rates of interest. The argument is that since the prices of all commodities for present and future delivery are already explicitly included in the system of Arrow-Hahn-Debreu equations, there is no room for the imposition of a discount rate on the economy. The inclusion of interest rates is conducive to the over determination of the system of equations.

Indeed, the prices of all goods and services under all states of nature are already described by the original set of equations. An overdetermined system is characterized by more equations than unknowns, and it either has no unique solutions, when some equations represent linear combinations of others, or it is inconsistent, leading to no solution at all. It is not clear how the interest rate should enter the system of equations, but when the system is not inconsistent, the rates of interest determined within the system should nevertheless be explained with reference to the relative prices and intertemporal price ratios. However as noted by Cowen, it is difficult to conceive a theory of interest that relates the price of apples to that of oranges. It is further argued that “[o]nce we define the interest rate as the set of intertemporal price ratio percentages, GE theory loses its ability to tell us anything specific about the magnitude of interest rates. These rates may be positive, negative, or even zero. Most likely, our system of equations will simultaneously contain all three possibilities as solution” (1983, 610–11). Thus, the theoretical analysis of general equilibrium may not be able to provide a consistent internal structure and meaningful definition of interest rate, which represents neither the price of commodities nor that of capital goods.<sup>4</sup> The essential argument by Cowen (1983) is that the GE model provides a framework for the analysis of competitive equilibrium, but leaves no room for capital theory. As argued by Askari, Iqbal and Mirakhor (2009), money markets do not exist under Islamic finance, since by definition, money markets are where “money today is traded for more money tomorrow”—the very definition of prohibited transactions or *ribā*.

Thus, apparently, fixed-income securities are not strictly consistent with the definition of pure contingent claims or Arrow-Debreu securities, which,

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<sup>3</sup>It is also noted that money is irrelevant in the Arrow-Debreu model of general equilibrium.

<sup>4</sup>It is noted that different arguments can be made regarding the essence of interest rates, including the view by Thornton (2013), among others, that interest rate represents the price of credit, not the price of money.

as explained above, provide payoffs of one unit under a particular state of nature, and zero otherwise. A riskless asset is represented by contingent claims of equal amounts of future consumption in each state of nature. The predetermination of fixed income is made regardless of the mutual exclusivity of states of nature, with only the event of default having the potential to alter the schedule and amount of payments. As argued by Kraus and Litzenberger (1973) in the trade-off theory of capital structure, corporate bonds represent claims on the residual value of the firm in states of nature where the firm cannot earn the promised return on bonds. But they are not merely a bundle of contingent claims, since they also constitute a legal obligation to pay fixed income. Intuitively, this implies that mutually exclusive states of nature with identical payoffs are regarded as a single state with fixed payoffs determined *ex ante*. Apart from the state-contingent nature of default events, there is no uncertainty about the outcome of interest-based securities simply because payoffs are indifferent from the realization of any particular state of nature. The existence of different states of nature is irrelevant to the fixed-payoffs promises in debt contracts. Thus, because of the incompleteness of contract, it can be argued that fixed-income securities are not representative of investment under uncertainty.

**The Information Paradigm** The theoretical analysis by Arrow and Debreu (1954) demonstrates that general equilibrium for a competitive economy can be achieved under the assumptions of complete markets and perfect information, and there is no role for monetary factors or transactions costs. Stiglitz (1994) recognized that Arrow-Debreu's analytical insight was to identify the singular set of assumptions under which Adam Smith's invisible hand proposition would be valid.<sup>5</sup> Under this set of assumptions, the pursuit of self-interest is conducive to competitive equilibrium. But it is argued also that the relevance of this neoclassical model of general equilibrium for welfare economics would be rather limited in the absence of perfect information and in the absence of important markets for risk allocation. The assumption of perfect information implies that the set of information available is fixed and invariable to the behavior of individual economic agents, independent from the pricing system, insensitive to

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<sup>5</sup>As noted by Stiglitz (1994), it is also possible to identify other singular conditions for markets to be constrained Pareto efficient. The existence of risk markets, or lack thereof, would be irrelevant to Arrow-Debreu analysis if all economic agents were identical and faced with identical shocks. Such conditions would preclude the development of markets for risk allocation since the rationale for securities trading is to allocate risks between different economic agents holding different pricing expectations.

changes in other economic variables. It is research about the implications of imperfect information for welfare economics that gave birth to the *information paradigm*, which addresses the information-theoretic concerns about the distortive effects of imperfect and asymmetric information on optimal resource allocation. The efficiency of competitive economies, which is considered as the first fundamental theorem of *welfare economics*, is deemed, according to Stiglitz (1994), to be fundamentally flawed. This assertion is based on theoretical evidence from Greenwald and Stiglitz (1986, and 1988) that markets are not *constrained* Pareto efficient under imperfect or asymmetric information and an incomplete set of markets for risk allocation.

This result follows from the existence of externalities in the decisions of some economic agents that are not taken into consideration by others. For instance, the purchase of insurance reduces the incentive to avoid the occurrence of a risk event, leading to moral-hazard problems. Also, Stiglitz (1994) argues that competitive market equilibrium with imperfect information is not necessarily described by market conditions where demand equals supply. The assumption that the pricing system ensuring market-clearing conditions is linear may not be tenable in light of price discounts relative to purchased quantities. The incomplete set of markets can also be explained by prohibitive information costs and transactions costs, which render difficult the inception of markets for risk allocation under all contingencies and all future delivery dates. Furthermore, Stiglitz (2011) notes that the recent literature on general equilibrium indicates that even under rational expectations, markets are not necessarily (constrained) Pareto efficient. This degree of market efficiency is never achieved under imperfect and asymmetric information and incomplete markets for risk allocation. It is the failure of modern macroeconomic models to account for market inefficiencies that limits their relevance for prediction, policy, or explanation purposes.

### **Rethinking Conventional Economics and Finance**

Thus, the scope and limits of Arrow-Debreu equilibrium analysis are subject to continuous scrutiny. But this general equilibrium model provides a theoretical framework for optimal risk sharing. In an ideal conventional financial system, financial markets and financial intermediaries provide opportunities for intertemporal consumption smoothing by households and capital expenditure smoothing by firms. Savings represent a trade-off between current and future consumption, and real investments represent present expenditures with expectations of future economic output. It is natural that attitudes toward risk, including income risk and consumption risk, differ

across market participants. The Arrow-Debreu framework allows for the distribution of risk in the economy among economic agents according to their respective degrees of risk tolerance, as noted by Hellwig (1998). In addition, the significant advances in general equilibrium models and finance theory have, nevertheless, provided a rigorous analytical framework for the examination of an ideal financial system for optimal allocation of risks in the society. They provide also clear evidence about the existence of a trade-off between risk and return and about the concept of no-arbitrage asset pricing, which underlie the capital asset pricing model and the arbitrage pricing theory.

However, the recurrence of financial crises has exposed the inherent instability of the conventional financial system. Reinhart and Rogoff (2009) provide evidence from the history of debt crises about the universality of serial defaults. The procyclicality of the financial system reflects the propensity of the banking system to expand credit during economic booms and restrict it in response to economic downturns. This procyclicality is, as noted by Rochet (2008), intrinsic to the financial system, but it is associated with financial fragility, which as defined by Allen and Gale (2009) reflects the potential for small shocks to generate significant effects on the financial system. As argued by Stiglitz (2011), there is a general recognition of the failure of standard macroeconomic models to predict the U.S. financial crisis or to understand the extent of its implications. It is further argued that the pursuit of self-interest “did not lead, as *if by an invisible hand*, to the well-being of all.” Indeed, Mirakhor and Krichene (2009) argue that the Arrow-Debreu conceptualization of an exchange economy based on risk sharing was transformed in steps into an economy based on risk transfer and eventually on risk shifting to taxpayers through government bailouts. As argued by Reinhart (2012), elevated levels of government indebtedness are conducive to a resurgence of financial repression, as reflected by tightly regulated financial environment. Since financial repression involves a distortion of resources allocation, as noted by Cottarelli (2012), this process is not consistent with the ideal conventional financial system and the Arrow-Debreu competitive economy with optimal allocation through risk sharing.

In light of the properties of the conventional financial architecture, there is an ongoing debate about rethinking the foundations of macroeconomics and financial economics, and reconsidering the implications of behavioral economics and behavioral finance for policymaking, regulatory, and academic purposes. In this regard, Stiglitz argues that “New Macroeconomics will need to incorporate an analysis of risk, information, and institutions set in a context of inequality, globalization, and structural transformation, with greater sensitivity to assumptions (including mathematical assumptions) that effectively assume what was to be proved (for example, with respect of risk

diversification, effects of redistributions). Agency problems and macroeconomic externalities will be central” (2011, 636–637). The misalignment of incentives, moral hazards, information asymmetry problems, and regulator’s capture stemming from risk transfer activities indeed contribute to the complexity of an interconnected financial system and to the complexity of prudential regulation. It is for these reasons that Bean (2009) also argues for the need to reconsider the role of financial intermediation in the development of macroeconomic models, in consideration of the peculiar properties of the balance sheets of financial intermediaries.

The renewed argument is thus made also for abolishing fractional reserve banking with the aim of dissociating the credit and monetary functions of commercial banks. As argued earlier by Fisher (1936), the merits of the Chicago Plan for monetary reform, created by some Chicago economists during the Great Depression based on the requirement for hundred percent reserves against demand deposits, include the attenuation of business cycle fluctuations, elimination of bank runs, and reduction of the levels of public and private debt. The revisit of the Chicago Plan by Benes and Kumhof (2012) using a dynamic stochastic general equilibrium model provide analytical evidence that the implications of the monetary reform program are strongly validated. It was also found that altering the banks’ attitudes toward credit risk resulted in additional benefits, including significant steady-output gains due to the reduction or elimination of distortions such as interest-rate risk spreads, and costs of monitoring credit risks. There is also a potential for steady-state inflation as the focus of banks is directed towards the financing of investment projects as the government’s ability to control broad monetary aggregates is increased. These analytical results are also consistent with the proposal for limited-purpose banking advanced by Kotlikoff (2010), which argues for confining banks to their core and legitimate function of channeling savings toward real investment. It is further argued that financial intermediation through limited purpose banking is less prone to breakdowns and that trust in the financial system would be restored.

In the aftermath of the U.S. financial crisis, there has also been a renewed focus on the role of morality and the relation between finance and good society, which is examined by Robert Shiller (2012), among others.<sup>6</sup> Shiller notes that not everyone is “good” in the good society, but the issue is whether it is possible to redefine the role of institutions to contribute toward a system “that encourages all the complex basic patterns of actual human behavior

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<sup>6</sup>As argued by Lippmann (1937), there is no architectural design or scheme in the good society, where the emphasis is rather made on the moral maxim of the golden rule, which establishes human inviolability, and the prohibition of arbitrariness in human transactions.



into an effective and congenial whole.” (2013a, 402) This process involves the democratizing and humanizing of finance. As argued by Shiller (2011), democratizing finance entails the development of technology and human arrangements such as financial education and financial advice to facilitate greater participation into the financial system. The humanizing of finance involves the organization of financial institutions under effective incentives to take into account the reality of human nature and human psychology. It is about the development of institutions that are cognizant of behavioral patterns and attitudes toward risk that are conducive to the formation of asset bubbles and financial crises.

There is indeed a growing awareness about an insufficient representation, if not neglect, of human psychology and economic history in economics teaching. Whereas the role of mathematical models in understanding the complexity of economic systems, properties of general equilibrium, and effects of financial crises is widely recognized, the relevance of abstract theory to the discipline is not. There are indeed concerns that economics has developed as a mathematical science in pursuit of minute exactness, with insufficient relevance to economic experience and public policy. As noted by Boulding, the failure is apparent, for instance, in the economists’ attempts to “develop mechanical models of the business cycle, somewhat along the lines of celestial mechanics” (1970, 8). For similar reasons, the relation between moral philosophy and economics is also revisited. For instance, Zingales argues for an active role for finance academics in elevating moral standards, stating:

*[o]ur standard defense is that we are scientists, not moral philosophers. Just like physicists do not teach how atoms should behave, but how they do behave, so should we. Yet, physicists do not teach to atoms and atoms do not have free will. If they did, physicists would be concerned about how the atoms being instructed could change their behavior and affect the universe. Shouldn't we be concerned about the effect of our “scientific” teaching? (2015, 32)*

Thus, there is a serious debate about the systemic failures of the actual financial architecture. The intellectual discourse about the inherent instability and inconsistencies of the financial system underlines an increased awareness about the limits of regulation, and about the need to reform the basic fabric of the financial system in ways that are cognizant of human nature. The convergence toward an ideal conventional financial system rests on moral philosophy and competitive economy. The efficient risk allocation in a competitive exchange economy is achieved through risk-sharing mechanisms that do not depend solely on the completeness of markets, completeness of contracts, and perfect information, but also on a system of

morality and justice. The epistemological roots of an ideal Islamic financial system can be also understood in light of Islamic thought, the full spectrum of Islamic financial instruments, and contributions of Muslim merchants to the early development of modern corporate entities and Muslim scholars to the disciplines of Islamic finance and economics. It is shown that an ideal Islamic financial system is also based on a risk-sharing mechanism that promotes the optimal allocation of risks and resources, and on the internalization of the code of conduct based on moral and ethical values.

## **EPISTEMOLOGY OF AN IDEAL ISLAMIC FINANCIAL SYSTEM**

Any epistemology of Islamic finance must, as with Islamic economics, find its roots in *al-Qur'an*, which constitutes the fountainhead of Islamic thought. It is from *al-Qur'an*, then, that the discussion of an ideal Islamic financial system can be started, based on the fundamental rule of the permissibility of *al-bay'* exchange and impermissibility of *al-ribā* derived from its chapter 2 verse 275. This constitutes, arguably, an organizing principle in Islamic finance and economics, establishing an important distinction between two types of common transactions, and their separate treatment under Islamic law.<sup>7</sup> As noted by Kamali (2000), in the absence of an explicit injunction, the general provision of permissibility (*ibāhah*) applies to all *bay'* transactions

<sup>7</sup>It is noted that the domain of Islamic law is, traditionally, divided in two broad branches: (1) worship, or *ibādāt*, and (2) transactions, or *mu'āmalāt*. The concept of social welfare is central to the objectives of Islamic law, or *maqāsīd al-Sharī'a'h*. As rightly argued by *Ibn al-Qayyim al-Jawziyyah* (691–750 CE), “the basis of *Sharī'a'h* is wisdom and welfare of the people in this world as well as the Hereafter. This welfare lies in complete justice, mercy, well-being, and wisdom. Anything that departs from justice to oppression, from mercy to harshness, from welfare to misery and from wisdom to folly, has nothing to do with the *Sharī'a'h*.” The expression of the ultimate objectives of *Sharī'a'h* in terms of welfare is also evident in the argument by *Abu Hāmed al-Ghazālī* (d. 1111) that “the basis of the *Sharī'a'h* is to promote the welfare of the people, which lies in safeguarding their faith, their intellect, their posterity, and their wealth.” The primary sources of Islamic law are *al-Qur'an* and tradition of the Noble Messenger (*saw*s), but there is also room for *ijtihād*, consensus of opinion, and *qiyās*, analogical deduction, though the latter may be de-emphasized by some scholars. Thus, Islamic finance bears some resemblance to conventional finance in having part of its epistemological roots in economic thought and reasoning. Since the scope of Islamic law encompasses not only the religious aspects of life, but also the ethical, moral, sociopolitical, and economic spheres, Islamic finance products should be *Sharī'a'h* compliant and thus sanctioned and sanctified by religion.

clear of interest (*ribā*), ambiguity (*gharar*), or gambling (*maysir*), such as the exchange of goods for their monetary value, sale of one object for another or one currency for another, sale at cost plus profit, and forward sale of *salam*, among others. It can thus be argued that the contract of *al-bay'* represents an agreement of *mubādat-al-māl bilmāl*, which entails the exchange of property with property, or exchange of two bundles of property rights claims that find expression in modern laws and customs.

Several translations of the meaning of *al-Qur'an* proceed on the basis that *al-bay'* is the Arabic term for *trade* or *commerce*. This implies that no distinction is made with respect to *at-tijārah*, which is also usually translated into the same English terms *trade* or *commerce*. However, these terms appear simultaneously in chapter 2 verse 282, and chapter 24 verse 37, suggesting thereby some conceptual differences. It can be argued upon closer examination of major Arabic lexicons, including *Lisān al-ʿArab*, and *Mufradat alfādh al-Qur'an*, among others, that there is a significant, albeit subtle, difference between *al-bay'* and *at-tijārah*. With reference to alternative verses in *al-Qur'an*, such as chapter 35 verses 29–30, and chapter 61 verses 10–13, it is suggested that *at-tijārah* is a trade contract entered into with an anticipation of profit, and certainty about such benefits is only guaranteed for covenants entered into with *The Law Giver*. It can be also argued that there is a sale (*bay'*) transaction in each trade (*tijārah*) insofar that the object of trade is purchased with the prior intention of selling, and that all *bay'* transactions necessarily involve the exchange of property with property.

Apart from spot transactions where delivery and settlement take place simultaneously, there is an element of risk inherent to all exchange contracts with deferred delivery or deferred settlement, because they involve time. Indeed, because the conclusion of transactions depends on the exchange and commitment of cashflows over time, they necessarily take place in an environment of uncertainty. The element of risk arises when different outcomes are possible, or mutually exclusive states of nature can be defined. The nature of risk and amount of quantifiable risks may differ from one transaction to another. It is possible to consider, for instance, the risks in *salam* contracts with immediate payment but deferred delivery. There is a price risk or valuation risk that derives from the volatility of future price levels, and which is shared by both contractual parties. There are additional risks, such as substandard quality risk and nondelivery risk borne by the purchasers, and production risks and transportation costs risks borne by manufacturers. These risks are borne by both parties to contracts with deferred deliveries or deferred payments.

There are also counterparty risks in the sense that the ability of each party to meet its own production schedules and its own payment obligations may depend on the performance and default probability of third parties.

In particular, the risks associated with the production process are inherent to the concept of specialization through comparative advantage, which is at the foundation of the classical thesis about the advantages of trade. It is important to note that the risks of specialization also arise with respect to spot exchange, and that pre-exchange risks of production are also shared by both parties to the exchange, either on spot or deferred delivery. The argument of risk sharing applies to all other forms of permissible contracts under the Islamic law of transactions (*mu'amalat*), including partnership-based contracts at the other end of the spectrum such as *mudhārabah* (principal-agent partnerships), and *mushārahah* (equity partnerships). Arguably, the permissibility of *al-bay'* exchange activities can be explained by the existence of risk elements inherent to exchange, and the necessity of dealing with uncertainty through a risk-sharing mechanism.

There is a general principle of freedom of contract (*hurriyat at-taā'qud*), and the normal state of permissibility (*ibāhah*) prevails unless there is a clear injunction *haram*, such as the prohibition of *ribā*. In light of the discussion with *al-bay'* or exchange, it can be argued that the rationale for the prohibition of interest lies in the absence of opportunity for risk sharing. Indeed, interest-based transactions are founded on risk transfer rather than risk sharing mechanisms. The event of default can only be defined in terms of the inability to deliver "promised" payments made on an *ex ante* basis with respect to credit or fixed-income securities. Default cannot, however, be defined with respect to equity, where risk sharing applies and the extent of profits and losses can only be determined *ex post*. Thus, "promises" of fixed returns determined *ex ante* do not take the organic relation between the real economy and financial sector fully into consideration. Financial returns are thus dissociated from the return from the real economy, and the relation between risk and return is thus dissolved. The replacement of risk sharing with risk-transfer and risk-shifting mechanisms is distortive of the exchange relations on which economies can potentially thrive.

The notion that economic growth can only be achieved by sacrificing social and economic equity in mainstream economics promotes a *laissez-faire* variant of capitalism that does not promote social equity and instead reinforces a dehumanization of economic life. It can be argued that Islamic finance also supplies a coherent theory of rational individual behavior, competitive markets, and social equity. It is based on the same assumptions about economic activities in terms of savings and investment, and considers risk sharing the optimal mechanism for efficient risk allocation in a vibrant and dynamic economy. However, the principal challenge faced by scholars in Islamic economics and Islamic finance is to provide some convincing evidence that these objectives of socioeconomic justice and economic development are not mutually exclusive. The requirements

of an ideal Islamic financial system that promotes the twin objectives of efficiency and equity include an optimal set of institutional building. Thus, to understand the relation between the objectives of efficiency and equity in Islamic finance and economics, the discussion proceeds hereafter in relation to three central precepts of institutional economics: (1) property rights protection, (2) enforcement of contracts, and (3) good governance.

### The Institutional Structure

The institutional framework for an ideal Islamic financial system is to some extent consistent with the fundamental principles of institutional economics, but it is also inclusive of rules of conduct and enforcement, which are derived from the morality and justice system embedded in Islamic teachings. Consistent with the objectives of *Shari'ah*, the principal purpose of this institutional framework is to achieve social welfare through the internalization of ethical and moral rules of behavior. Three main features of the institutional structure are addressed below (1) ownership and property rights, (2) contracts and markets, and (3) trust and mutuality. It remains, however, true of any society that trust remains its permanent lubricant.

**Ownership and Property Rights** The central argument is that economic justice demands that wealth is created only through labor and enterprise and that there are no restrictions that curtail the rights of people to work or that prevent equal access to resources. It is in the abolition of legal and institutional hurdles against equal opportunities that socioeconomic justice can be better served. Thus, ownership is recognized over the resources thus created from the application of labor, and only then can property rights be subject to free transfer through exchange, inheritance, contract, gift, or redemption of rights. This redemption of rights allows for an equitable sharing of wealth with the less able. There is a clear emphasis on social justice and harmony where the insatiable desire for wealth is consistent with an insatiable desire for charity. There is reference in *al-Qur'an* to righteousness, *birr*, as the state of active participation in deeds of benevolence. Thus, an insatiable desire to increase wealth may be explained by an equally insatiable desire to contribute toward philanthropy and may not constitute a sign of unfettered self-interest.

An important implication of the principle that property rights are created through labor and enterprise is that there is no room for sources of instantaneous creation of property rights, such as theft, interest (*ribā*), or gambling (*maysir*). Also, the principle of ultimate divine ownership in Islam implies that the owner's freedom to dispose of property rights is not absolute. There are, for instance, restrictions against the use of property rights in

prohibited transactions, and against waste and destruction. The injunctions against excessive accumulation of wealth are injunctions against the amassing of property rights that are conducive to a monopoly over opportunities, intrusion upon the rights of others, and privileged access to resources. Given these restrictions about absolute ownership, wealth circulation is allowed to play an essential role in economic development and social justice.

Another corollary to the principle that wealth is created through labor and enterprise is that it can only be shared through either a redistributive mechanism or risk-sharing mechanism. As noted above, redistribution through *zakah* constitutes a form of redemption of property rights to the poor. The risk-sharing mechanism provides an opportunity to increase wealth, but only under the conditions of appropriate exposure to risk. Thus, wealth-increasing arrangements such as *al-ribā*, which do not take into consideration the trade-off between risk and reward, are deemed impermissible. Thus, restrictions imposed on the scope of individual freedom with respect to property rights are essential to achieve the right balance between individual rights and social interests. They are also consistent with the office of gerency and conducive to capital formation, which is required for economic development, and social justice through poverty alleviation. Thus, this institutional setting differs from the conventional property rights system not only in the restricted freedom of disposal through impermissible transactions, but also in the consideration of property rights as a means of inclusion of the less able, because of idiosyncratic factors such as illness and disability, in the wealth of the more able. It is through risk-sharing mechanisms, in addition to inheritance rules, that wealth is necessarily shared with the society to provide new opportunities for property rights through labor and entrepreneurship.

**Contracts and Markets** The second facet of the ideal Islamic financial system is represented by the rules of behavior in the domain of property rights transfer through contract and organized exchange. Since the concept of “property” represents a set of usufruct rights, powers, duties, and liabilities defined with respect to an underlying asset, it is possible to appropriate rights through the combination of one’s labor with the resources, but the concomitant duty of sharing remains. Property is therefore associated with rights and obligations in the use of resources: (a) the right not to be excluded and (b) the obligation not to exclude others. In principle, the property rights and obligations cannot be dissociated from each other, but as argued by Askari, Iqbal, and Mirakhor (2015), it is the advent of the market system in Western economies that led to a revision of the concept of property, which eliminated the right not to be excluded from the use of assets owned by third parties. The rationale behind this exclusion is that

this right is not consistent with market economy because it was deemed not marketable. Thus, the Western conception of property rights is presently centered on the right to exclude others. But the right not to be excluded by others remains intact, as it does not undermine the functions of markets in the allocation of resources based on the risk-sharing principle.

From the economic perspective, contracts provide a legal institutional framework for the transfer of property rights, but also for the allocation of risk. Because of the uncertainty about the future outcome of labor and enterprise, contracts are useful in facilitating the allocation of risks. The Islamic jurisprudence includes an entire class of classical nominate contracts, including participatory arrangements such as *mudhārabah* (principal-agent partnership), *mushārahah* (equity partnership), and *mushārahah mutanāqisah* (diminishing equity partnership). In particular, *mudhārabah* partnership contracts provide the basis for an essential part of the business of Islamic banking institutions. The full spectrum of permissible contracts also includes *ijarah* (leasing contract), *istisnā'* (consignment to manufacture), among other things. All these contracts have a basis in the Islamic law of *muā'malāt*, which implies that their purpose is congruent with the fundamental objectives of *Sharā'ih*, and consistent with the principle of risk sharing.

There is also an essential place for the market system in an Islamic economy because private enterprise, freedom of contract, property rights, and pricing mechanisms are consistent with the promotion of social welfare and economic efficiency. In conventional economics, the market system constitutes, after the retreat of socialism, the *raison d'être* of capitalism and its defining ideology. In an Islamic economy however, this market system is also a necessary mechanism for the allocation of risk, but the mere existence of markets may not be sufficient to ensure social justice. The need for competitive markets arises because of their ability to allocate risk efficiently and provide an effective system of price discovery. But it is only in a world of perfect markets with no transactions costs, and perfect information about financial assets that this function becomes effective. It is understood that there were, for instance, no taxes imposed on market access, no barriers to entry or exit, and no transaction taxes, no restrictions on international and interregional trade, no import or export taxes in the free-market system designed under the Noble Messenger (*saws*). But there were prohibitions on price controls and against hoarding of commodities. There was also free movement of goods across markets, as well as free and transparent sharing of market information. The guarantee of contract enforcement was also associated with the obligation of clear specification of the terms of contract, including the conditions of delivery and settlement, and property rights and obligations of all contractual parties. There was also the institution of



market supervisors to ensure the compliance of market participants to the rules prescribed for the proper operations of markets.

The supervisory bodies similarly established in the conventional system to guarantee compliance to market regulation are deemed to be not only necessary but also sufficient for the proper functioning of markets. This is not the case of the institutional market conditions in an Islamic economy, which requires also a morality and justice system. There is indeed an additional requirement to the enforcement of a code of morality that is internalized by all market participants. Thus, the institutional structure of markets in an Islamic economy depends on the free flow of information, protection of property rights, and legal contract enforcement system, but also, as argued by Askari, Iqbal, and Mirakhor (2015), on trust as well as the right not to be harmed and obligation not to harm others.

**Trust and Mutuality** Thus, the third facet of the ideal Islamic financial system is about trust and mutuality. Trade requires mutual consent, and there is thus no coercion (*ikrāh*) in the conclusion of contracts, as much as there is none in the adherence to the first covenant (*mūthāq*) with Allah (*swt*).<sup>8</sup> The sacred principle of the freedom of contract implies that all contractual obligations are fully honored. It is indeed stated in *al-Qur'an* that believers are required to fulfill all obligations. Faithfulness to contracts is therefore deemed a sign of strong belief. However, to enter into an agreement implies not only that promises are binding, but also that each party expects the other to fulfill its own obligations. The concept of mutual trust is thus essential to the conclusion of contracts and has also implications for contract enforcement. This is not just an issue of asymmetric information, which would render the contract invalid from the perspective of *Shari'ah*. Such a prohibition is based on ambiguity, *gharar*, about the terms and conditions of contractual agreements. However, even in the presence of perfect information, the conclusion of an agreement rests on mutual understanding and trust that each party is committed to the fulfillment of its obligations. This implies that it is exchange that nurtures a culture and reputation for honesty, sincerity, and trustworthiness.

As noted above, the importance of the institution of trust is also recognized by Arrow (1974). It is important to note that the socio-political-economic system can be governed by different types of relationships.

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<sup>8</sup>Economic agents are commanded to act lawfully for their own benefit as well as the welfare of others. But the moral and ethical code of conduct may not be covered by modern laws governing the socio-political-economic system. This may explain in part the failure to internalize the morality and justice system, which may be, as argued by Adam Smith himself, sanctioned by religion, as is the case indeed with Islamic finance.

Boulding (1970) draws parallels between social systems and biological systems, where the genotype represents the generic code for the growth and development of the phenotype or living entity. It is then argued that it is the genotypical relationships that define the development of social organizations and role structures. There are genotypes of relationships in social organizations, including (a) *threat* relations that allow one party to impose its course of action or role on another based on credible threats and restrains, (b) *exchange* relations based on the division of functions, and (c) *integrative* relations that do not fall under the classes of threat or exchange, but result from the mutual acceptance of the relative status of parties. The integrative relations based on the relative status of parents to children or judges to disputing parties, for instance, establish the legitimacy of authority and the identity and development of community.<sup>9</sup> It is argued also that without integrative relations, neither threat nor exchange relations can be sustainable. It can be thus argued that *exchange* relations provide the basis for the division of labor and specialization, which are at the foundations of the theoretical arguments advanced by Adam Smith. These social generic structures that *threat* relations are conducive to submissive and repressive, and thus, regressive systems. The *exchange* and *integrative* relations pave the way to evolutionary and inclusive, and thus progressive, social and economic systems.

A social generic structure based on exchange relations requires the internalization of a general code of conduct, ethics and morals. Boulding argues that a degree of mutual trust and honesty is necessary for the development of financial institutions into complex structures beyond the primitive form, and that “the failure of the integrative system of a country to develop concepts of mutuality, trust and community beyond the confines of the family or the small intimate group is often one of the major obstacles to its economic development” (1970, 13). Also, an environment characterized by poor protection of property rights, costly information, and higher transactions costs is naturally conducive to weaker trust in the enforcement of contract. This argument is also consistent with the virtue of truthfulness, sincerity, and trustworthiness. Mutuality is also central to the concept of Islamic insurance, *takāful*. It is the intending or intention, *niyyah* that determines one party’s commitment to contractual terms and its own expectations about the

<sup>9</sup>Boulding (1970) provides a clear definition of the different types of relationships. Whereas exchange relations can be expressed as “*you do something that I want and I will do something that you like,*” threat relations are reflected in statements such as “*you do something that I want or I will do something that you do not want,*” and integrative relations can be described with “*you do something because of what you are and what I am.*”

other party's intentions. Thus, when the fulfillment of obligations is indicative of belief, an effective mechanism for contract enforcement is in place, and reference to the code of conduct of the Noble Messenger (*saws*) is made, *al-amīn* (the trustworthy), then trust and mutuality may not be regarded as naïve acceptance of vulnerability. It remains true of any society that trust is the lubricant of the economy and that social capital should be taken into account as a determinant of long-term economic development.

### Islamic Finance in the Classical Age of Islam

In light of the institutional structure of Islamic economics, it is possible to actualize Islamic finance based on exchange relations, devoid of threat and coercion and devoted to the promotion of economic efficiency, equity, and justice. This objective is achieved through an optimal allocation of resources and transfers of property rights based on risk sharing. Since the increase in property rights can only be achieved through the application of labor to available resources, there are inherent risks in economic enterprise. Thus, there are arguably no legitimate means of increasing wealth without submitting it to the prospects of profit and loss. The allocation of resources under uncertainty constitutes also an allocation of risk. By design, the classical nominate contracts, including *mudhārabah* and *mushārahah*, among others, constitute forms or participatory profit–loss sharing arrangements that are perfectly legitimate according to Islamic jurisprudence. Prior to discussing the actual state of affairs of Islamic finance, it is important to start with a historical perspective of the crucial role it played in the development of corporate entities in modern capitalist systems based on equity partnership.

It may be argued at *prima facie* that the prohibition of usury was responsible for retarding the development of capital markets. According to Koyama (2010), the persistence of the Church's prohibition in medieval Europe constituted a barrier to entry, which benefited secular rulers, small groups of merchant bankers, and the Church itself. This proposition is consistent with the concept of regulatory capture. In contrast, the prohibition of usury in the Islamic world, which parallels the Church's prohibition in medieval Europe and continues to this date, is associated with different forms of partnership. Udovitch notes the existence of “numerous forms of partnership and especially of highly developed and adaptable *commenda* arrangements which, from the point of view of both the investor and trader, adequately, flexibly and licitly fulfilled the economic function of an interest-bearing loan” (1975, 10).

Upon closer scrutiny however, *commenda* (*accommodatio*) arrangements represent perfectly permissible risk-sharing partnerships based on *qirād*.

As argued by Koehler (2009), medieval Italian merchants dealing with Muslim traders may have adapted the Islamic concept of *qirād* to establish that of corporate limited liability. According to The International Islamic Fiqh Academy (2001), the *qirād* or *mudhārabah mushtarakah* is indeed a form of joint-silent-partner enterprise in which investors, together or sequentially, grant to a legal entity the authority to invest funds in a manner that protects the rights of all parties. According to Lopez (1976), there is consensus among medieval historians about the significant contribution of *commenda* to the fast growth in trade and investment in Europe. Further evidence from Mirakhor (1983) indicates that *commenda* were also used in financing of infrastructural projects in Germany. Finally, Heck asserts that “[n]ot only did medieval European rulers deliberately emulate the superb coinage of the Muslims, moreover, the evidence is compelling that they also copied many of their forms of corporate associations” (2006, 235). Thus, it is interesting to note that Islamic merchants in the medieval era gave important insights into the distinction between equity and debt, between interest-free and interest-based financing, between risk-transfer and risk-sharing arrangements. As argued by Koehler (2009), the origins of modern corporations may be traced back not to medieval Italian merchants, but to Islamic finance, which constituted the progenitor of venture capital.

Islamic capitalism, as argued by Çizakça (2011) subject to certain caveats, may be an appropriate appellation of the economic system practiced by the Islamic world from the 13th to approximately the middle of the 17th century, the classical age of Islam. The medieval Islamic economy was not industrialized, but it was arguably an open economy guided by the principles of free markets, promotion of international trade, and entrepreneurship with Islamic finance modes of partnership. It is an economic system that predates the revered treatise of Adam Smith by a millennium and that has developed its own form of capitalism based on *al-Qur’an* and tradition of the Noble Messenger (*saws*), *as-Sunnah*. As rightly argued by Çizakça (2011), the association of capitalism with the revered sources of divine knowledge may be deemed rather irksome, but it is useful to remember that the Noble Messenger (*saws*) was a merchant. This argument extends to many of his followers, including those who assumed power but without engaging in trade. The Arab roots of capitalism are also examined by Hicks, who suggests that many forms of corporate association were developed by Muslims in order to accommodate the prohibition of interest-bearing transactions, and thus “medieval ‘Arab capitalism’ initially evolved expressly as a principal byproduct of such an accommodation” (2006, 5).

The principal epistemological issue here is that Islamic jurisprudence has laid the foundations of a system of morality and economic justice that

promotes freedom of agreement, enforcement of contract, private ownership, property rights protection, and free trade. There is thus no basis to the argument that Islamic law promotes economic and social backwardness. The epistemological question arises, however, as to the reasons for replacing the innovative forms of Islamic finance in the classical age of Islam with imitative practices in present days that are as much concerned with conformity to Islamic jurisprudence as with familiarity with conventional finance. There are indeed concerns that the development of the Islamic finance industry is not driven, as in the past, by the risk-sharing mechanism based on equity financing, but by debt-like financing obligations. The examination of these important issues belongs to the realm of institutional economics discussed above, which emphasizes the role of institution building such as contract enforcement, property rights, trust, and market environment.

### **RISK-SHARING FINANCE IN A WORLD OF UNCERTAINTY**

Financial economics, as defined by Allen and Gale (2009), is concerned with the allocation of resources over time and under uncertainty. The traditional analysis of the behavior of consumers and producers in microeconomic theory can be extended to financial economics to define uncertainty based on the concept of *state of nature*, and understand the allocation of risk in terms of *contingent commodities*. There is uncertainty about the individual's income when this is a function of several possible states of nature. It is important to note that Frank Knight, who examined decision making under uncertainty as dependent on outcomes with known probabilities, also made a conceptual distinction between what is measurable, *risk*, and what is not, *uncertainty*. This provides the basis for a separation between insurable and uninsurable risk, but Knight argues also in his treatise *Risk, Uncertainty, and Profit*, that “[i]t is difficult to think of a business ‘hazard’ with regard to which it is in any degree possible to calculate in advance the proportion of distribution among the different possible outcomes. This must be dealt with, if at all, by tabulating the results of experience” (1921 [1964], 215).<sup>10</sup>

This assertion emphasizes the difficulties in measuring the distribution of investment return with accuracy. The same line of argument is also

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<sup>10</sup>The difficulties in calculating the probability distribution of investment outcomes do not necessarily imply the futility of this exercise. The main issue arises, however, with respect to the predetermination of the rate of interest, irrespective of the occurrence of any of the possible outcomes. This argument implies that risk-sharing mechanism through profit-loss sharing with returns determined on *ex post* basis more appropriately takes the forward-looking nature of real investment into account.

shared by Ludwig von Mises and John Maynard Keynes, who contend that uncertainty about investment outcomes is not amenable to mathematical measurement. The concepts of uncertainty and risk appear thus as an essential feature of economic activities and entrepreneurship. This is indicative of the forward-looking nature of investment outcomes, which may be subject to unpredictable fluctuations. Therefore, the predetermination of a rate of interest that assumes “in advance the proportion of distribution among the different possible outcomes” to be equal is inconsistent with the forward-looking nature of real investment. It is manifest that the risk sharing provides a consistent mechanism for the distribution of risk, and reward that is contingent on the success of forward-looking enterprises.

Thus, the argument can be made that the risk-sharing principle in Islamic finance promotes a stronger linkage between the financial sector and the real economy by emphasizing the financing of real investment, trade, and exchange of commodities through risk-sharing instruments. This mechanism is conducive to an optimal allocation of risk according to the individual degree of risk tolerance and risk bearing. It provides a viable alternative to financing modes based on risk-transfer and risk-shifting. It is also consistent with the institutional structure of an Islamic economy based on the protection of property rights, enforcement of contracts, and the promotion of the institution of trust in the society. The risk-sharing mechanism is reflected in different variants of financing instruments and in the institution of equity markets, which are examined hereafter.

### **The Essence of Risk Sharing**

The overarching argument throughout this epistemological analysis is that risk sharing constitutes the objective of Islamic finance. Indeed, together with the injunction against *ribā*, there is a declaration of permissibility (*tahīl*), not just tolerance, of exchange (*bay'*) contracts. It follows from the discussion of property rights above that the exchange of one commodity for another in *al-bay'* contract implies the exchange of property rights. In the case of *al-ribā* contract, however, an amount of money is provided as loan at some point in time for another amount, with excess over the principal to be received at another future point of time. The following important points can then be stated. First, there is no transfer of property rights over the principal amount from the lender to borrower. Two, there is no retention of property rights over the principal by the lender either. Three, there is rather a transfer of property right from the borrower to lender over the excess amount to be paid as interest. These fundamental differences between *al-bay'* and *al-ribā*, based on property rights transfers, provide some insights on the possible reasons for the distinction that Allah (*swt*) made about these contracts.

The declaration of permissibility of exchange and forbidding of *al-ribā* are actually made to refute the proposition that trade is like usury.

In light of this fundamental distinction, it becomes clear also that risk-sharing mechanisms in Islamic finance are characterized by different patterns of property rights transfer. With respect to partnership agreements for instance, there is transfer of property rights over the amount of return on investment to benefit investors only to the extent of their participation in the partnership. This transfer of property rights is effective on *ex post* basis because the rate of return to finance is also known only on *ex post* basis. As noted above, the rate of return is function of the future state of nature, and it is the outcome of real activity. It is this linkage of financial returns to economic risks that reinforces the organic relation between the financial sector and the real economy.

Given the objective of risk-sharing, Islamic finance implies the prohibition of transactions where a rent is collected by one party as a percentage of the value of property made available to another for a specific period of time without transfer of ownership rights. As noted by Askari, Iqbal, and Mirakhor (2009), such transactions result in shifting risks from lenders to borrowers. These transactions do not provide the basis for risk-sharing in the standard Arrow-Debreu framework. The transactions in which parties derive rents in terms of interest rates do not represent payoffs contingent on particular states of nature. The debt-creating mechanism does not appropriately reflect the impact of economic uncertainty on real investment. Admittedly, economic conditions influence the probability of default, but they affect the payoffs only in the event of default. The credit-default risk contributes to the determination of yields on fixed-income securities, but the return on debt is determined *ex ante* irrespective of possible states of nature. Under these conditions, state-independent payoffs are only altered by the single event of default, which may or may not be determined by the states of nature of the economy. The incompleteness of the contract is reflected by the existence of identical payoffs independent of the states of nature. It is this incompleteness of contract that truncates the loss function for financiers, and this truncation is conducive to an asymmetric distribution of risk between parties.

As noted by Mirakhor and Krichene (2009), financial assets in the Arrow-Debreu model are contingent claims that do not represent *ex ante* fixed-income debt contracts. The claims accrue to asset-holders only under the condition that the associated state of nature materializes in the future. Thus, when firms use indirect modes of financing through the issuance of debt instruments such as corporate bonds or recourse to bank loans, the debt arrangements with fixed-income claims determined *ex ante* do not constitute state-contingent claims. These fixed-income securities are



associated with payoffs that are independent of the outcomes of real investments. The concept of internal rate of return is useful in assessing the return on investment projects with reference to a benchmark rate of interest. This constitutes a hurdle rate useful for the purposes of efficient resources allocation. But the rate of interest charged in debt-financing arrangement may bear little relation to intrinsic rates of return on investment projects and, thus, little connection with the real economy.

Since commodities and financial securities are contingent on future states of nature, and provided that such states of nature are mutually exclusive, these contingent claims are risky. It is when all future states of nature are associated with the same payoffs that the occurrence of any particular state becomes irrelevant to fixed-income securities. As these *contingent-claims* are no longer contingent on the states of nature, they can be regarded as risk-free assets and interest-based securities. In fact, all investment decisions under uncertainty are risky because the full spectrum of states of nature is rather infinite. The contractual agreements, reached through consent or coercion, that accrue fixed income to one party represent a transfer of risk. Though risk taking in loans and bonds takes the form of credit-default risk, these arrangements invariably result in the truncation of the loss function for the financier. Given the asymmetric distribution of risk, interest-bearing arrangements are risk-transfer contracts.

The risk-transfer mechanism underlying interest-based bank loans and fixed-income securities explains the existence of credit-default risk, which in turn explains the recourse to other risk-transfer techniques, including credit-default-swaps and structured finance. MacMinn (2000) argues that risks can be regarded as commodities that may be exchanged, and since the firm represents a nexus of contracts, and by extension a nexus of risks, these risks can be separated and traded as commodities. However, the history of capitalist economies is one of repeated collapses of the financial system, as argued by Arrow (2013), who notes also that the failure of markets for derivatives securities to function properly constitutes an essential element of the U.S. financial crisis. The Financial Crisis Inquiry Commission (2011) concluded indeed that the derivatives markets, as well as commercial paper and repo markets, which represent an important part of the shadow-banking system for short-term financing, reflected the impact of the housing bubble collapse.

With the preclusion of default events under equity financing, there is no default risk and no economic rationale for credit-risk transfer. There is no justification for credit-default swaps either. There is, therefore, no guarantee against default in case of equity financing, simply because the notion of default does not exist. It is not possible to define default events when

the promised payments are not nominally fixed in time and amount. The return-on-equity is instead *fully* contingent on future states of nature. Given the uncertainty about the outcome of economic activities, full knowledge about the stream of future profits is not possible. This limited knowledge implies that future returns can only be estimated with some degree of confidence based on informed judgment. Indeed, the unpredictability of changes in technology and consumers tastes precludes perfect foresight. Since these returns can be known with certainty on *ex post* basis, it is not clear why the payoffs on credit instruments remain invariant to states where the economy fails to deliver outcomes according to expectations.

Thus, the crucial distinction is made between exchange in the real sector and financial instruments used to facilitate such transactions. Even though the contracts entered into for exchange in the real economy may be perfectly permissible, the financial instruments used to finance such transactions may not. It is noted that exchange contracts entered into in the context of direct investment should not be confused with the financial transactions and instruments used to finance such investment. For instance, the exchange of *Shari'ah*-compliant real assets is permissible in Islamic finance, but structured finance instruments used to facilitate such exchanges are not necessarily acceptable. Though the securitization of *Shari'ah*-compliant real assets is itself permissible, the slicing of the loss function between equity and mezzanine tranches to secure fixed income for senior tranches may be deemed rather impermissible. Apparently, the issuance of securities backed by *Shari'ah*-compliant real assets does not pose the typical problems of interest-based loans, but structured finance products should be closely scrutinized as to their characterization as risk-transfer or risk-sharing vehicles. Thus, the requirement for the object of exchange to be a *Shari'ah*-compliant real asset is no substitute for the other condition that the return on financial claims is determined on the basis of risk-sharing agreements. The risk-sharing objective of Islamic finance implies that the risk-return profile of financial instruments should be tested for risk transfers and asymmetric allocations of risks.

There is a subtle but significant difference between risk sharing and risk taking, though. The issue is important because it has implications for the pricing of risk by economic agents, and because of the impact of risk taking by the banking sector on monetary policy transmission. The decrease in central bank's policy rate increases the incentives for banks to extend credit based on expectations of higher profitability from new lending. From the perspective of prudential regulation, risk-taking is associated with credit-risk and maturity-mismatch in the balance-sheets of banking institutions. The notion of risk taking in Islamic finance, however, differs fundamentally from

this conventional definition of bank risk taking. In the absence of *ex ante* predetermined rates of interest, there is no risk-taking channel for monetary policy transmission through the banking sector.

Given the impermissibility of interest-based debt transactions, risk-taking is defined with respect to real investment rather than bank credit and its implications for financial stability. Indeed, risk sharing in Islamic finance necessarily implies risk taking since the real investment decisions typically antedate financing decisions. There is thus risk taking in exercising the option to invest, followed by risk sharing in choosing the appropriate interest-free mode of financing. The meaning of risk taking differs across Islamic finance and conventional finance. Under conventional finance, risk taking is constrained within the financial sector, where its linkage with the real economy is severed, leaving room for risk management only through risk transfer and risk shifting. It is because risk taking takes place in the real economy that the door is open for risk sharing under Islamic finance. From the perspective of prudential regulation, whereas risk taking conducive to financial instability is a legitimate matter for concern, risk taking conducive to economic growth is not just desirable but necessary.

The allocation of risk in the society through risk-sharing may provide also safety in numbers for risk-averse investors. This risk-sharing can be achieved through three main interrelated forms: (1) financial instruments for risk-sharing based on permissible *mu'āmalat* agreements of partnership such as *mudhārabah* principal-agent partnership, and *mushārahah* equity partnership, (2) redistributive institutions for risk sharing such as the institution of mandatory levies of *zakāh* and voluntary commitments to *sadaqah* (charity), *qardh hasan* (benevolent loan), and *waqf* (charitable endowment), and (3) intergenerational redistribution of risk through inheritance rules that are also conducive to reallocation of wealth, resources, and risks among inheritors. Together with injunctions against wealth accumulation, the redistribution functions are based on the notion that property does not confer an absolute right for the more able segment of society to exclude the rights of the less able. These rights are redeemed through obligation set upon the more able to allow for a fair share of the less able into the balance of resources of the society.

The redistributive mechanisms have also the potential of reducing the persistence of hand-to-mouth consumption patterns, in which households with poor income tend to consume all disposable income, resulting in high correlation, or parity, between income and consumption. The fraction of hand-to-mouth consumers in the society is indicative of the degree of development of its financial system and its capacity of financing real investment with larger pools of savers. It is possible to conceive instruments based on mandatory and voluntary levies to be included in the full spectrum

of Islamic financial instruments in order to provide opportunities for consumption smoothing and reduction of idiosyncratic risks to all households, irrespective of the levels of disposable incomes and endowments. The availability of financial instruments for risk sharing, including insurance against risks to livelihood and home equity depreciation, to all classes of society represents an intrinsically different approach to the democratization of finance. Islamic finance provides risk management solutions to the society based on risk sharing rather than risk transfer mechanisms, which led to the U.S. credit and financial crisis.

### **The Role of Equity Markets in Risk Sharing**

The re-emergence of Islamic finance industry is characterized by the development of a class of short-term, low-risk and liquid instruments. The precautionary demand for liquidity from Islamic financial institutions is understandable in light of the prohibition of interest rate, which precludes *I-owe-you* debt securities and traditional money markets. As argued by Askari, Iqbal, Krichene, and Mirakhor (2012), the development of “money markets” based on exchange claims on real assets is, however, possible. The returns determined *ex post* on the basis of the profit–loss sharing principle would be associated with low volatility as they are contingent on the performance of the real assets. The linkage between the real and financial sectors under Islamic finance would secure a large supply of financial assets that could be securitized through the issuance of certificates of different maturities in the primary markets. It is the role of governmental institutions to support the inception of primary and secondary markets through the function of supervision to ensure compliance with *Shari‘ah* requirements. It is the development of secondary markets that arguably poses more challenges related to the need for reliable sources of funds to facilitate the functions of market makers and traders. In the absence of borrowing from financial intermediaries, it is the crucial role of central banks to provide the necessary arrangements for secure sources of funds, and supervision of secondary markets.

In addition to short-term low-risk instruments, there is a crucial role for equity markets, which provide opportunities for investment in growth and value firms. In contrast to the demand-driven markets for safer and liquid securities such as *sukuk* certificates, the longer-term higher-risk instruments, which lie at the other end of the full spectrum of Islamic financial instruments for risk sharing, remain relatively less developed. The importance of securities markets for optimal risk allocation is recognized in the seminal study by Arrow (1964), in which the analysis of pure exchange economy is extended to securities in order to account for claims payable in money

rather than commodities. The role of capital markets in the aggregation of information, price discovery, and signaling effects for the firm's investment and financing decisions is unmatched by the function of financial intermediaries, which is important in its own right. It is through efficient capital markets that opportunities are available to financial intermediaries for portfolio risk diversification on the asset side of their balance sheets. The stability of the financial system relies indeed on the existence of efficient markets for the trading of financial assets, and on efficient financial intermediaries that provide opportunities for channeling savings toward investments, leading to increased liquidity and lower transaction costs.

In the absence of bond markets, which are characteristic of conventional capital markets, there are markets for asset-linked securities in the Islamic financial system. The immense pool of *Shari'ah*-compliant income-generating assets provides the basis for a securitization process that culminates in the issuance of certificates with various maturities. The return on these securities is determined by the performance of the underlying assets, and it is relatively easier to assess the risks associated with a portfolio of homogeneous assets. Given the lower variability in the expected income generated by the assets, there would be lower volatility of returns on asset-linked securities. The market for asset-linked securities provides opportunities for investment in low-risk stable-income, albeit not necessarily fixed-income, securities, which lie at one end of the spectrum of Islamic financial instruments. However, it can be argued that if risk sharing is the essence of Islamic finance, it is equity markets that provide the ideal instrument to achieve it. In contrast to asset-linked security, equity represents a share of the capital of the firm. It provides an exposure to the risks of the entire general business of the firm, which are arguably larger than risks attached to the pool of securitized assets. The scope of risk sharing in equity markets is therefore wider than that of asset-linked securities.

Stock markets are platforms for the efficient sharing of risks, as noted by Diamond (1967), among others. It is possible for firms to raise long-term capital for long-duration growth-oriented projects. The disincentives for investors to finance such projects is also reduced, as the opportunity is offered through liquid markets to terminate risk exposure before the maturity of projects. The trading of equity instruments also allows economic agents, including financial institutions, to mitigate liquidity shocks. Thus, equity represents a mechanism for the reallocation of risks in the society according to the individual degree of risk tolerance and risk bearing. Hence, stock market listings create incentives to individual investors for sharing risks inherent to long-term productive projects. They create also incentives for firms to engage in higher degrees of technological specialization, which is conducive to economic growth. As argued by Saint-Paul (1992), there is

a strong interaction between financial markets and technological choice, in which financial markets provide opportunities for financing riskier technologies, and technological advances also create the need for financial markets. There are multiple equilibria in which the economy converges either toward states of underdeveloped financial markets and little division of labor or toward states of strong financial markets and greater division of labor. Arguably, financial markets contribute toward specialization and economic development by spreading and sharing risks associated with technological choices among investors. Thus, an ideal Islamic financial system is dominated by equity markets that allow for a larger scope of risk sharing that accommodates the needs of the society to undertake riskier technological choices. The greater division of labor and specialization is conducive to economic development, which contributes toward larger participation into stock markets and increased risk sharing in the society.

The important issue arises then as to whether higher rates of savings and capital accumulation are as important as the processes in which capital is allocated to real investment. Whereas the demand for equity is driven by savings and expectations of income and capital gains, supply of shares through initial public offerings is, in principle, determined by real investment. As argued by Stiglitz (1989), the existence of informational imperfections implies adverse selection and signaling effects associated with new equity issues when the willingness of firms to raise equity funds is affected by perceptions of poor-quality investment projects. There may be a tendency for firm valuation to decrease with new equity issuance, with implications for the market value of outstanding shares. In addition, there are adverse incentive problems when equity funding lowers the incentive for entrepreneurs, and managers in particular, to act in the best interest of shareholders, resulting in agency conflicts.

However with respect to interest-based debt financing, there are also adverse selection problems when firms express the unwillingness to be subject to lender scrutiny and monitoring in the presence of sound investment projects. Furthermore, adverse selection and adverse incentive effects can be also significant in the presence of excess demand for credit but interest-rate rigidity. Given the commitment of borrowers to fixed payments, the incentives for lenders to assess the total firm value are reduced. Under credit rationing conditions, there may be an adverse selection of risky projects by borrowers, and a propensity for lenders to discontinue credit in the event of default instead of raising interest rates on new loans. Under these conditions, banks may discourage risk taking, which implies the allocation of resources toward the low end of the risk–return spectrum of real investment, and sub-optimal social welfare conditions. Thus, the form of financing affects how risks are shared, how capital is allocated, and ultimately how firms behave.

The firm can issue claims against its own future returns based on equity and debt, but the choice is not only driven by the cost of capital, and informational imperfections. Invariably, it is the long-term profitability of the firm that provides the basis for its long-term liquidity, and the validity of the fundamental assumption about the business entity as an ongoing concern. Naturally, it is the recourse to equity that provides signals about long-term viability, which is more consistent with the status of ongoing concern. From a social point of view, the distinctive feature of equity-financing is that, as noted by Stiglitz (1989), firms are less likely to reduce production under economic downturns as much as they would with debt-financing, because risks are shared between financiers and entrepreneurs. The equity markets are, on average, associated with higher risks but also expectations of higher rewards than risk-free assets. However as noted by Allen and Gale (2009), long-term investments are also, by definition, associated with longer maturities and thus less liquidity as well, leading to a trade-off between liquidity and returns. It is important that equity markets provide a venue for liquidity demand, which has also implications for asset price volatility.

Thus, the amount of liquidity supplied to equity markets constitutes an important determinant of participation. There is valuation risk in the sense that scarce liquidity is conducive to asset prices that are less determined by discount cashflows than by the amount of liquidity. The low rate of participation in stock markets may be also due to institutional factors such as high transaction costs and lack of trust due to speculative trading. For instance, Erbaş and Mirakhor (2007) provide evidence that ambiguity aversion can potentially explain the equity premium puzzle. This equity premium puzzle is based on the evidence by Mehra and Prescott (1985) that the average return on stocks above risk-free assets is rather too high to be explained by standard models of asset pricing. Indeed, conventional wisdom implies that arbitrage opportunities are bound to disappear as capital moves away from risk-free assets toward higher yields in equity markets. As discussed above, the ambiguity derives from Knight's association of uncertainty with difficulties in measuring the distribution of investment return with precision. Thus, Erbaş and Mirakhor (2007) argue that as a result of difficulties in quantifying risk, market perceptions of equity returns as more ambiguous than risk-free assets would be conducive to the requirement for an ambiguity premium. This adds to the amount of risk premium and results in higher equity premium on average. The question also arises with respect to the low international risk-sharing puzzle, but the reasons may have to do with factors such as barriers to free access and low trust, which explains also low participation in domestic equity markets.



### The Role of Government in Risk Sharing

Given the low participation rates, there is an important role for the state in promoting risk sharing through equity markets. Whereas the existence of equity markets in itself does not justify government intervention, the existence of market imperfections, imperfect and costly information, and contract enforcement may. There is indeed a need for a minimum level of interference from governmental institutions to reduce the costs of participation, promote contract enforcement, and ensure good governance structure and transparency from firms and markets. These institutional factors have the potential to increase trust in equity markets. There is also a need for measures from central banks to provide liquidity supply to market makers to ensure the proper function of secondary markets. The set of actions, policies, and institutional prerogatives can be envisioned in consideration of the risk-sharing principle and behavior of market participants according to Islamic finance. These institutional, administrative, and regulatory measures can take the following forms:

- Investment in human capital to meet the needs of the Islamic finance industry with competent and well-educated financial intermediaries in legal and *Shari'ah* scholarship, financial accounting, financial economics, and financial management, financial advisors, and financial journalism. The creation of international world-class business and finance schools and law schools is important for the supply of human capital in the fields of financial and reputational intermediaries. But it is also instrumental in the internalization of the system of moral and ethical values into the set of skills, knowledge, and expertise in Islamic finance.
- Investment in massive public education campaigns to raise the awareness about the benefits of stock market participation.
- Creation of positive incentives for saving and for risk-sharing through equity investment.
- Institution of legal requirements for the protection of the rights of minority shareholders. These measures are inseparable from the institutional efforts to promote larger participation in equity markets and risk sharing in the society.
- Creation of a level-playing field for equity to compete with debt-financing instruments. This implies the implementation of policies that address the legal, administrative, financial, and regulatory biases as well as tax incentives that result in preferences for debt over equity holding.

- Restriction of the credit and monetary functions of the banking system and risk-taking capacity of the shadow-banking system, with measures such as limits on leverage and short-selling activities.
- Development of an independent, sound, and dynamic regulatory and supervisory system for stock exchanges. The supervisory functions are not only limited to monitoring the behavior of markets and market participants, but also entail implementing prudential measures to prevent regulatory arbitrage.
- Promotion of good governance, transparency, and information sharing, such as the mandatory dissemination by all exchanges of accurate aggregate trading and price information to the public in a timely manner.
- Design of an optimal regulatory and supervisory framework for reputational intermediaries. This includes the promotion of self-regulation to prevent inaccurate or false reporting and systematic misrepresentation of public or private interests.
- Construction of wide-access information system for the gathering and dissemination of macroeconomic information and firm-specific information including self-dealing and insider trades, which create adverse selection and moral hazard problems. It is crucial that the free flow of accurate and reliable information not be hampered by high costs of access to the large public, because this has direct implications on the rate of participation in the stock market.

Arguably, the sharing of timely, accurate, and thus reliable information is an essential condition for risk sharing in Islamic finance. This set of measures spans various fields of knowledge and expertise, including information technology, financial regulation, judiciary and legal practice, education and corporate governance, among others. But, forward-looking expectations constitute an important feature of investment in equity markets, and it is thus essential that the list of policies and actions discussed above, which is not exhaustive by any means, focuses on the role of information in the formation of expectations in financial markets. The imposition of robust listing standards on stock exchanges, and strict enforcement of disclosure rules through firm delisting measures would pave the way for a culture of prudence, honesty, openness, information disclosure, and transparency. The institution of trust in Islamic finance is conditional on the existence of independent, strong, and dynamic regulatory bodies that supervise the adherence of economic agents to the various rules and regulations. But the investment of educational resources in the promotion of a place for ethics, morality, justice, and good faith in transactions is essential to ensure that it is not just the letter of the law but its essence, or *maqāsid al-Sharīʿah*, that are adhered to.

As noted by Lippmann, “[t]he laws depend upon moral commitments which could never possibly be expressly stated in the laws themselves” (1937, 346).

It is important that government intervention to ensure a level-playing field for risk sharing is driven also by the pursuit of sustainability through social inclusiveness and participation by all segments of the society. The government itself shares risks with the population through deposit insurance, monetary policy, and tax and spending policies, as well as risks with the poor and less able through social expenditures policies. But it can play a larger role in risk sharing with the society by financing development budget projects in particular, through equity and direct ownership with its citizens. This equity-based financing is conducive to the reduction of sovereign-debt problems, and the debt-servicing burden on government budgets. The rationale behind the government’s commitment to public goods projects has to do with the *indivisible* and *nonexclusive* nature of infrastructure and development projects and with the prohibitive costs for the private sector. However, Choudhry and Mirakhor (1997) argue that since the social rates of return on such projects can be at least as significant as the rate of return in the private sector, it is possible indeed to consider equity financing based on public–private partnership. The social rate of return is defined as the equilibrium rate that equates the marginal benefits generated by the infrastructure project to the opportunity costs associated with the provision of marginal services. Private participation in joint government projects is conditional upon the social rate of return being at least as high as the average return to the private sector. It is also noted that because of perceptions of lower risk associated with government-issued certificates, the expected rate of return would be reflective of lower risk of default and lower risk premium. As noted by Haque and Mirakhor (1999), the return on government papers is not inclusive of risk premium attributable to possible private defaults.

Though such joint partnership schemes can be associated with informational and governance problems as well as possible market distortions, the long-term benefits of government participation papers can be rather substantial. First, from the government’s perspective, the securitization of infrastructure projects reduces the reliance of government budget on borrowing by tapping into the larger base of household and firm savings. It expands the opportunities to finance larger portfolios of development projects under the same budget constraints. It brings about some clarity in the definition of the objectives of monetary policy and restricts the amount of new money creation. It changes the complexion of monetary expansion and financial regulation with a shift of focus from credit to equity. This form of government risk-sharing partnership also removes the disincentives for the private sector to participate in long-term projects, with

the potential of strengthening crowding-in effects. The implementation of growth-promoting policies through risk sharing instruments is thus conducive to greater budget stability and ability to manage external imbalances and risks of sudden stops of capital flows.

Second, it can be argued from the perspective of institutional structure that equity-based forms of government finance also promote the role of financial institutions and financial markets. They increase the supply of securities, promote trust and credibility in equity trading, and have the potential to revitalize stock markets by increasing market depth and breadth, thereby reducing the costs of market participation. They have the potential to improve market liquidity and the ability of market participants, including firms, financial intermediaries, and households, to mitigate liquidity shocks. It can thereby improve the public awareness about the crucial importance of equity markets in the mitigation of idiosyncratic risks. Third, from a social point of view, the issuance of non-interest-based government certificates that can be traded in the equity markets is conducive to widespread risk sharing in the society. It is conducive to positive redistribution effects, as government resources traditionally used to service public debt can be prioritized toward social expenditures and social participation in projects with higher social returns. It promotes the direct ownership of resources by larger segments of the society, thereby reducing the economic problems associated with the *tragedy of the commons*, and instilling a sense of concern, solidarity, and commitment toward the preservation and maintenance of public goods for individual and social well-being. It is thus conducive to better governance, as it is conducive to the democratizing of finance by promoting the status of citizens as owners-shareholders of public projects.

Thus, in light of the discussion of the various adverse selection and adverse incentives, regulatory, and institutional measures as well as government finance, it can be argued that despite market and informational imperfections, it is equity markets that provide an optimal platform for risk sharing and establish a stronger linkage between the financial sector and real economy.<sup>11</sup> In contrast, interest-based debt instruments are based on a risk transfer mechanism that weakens the connection between returns in the financial sector and returns from real investment. Since the occurrence of default itself can only be known *ex post*, interest-based securities cannot be considered as pure contingent claims. The increase in credit risk and transfers of credit risk off-balance-sheet pose serious threats to financial

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<sup>11</sup>The equity markets provide strong signals about the rate of corporate investment, and this explains the use of the *Q*-theory of investment based on Tobin's *Q* ratio, which relates the firm value to the replacement cost of assets.

system stability and complicates prudential regulation aimed at reducing systemic risk. Through risk transfer, there is a potential for risk concentration in the financial system that may become intractable. In addition to financial fragility reflecting the potentially significant impact of small perturbations, the financial system may be also unable to cope with extreme events and long-tail effects. Arguably, there is an underestimation of rare events in risk management models, an issue which is important on its own right, but there may be also (and oft-neglected) merits of efficient risk allocation not through risk transfer but risk sharing. There may be indeed credit defaults with respect to corporate or sovereign bonds and bank loans leading to long-tail effects, but no defaults on equity claims. Whereas the payments on debt claims are only in *part* determined by economic activities, return on equity is *fully* determined by economic variables. Thus, the risk-sharing and return-sharing mechanism increases the capacity of the society to absorb the impact of extreme events and provides insurance against intrinsic uncertainty caused by stochastic fluctuations in the economy.

## SUMMARY AND CONCLUSIONS

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This chapter provided an epistemological analysis of conventional finance and Islamic finance. The question about epistemological roots is important because of public perceptions that the Islamic finance industry has grown, over the past few decades, on the platform of the conventional financial system. It was developed to address “market failures” in the sense that demand for *Shari‘ah*-compliant financial products was not met by the range of financial services in the conventional financial system. Islamic finance, in its new form and substance, is perhaps reflective of the interests of pioneer bankers and market players well-versed in conventional finance. The focus was, and arguably still is, on the development of financial instruments that are both familiar with conventional finance and compatible with *Shari‘ah* requirements. The pursuit of these objectives, which are not necessarily mutually exclusive, continues with the development of synthetic and structured products resulting from the replication and retrofitting of conventional financial instruments. These developments are rendered possible through the innovation, expertise, and creativity of market players, including financial institutions, reputational intermediaries, and *Shari‘ah* scholars.

It can be argued, however, that financial products may be deemed Islamic insofar that attempts are made to eschew *ribā*, but there is more to Islamic finance than the avoidance of interest. The central argument throughout this chapter is that risk sharing is the objective of Islamic finance. Thus, the avoidance of *ribā* may be regarded as meeting only part of the verse

of *al-Qur'an*, in which Allah (*swt*) first ordained the permissibility of *bay'* exchange and then the prohibition of *ribā*. Whereas attempts to ensure non-violation of *ribā* prohibition are necessary, noble, and justifiable, the lack of focus on risk-sharing instruments does not meet the other part of verse related to exchange, and the development of the Islamic finance industry without the central purpose of promoting exchange may be thus unjustified. It may be argued that the development path may not be ideal, particularly as an alternative path based on risk-sharing finance was defined by pioneer scholars in finance and economics acting with proper knowledge and understanding of *Shari'ah*, and remembrance of the past Islamic finance in the classical age of Islam. The reality remains that it is conventional finance that provided a platform for the emergence of the Islamic finance industry, and it is important to examine their respective epistemological roots.

The essential argument in the epistemology of the conventional economic system, which comprises the financial system itself, is that the discipline of economics owes its origins to the influential work of Adam Smith. The general equilibrium model by Kenneth Arrow, Gerard Debreu and Frank Hahn provided a rigorous analysis of the essential features of an exchange envisioned by Smith. The efficient allocation of resources in this exchange economy is shown to be driven by risk sharing. However, many historians of economic thought, economists, and philosophers such as Amartya Sen, among others, contend that the emphasis in neoclassical economics on Smith's notions of self-interest and invisible hand and the disregard for his vision of the institutional structure based upon a system of morality and justice are reflective of distortive interpretations of his writing. The argument is thus made in this chapter that Smith's belief in the rules of morality and laws of justice is reflective of his belief in the laws of the Deity, and these moral rules are also reminiscent of the same ethical and justice values prescribed by Allah (*swt*) and the Noble Messenger (*saws*). There is also evidence that the essential arguments by Smith in seeking to understand the invisible connecting principles of the human order echo also those of Isaac Newton about the principle behind natural order. It is thus noted that belief in the Deity can explain Smith's argument that human order is the design of the Law Giver who endowed humans with the virtues of prudence, justice, and benevolence.

There is also a recognition by Kenneth Arrow that the optimal allocation of risk, according to Arrow-Debreu-Hahn models of general equilibrium, also depends on trust as part of the moral rules envisioned by Smith. The analytical model provides evidence that resource allocation in a competitive economy is optimally achieved through risk sharing using contingent financial claims on the real sector. The Arrow securities are associated with payoffs contingent on the realization of a particular

state of nature, and as such they are consistent with equity instruments that allow for risk sharing in the economy. It can be argued that had the conventional financial system developed along the path of risk sharing defined by Arrow-Debreu-Hahn, the concentration of credit risk in the financial system could have been avoided and financial crises could have been prevented. In the aftermath of the U.S. credit crisis that exposed the inherent risks of instability of the financial system, there are various proposals to reform the financial architecture. These include recommendations for stronger prudential regulation through higher capital adequacy ratio and restrictions on leverage within the shadow-banking system. There are also proposals for reform of the fractional reserve banking system to dissociate the credit and monetary functions, which are made through a revisit to the Chicago Plan and the concept of limited purpose banking. From the perspective of economic theory, there are also recommendations by Joseph Stiglitz, among others, for new macroeconomics that incorporate risk, information, and institutions while also taking into consideration the effects of inequality, globalization and structural transformation. It is not clear whether the intellectual debate and reform proposals can steer the conventional financial system away from interest-based debt financing, which promotes risk transfer and risk shifting, and toward an ideal system envisioned by Smith and Arrow based on risk-sharing mechanism.

This chapter has shown also that from an epistemological point of view, an ideal Islamic financial system is based on risk sharing. The optimal allocation of resources achieved through Arrow-Debreu model of general equilibrium is fully consistent with the objective of risk sharing in Islamic finance. The evidence from the theoretical modeling of an Islamic economy without interest and under a full reserve banking system by Askari, Krichene, and Mirakhor (2014) suggests that the Islamic financial system converges to equilibrium. The financial system stability derives from equity-based financing under the principle of risk-sharing in Islamic finance, which strengthens its capacity to absorb shocks without strong fiscal and monetary policies. Also, Islamic finance and economics recognize the importance of the completeness of contracts and institutional structures such as contract enforcement, trust, and equity markets.

The Islamic finance industry has developed instead a set of short-term, low-risk liquid instruments. It can be argued that short-term instruments are needed to meet the liquidity demand by financial institutions, but long-term instruments are also necessary for the generation of employment and promotion of economic growth. Given the trade-off between liquidity and returns, there are disincentives for the private sector to undertake long-term investment, which are by definition associated with longer maturities, longer payback periods, and thus lower liquidity. There are perceptions that the



focus in Islamic finance is made on relatively safe assets with debt-like obligations promising returns with minimal risk over short time periods. The repeated reinvention of the same short-term low-risk instruments with only minor differences for the sake of product differentiation carries the risk of path dependency and perpetuation of Pareto suboptimal allocation of resources. The theory of spanning suggests indeed that a basic instrument can be spanned by an infinite number of derivatives. But the perpetual issuance of short-term low-risk investment can deprive the economy of financial resources better devoted, from a social point of view, to long-term, employment-generating, and growth-promoting investments. The notion of path dependency implies that the future of Islamic finance may well depend on what is focused on presently. Hence, the risk is that persistence may well leave a simple but disturbing message that in the absence of *ribā*, it is only safety, short-termism and liquidity provision that Islamic finance is all about.

The central argument throughout this chapter however is that Islamic finance, viewed from the epistemological perspective, is about risk sharing rather than safety of investment under uncertainty. Islamic finance takes indeed into account the interaction between time and uncertainty in the design of contracts based on risk sharing. As argued by Fischer and Merton (1984), all securities constitute, in the absence of differential tax treatment, perfect substitutes under certainty, which implies that a single financial market would suffice for the economy, and that investment decisions would be based on net present value calculations of known future cashflows discounted at known risk-free rates of interest.<sup>12</sup> Under uncertainty, however, it is risk sharing based on the individual ability to bear risks that provides an optimal mechanism for the allocation of risks and resources in the society. From a social point of view, indeed, there is a need to finance long-term high-risk investment projects, and the optimal allocation of resources is through risk sharing. The concept of risk sharing is the essence of Islamic

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<sup>12</sup>It can be further argued that under certainty, there is no risk premium either. With the exclusion of unprofitable investments, there is conceivably room only for the sharing of known profits at known rates of return. In the absence of risk, there is neither risk sharing, nor risk transfer, nor risk shifting. The cost of capital would be determined in the single financial market that is necessary for the economy. Thus under certainty, the required rate of return on financial assets traded in this single financial market is also known since there is no risk-return trade-off. This rate of return is contingent not on different states of nature, but on the maturity of investment projects, timing and amount of known future cashflows. Hence, it may be argued that given the known rate of return, and the absence of risk transfer, there is no justification for risk-free rates of interest.

finance. And if there is substance to the proposition that risk sharing is the objective of Islamic finance, then equity-based financing instruments and equity markets should be its driving and dominant force toward sustainable development.

History and tradition should provide inspiration for the development of Islamic finance. The equity-based forms of Islamic finance that prevailed during the classical age of Islam provided historical evidence that the reconciliation between efficiency and equity is not impossible. This innovative Islamic finance also provided the safe plateau for the emergence of Western corporate structures. The platform provided by the conventional financial system for the emergence of an Islamic finance industry may not be optimal however, because it is not based on an ideal conventional financial system. It is for this very reason that it should not be permanent. The convergence toward an ideal financial system is possible, as it can take place through the internalization of the morality and justice system and an institutional structure that promotes these objectives through the risk-sharing mechanism. It is toward an Islamic financial system that considers equity financing as *conditio sine qua non* for efficient allocation of resources and for economic justice that efforts should be invested.

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