

Some Implications of Debt versus Equity-Based Financing in the Backdrop of Financial Crises

Hayat Khan

1. Introduction

Islamic banking and finance has its roots in the prohibition of *ribā* (which includes interest on loans and the sale of debt on discount), *gharar* (contractual uncertainty⁽¹⁾) and *maysir* (which includes gambling). These prohibitions (i) imply a ban on money generating money; (ii) require that any return on money must come from participation in real economic activities and (iii) restricts trade to items with property rights at initiation, which are building blocks of the conventional financial architecture. An alternative, based on the principles of Islamic finance, is widely referred to as equity-based financing where the underlying principal contracts operate under the equitable norm of risk-sharing.

Perhaps the most interesting aspect of Islamic finance is that the stated principles and prohibitions did not emerge through some scientific discovery or theoretical developments to deal with the shortcomings of existing models. In fact, initially, mere religious directives and ideological considerations were the main push factors behind the progression (Tahir, 2009). Any calls for rethinking the financial architecture by its proponents, therefore, did not appear that attractive to be taken seriously. With Islamic finance growing out of its infancy,

(1) This refers to contractual uncertainty related to the subject matter, its price or delivery which among other things implies a ban on short-selling. For a more clear definition, see glossary in Intro-pages of the issue [Chief Editor].

recurring financial crises act as an innate laboratory set-up that exposes the weaknesses of the financial system in vogue and offers advocates of Islamic finance an opportunity to present scientific arguments in favor of its principles (Ejaz and Khan, 2009). It is, therefore, not surprising to see a growing number of research papers and newspaper articles advocating the need for rethinking the very financial architecture worldwide⁽²⁾. Advocates of Islamic finance also contributed to the ongoing debate including Usmani (2010), Chapra (2007, 2008), Siddiqi (2008), Ahmed (2009), and Ejaz and Khan (2014). All these studies, one way or the other, relate the reasons behind the recent Global Financial Crisis (GFC) to a violation of the principles of Islamic finance stated above. Chapra (2007, 2008) attributes the GFC to excessive debt and the lack of market discipline due to the absence of risk-sharing; Siddiqi (2008) blames immoral tendencies with respect to the existence of *ribā* and *gharar*. Ahmed (2009) draws attention to the failure of risk mitigation at different levels as the main cause of the crisis. Usmani (2010), in his submission to the World Economic Forum, emphasises on the nature of money and argues that it should not be treated as a commodity. Similarly, Ejaz and Khan (2014) focus on the problems with the underlying contracts and discuss whether replacing the debt-based financing with equity-based financing, as practiced in Islamic banking, would have prevented the crisis from happening.

This paper reflects on some of the consequences of replacing debt-based financing with equity-based financing and alludes to some testable hypothesis and theoretical and philosophical debates for future research. The paper complements the analysis presented in the paper of Askari in this issue. At the end of the paper, we focus on certain aspects that need to be emphasized.

The paper is organized as follows. Section 2 starts with a discussion of the impact on the level and stability of prices and returns, of allowing money to generate money and selling something without owning. Section 3 highlights the impact of debt-based financing and risk-transferring on aggregate risk and Sharpe ratio in the economy vis-à-vis

(2) The World Economic Forum invited representatives of religion in this regard and produced a report called *Faith and the Global Agenda: Values for the Post-Crisis Economy* in collaboration with Georgetown University.

an economy based on the principles of risk-sharing. Section 4 presents a theory of financial crises based on the principles of Islamic finance. Section 5, provides a comparison of Shiller's 'Continuous Workout Mortgages' as a solution to the GFC and diminishing *mushārah*-based house financing. Section 6 provides a context for the reasons behind the absence of 'true' risk-sharing contracts (*muḍārah* and *mushārah*) in the Islamic finance industry in practice. In Section 6, we also discuss an alternative to the *muḍārah* and *mushārah* contracts. Section 7 concludes the paper.

2. Money, Prices and Return

Interest-based system allows money to earn money without tying it to real projects. The underlying assumption behind interest-based financing is that this money will eventually be invested in a real sector project, which is not necessarily true, as we have come to learn the hard way, during the GFC. John Snow, a former Treasury secretary, told the Financial Crisis Inquiry Commission that financial firms had grown mainly by simply lending to each other and not by creating opportunities for investment and that "we overdid finance versus the real economy and got it a little lopsided as a result" (The Financial Crisis Inquiry Commission report 2011). This leads to an increase in the money supply and an upward shift in aggregate demand. This shift in aggregate demand is greater than a rightward shift in aggregate supply which results in demand pull inflation.

Islamic finance, on the other hand, requires money to be invested in real economic activities which induces a rightward shift in the aggregate supply curve. The rightward shift in aggregate supply will be of comparable magnitude to the shift in aggregate demand which implies relatively lower prices. Other things being equal, this implies greater real return. A counter argument to this could be that money creation implies greater opportunities to invest in real projects as it increases the circulation of money. The total worth of real projects in a conventional economy may, therefore, even be greater than an economy operating under the principles of Islamic finance⁽³⁾. This will however be true only if the multiplier effect of a real investment is lower than the multiplier

(3) Sub-prime loans for example result in new projects.

effect of money creation on real output which, if true in the short-run/medium run, is unlikely to be true in the long-run⁽⁴⁾. Given that financial crises are recurrent, money creation is widely believed to result in a Ponzi game type solution which results in a crisis (see Minsky theory of financial crises below). Moreover, Islamic finance promotes genuine trade and prohibits short-selling and day-trading, for example, which eliminate price volatility caused by speculators in the market^(5,6).

3. Risk in a Debt vs Equity-Based Financial System

Total risk in finance is divided into systematic and unsystematic risk. Systematic risk is the risk that tend to have a similar impact on the entire market, whereas, unsystematic risk is idiosyncratic in nature and is specific to a stock or a security. The latter is, therefore, diversifiable (reduced by putting together a number of stocks in a basket) while the former is not. Whereas a detailed analysis of the two risks in an Islamic financial system versus conventional financial system will be more revealing, I will resort to a heuristic proof to demonstrate that total risk in an Islamic economy will be lower than in a conventional economy. This claim requires realization of the following points:

- i. Debt-based instruments guarantee a safe return of the principal amount along with fixed interest payments. This guaranteed fixed return induces investors to take greater risks and invest in relatively riskier projects.
- ii. Allowing the sale of debt opens the possibility of creating sub-prime loans as primary lenders simply generate these transactions to pass them on to others. This originate-to-distribute model further increases total risk in the economy⁽⁷⁾.

(4) One way of measuring this effect would be to look at the impact of financilaization on inflation, real return, industrial production, and net job creation while controlling for debt vs equity financing.

(5) The effect of short-selling and day-trading on price volatility is straightforward to investigate. These variables can also be introduced as independent variables in the regressions mentioned in the previous footnote.

(6) Regulator in many countries temporarily banned short-selling to stabilize the market since the start of the recent global financial crisis. These countries include the US, France, Germany, Spain, Italy, Greece, Belgian and Taiwan.

(7) Many studies blame the subprime mortgage market to be the source of the recent GFC (Global financial crisis). Steiglitz (2011) for example, argues that the mortgage brokers were encouraged to focus on the quantity rather than the quality of these loans since they were not the eventual holders. Also see Taylor (2011).

- iii. Conventional finance allows investors to transfer risks to others (to hedgers or speculators in the derivative market, for example) which again encourages investment in relatively risky projects.

It is, therefore, reasonable to postulate that aggregate risk in an economy with debt-based instruments and risk-transferring mechanisms will be higher than an economy without such facilities. Since, every real project is as good and as risky as itself, this largely implies lower systematic risk in an economy operating under the principles of Islamic finance vis-à-vis conventional finance. This, together with the analysis in the previous section, implies that the Sharpe ratio of an economy operating under the principles of Islamic finance may be higher, implying higher return per unit of risk, than that of a debt-based economy⁽⁸⁾. This, however, does not mean that resorting to risk-sharing will practically eliminate financial risk. Islamic finance products vary in terms of their exposure to risk. *Muḍārabah* and *mushārah* are considered high-risk alternatives relative to *ijārah*, *murābahah* and *bay' bi-thaman al-ājil* (BBA)⁽⁹⁾. It, however, *does* imply relatively efficient project financing and equitable distribution of losses in case of a crisis. This is because investors with equity position in real projects are expected to select relatively better projects than those resorting to debt-based contracts. Thus, the former spreads losses more equitably than the latter. Chapra (2007, 2008) states that the interest-based system has always been inferior to a system based on risk-sharing in terms of equity and social justice. The claim that the former is better in terms of efficiency has become more convincing than

(8) Although not fully representative of the claim presented here, a comparison of conventional companies (or those screened for Shariah-compliance) at the macro level might be a good starting point. There are some studies that look at the performance of Shariah-compliant stocks at a limited level. See for example, Marzaban and Asutay (2012) and Marzaban and Donia (2010). This line of research deserves further attention. A number of organizations provide screening criteria (with exogenously set screening thresholds) including Dow Jones, S & P, FTSE, MSCI, AOOIFI, DIB, AZAAD, Al-Meezan, and Shari'ah Capital. Each screening method results in a different Shari'ah-compliant universe of stock. The process needs some objectivity and requires a comparative analysis of the screening methods in terms of performance on different measures of returns. This kind of analysis will help creating information that could be used by investors in their decision-making.

(9) Cross comparison of competing alternatives would require using the least risky alternative as a benchmark to replace the conventional risk-free rate. This also provides an explanation as to why do financial institutions shy away from *muḍārabah* and *mushārah* as a mode of project financing.

before due to the recurrent financial crises and the persistent instability throughout the world⁽¹⁰⁾.

4. A Theory of Financial Crises from Islamic Finance Perspective

The global financial crisis was a direct consequence of the risk promoting and transferring mechanisms discussed in the previous section. Khan (2009) and Khan and Ejaz (2014) argue that the conventional financial system does not legally “tie the knot” between nominal and real transactions which would require replacing interest-based mechanisms with an arrangement where nominal transactions are backed up by real transactions and a ban on securitisation of nominal assets that is based on the principles of risk transferring rather than risk-sharing.

A sustainable system requires that all nominal transactions must be backed up by real transactions. Debt-based finance however creates a wedge between the real and nominal economy which leads to Ponzi game. Financial crises are, therefore, an innate way of ‘cleaning’ (bringing the two closer to parity) the system. Crises are therefore more likely to eventuate when the gap between the nominal and real economy widens and the negative impact of any crisis would be proportional to the gap between the nominal and real economy, and the mechanisms governing the distribution of risk⁽¹¹⁾.

I will abstract away from a full-fledged comparison of this theory of financial crises vis-à-vis Minsky’s ‘Financial Instability Hypothesis’. It would however, be useful to highlight some basic similarities and differences between the two (leaving fine details for future research). Minsky (1975, 1986) presented his theory of financial crises based on the instability of the financial system after 1960s. The theory has recently received a revived attention in the aftermath of the GFC. Whalen (2010) writes:

(10) There is now sufficient data on Sharī‘ah-compliant funds to investigate whether or not Islamic fund managers select relatively better projects. It will be interesting to investigate the standard market timing selectivity performance of Islamic fund vis-à-vis conventional fund managers.

(11) This theory can be empirically tested after constructing suitable measures of the “real” and “nominal” worth of an economy and devising measures of risk sharing. An indirect method will be to look at the short to long term impact of financialization on industrial production or net job creations in the economy.

“According to Minsky, capitalist financial systems tend to endogenize cycles –moving from a conservative state of affairs called ‘hedge financing’, to a more risky form called ‘speculative financing’, to an unsustainable form called ‘Ponzi financing’, and then back to ‘hedge financing’ for another round. This pattern of economic activity generates a series of booms and recessions, and the severity of the latter depends largely on the effectiveness of government regulation and stabilization policies.”

Minsky uses the *hedge*, *speculative* and *Ponzi* terminology to distinguish between the financial fragility of the system. *Hedgers* are able to finance their liabilities with sufficient cash inflows, *speculators* can do so only partially, and *Ponzi* units are the least able to do so (they will have to resort to a vicious cycle of refinancing ever growing liabilities). Financial fragility is, therefore, increasing in debt-based contracts (Wolfson 2002).

In our characterization above, the gap between nominal and real transactions widens as we move from the ‘hedge financing’ stage towards ‘speculative financing’ and ‘Ponzi financing’. Consistent with the Minsky’s theory of crises; crises in our theory are more likely to ensue when we move towards the Ponzi financing stage. The farther the system is into the Ponzi side of the cycle, the wider would be the gap between nominal and real transactions and financial crisis would be more likely to be severer. The difference however, lies in the solution proposed by the two theories to avoid crises. Minsky’s solution does not question the capital structure and the use of risk-sharing as an alternative to the debt-based contracts. He instead, advocates a greater role for regulation and monitoring of the system. The theory of financial crises consistent with the principles of Islamic finance on the other hand advocates the replacement of debt-based contracts with equity-based contracts which legally ties the nominal and real transaction and stops debt to create liabilities without creating real output. It is, therefore, a scheme that locks the system into the hedge-financing stage by means of invoking the appropriate contracts rather than regulations.

5. Continuous Workout Mortgages vs Diminishing *Mushārah*

While explaining the reasons behind the recent global financial crisis and proposing possible solutions, researchers have pointed out to a number of reasons. The most widely accepted reason behind the GFC is that the crisis emanated from mortgage loans to borrowers with high credit risk. The most interesting solution from the point of view of Islamic finance was suggested by Shiller (2008, 2009) referred to as ‘continuous workout mortgages’ (CWMs). CWM closely resembles the diminishing *mushārah*-based house-financing. CWM requires lender to share price risk with the borrower, thereby, indexing the debt to a local index of home prices. This is an extension of the standard ‘Price-Level Adjusted Mortgages’ model which indexes the debt to a CPI instead of a local index of home prices. CWM eliminates the incentive to exercise the costly option to default that, by construction, is embedded in every loan contract (Shiller et. al., 2013).

Theoretically, a diminishing *mushārah* contract works in a similar fashion. The customer continually buys units of the house and pays rent on the bank’s share of the house until 100% of the ownership is transferred to the client. In order to be Sharī‘ah-compliant, the price at which the customer purchases ownership units of the house should be determined by market value of the house in a manner similar to the CWM. In practice, Islamic banks fix the price in advance with the option of revising it after few years. The price of these units is, unfortunately, not benchmarked with reference to a local index of home prices but with conventional mortgage rate or a targeted rate of return on bank’s investment¹². If these variations between theory and practice can be resolved, then the diminishing *mushārah* model and the CWM would work quite similarly. Some differences, will however, remain. An obvious difference between the CWM and diminishing *mushārah* is in the underlying contract. In case of a catastrophe (such as earthquake, which is an uninsurable event) a CWM customer will have to bear the entire loss (as in any other debt-based contracts). A customer under a

(12) AAOIFI Sharī‘ah standards on *mushārah* do not provide any guidance on the price at which one partner should buy the units from another party. Since buying or selling something at a price other than its fair market value is equivalent to expropriating something for someone without a counter value, this practice seems to be tantamount to charging *ribā*.

diminishing *mushārah* contract will be liable to the extent of his/her share in the house. The bank will also share the risk to the extent of its share.

6. *Muḍārah* and *Mushārah* in Practice and a Practical Alternative

The previous sections highlighted the importance of risk-sharing contracts. The two most frequently quoted contracts that represent true risk-sharing are *mushārah* (profit and loss sharing) and *muḍārah* (profit sharing, loss bearing). Advocates of Islamic banking and finance advise using these contracts as the basis for Islamic alternative to the conventional banking system. In practice, however, these contracts haven't made much progress on the asset side of the balance sheet of Islamic financial institutions. Islamic banks and financial institutions mostly rely on fixed-return, less risky, modes such as *murābahah*, *ijārah* and BBA. In the remaining part of this section, we present a *mechanism-design* or optimal contracting perspective on these two contracts and explain as to why these contracts have largely been ignored. This section shows that the incentives offered by these contracts are weaker and riskier than other Shari'ah-compliant alternatives. We show this in a standard principal-agent framework and identify *wakālah-ju'ālah* as an alternative risk-sharing contract with better odds of success under present circumstances than *mushārah* and *muḍārah*.

In order to provide a logical context for our discussion, consider a principle (*P*) who enters into a contract with an agent (*A*). The agent exerts effort (*e*) in a real project to generate certain profit (*x*). The agent receives a standard wage-profit contract which includes a lump sum wage and a share in profit. Let the lump sum wage be labeled as “*a*” and the share in profit as “*b*”. “*a*” is typically referred to as intercept of the incentives scheme and “*b*” as the slope or piece rate. Total compensation, *w*, can be written as

$$w = a + bx \tag{1}$$

Following standard practice, let us assume that the profits, *x*, are distributed according to the distribution function *F(x,e)*. In particular

$$x = e + \varepsilon_e, \varepsilon_e \sim N(0, \sigma^2) \tag{2}$$

where σ^2 is a measure of noisiness in the environment. This implies that the effort is unobservable, which is the source of information asymmetry and moral-hazard.

The utilities from payoffs of P and A are:

$$U_p = u_p(x - w) \quad (3)$$

$$U_A = u_A(w - C) \quad (4)$$

where $C(e)$ is the private cost (disutility) of exerting effort with $C' > 0$ and $C'' > 0$.

When the principal offers a contract $\{w(\cdot), e\}$ to the agent, the agent chooses the effort level such that her expected utility from the given contract is maximized. i.e.

$$e \in \arg \max [u_A(w(\cdot), e) = \int u_A(w(\cdot), e) dF(x, e) \quad (5)$$

The principal, on the other hand, maximizes her utility subject to the agent's optimal response to the incentives and the participation constraint, i.e.,

$$e^* = e^*(b) \quad e^{*'} > 0 \quad (6)$$

$$U_A \geq U_{AO} \quad (7)$$

Equation (6) states that optimal effort is increasing in performance-based pay only and that the lump-sum wage does not motivate effort. In the presence of Akerlof's 'gift exchange', the level of effort also increases with an increase in the base wage. We however, ignore the dynamics of *gift exchange* as our main conclusion relies heavily on the participation constraint (equation 7) which determines the distribution of payoffs generated by the current contract vis-à-vis other alternatives.

The participation constraint simply says that payoff of the agent from the current contract (U_A) must be greater than any pay-off from outside option (U_{AO}). The parameter that directly affects this inequality is the base-wage (a). For example, when $C=0.5e^2$ and the agent is risk-averse with CARA utility function the participation constraint is satisfied when

$$a \geq U_{AO} - be + 0.5e^2 + 0.5\phi b^2 \sigma^2 \quad (8)$$

where ϕ quantifies the degree of risk aversion.

When 'a' is equal to the term on the right-hand side of equation (8), the current contract results in as much payoff to the agent as her best alternative contract. The higher the base-wage (a) from the expression on the right-hand side, the more attractive the current contract is relative to its competing alternatives. Also notice that a relatively noisier environment requires payment of higher base wage for the option to be chosen over the best outside options. The same is true for alternative contracts with relatively attractive outside options (higher U_{AO})

With the above general framework in mind, it is straightforward to note the following with reference to *muḍārabah* and *mushārah* contracts

(i) A standard *muḍārabah* contract restricts incentives to the performance-based pay ($a=0$), which makes it difficult for the principal to balance its incentives vis-à-vis other competitive alternatives.

(ii) The outside option is more attractive (U_{AO} is higher) when competing alternatives are less risky as the welfare loss due to uncertainty is relatively lower. Since *ijārah*, *murābahah* and BBA type alternatives to the standard *muḍārabah* type contracts are relatively less risky, Islamic banks heavily rely on these alternative contracts relative to *muḍārabah* and *mushārah*. This also means that *muḍārabah*-based financing might best suit microfinance markets. This is because *agents* targeted by microfinance initiatives typically have less attractive outside options. The moral hazard problem in the microfinance market is also relatively less severe as any financing opportunity is seen as a favor which is reciprocated with high effort.

(iii) The model can be extended to explicitly incorporate cheating-temptations (for example, overstating costs) which increases riskiness of a project. Three types of policies are helpful in this regard.

○ **Regulatory controls:** Actively monitoring the operation to increase the possibility of detecting fraud and imposing penalties.

○ **Ratings:** Putting in place a system that generates information on the basis of credit history and past performance.

○ **Morality:** Cheating is universally believed to be associated with guilt. Invoking the principle of honesty and doing the right thing increases the disutility from guilt that directly affects cheating. This is where religion plays a role.

Muḍārabah and *mushārah* type contracts require active presence of these remedial measures more than their counterparts (as they are relatively less risky). Most markets lack the presence of these measures, which renders ‘true’ risk-sharing problematic. Relevant regulatory controls and a system that generates credible information to facilitate sound decision-making, would, therefore, reduce the risks associated with *muḍārabah* and *mushārah*-based projects and will add to their attractiveness relative to the alternative contracts. The ‘moral policy’ complements the impact of regulatory and rating controls and act as a substitute in their absence. Some researchers argue that *muḍārabah* and *mushārah* will be profitable under a ‘moral’ society only, which given our discussion above, is partly true.

6.1 A Practical Sharī‘ah-Compliant Alternative to *Muḍārabah*

What is interesting to note is that the standard wage-profit contract (equation 1) is also a Sharī‘ah-compliant contract and *muḍārabah* and *mushārah* are some restricted versions of the contract. The base-wage incentives could be thought of as an upfront *wakālah* fee, and the performance-based pay can be accommodated under a *ju‘alah* contract. The standard wage-profit profile is, therefore, a *wakālah-ju‘alah* hybrid which is allowed by Sharī‘ah (refer to AAOIFI Sharī‘ah standards no 15, 23 and 34). When *wakālah* fee is zero, the contract reduces to a standard *muḍārabah* contract; and in the absence of *ju‘alah*, the contract reduces to an *ijārah al-amal* contract. The *wakālah-ju‘alah* hybrid has a competitive advantage over *muḍārabah/mushārah* as the *wakālah* fee could be used to improve competitiveness of the risk-sharing contract vis-à-vis other outside options. The rules of *wakālah* and *ju‘alah* are more flexible and open doors to other alternative specifications than the simple wage-profit profile above. The contract of *wakālah*, for example, allows the operational expenses to be paid by the agent. This would require a relatively higher *wakālah* fee than the base case. The *ju‘alah* contract, on the other hand, can be related to the end profit or its underlying constituents (for example, costs under certain heads).

7. Conclusions

Recurrent financial crises have exposed the fragility of the debt-based financial system and provides advocates of Islamic finance with an opportunity to document scientific evidence in favor of its principles. This paper discusses some of the implications of debt-based financing vis-à-vis equity-based financing from Islamic finance point of view. The paper highlights some of the important points in the debate and suggests some possible avenues of theoretical, philosophical and empirical research. The paper argues that real return in an economy operating under the principles of Islamic finance may be relatively higher than a debt-based economy, due to low inflation, stable prices and better project selection. Total risk in the financial system is shown to be relatively lower. The Sharpe ratio of an economy operating under the principles of Islamic finance is, therefore, expected to be higher, implying higher return per unit of risk, than that of a debt-based economy.

The paper also presents a theory of financial crises based on the principles of Islamic finance. The theory states that Islamic finance promotes real investment where nominal transactions are equitably backed up by real transaction and that a debt-based system creates an unnatural wedge between the two. The wedge is increasing debt, and a financial crisis is nature's way of closing the gap. Crises are, therefore, more likely, and more severe, when the gap increases. This theory has some similarities and some differences with Minsky's theory of financial crises. The major difference relates to policy implications. Whereas Minsky's solution focuses on greater regulatory controls and monitoring, Islamic finance's solution focuses on replacing the debt-based contracts with equity-based financing.

The paper also draws attention to interesting similarities and differences between Shiller's 'Continuous Workout Mortgages' (CWM) and diminishing *mushārahah*. CWM was proposed as a result of objective exercise by the proposers in an attempt to prevent crises in the future. CWM indexes the value of debt to an index of house prices in the local area which allows the lender to share price risk with the borrower. That is similar to the diminishing *mushārahah* model of house financing in Islamic finance.

The paper also provides a mechanism design perspective for the bias of Islamic financial institutions away from *muḍārabah* and *mushārahah*. The paper shows that a viable application of these contracts requires regulatory support that is missing. Islamic banks, therefore, resort to relatively fixed-return and less risky alternatives as an optimal choice. The paper also argues that a *wakālah-ju'alah* hybrid incentive scheme is in a better position to compete with alternative contracts than *muḍārabah* and *mushārahah*.

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Hayat Khan obtained his Bachelor's and Master's degrees from the International Islamic University Islamabad (IIUI) and his Ph.D. from the University of Melbourne. He is co-founder and director, since 2013, of the Master of Islamic Banking and Finance degree at La Trobe University (LTU). He received a Gold Medal in economics (Master's degree); awards of the best student of B.Sc. (Hons) and M.Sc. economics and Killmany award for outstanding performance in Ph.D. coursework. He also received the 2010 Dean' Teaching Award for excellence in teaching and the 2011 LTU Teaching Citation. Hayat's research focuses on Financial and Economic Theory, Welfare Economics, and Islamic Banking and Finance. His recent publications are: "Optimal Incentives for *Takāful* Operators" (forthcoming in *The Journal of Economic Behavior and Organization*); "The Underlying Cause of the Global Financial Crisis: An Islamic Perspective (2014, *Economic Papers*), and "Examining Models of Social Preferences and a Generalized Model of Inequity Aversion: An Analysis and Application (2014, *Corporate Ownership and Control*).

E-mail: h.khan@latrobe.edu.au