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## Conventional vs. Islamic debt-equity portfolio swaps

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**Abstract:** This conceptual paper investigates debt-equity portfolio swaps as a solution to post-SARS-CoV-2 pandemic public and private debt. The emphasis in the paper is the need to be less reliant on a debt-based system. The findings indicate that the replications of a conventional portfolio into an Islamic portfolio are compatible with the regulatory standard, sharia boundaries, and professional practices developed from investment theory. Data was collected monthly from 2016 to 2021, and the result confirmed that the Islamic portfolios have a higher return and less risk than conventional portfolios. The implications of this research are to provide a road map to the regulators, policymakers, governments and the financial industry on how to rearrange some of the public and private debt. A likely remedy is the incorporation of Islamic financial instrument principles through the equitisation of public and private debt.

**Keywords:** portfolio replication; debt-equity swaps; Islamic portfolio; debt; equity system.

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### 1 Introduction

We argue in this paper: first, that under reasonable (convexity) assumptions mutual replication of conventional and sharia compliant or equity-based investment funds is feasible; second, that equity-based financing is more robust against shocks than debts-based financing; third, we feel that we can safely recommend a shift towards a more equity based global financial system. Our theoretical model and associated empirical work strengthen our confidence in our recommendation and we hope that we can convince the reader accordingly or at the very least convince other researchers to continue the path we begin here.

One of the biggest challenges the world is facing is how to rebuild our economy in a new paradigm post-SARS-CoV-2 pandemic. The underlying principles of Islamic finance perfectly fit a rebuilding strategy through risk-sharing and equity-like contracts over debt-based contracts. Merging the features of the conventional and the Islamic financial systems will have the advantage of creating a debt-equity financial model that the world needs to rebuild our economy on a more solid foundation.

The problem of public and private debt is always with us, especially now that both are mounting globally. The UK private and government debt to GDP ratios were 230% and 110%, respectively, as of February 2021<sup>1</sup>. The main global challenge is the increasing global burden of private debt, which impacts negatively on growth. Empirical research indicates (Reinhart and Rogoff, 2009; Blinder 2015) that when private debt reaches 100–150% of GDP, it obstructs economic growth.

A negligible percentage of the nearly \$100 trillion financial assets in the global balance sheet are sharia-compliant. Most western financial systems are based on debt financing. Japan exceptionally embraces both debt and the equity-based financing, a fact that contributed to the growth of its economy in most of the post-war era (Akacem, 1986; Hassan, 1986; Akacem and Gilliam, 2002). Arguably the recent halt in growth was the result of greater emphasis on debt-based funding.

A portfolio refers to any amalgamation of financial assets. The monetary value of each asset may impact the risk/reward ratio of the portfolio. Portfolio replication for a particular asset is a portfolio of assets sharing the same properties as the reference assets.

The following sections develop our argument. Section 2 outlines the relevant literature, especially the recent advances in instruments that facilitate replication, and the variety of Islamic instruments available currently. Sections 3 and 4 set out our fundamental theory and our associated empirical work, demonstrating the role of risk-sharing in equity-based transactions in relation to portfolio replication and extending the scope of literature in the area. Section 5 presents the findings and the analysis. We conclude the paper, in Section 6, by considering the significance of the model for the restructuring of the global financial system to a greater orientation towards equity-based finance.

## **2 Review of relevant literature**

Many recent papers have compared the performance of equity based, especially sharia compliant funds with mixed debt-equity funds. The results are ambiguous with respect to the outperformance of one or the other.

On the side favouring the performance equity-based funds we highlight a number of relevant papers. Mansor and Bhatti (2011), Abdullah et al. (2007) and Elfakhani et al. (2005) measured the performance of conventional and Islamic portfolios through cross-country samples. Their findings indicate that Islamic portfolios outperformed their conventional counterparts, especially during the 2008 financial crisis.

Hoepner et al. (2011) investigated the financial return of 264 Islamic equity funds in 20 different countries. Their results confirmed that the Islamic portfolios return exceeded the market benchmarks in Islamic financial markets. Their results broadly agreed with later research by El Khamlichi et al. (2014) of 111 Islamic global equity funds and those of Kamil et al. (2014) showing that the risk-sharing structure of Islamic portfolios provides higher returns than the partial risk-bearing conventional portfolios.

Mosaid and Boutti (2014), Hakim and Manochehr (2004) and Tlemsani (2020), demonstrated that sharia-compliant equities outperformed the conventional general indexes in a specific period and that those sharia-compliant portfolios have no added charges.

On the other hand, some studies favour the out-performance of debt-based funds. Nainggolan et al. (2013) studied the performance of 387 Islamic portfolios. Their

findings indicate that the Islamic portfolios generally underperformed conventional portfolios by 4.8% per year. However, illustrating the ambiguity surrounding relative performance, they showed that during the financial crisis 2007–2009 the Islamic portfolios outperformed the conventional portfolios.

Zeeshan et al. (2020) investigated the performance of 90 portfolios (45 Islamic) between 2011 and 2019. Their findings show that conventional portfolios outperformed the Islamic portfolios regarding the risk-adjusted performance, a factor that significantly complicates portfolios replication over a specific time interval.

The evolution of portfolio theory is so well documented in the literature that it's long been standard textbook fare. Markowitz's (1952) paper has become part of the canon of portfolio literature founded upon Bachelier (1901) and others perhaps in the sixteenth century; a canon brilliantly documented by the *Classic on Gambling and Statistical Logic* by Epstein in 1977. Tobin (1958) cast the theory in the context of demand for money theory and mean variance analysis leading to the variance co-variance based models of Sharpe (1964). The path was extended by Fama (1970), and classic Black and Scholes (1972) models.

Dewandaru et al. (2014) attempted to include sharia compliant investment in multi-asset portfolios. However, their work was considered invalid by some Islamic scholars because they included a non-sharia asset. Dewi and Ilham (2012) had previously published comparative research on Indonesian and Malaysian portfolios markets.

Studies of Islamic portfolio management are limited in number. However, Camgoz et al. (2019) in a paper that has become a milestone for Islamic investors, demonstrated that over a period of 2002–2017 there was no statistically significant differences between risk and return characteristics of Islamic indices and their conventional counterparts.

Bahloul et al. (2017) described the surplus benefits after adding sharia limitations to conventional portfolio investors, specifically US equity portfolios. Hassan et al. (2018), Naifar et al. (2017) indicated that the Islamic Sukuk (bonds) correlate positively with the conventional bonds market and contribute positively to conventional fixed-income portfolios.

Metzler discussed contracts based on equity rather than just debt and attempted to show that an equity-based system suffered less volatility than the debt-based systems. His work was reinforced by an influential paper by Khan (1986) demonstrated the compatibility of Metzler's models with Islamic based models. Further he demonstrated that equity-based models are more stable in the context of exogenous shocks than debt-based models.

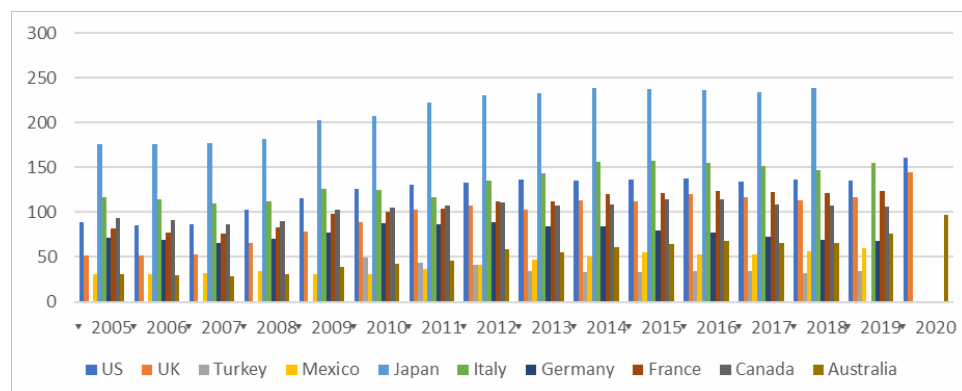
Historically financial crises are associated the burden of debt. This is well documented by Kindleberger (1986) and Reinhart and Rogoff (2010) for example. This paper provides a solution to the debt problems by reducing the debt volume by shifting some of it to an equity model where financial contract should include a substantial portion of profit/risk-sharing agreements.

Restructuring debt into equity will help to eliminate the barriers to growth and speed up the recovery. The underlying principles of Islamic finance can contribute to restructuring debts into equity and create more investment into the real economy. The Islamic financial model of risk/rewards sharing is an ideal tool for the equitisation of excessive debt for the household and sovereign debt. For households, the use of Islamic home finance is where the borrower and the lender become co-owners of the property until the borrower has completely paid off the mortgage. This is crucial to the economy, given the size of the mortgage debt worldwide. Public debt can be moved to an

equity-based system via the supplement of GDP real growth securities or the issuing of debt with a rate of interest that is perpetual and above the growth rate of nominal GDP; this will create a more needed degree of risk sharing to the public finances in general.

Several countries' economies around the globe, particularly post the 2020 pandemic, are suffering from lack of growth, deficit, recession, unemployment, hostility measures, and budgets. In particular, the size of the debts (Figure 1) could take advantage of debt-equity swaps instruments, which can facilitate the integration of transferring debt into equity, the constraint of these swaps is that some countries may not desire an overseas venture over a debt-equity swap programme, as it is routinely interpreted as a cut in the public sector and could provoke a high social cost in the short term.

**Figure 1** G7 countries debts % of the GDP (2005–2020) (see online version for colours)



The solution to the increased size of the debt is a shift in the direction of equity financing by replicating conventional debt portfolios into Islamic equity portfolios. It is a common practice of restructuring a bank's equity and debt mixture, which includes a key modification in the way banks are funded. The procedure largely includes the swap of one form of funding for an alternative, i.e., buying back shares from the bank's capital structure and substituting them with bonds in this case, Islamic Sukuk (bond) is an option.

The equitisation of a bank's debt is much fairer than transferring the burden to the taxpayer of recapitalising systemically significant monetary institutions by the government. We are not persuaded by the case to recapitalise the banking industry because of supervisory and regulatory faults; these supervisory and regulatory breakdowns are where the parliaments and governments did not provide appropriate oversight. Indeed, the taxpayers are eventually accountable for having voted non-functional governments and parliaments. The loose creditors have had the advantage of complimentary default insurance for countless years. We think the time has come for sharing the risk/profit/loss/responsibility.

What technique can be used to swap public debt into equity? The obvious answer is to substitute the conventional bond based on a variable or fixed rate of interest with an asset that contributes to the growth rate of nominal GDP as its interest rate. For example, let us consider where the growth rate of nominal GDP matches the nominal interest rate. A £10 million value of five-year debt, with amortisation of £2 million per/year if the growth rate of nominal gross domestic product for a particular year were negative. A 5%

nominal domestic product growth in year 1, then the interest of year one would be £1 million. When less than 2% nominal domestic product growth in year 1, interest payments would be minus £100,000, which can be considered a reduction in principal repayments in year 1 to £1.9 million.

### 3 What Islamic finance ‘is’

The discourse of Islamic finance involves the principles of

- a diversification of risk-by-risk sharing
- b financing only tangible assets rather than leverage
- c equity rather than debt
- d riba (usury) is forbidden.

Conventional finance has failed due to

- a excess debt
- b diversification of risk based on unreal models
- c overleveraging of assets
- d excessive securitisation and creation of new assets that were neither transparent nor properly understood.

All these factors lead to substantial systemic risk and the too big to fail problem.

#### 3.1 Risk sharing

Islamic financial law proscribes *bay al dayn* which is basically a contract of the sale of debt, in the modern practice, *bai al dayn* is used mostly for liquidity purposes and/or for the aim of capital gains resulting from the tradability of the debt certificates. Even though the sale of debt is banned in Islam financial law, there are some thoughts (Malaysia) in the current literature of Islamic finance that distinguish, in proscription, between commercial debts, resulting from sale and non-commercial debts, resulting from loan contracts. Therefore, according to these thoughts, the debts resulting from financing whose underlying contracts are not explicitly loan contracts, including *Tawarruq*, are believed tradable whether at discount or a mark-up.

Islamic law ban *bay al dayn* (the sale of debt), as it entails a transfer of risk that amounts to a moral hazard, Tlemsani and Matthews (2020). Risk sharing is consistent with the idea of taking responsibility for one’s actions. To illustrate this, the author has developed a mathematical model that demonstrates the different aspects of risk-sharing transactions that comply with sharia law; this is a solution to shift some private debt-based transactions into equity-based transactions in portfolios of mortgages.

In an Ijara (leasing)-based mortgage,  $I(t)$  is an investor’s equity (shares) in a building at the time ( $t$ ), and the rise and fall in equity (shares) is  $\Delta C(t)$ . As a percentage of the original price on top of the variation in the building price and the investor’s payment as a percentage are  $P(t)$ .

$$R_{adjusted}^2 P(t) = \frac{\text{Investor's down payment (ID) at } t_0 + \text{Overall lease costs from } t_0}{\text{Building purchase price} + \text{cost} + (\text{Current building price} - \text{Building purchase price})}$$

This can be written as shown below:

$$P(t) = \frac{ID(t_0) + \sum_{t=t_0}^T lease(t)}{[B(t_0) + C(t)] + [B(t) + B(t_0)]}$$

The investor's equity in the building over some time then develops into  $I(t)$ .

$$I(t) = P(t) + P(t)^{[B(t)-B(t_0)]} \tag{1}$$

$B(t_0)$ ,  $B(t)$ ,  $C(t)$  and  $ID(t_0)$  refer to the initial  $B(t_0)$  and terminal building price  $B(t)$ , the costs  $C(t)$  and the investor's down-payment  $ID(t_0)$ .

$$\text{The Islamic bank's equity (share) at every time } t \text{ is } 1 - I(t) \tag{2}$$

The lease payments are computed as follows:

$$\text{Lease } (t) = \text{Wage index} + 2\% = \sum_{t=t_0}^T Lease(t)$$

The shared risk between the investor  $I(t)$  and the Islamic bank is denoted as  $[B(t) - B(t_0)]$ . The nearer the investor is to repaying the Ijara mortgage, the higher the risk as the investor's equity (percentage) in the building increases. The longer the investor is from repaying the Ijara mortgage, and the lesser the down-payment, the higher the risk encountered by the Islamic bank (mortgage provider).

$C(t)$  is the Islamic bank's running and related costs, along with a profit margin agreed by arbitration between the Islamic bank and the investor. The result of arbitration regarding the profit margin differs according to the qualified negotiating skill of the two sides, which depends on the market condition. However, the lower profit margin of Islamic banking benefits the banks.

If the investor cannot meet the financial obligations (payments) on time  $t$ , the investor's profit or loss is:

$$P(t)^{[B(t)-B(t_0)]} \text{ and the Islamic bank's profit/loss is: } 1 - P(t)^{[B(t)-B(t_0)]} \tag{3}$$

The adjustments (rise) in the investor's equity (shares) is:

$$\Delta I(t) = \frac{\sum_{t=t_0}^T lease(t)}{[B(t_0) + C] + [B(t) + B(t_0)]} \tag{4}$$

In this Ijara-based mortgage, the question of riba depends on the size of  $C(t)$ , to the point that  $C(t)$  consists of a monopoly lease, which can be interpreted to be usurious.

However, if the interest is described arithmetically, merely as a rate of inflation and accumulation on a given outlay, then the bank's *arithmetic interest*,  $R_B$  on the transaction is:

$$R_B = \frac{ID(t) + \sum_{t=t_0}^T lease(t) + [B(t) - B(t_0)]}{B(t_0)}$$

This represents the real rate of *arithmetic interest*, as the original building price exists on the denominator and the numerator. From the above demonstration of the Ijara mortgage, we can confirm that the Ijara mortgage is based on sharing the risk and equity. Both the investor and the Islamic bank share the proprietorship of the building. By contrast, the conventional mortgage model is a debt-based system where the risk is transferred to the investor, as the investor owns all the equity of the building and has a secured loan against the value of the building and his/her assets in case of a default.

### 3.2 Real assets in Islamic and conventional finance

Since Islamic financial portfolios are hypothetically based on real assets, in this section we focus on the characteristics and implications of the term ‘real assets.’ We aim to establish how Islamic portfolios based on real assets might differ from their conventional counterparts since the modern concept of ‘real assets’ either can or cannot replicate the real assets that existed in the Islamic economy or in financial history.

Many scholars have associated the term ‘real’ with the materiality, existing or tangibility aspect; for instance, Teborek and Cohen (2012) define real assets as anything that we can hold, touch, or even smell.

According to Bodie et al. (2009), real assets are defined as the production of goods and services for consumption, such as equipment, plants, property, cars, human capital, etc. Keynes (1930) stated that real assets represent goods in manufacturing, buildings, capital wealth and our stocks of commodities. By contrast, financial assets such as bonds, mutual funds, securities and stocks are only pieces of paper or computer data entries that do not add to the productive function of the economy. Financial assets are the method through which entities in advanced economies hold on to their claims on real assets; therefore, financial assets are claims to the revenue created by real assets.

In terms of the financial value that investors place on the gratification of the mentioned needs or wants, here, according to Teborek and Cohen (2012), the real assets have an intrinsic value due to their ability to be traded for other services or goods of value. The distinction between the definitions of real and financial assets, according to Steward (2013), is that the real assets have a claim of being an original physical asset, whereas the worth of financial assets results from a predetermined claim and from products that are autonomous from variations in the cost of money.

Dolgun and Mirakhor (2021) stressed that the financial structure would involve a direct connection between the real and the financial industry when there is the exclusion of debt and more risk-sharing transactions. Consequently, this leads to the introduction of the ‘materiality’ factor, which attaches financing clearly to the core asset. Therefore, the financing transaction is strongly linked with the real industry, and there will be a solid relationship between the return on capital and the performance of the asset.

Kahf (2005) identifies that the principles of Islamic financing are intrinsically interlinked with business activity tangible products, ethically manufactured and dedicated for use within society. The underlying traits of Islamic finance are developing within itself, a strong and direct connection to the tangible activity or real economy, incorporation of ethical principles in funding, and the reform of rapport with the investors

(depositors), on the principle of sharing the risk as an alternative to loans. Islamic banking also provides means of payments in the form of producers' principal in projects based on sharing the actual, real-life outcome of a production process and the net profit/loss of a productive enterprise.

Modigliani and Modigliani (1997) proposed a division between the real economy and finance, since the real parameters i.e., output demand, cost of capital and labour, productivity, technological progress, are the determinants of investment decisions and corporate growth. The finance role at this outset is only investment procedure facilitators. He stated:

“With well-functioning markets (and neutral taxes) and rational investors, who can ‘undo’ the corporate financial structure by holding positive or negative amounts of debt, the market value of the firm – debt plus equity – depends *only* on the income stream generated by its assets. It follows, in particular, that the value of the firm should not be affected by the share of debt in its financial structure or by what will be done with the returns – paid out as dividends or reinvested (profitably).” (p.xiii)

#### 4 Financial portfolios theory

Replicating a portfolio is used to find assets that can regenerate the same liabilities or cashflows through financial modelling that predict the possibility of different results in different conditions using random variables. We can consider portfolios with the same value. If the portfolios have assets that produce the same liability or cashflows, this will only apply in the non-appearance of arbitrage.

Portfolio replication tools can be used for several purposes, such as market risk management, hedging, and financial modelling, which involves a subsection of the liabilities with a suitable scalar related to every group to characterise the complete liability portfolio. Using these tools, insurance companies can screen the financial risk at a higher incidence. The major benefit of this technique the time saved in reassessing the consequences of financial market growth. Banks can reassess the worth of their assets in real-time, as those assets are closed from options that exist for a decisive asset market price.

In terms of managing financial risks and reporting, portfolio replication has become an effective method in creating economic-capital figures very precisely, fast and asset-liability management (ALM) risks for insurance companies.

##### 4.1 Portfolio replication methodology

The determination of the portfolio replication technique depends on finding the values of decision variables that result in the optimisation target, which can be gathered into

- a market value, which is a replication of the market value of liabilities
- b cashflow replication, where the future cashflows are replicated in each period in diverse situations.

Cashflow replication consists of the following methods:



- a *Time-dependent replication*: this will involve matching cashflows per time step separately. Therefore, the replicating portfolio will contain many minor replicating portfolios, each representing a different year. At every corresponding period, the cashflows are recorded and the optimisation executed.

$$CF_{Liab}(s, t) \approx \sum_{p=1}^P w_p CF_{Asset}(p, s, t)$$

$s$  is the scenario,  $t$  is the period,  $w_p$  is the asset's weight in the world of replicating assets,  $p$  is the asset type  $CF_{Liab}(s, t)$  totalled cashflow of liabilities at time  $t$  in  $s^{\text{th}}$  situation and  $CF_{Asset}(p, s, t)$  is the cashflow of  $p^{\text{th}}$  asset on period  $t$  in  $s^{\text{th}}$  situation.

- b *Combined cashflow replication*: in short term liabilities, as the time value of money is less significant, we can use the totality of the cash flows for the replication.
- c *Discounted cashflow replication*: this method includes gathering a set of liabilities matching and replicating portfolio cashflows discounted to a specific period.

$$\sum_{t=1}^n CF_{Liab}(s, t) * \prod_{j=0}^t (1 + R(s, j))^{-1} \approx \sum_{t=0}^n \left[ \sum_{p=1}^P w_p CF_{Asset}(p, s, t) * \prod_{j=0}^t (1 + R(s, j))^{-1} \right]$$

$R(s)$  interest rate for one year of scenario  $s$ .

- d *Assembled cashflow replication*: this technique involves rolling up cashflows using the onward risk-free rates and considering their timing. The complete portfolio will comprise a one replicating portfolio for all future years.

$$\sum_{t=1}^n CF_{Liab}(s, t) (1 + FR_{t,n})^{n-1} \approx \sum_{t=0}^n \left[ \sum_{p=1}^P w_p CF_{Asset}(p, s, t) * (1 + FR(t, n))^{n-1} \right]$$

$FR(t, n)$  forward risk-free rate from year  $t$  to  $n$ .

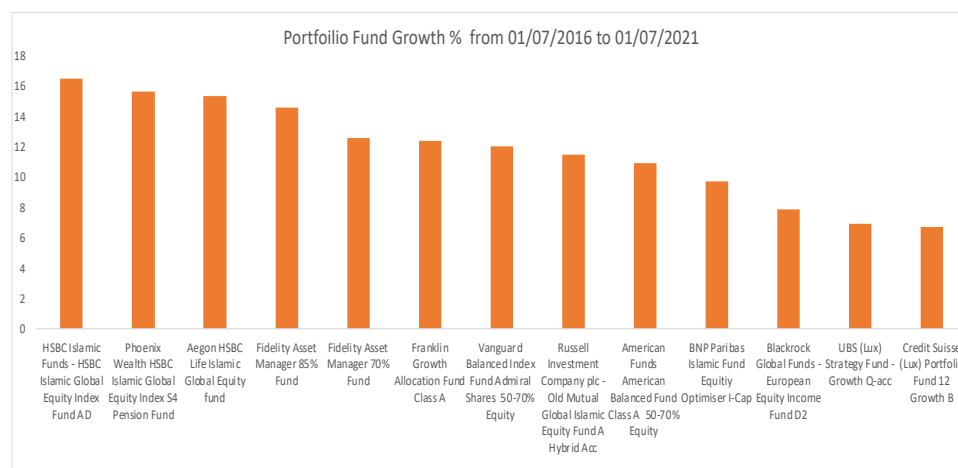
The duration and the cashflows matching interest-rate risk are the main differences among the above cashflow replication methods. In addition, the replication development method needs a considerable number of situations (over 1,000) to be considered in an adjustment situation. Within these situations it is essential to run the liability models to identify the cash flow that we can use in the replication process. These situations must be selected to rationally signify a reasonable series of economic conditions compatible with the used stress tests with the replicating portfolio.

## 5 Findings and analysis

This study investigates the road map to transfer debt into equity by replicating a conventional portfolio into an Islamic portfolio. To achieve the aim of this study, we need to examine the performance of the Islamic portfolio compared to the conventional portfolio as the investors are always in pursuit of a higher return/opportunity. Data on the conventional and sharia portfolios were obtained from Market FT, Bloomberg, Morningstar, Investing.com and Refinitiv. The time horizon of each portfolio to establish its performance and risk is 60 months (five years) from July 2016 to July 2021 (Figure 2).

This is a fair comparison between portfolios and their peers and a reflective period for investors influenced by recent news and the post-covid economic environment.

**Figure 2** A five-year comparison of Islamic and conventional portfolios’ performance (see online version for colours)



Source: Authors’ work, data from Market FT from 01/07/2016 to 01/07/2021

The criteria of portfolios selection in Appendix are as follows:

- Islamic portfolios which are supposed to be equity-based only
- conventional portfolios with a combination of both equity and debt, the ratio varies and some portfolios are 100% equity, others from 50 to 85% equity
- conventional debt-based portfolios.

The reason behind this selection method is to measure the correlation between equity and a portfolio’s risk/return. In addition, this approach will benefit from closing the gap in research concerning the study of the multi-asset-class optimised portfolio (MPT) in Islamic investment that complies with the underlying principles of sharia law, as none of the \$100 trillion of global assets are sharia-compliant.

The comparison between Islamic and conventional portfolios (with equity or without) will answer the research question: Can the conventional portfolio be replicated by the defining characteristics of the Islamic portfolio in modern capitalism? And can the performance of selected portfolios in terms of risk and return metrics be measured?

Table 1 comparatively analyses the risk and return in Islamic and conventional portfolios using several performance evaluation methods. The result indicates that the average return on Islamic portfolios (from 11.49 % to 17.29 %) outperformed the average return on conventional portfolios (from 6.71 % to 14.56 %), the only exception was the BNP Paribas Islamic portfolio (9.72 %). The R squared for both portfolio’s performance is in line with the benchmark. However, conventional portfolios generally have a higher R squared than Islamic portfolios expect for HSBC Islamic Global Equity AD and BNP Paribas Islamic portfolio I-Cap. This could be because the Islamic portfolios are newer and smaller in value than their conventional counterpart.

**Table 1** Performance, risk and return metrics for Islamic and conventional portfolios

Five years 01/07/2016 to 01/07/2021	Aviva/HSBC Islamic global equity index S6 pension fund	HSBC Islamic global equity index,fund AD	Phoenix wealth HSBC Islamic global equity index S4 pension fund	Aegon HSBC life Islamic global equity fund	Fidelity asset manager 85% fund	Fidelity asset manager 70% fund	Franklin growth allocation fund class A	Vanguard balanced index fund admiral shares 50- 70% equity	Russell investment old mutual global Islamic equity fund a hybrid acc.	American funds American balanced fund class A 50-70% equity	BNP paribas Islamic fund equity optimiser 1-cap	Blackrock global funds – European equity income fund D2	UBS (Iax) strategy fund – growth Q-acc	Credit suisse (Iax) portfolio fund L2 growth B
Portfolio growth	17.29	16.51	15.62	15.33	14.56	12.57	12.39	12.05	11.49	10.95	9.72	7.86	6.92	6.71
ROE	32.81	-	-	-	-	-	19.16	20.77	16.13	16.12	26.18	23.73	24.31	19.97
ROA	13.65	-	-	-	-	-	6.86	7.55	5.11	5.12	9.47	9.02	8.02	7.27
Rating on return	*****	***	*****	****	*****	*****	***	***	*****	**	*****	**	****	*****
R squared	97.17	92.37	76.51	88.04	76.34	75	93.6	89.31	98.08	97.9	97.04	94.55	94.27	93.4
Standard deviation	12.17	12.62	13.28	12.52	13.28	13.27	9.11%	10.09	11.49	13.58	11.6	8.39	9.36	15.16
Sharpe ratio	1.32	0.79	1.21	0.94	1.22	1.34	0.78	0.74	0.99	0.99	0.97	2.48	2.42	1.02
Alpha	0.81	-5.62	3.34	-3.85	3.61	5.18	-1.43	-1.27	0.07	0.07	-0.12	1.75	1.47	5.82
Beta	0.95	0.97	0.93	0.97	0.93	0.92	1.09	1.1	1.24	1.47	1.25	0.87	0.96	0.79
Information ratio	0.02	-1.76	0.41	-0.97	0.46	0.69	-0.32	-0.16	0.82	0.9	0.69	-0.57	0.38	0.44
Initial charge	5.54	0	0	0	5.54	0	5	2.5	0	0	0	0	0	0
Max annual charge	0.75	0.6	1.35	1	1.45	0	1.7	0.84	0	0	0	0	0	0
Ongoing charge	0.94	0.83	1.35	0.13	1.45	0	2.2	1.13	0.7	0.72	0.93	0.58	0.07	1.07

Return %

Risk/return

Costs and expenses %

The standard deviation among the Islamic portfolios is less variant 12.17 to 13.28 compared to the conventional portfolios, which is between 8.39 and 15.16. This indicates that the return of Islamic portfolios is less volatile. This could be due to the nature of the Islamic portfolio's tangible assets, which are less risky. This is also confirmed by beta analysis as in conventional portfolios beta is relatively higher than Islamic portfolios. This indicates that the conventional portfolios are more volatile and Islamic portfolios are more stable.

Alpha in Islamic portfolios is more variable, between  $-5.62$  to  $5.18$  in comparison to the conventional portfolio which is between  $-1.43$  and  $5.18$ , a possible explanation is that some Islamic portfolio fails to generate returns at the same rate as the broader sector. The Sharp ratio is positive for both portfolios, which indicates that both can generate a higher return on a risk-adjusted basis.

The findings (Table 1) of this study confirm the performance superiority of Islamic portfolios associated with conventional portfolios with or without equity and that conventional portfolios with a higher share of equity outperform the conventional debts-based portfolios.

The Islamic portfolios are less unpredictable and can absorb an external shock, such as the 2008 financial crisis, better than conventional portfolios for several reasons:

- Islamic portfolios require tangible assets (Islamic Sukuk/bond) with fixed income security, real ownership (SPV in Sukuk)
- the fact that Islamic financial portfolios exclude enormously indebted firms and financial institutions which are debatably more unstable
- Islamic financial assets dismiss securities with no tangible assets (derivatives, hedging ..., etc.), which is an advantage of the real economy.

## 6 Conclusions

In uncertainty, high social costs of default and financial crises, a debt system categorised by secured financial obligation are unsustainable. The misrepresentation of the policymaker and greed motivation have added to the usage of private debt. The nonsense is that interest is a deductible cost when calculating corporate taxes. However, the retained earnings or dividends are not deductible. Another misrepresentation is that interest is deductible in a residential mortgage in personal income tax (not applicable in the UK).

All or part of the unsustainable debt needs to be converted into risk-sharing, such as an equity-based system i.e., conversion of defaulted mortgages into equity sharing tools and debt to equity swap for banking industry will be able to reduce the impact of the next financial crisis. The Islamic principle of risk-sharing could be used as part of a regulatory framework designed to curb financial bubbles. Insisting on risk-sharing and all equity finance would be more effective to deal with bubbles and systemic risk than complex regulations that offer multiple avenues for avoidance because of their complexity.

In conclusion, it is too early to assume that an entire Islamic financial system based only on equity will be successful. However, the experience of the Japanese financial framework, which is a combination of both debt and equity models, demonstrates that the development of Japan's economy between the 1950s and 1970s was significantly

improved (with an average real growth rate of 10%) by the readiness of its financial institutions to collaboratively loan money and take equity risks in the Japanese industrial and manufacturing sector. Thus, at least in one instance, the equity-based model has been effective in generating economic growth and is arguably superior to a traditional debt banking model.

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## Notes

1 <https://tradingeconomics.com/united-kingdom/forecast>.

## Appendix

**Table A1** List of portfolios

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HSBC Islamic Funds – HSBC Islamic Global Equity Index Fund AD LU0110459103 USD
BNP Paribas Islamic Fund Equity Optimiser I–Cap LU0245287403 USD
Aegon HSBC Life Islamic Global Equity fund GB00B3FG4R82 GBP
Russell Investment Company plc – Old Mutual Global Islamic Equity Fund a Hybrid Acc IE00BYMM1W08 USD
Phoenix Wealth HSBC Islamic Global Equity Index S4 Pension Fund GB00B3NQ6742 GBP
Aviva/HSBC Islamic Global Equity Index S6 Pension Fund GB00B3DL6C41 GBP
Credit Suisse (Lux) Portfolio Fund 12 Growth B LU0078041992 CHF
UBS (Lux) Strategy Fund – Growth Q-Acc LU0941351412 CHF
Fidelity Asset Manager 70% Fund FASGX
Fidelity Asset Manager 85% Fund FAMRX
Franklin Growth Allocation Fund Class A FGTIX
American Funds American Balanced Fund Class A 50–70% Equity ABALX
Vanguard Balanced Index Fund Admiral Shares 50–70% Equity VBIAX
Blackrock Global Funds – European Equity Income Fund D2 LU0579997130 EUR

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