Sustainable Sukuk Markets: The Role of Sovereign Sukuk

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Abstract

An essential driver of Sukuk markets is sovereign Sukuk. The prevailing mechanism for issuing sovereign Sukuk is complex and imposes severe limitations on the issuance of sovereign Sukuk. This paper presents an alternative model for a scalable, efficient and sustainable framework of sovereign Sukuk. The key to this framework is the establishment of the "Sovereign Finance Corporation" as an entity dedicated to financing the government's activities using fixed-income Islamic modes of financing. The SFC acts as a financial intermediary between the government and capital markets and as a reserve builder for future financing of the government. The cash flow analysis and numerical simulations suggest the promising feasibility of the proposed framework.

Keywords: Sukuk, Simulation, Sovereign Finance Corporation, Fixed income, Islamic finance, Supply Chain Platform

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Introduction

Sukuk markets are growing steadily worldwide. Sovereign Sukuk represents a major component and an instrumental factor behind the growth and resilient of the market. According to the International Islamic Financial Market (IIFM) Sukuk Report, total sovereign Sukuk issuance during 2001-2019 stands at USD 680.7 billion, or 54.58% of all global Sukuk issuances during that period. In 2019, sovereign Sukuk issuance represented 59% of domestic issuances, and 30%of international issuances. Sovereign Sukuk dominated the Sukuk market, both domestic and international, but they played a more important role domestically.

Despite the critical role of sovereign Sukuk, the prevailing Sukuk structures impose severe limitations on the scalability and sustainability of the market. For this reason, there is an increasing need for a flexible and sustainable mechanism for the issuance of sovereign Sukuk. Structured adequately, such a mechanism could serve the needs of liquidity management of the Islamic financial industry.

This paper presents a model that aims to meet these objectives based on Shari'ah resolutions of the OIC Fiqh Academy and AAOIFI Shari'ah standards. The proposal lays down a flexible framework for financing a wide range of government activities without the need to pledge physical sovereign assets. It also permits the use of various Islamic modes of finance without hindering the ability to trade Sukuk according to Shari'ah principles. The model is not intended to replace existing instruments for sovereign financing; rather, it acts to complement them and offer an opportunity to diversify sources of funding.[2]

1. Overview

1.1 Issues in the Prevailing Sukuk Model[3]

One of the currently common structures of Sukuk involves the sale of a tangible physical asset to a Special Purpose Vehicle (SPV), on the condition that the asset is leased back to the seller (who needs financing), with the undertaking to buy it back at maturity at nominal value. The certificates issued by the SPV represent the Sukuk, which pay regular income reflecting the rental payments of the leased asset. This model has the advantages of being simple and allows the issuance of tradable Sukuk due to ownership of the tangible asset. Being based on rental payments, these Sukuk are classified among fixed income instruments. From a practical perspective, however, a number of obstacles emerge.

Asset Ownership

[2] The proposed model is a cumulative outcome of collaboration among international lawyers, Shari'ah scholars, Islamic finance experts, as well as officials from IsDB Member Countries led by the author and the Financial Product Development team at the Islamic Research and Training Institute. A brief description of the model appeared in Al-Suwailem (2015). The current paper includes substantial improvements as well as cash flow analysis and numerical simulation.

[3] This section is adopted from Al-Suwailem (2015).

First, there is the issue of transferability of the ownership of a sovereign asset to investors, particularly if they are non-citizens. This leads to complex legal procedures for Sukuk issuance in order to avoid the "true ownership" of such assets. Hence, Sukuk were transformed from being "asset-backed," i.e., representing the true and legal ownership of the underlying assets, to being "asset-based," whereby Sukuk holders do not fully and legally own the underlying asset. The underlying assets, therefore, become of marginal value in the structure. This can be seen from the clauses common in Sukuk documents stating that:

"No investigation or inquiry will be made, and no due diligence will be conducted in respect of any of the constituent assets" …

"In particular, the precise terms of any of the constituent assets comprised in the Portfolio will not be known" …

"No steps will be taken to perfect any transferor any of the relevant constituent assets comprised in the Portfolio".

This obviously violates the basic Sharīʿah requirements of a valid sale transaction. As a result, such Sukuk are not fundamentally different from conventional bonds. They are explicitly described in the Sukuk documents as "unsecured". This contradicts the claim of "purchase" and "ownership" of the underlying assets.

Haneef (2009) provides an overview of the developments of Sukuk since 2000, and concludes (p. 110):

Today, almost all Sukuk offerings are asset-based securities. The Sukuk will have Sharīʿah-compatible underlying assets, but the Sukuk holders will not have any security interest over the assets. The asset-based Sukuk are treated as senior unsecured securities similar to unsecured conventional bonds.

Limitations of Physical Assets

Second, Sukuk issuance is constrained by the existence of unencumbered, physical Sharīʿah-compliant assets with an aggregate value at least equal to the nominal amount of the Sukuk be used to support each issue of Sukuk. Such assets may not be possible in all cases, nor as regular as needed. Consequently, the structure does not allow sovereigns to issue Sukuk on a regular and predictable basis.

Accounting Issues

From an accounting perspective, the assets used to issue the Sukuk are not transferred from the balance sheet of the obligor or the seller because of the undertaking to buy them back at nominal value. This undertaking is a debt obligation on the obligor. With this debt on the balance sheet, the assets cannot be transferred from the seller's balance sheet. But the presence of these assets on the obligor's balance sheet is inconsistent with a true and genuine sale transaction.

Alignment of Finance and Economic Activities

Finally, the structure does not align Sukuk issuance with economic activities. The sale and lease transactions are applied to assets of no economic contribution. Hence, the financing and economic activities are disconnected. This might lead to an unproductive build-up of debt.

Sharīʿah Rulings

Due to the Sharīʿah-related problems facing this model of *ṣukūk*, the International Islamic Fiqh Academy, in its 20th conference in 2012, issued resolution no. 188 prohibiting stipulated sale-and-lease-back that ends up obtaining money spot in exchange for more money in the future. The resolution states:

"It is not permissible to sell an asset at a cash price on the condition that the seller leases back this asset with a promise to own, at a total price, including the rent and the price, that exceeds the cash price, regardless of whether this condition is expressed or implied, because this is a form of 'Einah that is prohibited by Sharīʿah. Accordingly, it is not permissible to issue Sukuk based on this formula".

The *Ijārah* Standard issued by the Sharīʿah Board of AAOIFI ruled that it is not permissible to stipulate the lease-back in the sale contract.

Paragraph 3/2 of Standard (9) states:

"It is permissible to acquire an asset from a party and then lease it to that party. It is not permissible, however, to stipulate the lease as a condition in the sale contract by which the institution acquired the asset."

Given these resolutions and the above-mentioned difficulties, there is a serious need for a sound and credible alternative that meets the needs of sovereigns in raising funds and complies with the principles of Islamic finance.

1.2 Objectives of the Proposed Framework

To meet the need of the OIC Member Countries for mobilizing resources, a Sukuk model should ideally satisfy the following characteristics:

1.Sukuk issuance should not require using sovereign physical assets since such assets may not always be available. Moreover, the transfer of sovereign ownership of tangible assets might prove tremendously problematic.

2.The model should provide sufficient flexibility to select the most appropriate mode of financing and not be restricted to a single mode of financing.

3.The model should allow issuing Sukuk on a regular basis to meet the goals of the government's financial plans and to enable the financial market to manage liquidity in a robust manner.

4.The model should be scalable to allow Sukuk to grow as the financial capacity of the government grows in tandem with economic expansion.

5.The model should be structured efficiently to allow the sovereign to mobilize resources at competitive prices.

1.3 The Sovereign Finance Corporation

The proposed model can be summarized as follows:

1.The government establishes a financial institution, the Sovereign Finance Corporation (SFC) that will be responsible for financing the government's economic activities. Ideally, a law establishing the SFC and defining its duties and prerogatives shall be passed.

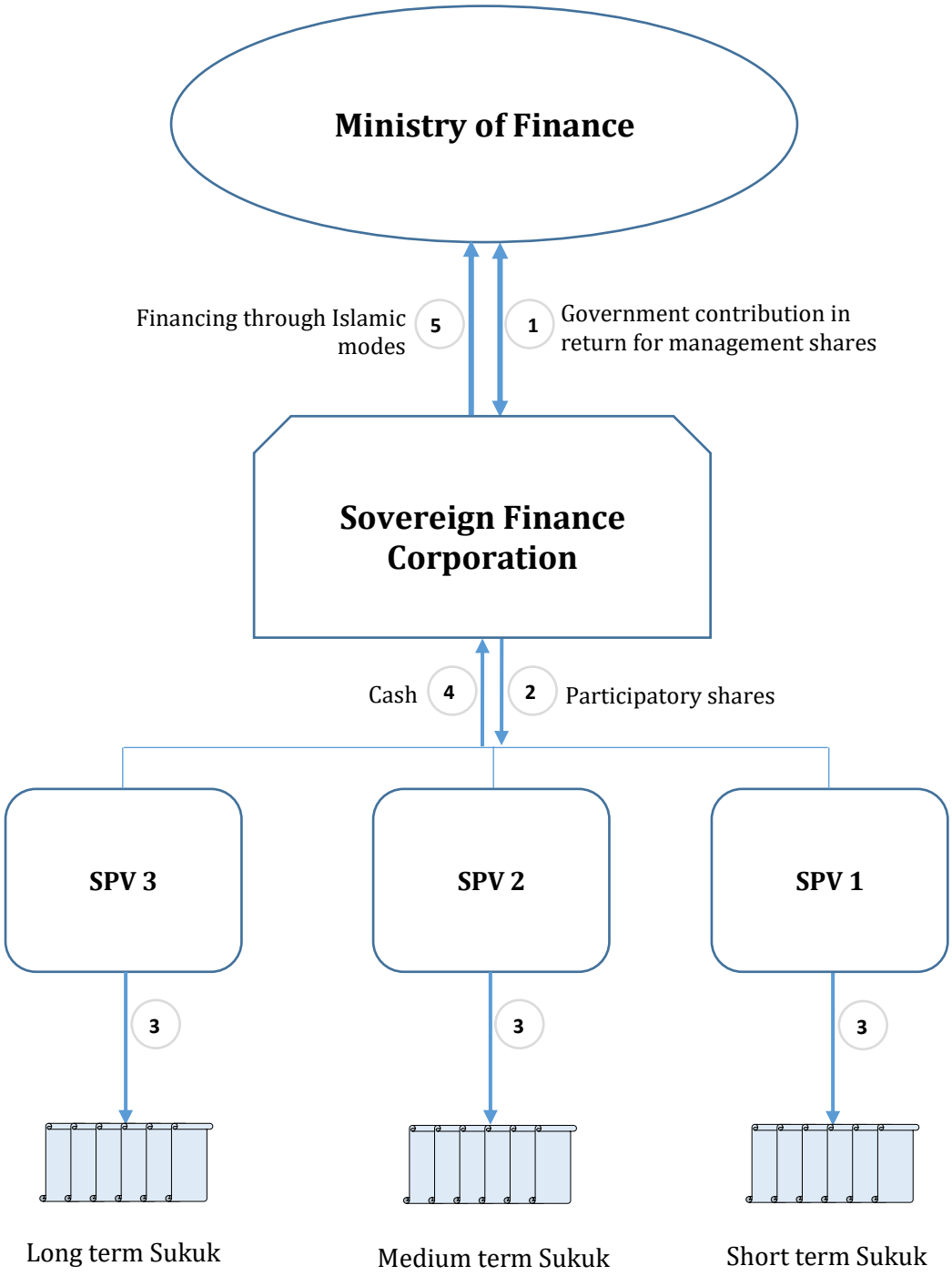
2.While it is not a commercial bank, the SFC plays the role of "the government's Islamic bank." It exclusively finances government economic activities through Shari'ah-compliant fixed income contracts such as Murabahah, Ijarah, and Istisna'a. By doing so, the assets of the SFC represent sovereign obligations.

3.The SFC issues two types of shares:

a.Management Shares (5-10% of the capital), to be owned by the government (Ministry of Finance). The government acquires these shares by providing cash or in-kind contributions.

b.Participatory (or Investment) Shares, to be owned by investors via Sukuk certificates as described below.

Figure 1: Participatory / Management Shares



1.4 Sukuk Issuance

1.The SFC establishes a Special Purpose Vehicle (SPV) and transfers the Participatory Shares to the SPV.

2.The SPV issues Certificates (Sukuk) to investors, backed by the Participatory Shares. The Sukuk represent ownership of SFC shares.

3.The Sukuk Certificates are redeemable over a defined period of time (say 5 years).

4.The SFC can create more than one SPV to issue Sukuk with various maturities.

1.5 Tradability

Since the SFC is a fully-fledged financial institution, its shares are treated the same way as the shares of any Islamic bank. According to OIC Fiqh Academy Rulings no. 180 and 196, these shares are tradable since they represent the ownership in the institution.

1.6 Redemption

The SFC promises to redeem the Sukuk at par subject to the performance of the underlying assets and the generated cash flows. From this perspective, the promise to redeem is not a debt obligation on the SFC, and thus no Shari'ah issue should arise in this regard. The involved risks nonetheless are still sovereign risks, as elaborated below.

1.7 Risks

Since the SFC is exclusively financing the government through fixed income contracts such as Murabahah, Ijarah, and Istisna'a, the SFC assets are carrying only sovereign risk. The SFC by construction has no debt obligations, and thus SFC shares reflect only the risk of the underlying assets, namely sovereign risk.

This risk is further reduced by the contributions from the government in the SFC's capital, which can be used as collateral government's obligations. In addition, the profits accumulated by the SFC above Sukuk returns (coupons) serve as reserves that enhance the creditworthiness of the SFC over time and thus reduce the cost of future funding.

Although the SFC does not guarantee the nominal value of Sukuk, redemption is subject to the performance of the underlying assets, which are sovereign obligations. Thus, risk is a sovereign credit risk. Furthermore, since the government owns the management shares, management risk is also sovereign. From Sukuk holders' point of view, therefore, the risks of the Sukuk are solely sovereign risks.

1.8 Sukuk with Different Tenors

As stated earlier, it is possible to create several SPVs to issue Sukuk with different tenors: short, medium and long term. Sukuk with different maturities will have different coupon payments. This can be structured by setting different sharing ratios between Sukuk holders and the SFC as the manager of the SPV issuing the Sukuk. The ratios will be in line with the maturity of the Sukuk.

Sukuk with various maturities can significantly facilitate the liquidity management of the Islamic financial industry. It also provides tools for monetary policy and lender of last resort to Islamic banks. Any profit potentially generated from this maturity mismatch is intended to be kept as reserves in the SFC, and as for all other non-distributed profits; it will over time enhance the creditworthiness of the SFC.

1.9 Waqf Sukuk

Waqf Sukuk are ordinary Sukuk whereby investors agree to donate their returns (coupons) to the SFC to support public projects. The Waqf Sukuk will have a separate SPV, as with other Sukuk classes, but the coupons will be reinvested with the SFC. Although the relative size of the Waqf Sukuk might not be substantial, they would play an essential role in enhancing the social responsibility message of the SFC and thus in gaining public confidence and support.

1.10 Support from the Central Bank

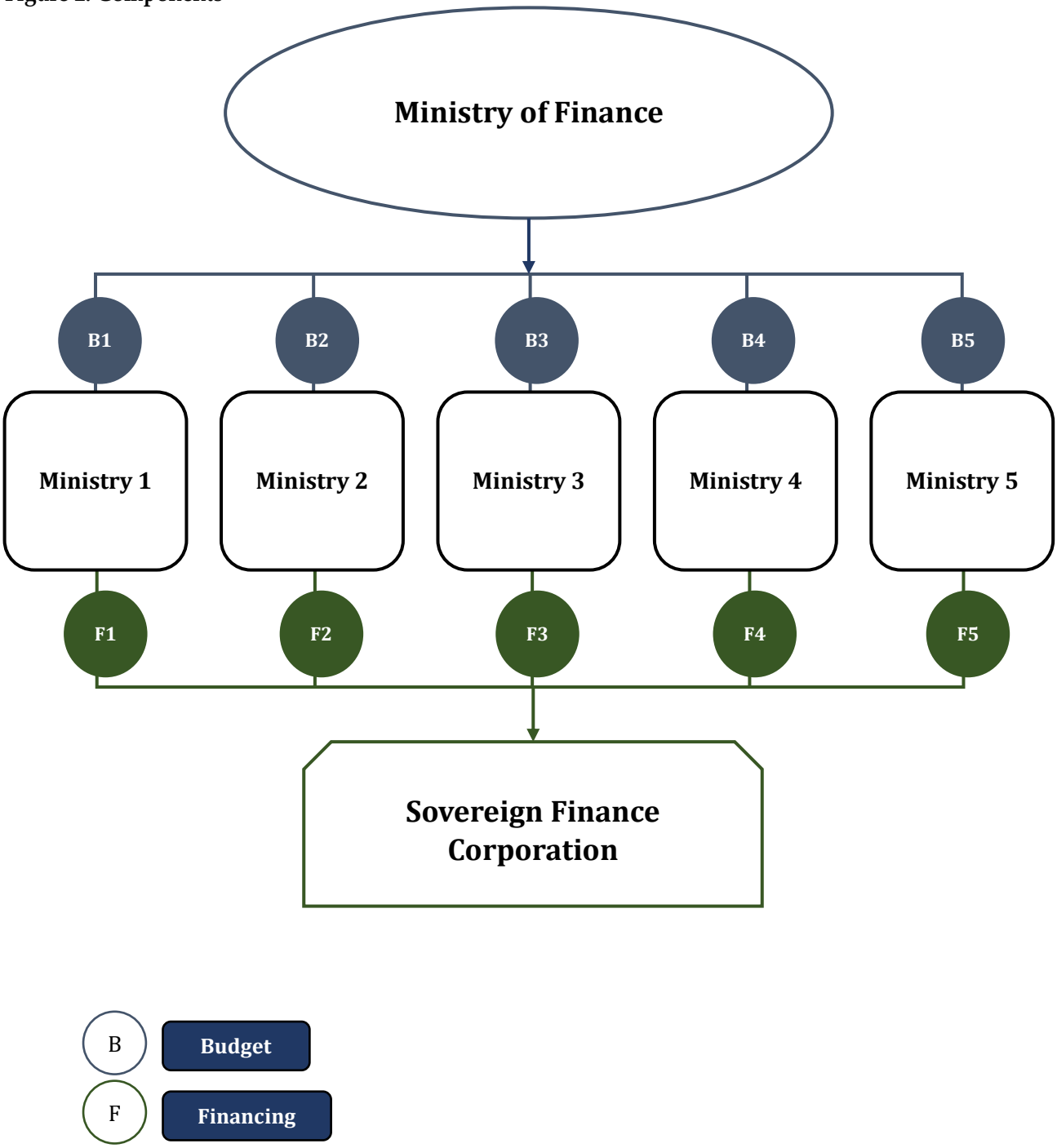
Since Sukuk can be issued with different maturities, Sukuk redemption may need liquidity support given the possible mismatch between the maturity of the Sukuk and that of government obligations. To mitigate any mismatch, the Central Bank may provide a line of financing to the SFC. The Central Bank may also provide currency exchange hedge in case the Sukuk are issued in a foreign currency so that this risk is still sovereign.

2. Organizational Relations

There are many ways to organize the relationship between the SFC and government entities, but we need to find the most efficient and effective. One approach is to consider the SFC as the "government's Islamic bank," as mentioned earlier. The SFC is a financial intermediary between government entities on one side, and capital markets on the other. This intermediation adds value by reducing the overall cost of financing for the government while providing investors competitive returns, as we shall see in subsequent sections.

The SFC will provide financing to government entities (or ministries) to supplement their budgets. Traditionally, ministries receive their allocated budgets from the Ministry of Finance (MoF). Through the SFC, ministries and government entities will be able to expand their activities beyond the budget, by obtaining financing from the SFC. The SFC will treat the approved budget as the "income" of the entity and will provide financing within the limits of this income, as banks usually do. Accordingly, repayment of the financing will be from the entity's allocated budget. This allows the entities to plan and manage their financing according to their available resources with a reasonable degree of flexibility under the control and supervision of the Ministry of Finance.

Figure 2: Components



In addition, the above model allows for better harmony and synchronization between funding and spending at the ministry level. Since each ministry is able to interact directly with the source of financing, they are able to better align the two sides of the budget constraint, revenues, and expenditures. This alignment is expected to promote better coordination and information sharing (Welham et al., 2015).

2.1 Supply Chain Platform

The SFC model can capitalize on the recent developments in supply chain management. Properly managed supply chains are essential for the success of a business (Sarkar, 2017). Technological advancements in supply chain platforms make this even more important (Hofmann et al., 2018). The revolutions in platform economics prove that this is indispensable in the 21st century (Evans and Schmalensee, 2016).

Supply chain platforms for governments are have been successfully applied in some OIC Member Countries. For example, Saudi Arabia developed its *Etimad* platform[4] to manage its suppliers' relationships and processing government's procurements. The platform introduced financing by local Islamic banks.

Following a similar approach, the government can set up a supply chain platform to manage supplies for its entities. Financing these supplies using fixed-income Islamic contracts will be straightforward and actually more Shari'ah compliant than the traditional, manual approach. The OIC Fiqh Academy approved contracting through electronic means more than 30 years ago, in its ruling no. 52 issued in 1990.

Accordingly, we can think of the SFC as the entity holding and managing the government's supply chain platform. That is, the SFC will not be a traditional "brick and mortar" financing company. Instead, it will be primarily a platform coordinating the supplies of the government's entities and financing them. Put differently, the SFC Sukuk may be viewed, at least in part, as securitizing the supply chain platform. The SFC becomes a true model of integrating finance with real economic activities.

2.2 Sustainability

The SFC model is intended to be a sustainable source of financing. This can be achieved by *amortizing* debt through periodical installments. This allows available resources to be used for an indefinite period of time. When the government invests in the equity of the SFC, it provides resources for self-financing (or "renewable financing") of public spending. Since financing is for-profit (through the markup), the SFC will be able to pay for its expenses and to expand its operations in tandem with the expansion of the government and the economy. The government's equity in the SFC, therefore, serves as a reserve for future generations. From this perspective, the SFC complements the role of the Sovereign Wealth Fund in building up sustainable resources.

[4] https://www.mof.gov.sa/en/eservices/Pages/Eitimad.aspx.

Amortization also provides an incentive mechanism to discipline financing and spending by the government entities. Compared with a bullet payment approach, installments are relatively larger in absolute value than the amount payable for the bullet payment financing (typically the coupon of the Sukuk). The higher installment incentivizes the entity planning to obtain financing to select only those activities or projects with sufficient value that justifies the periodical installments. This also helps to control the accumulation of debt, since unless the full installment is available in the entity's budget, the corresponding amount of financing will not be available. Put differently, the additional amount in the installment over the coupon acts as a "barrier to debt" that helps manage the level of debt and thus improve government's credit risk.

Moreover, each ministry or government entity needs to ensure that the installments are paid from the budgeted programs so that the budget suffers no additional burden. For example, suppose the budget allocates $\$x$ p.a. to the Ministry of Health, say, for establishing a certain number of primary care centers annually. Then, the Ministry of Health will be able to obtain financing that allows it to establish double or triple that number in year 1, such that the same allocated annual budget, $\$x$, will be used to pay the periodical installments over the lifetime of the financing. Having more health care centers built in year 1 generates more social value in terms of public health than spreading them out over several years if no financing was available. In this manner, the Ministry of Health is able to achieve its developmental objectives without giving up its ability to pay for other programs.

On the spending side, higher installments, compared to the coupon payment only, impose discipline on spending by directing available cash to productive projects, thus controlling agency costs due to "free cash."[5]

Finally, amortization allows the SFC to allocate its capital efficiently among various ministries. When a ministry repays an installment, the funds become available for another round of financing to the same or other ministries, thus maximizing the utilization of resources. We shall see later in detail how amortization may help improve credit risk and reduce the cost of financing.

2.3 External Investors

Although it is conceivable that the SFC obtains funding completely from the government (through management shares), this might soften the incentives for debt repayment by ministries given that the SFC, in this case, will be an internal body within the government structure.

For the SFC to be fully independent, and thus its debt obligations are treated as "hard debt," external investors are invited to participate in the SFC through shares backed Sukuk, as explained in the Overview section. In this manner, the SFC becomes an independent financial

[5] See: Michael C. Jensen (1986) "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review*, vol. 76, no. 2, pp. 323-329.

institution operating according to market standards and best practices. The SFC will be responsible for protecting the interests of the investors, resulting in better management of resources and thus lower costs of funding. By combining government's contribution with investors' contribution, the SFC is able, in principle, to achieve both objectives: (1) Self-sustainable financing and (2) efficient access to external finance.

3 Cash Flow

3.1 Reinvesting Installments

As outlined earlier, the SFC finances government's activities using Shari'ah-compliant fixed income modes of financing. To simplify the analysis, let us assume the SFC raises $100 M in 5-year Sukuk, with the (expected) return of 5% p.a. For the time being, we assume the SFC has no equity from the government. We assume further that the SFC finances, say, a transaction by a particular ministry of $100 M value at a markup rate of 5%.[6] The ministry has to pay the deferred price in annual installments over 5 years. We assume for simplicity that there are no transaction or management costs. The following matrix summarizes the resulting cash flow.

The financing is executed in year 0, and it creates a debt obligation on the ministry of $115.49 M, to be repaid in five installments, each = $23.1 M. By the end of year 1, the ministry pays back $23.1 M, of which $5 M is deducted as returns (coupon) to Sukuk holders. The remaining $18.1 M is reinvested in financing other activities of the ministry or other ministries. See Figure 1.

[6] The rate applies to outstanding balance.

Figure 3: Cash Flow

Year	0	1	2	3	4	5
	100	23.1	23.1	23.1	23.1	23.1
		18.1	4.2	4.2	4.2	4.2
			22.3	5.1	5.1	5.1
				27.4	6.3	6.3
					33.8	7.8
						41.6

Installments

Available cash for reinvestment

The $18.1 financing creates another 5-installment obligation, each of which is $4.2. (Installments beyond year 5 are not shown here for brevity.) By the end of year 2, the SFC will receive two installments: $23.1 for the 0-year $100 financing and $4.2 for the 1-year $18.1 financing, for a total repayment of $27.3. Again, $5 coupon is deducted from the total repayment, and the resulting amount, $22.3, is invested again, and so on. By the end of year 5, the SFC would redeem outstanding Sukuk and issue new ones to keep the process going. The financials of each, the government and the SFC, are presented in Table 1.

Table 1:Financials of Government and the SFC

Year	1	2	3	4	5
Government					
Deferred price (b. of year)	115.49	20.90	25.73	31.67	38.99
Paid-off debt (e. of year)	23.10	27.28	32.42	38.76	46.55
Total debt	92.39	86.01	79.32	72.23	64.66
Debt outstanding (PV)	81.90	77.72	72.58	66.24	58.45
SFC					
Cash	18.10	22.28	27.42	33.76	41.55
Investments	81.90	77.72	72.58	66.24	58.45
Total Assets	100.00	100.00	100.00	100.00	100.00

There is a possibility of "reinvestment risk," i.e., a potential gap between repayment of installments and reinvesting these installments with the government, resulting possibly in a "negative carry". This risk can be minimized by a (unilateral) commitment of the government (the MoF) to finance a certain portion of government's budget through the SFC according to a pre-agreed financing plan. If the government in some years enjoys a surplus, part of the surplus could be invested in the equity of the SFC. As pointed out earlier, this investment serves as a reserve for the future. In addition, to minimize reinvestment risk, the SFC may invest surplus cash in higher-rated assets or Sukuk (e.g., IsDB AAA-Sukuk). This helps to diversify the portfolio of SFC assets and improve its returns.

The reinvestment risk is only a risk of generating less returns than desired, i.e., it is a risk related to the upside returns. But it offers protection on the downside risk. If, for example, the

credit rating of the government was downgraded, then the SFC may require additional collateral, raise the cost of financing, or finance only a portion of the requested funding, before deciding to reinvest with the government. Since the SFC is jointly owned by the government and outside investors, many of them might be international investors, and the SFC needs to protect the rights of those investors by preserving the credit quality of its assets. This protection results in a lower cost of funding for the government, so the government is the ultimate beneficiary of preserving the quality of SFC assets. The right of the SFC not to reinvest is obviously restricted to very special and unlikely events, but it does impact the cost of funding. This right shows how the SFC Sukuk differ from bullet payment bonds or Sukuk, as will be discussed shortly.

3.2 Asset Composition

If we assume the SFC is financing the government at the same rate it pays Sukuk holders, then it will not be making any net profits. Thus total assets will always be $100 M, the same value of the principal raised through Sukuk (when we have no government equity contribution).

We also note that outstanding debt with the government (in present value) by the end of year 5 is $58.45 M. Although the SFC raised $100 M in Sukuk, due to amortization, outstanding government's debt is about 40% lower than if it raised a bullet-payment Sukuk. The difference is cash paid out in installments. This percentage drops in later years to about 30%. Table 2 shows the same financials for the years 10-15.

Table 2:Financials of Government and the SFC (years 10-15)

Year	10	11	12	13	14	15
Government						
Deferred price (b. of year)	38.49	38.38	36.15	37.02	37.48	37.54
Paid-off debt (e. of year)	38.23	36.31	37.06	37.45	37.50	37.31
Total debt	73.62	75.69	74.79	74.36	74.33	74.56
Debt outstanding (PV)	66.77	68.69	67.94	67.55	67.50	67.69
SFC						
Cash	33.23	31.31	32.06	32.45	32.50	32.31
Investments	66.77	68.69	67.94	67.55	67.50	67.69
Total Assets	100.00	100.00	100.00	100.00	100.00	100.00

The pattern for later years is roughly the same. That is, the level of government's debt stabilizes around 67.7%. The maturity of this debt is 1-4 years. The remaining 32.3% is cash received from installments paid by the end of the year. In other words, at any point in time during the year, about 32% of the Sukuk assets are either cash or receivables of less than one-year maturity, while 68% is of 1 year or more maturity.

From Sukuk holders' perspective, this composition of assets improves the maturity structure of their investment and thus makes it less risky. It is as if they are investing in a diversified portfolio of assets, some of which are short-term, and some are medium-term. Based on the above model, the average maturity of invested assets, for year 15, is about 2.3 years. At the beginning of any given year, all cash is supposed to be invested with the government. Assets of SFC at this point in time are only receivables from the government. The table below shows

the payable installments to the SFC over the coming 5 years, starting at beginning of year 15. Reinvestment is not reflected below since it occurs at the end of the year.

Table 3:Payable Installments to the SFC over the Coming 5 Years

Receivable Installments

Beginning of Year 15

15	**16**	**17**	**18**	**19**
7.68				
7.23	7.23			
7.40	7.40	7.40		
7.50	7.50	7.50	7.50	
7.51	7.51	7.51	7.51	7.51
Total	**$111.87**			

The sum of payable installments equals total debt at the end of year 14, $74.33, plus the deferred price created at the beginning of year 15, $37.54 (see Table 2). The sum is $74.33 + $37.54 = $111.87. Table 4 below summarizes the distribution of SFC assets according to their maturities. Average maturity is simply the sum of the percentage of each group of assets times its maturity.

Table 4: Distribution of SFC Assets According to Their Maturities

Distribution of Assets at the Beginning of Year 15

Maturity (years)	Percentage
1	33.4%
2	26.5%
3	20.0%
4	13.4%
5	6.7%
Total	100.00%
Average Maturity	2.34 years

If the yield curve, or the term-structure of the interest rate, is positively sloped, then this should result in a lower overall rate for Sukuk. A positively sloped yield curve implies that the rate for short-term debt is less than that for the long-term.

Although the Sukuk term is 5 years, the SFC finances each transaction separately. Therefore, in the case of unexpected circumstances, the SFC shall take the necessary steps to protect the interests of investors according to the terms and conditions of the Sukuk certificates, as explained earlier. This means that, while investors are providing their capital for 5 years, their investment is managed in a manner that replicates the risk profile of a portfolio of short-term and medium-term assets. For a positively sloped yield curve, this implies that the coupon on the SFC Sukuk would likely be less than market rates of 5-year bullet-payment government debt. Thus, the cost of funding for the government is likely to be lower.

3.3 Costs

In addition to the maturity structure of the assets, the SFC model improves the cost of financing due to amortizing of debt. Amortization results in lower total cost compared to bullet-payment. If a $100 M debt at 5% p.a. is amortized over 5 years, total paid-out costs = $15.49 M. This translates into 3.1% p.a. of capital. For a bullet-payment structure (with an

annual coupon of $5 M), the debtor has to repay $100 M at the end of year 5. Total paid-out cost, therefore, becomes $25 M, or 5% p.a. of capital.

The bullet-payment structure might provide more flexibility to the debtor compared to amortized debt, since in the latter, the debtor has to pay $23.1 M in annual installments, compared to only the coupon of $5 M for the former. This gives the bullet-payment structure liquidity of $18.1 M annually. However, to repay the principal, the debtor needs to invest the $18.1 at 5% p.a. compounded in order to generate $100 at maturity. This will be an advantage if the debtor is a profit-making entity, in which case it will invest the $18.1 M in its operations (assuming it generates 5% p.a. or more). In this case, the debtor is able to invest the full $100 M in its own business.

However, if the debtor is not a profit-making entity, like most government entities, the $18.1 M must be invested with a third party; thus, the amount will not be available to support the operations of the entity. This makes the two structures, bullet, and amortized repayment, equivalent in terms of the available funds for spending. However, they are not equivalent in terms of risk. The bullet-payment generally poses higher risks to the debtor, and thus to investors, than amortized debt.

IMF researchers U. Das, M. Papaioannou, and M. Polan (2008), compare bullet-payment bonds to those with amortizing debt. They argue that bullet bonds tend to increase the rollover risk for the issuer as they create a 'hump' in the debt repayment profile. Further,

Amortizing bonds smoothen the repayment profile and decrease information asymmetry between the issuer and investors. Regular payments help investors monitor the issuer, and reassure them that the issuer is able to honor the payments. This can lead to a more rapid reduction in risk spreads. Also, amortizing bonds have a shorter duration than bullet bonds, thus making them less risky and, in turn, contributing to a lower cost of the issue (p. 16).

The two methods, bullet and amortized, may have equivalent risks only if the probability of default is assumed to be independent of size and maturity of the debt. Both assumptions are questionable, theoretically, and empirically. This is why we usually observe an upward sloping term-structure of the interest rate. Short-term debt usually pays lower rates than long-term debt, all other things equal.

In summary, in principle, the SFC model is able to integrate the flexibility of the bullet-payment with the efficiency of the amortized debt.

3.4 Building Reserves

As discussed earlier, the equity investment of the government in the SFC plays the role of reserves for future generations to support public projects. Equity also provides the returns needed to cover transaction costs and management expenses and thus making net profits. As

long as equity does not pay dividends, the SFC will be able to accumulate additional earnings to improve the risk profile of the SFC.

As pointed out in the Overview, government's equity can be used as collateral for its obligations towards Sukuk holders. The same is true for retained earnings. As these profits or earnings accumulate, the credit-risk of the SFC Sukuk improves, which may result in lower costs of funding compared to government's unsecured debt.

4 Simulation

In this section, we examine the performance of the SFC overtime given hypothetical assumptions about its capital and cost structure. As before, we assume the SFC finances government's purchases through Murabaha. For each transaction, the SFC charges 5% markup on amortized debt. The debt is to be repaid in 5 installments over 5 years, 1 installment per year. Collected installments will be used to finance other purchases by (other) government entities, and so on.

On the other hand, the SFC issues Sukuk backed by its shares, as explained earlier. To simplify, we assume the SFC issues $100 M Sukuk. The government, meanwhile, invests $8.5 M as equity in the SFC. The returns of these equities will be fully reinvested in the SFC operations. No dividends will be paid to the government. Total funds available to the SFC, therefore, is $108.5 M.

Probably the most important factors are the coupon paid to Sukuk holders. Given that the average debt maturity of the SFC assets is 2.34 years (see Table 4), then the Sukuk coupon will depend on the yield curve. So, we assume that the yield curve is positively sloped, as normally is the case, with the following numbers.

Table 5: Yield Curve

Yield Curve	
Maturity (years)	Rate (p.a.)
1	1.00%
2	2.00%
3	3.00%
4	4.00%
5	5.00%

Given the distribution of maturity of the SFC portfolio, then the average rate of the portfolio should be close to 2.34% p.a. If we add management costs and reinvestment risk, we may consider the rate to be around 3% p.a. paid once a year.

To make our assumptions more realistic, we assume each parameter to be randomly distributed. The following table lists all input parameters and their distributions.

Table 6:Distribution of Input Parameters

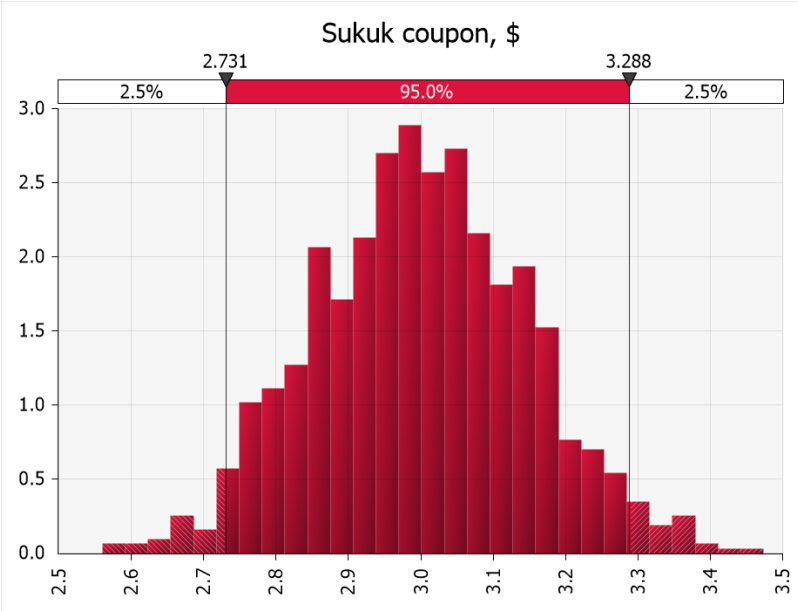
Distribution of Input Parameters		
Parameter	Value	Distribution
1-year yield	1.00%	*N*(.01, .001)
2-year yield	2.00%	*N*(.02, .002)
3-year yield	3.00%	*N*(.03, .003)
4-year yield	4.00%	*N*(.04, .004)
5-year yield	5.00%	*N*(.05, .005)
Markup rate	5.00%	*N*(.05, .005)
Management fees	$1 M	Uniform (1 M, 2 M)

The simulation was conducted using @Risk software, v.8.0, for 1000 iterations. The results are as follows.

4.1 Sukuk Coupon

Let us start with the Sukuk coupon paid to investors. As indicated previously, since Sukuk-holders own shares of the SFC, and therefore are directly exposed to its portfolio of assets, the Sukuk will reflect the risk profile of the portfolio. However, the distribution of the portfolio assets will change over time given the random distribution of input parameters. To simplify, therefore, we assume that the coupon rate is based on an equal distribution of different maturities, 20% each, resulting in 3% average rate. This is distribution obviously is biased to the benefit of the investors. The point is that the coupon rate reflects market rates of the yield curve. The SFC shall pay investors this rate as the cost of Sukuk.

Figure 4: Sukuk Coupon $



The graph above shows the distribution of the Sukuk coupon given the distribution of the yield curve. Investors were paid $3 M or 3% on average, with a minimum of 2.56% and a maximum of 3.47%. These rates reflect market rates of the yield curve, as pointed out earlier. The rates are well-above the rates of the actual distribution of assets. The average distribution of asset maturities is presented in the following table.

Table 7: Average Distribution of Assets Maturities

Average Distribution of Assets Maturities	
Year (b.o.)	Distribution
5	2.24
10	2.35
15	2.35
b.o.: beginning of the year	

At the beginning of year 5, the average distribution is 2.24 years; while for years 10 and 15, it is 2.35. The corresponding rate on assets, therefore, should be around 2.4%; yet investors re paid on average 3% p.a.

4.2 Reserves

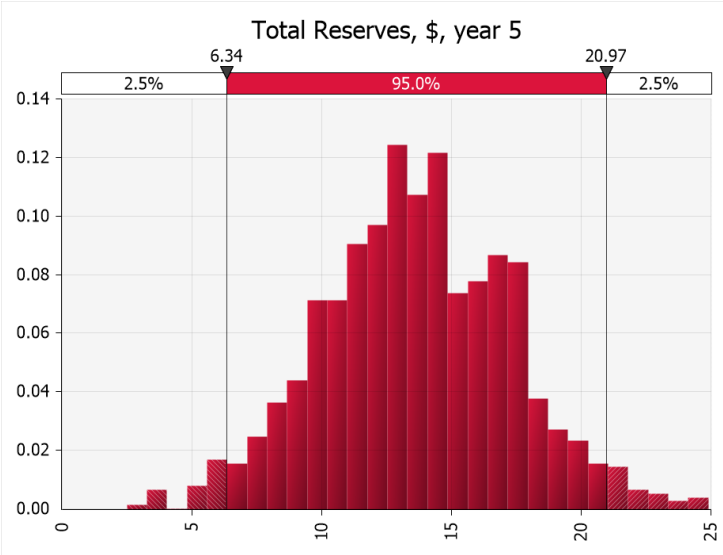
The SFC does not pay dividends to the government. It pays only the Sukuk coupon in addition to the management fees. All remaining income, therefore, is accumulated as retained earnings. Total reserves equal equity capital plus retained earnings. Total reserves, therefore, are an essential indicator of the performance of the SFC. They are also essential for its creditworthiness and, therefore, the cost of funding. The following table shows the average reserves for different years of the life of the simulation.

Table 8:Total Reserves, $M

Total Reserves, $M				
Year (e.o.)	Average	Minimum	Maximum	Std Deviation
5	16.37	2.48	24.9	3.6
10	26.42	-4.7	47.24	8.4
15	39.25	-13.3	77.65	14.7
e.o.: end of the year				

The distribution of reserves for year 5 is given below.

Figure 5: Total Reserves, $, year 5



The probability of negative reserves is nil. This tells us that the $8.5 M equity is sufficient to protect the SFC for the first 5 years. However, as the table shows, as time progresses, uncertainty builds up, and the SFC might incur losses by the end of year 10. However, the probability of negative reserves by year 10 is less than 1%, and about 2.1% for year 15.

Figure 6: Total Reserves, $, year 10

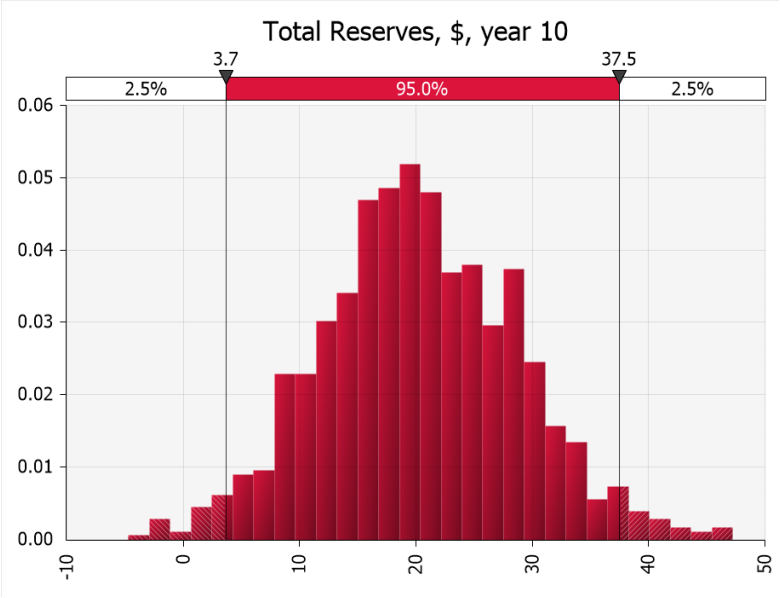
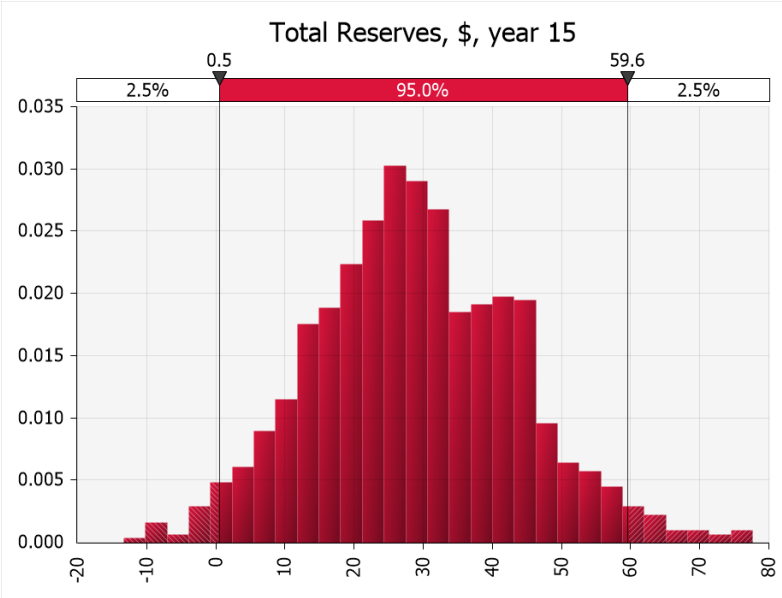


Figure 7:Total Reserves, $, year 15



As the SFC accumulates reserves, its creditworthiness could be very well better than that of the (uncollateralized) government credit risk. In the long run, therefore, the SFC will be able

to mobilize resources at rates lower than those of the government. As pointed out earlier, the SFC could serve as a reserve building entity to serve future generations of the country.

Conclusions

A major player in the Sukuk market is governments. Sovereign Sukuk are essential not only for the depth and size of the market, but also for other sectors on the economy. Despite the critical role of sovereign Sukuk in supporting development, the prevalent model is very restrictive and apparently not sustainable.

This paper proposes an institutional framework for sustainable and efficient issuance of sovereign Sukuk to support the real economic needs of governments and government agencies. The Sovereign Finance Corporation model aims to meet these objectives. The SFC finances government activities through fixed income Islamic modes of finance and issues investment shares to back Sukuk issued to finance the government's activities.

The flexibility and sustainability of the model allow the government to plan its spending through scalable Sukuk programs to support economic activities. It also allows for improved risk profile resulting eventually in lower costs of funding.

The SFC model is not without costs or risks. But it has the potential to add value to sovereigns seeking Islamic modes of financing. The basic ingredients of the model are already applied and tested in the market, but the overall structure is apparently novel. The SFC, therefore, is not intended to replace the existing sources of sovereign finance. Rather, it helps to diversify and expand the available sources and strategies of funding in an efficient and sustainable manner.

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