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Investment strategies with rebalancing: How could they serve Sukuk secondary market?

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Abstract

Although the Sukuk market is rapidly growing, it still faces many challenges. The "Buy and hold" effect slows down this growth as it freezes the exchange of these assets in the secondary market. In this perspective, this paper introduces an approach aiming at improving Sukuk exchange by using the diversity of the investors' risk profiles. Through this study that applies several investment strategies based on rebalancing, we demonstrate that these strategies have the potential to boost the Sukuk market's growth. This is actually due to the fact that the investor can choose among these strategies according to his investment profile and his market anticipation. However, this approach's effectiveness is conditioned to the adherence of a large number of investors. In terms of contribution, this paper fills the gap in the literature by introducing a pragmatic approach to reduce the impact of the "Buy and Hold" effect on the Sukuk market.

JEL codes: C01; C49; C52; D49; G11; G15

Keywords: Sukuk; Buy and hold effect; Investment strategy; Rebalancing; Secondary market

1. Introduction

According to the Accounting and Auditing Organization for Islamic Financial Institutions, Sukuk are defined to be investment certificates representing an undivided property in a tangible asset or in a well-defined project. Their market is currently dominating the Islamic financial industry. Indeed, in the third quarter of 2016, the Sukuk market reached a total issuance of $ 39.8 billion and a total outstanding amount of $ 368.2 billion. Thus, Sukuk represent a share of 17% of Islamic finance assets. They hold the second position after the Islamic banking sector (Thomson Reuters, 2016).

Sukuk market is the fastest growing field in the Islamic financial services industry with an increase of about 20% per year over the period 2008–2014 (Naifar, Mroua, & Bahloul, 2017; Reboredo & Naifar, 2017; Smaoui & Nechi, 2017). However, the development of the Sukuk market still faces several challenges, such as the "Buy and Hold" effect (Godlewski, Turk-Ariss, & Weill, 2010; Jobst, Kunzel, Mills, & Sy, 2008; Siddiqui, 2008). This is due to the fact that the majority of Sukuk holders held them to maturity (Zulkhibri, 2015).

The "Buy and Hold" effect, which consists in the purchase of an asset and keeping it to maturity, represents a dominant behavior of investors. This passive strategy is called a "Buy and Hold" strategy. Generally speaking, it is a long-term investment choice based on a bullish market forecast (Barberis, 2000; Fernandez-Rodrıguez, Gonzalez-Martel, & Sosvilla-Rivero, 2000; Shiryaev, Xu, & Zhou, 2008). For an investor, this strategy is not a problem per se if it reflects its intention to manage a particular asset. Once we consider an asset portfolio, this strategy may have undesirable effects (Willenbrock, 2011). Indeed, the allocation of assets differs from the initial allocation following market fluctuations. The resulting

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portfolio may differ from the investor's risk profile represented by the weight of each asset in the portfolio. Thus, portfolio adjustments should be made if the investor intends to maintain its risk profile (Willenbrock, 2011). At market level, the majority of investors' adherence to this strategy freezes transactions in the secondary market (Jobst et al., 2008; Siddiqui, 2008). As a result, several consequences related to asset liquidity are generated such as the increase of transaction costs, bid-ask spreads and price inefficiency (Amihud, Mendelson, Pedersen, & others, 2006).

Despite its impact, only few studies propose pragmatic approaches to reduce the "Buy and Hold" effect. Actually, unlike bonds literature, Sukuk literature reveals a dominance of qualitative studies over quantitative ones (Aliyu, Hassan, Yusof, & Naiimi, 2016; Zulkhibri, 2015). However, few studies analyze Sukuk as an investment instrument instead of focusing on their structuring. Moreover, in our humble knowledge, none of the existing studies have suggested a pragmatic solution to the « Buy and Hold » effect. Only Najeeb, Bacha, & Masih, 2016 investigate diversification opportunities for Sukuk portfolios across heterogeneous investment horizons, assuming that investors would maintain a "Buy and Hold" strategy.

Among qualitative studies, Tariq & Dar, 2007 show that different perceptions of Sharia (Islamic law) in Islamic finance impact Sukuk pricing. Thus, a financial engineering compliant with Sharia would enhance the attractiveness of these instruments. At the operational level, Shafi, Ariffin, & Salamudin, 2013 suggest the use of convertible Sukuk to mitigate investors risk especially when they are backed by tangible assets such as real estate. Furthermore, participatory Sukuk are more adapted to well-informed investors since they are usually more exposed to return risk than to credit risk (Wilson, 2008). Concerning quantitative studies, we distinguish three streams of research. The first one analyses the comparability between Sukuk and bonds. In fact, Cakir & Raei, 2007, pp. 1−20 affirm that bonds are different from Sukuk since their prices do not have the same behavior, which is confirmed by Godlewski et al., 2010 as well. Indeed, they identified a negative correlation between equity and Sukuk market but found no correlation between this market and bonds issuance. Moreover, Ariff & Safari, 2015 also confirm the difference between the two investment instruments by conducting a cause-and-effect study on their prices. In addition to that, some empirical studies show how similar is the relation between Islamic equities and Sukuk to the one linking conventional stocks to bonds (Masih, Kamil, & Bacha, 2016).

The second stream highlights the impact of macroeconomic factors on Sukuk market using the Multiple Regression and the Vector Autoregressive model (VAR). For instance, Ahmad, Daud, & Kefeli, 2012 affirm that the development of Sukuk market has a positive impact on the Gross Domestic Product (GDP) of Malaysia. In addition to GDP, Said et al., 2013 emphasize the relation between this market and several other factors such as the size of Muslim population, the quality of regulation and economic crises. Smaoui & Khawaja, 2016 added some other factors like lower corruption and interest rate spread. The third one focuses on the volatility of this market using Sukuk Dow Jones index as a proxy. In these studies, EGARCH is the prevalent model. It allows detecting the impact of shocks on the Sukuk market. Indeed, Nursilah & Sulistya, 2013 demonstrate the existence of a systemic effect between this market and other ones. Therefore, an investor has to take into consideration the information available at the overall market level and not only at the Sukuk market.

In this paper, we will contribute to the on-going studies on Sukuk Market by exploring the benefits of investment strategies based on rebalancing in improving exchange in Sukuk secondary market. An investment strategy is typically linked to an investor's risk profile. Generally speaking, every financial market is characterized by a diversity of investors and thus different risk profiles. In conventional financial markets, several investment strategies are developed in order to reflect this diversity. Many of these strategies are compatible with the Sharia and can be implemented within the Sukuk market. In this perspective, this work aims at stimulating trading in the Sukuk market by applying the existing investment strategies. In fact, we show through this study that the "Buy and Hold" strategy is not always optimal, which will encourage investors to adopt other strategies intrinsically. The remainder of this paper is structured as follows. The first part reviews the literature on the Sukuk market and addresses the impacts of the "Buy and Hold" effect. The second part presents Sukuk universe and the principle of different strategies used in our empirical study. Results and limitations are discussed at the end of this part. And the last part concludes the paper.

2. Literature review

The purpose of this section is to introduce Sukuk as an investment instrument with different types, risks and methods of rating. We will also highlight some factors that may be related to the passive behavior of investors by adopting a "Buy and Hold" strategy.

2.1. Sukuk Market

Similarly to bonds, Sukuk pay periodic coupons and have a fixed maturity (Ahmed, 2010; Godlewski, Turk-Ariss, & Weill, 2013, 2016). They were issued for the first time in the 1980s (Godlewski, Turk, & Weill, 2011, 2013). Sukuk market is currently experiencing strong growth with an overall issue volume of 39.8 billion US dollars in the third quarter of 2016. The Malaysian market, only, represents 58.19% with an issuance volume of 23.1 billion US dollars (see Fig. 1) (Thomson Reuters, 2016). Thus, Sukuk are considered as the most interesting instrument in Islamic finance (AL-Hersh, 2014).

Sukuk provide the opportunity to invest in several assets and projects. Their performance depends on their underlying's'. Usually, they are called "Islamic bonds" but they are different from bonds conceptually speaking. The exact translation defines them as "Islamic Investment Certificates" (Afshar, 2013). Also, Sukuk investors are considered to be not

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only cash lenders but owners of the underlying. Moreover, the amount received at maturity should be the redemption of the underlying at its market price (Usmani, 2007).

Sukuk market is attractive for both Muslim and non-Muslim investors as they are considered as a diversification asset (Wilson, 2004, pp. 6–7). To simplify their integration and management in conventional portfolios, they are generally quoted with the same conventions as bonds. Moreover, the decision to invest in Sukuk depends on other factors. According to Warsame & Ireri, 2016, this decision could be stimulated by behavioral factors such as quality of service and knowledge of Sukuk characteristics.

There are two categories of Sukuk in markets, asset-backed and asset-based ones. The first category represents a real transfer of ownership between the issuer and the holders. In case of issuer default, Sukuk holders have direct access to the underlying (Afshar, 2013; Aziz, Pahlavi, & Gintzburger, 2009), while asset-based Sukuk holders do not have this advantage. Thus, in case of issuer default, the conventional recovery procedure is applied (Afshar, 2013; Aziz et al., 2009). Furthermore, the rating of the two categories differs as well. Moody's agency, for instance, rates asset-based Sukuk by considering the solvency of the issuer, the same way as bonds. Asset-backed Sukuk are rated similarly to securitization (Mseddi & Naifar, 2013).

For Islamic Financial Institutions (IFI), Sukuk are considered to be a liquidity management tool (Wilson, 2008). As a matter of fact, these institutions invest the surplus of financing in short term Sukuk issued by central banks and sell them back to meet cash demand if necessary (Ariffin, 2012; Usmani, 2007).

As every financial instrument, Sukuk are exposed to multiple risks (Nanaeva, 2010; Tariq & Dar, 2007). The market risk arises from fluctuations in the flows generated by the underlying asset. For Sukuk based on debt, this risk depends on the fluctuation of the interest rate used as a benchmark (Tariq & Dar, 2007). Concerning credit risk, it is linked to the probability of default of the issuer and to the quality of the underlying (Tariq & Dar, 2007). Liquidity risk relies on Sukuk secondary market's turnover. This is actually observed in practice by a low trading volume, a significant bid-ask spread and high transaction costs. The risk of compliance is considered as a specific risk of these securities. Indeed, the principles of Sharia must be respected from issuance to maturity (Tariq & Dar, 2007).

Several indexes have been structured to enable a panoramic view of Sukuk market. They improve continued monitoring of Sukuk market evolution. Indeed, their structuring aims to educate investors and to improve transparency of the market (Siddiqui, 2008). Also, it allows performance comparison using benchmarks (Siddiqui, 2008). For example, we find the Dow Jones Citigroup Sukuk Index series. This Index series sets several eligibility criteria such as residual maturity, issue size and minimum rating (Dow Jones Sukuk Total Return Index (ex-Reinvestment) Methodology, 2016). However, no filter excludes Sukuk based on debt such as Sukuk Murabaha or Salam. Therefore, these indices are not replicable by investors since Sharia principles do not allow the exchange of this type of Sukuk in the secondary market.

2.2. The « Buy and Hold » effect

The majority of investors adopt the strategy of keeping Sukuk in their portfolios until maturity (Zulkhibri, 2015). This passive investment strategy, which is known as “Buy and Hold”, has a negative effect on the liquidity of the secondary market. Investors’ choice of this strategy is due to several factors. The first one is the insufficient supply compared to the growing demand (Harvey & Cosgrave, 2012). In fact, experience has shown that private Sukuk issuances on the primary market are often oversubscribed (Al-Amine, 2008). The second factor is related to Islamic considerations for Sukuk based on debt. Although they represent a significant part of the market, they are not tradable in the secondary market at a price different from their nominal value (Afshar, 2013; Yean, 2009). Due to the lack of sovereign issues, the third factor is the absence of benchmarks constituted by sovereign Sukuk. Last but not least, Sukuk traders do not have a reliable marking to market valuation models that are compatible with Sukuk structures (Harvey & Cosgrave, 2012), which increases the probability of being arbitrated. This phenomenon is highly correlated to liquidity risk and impacts directly the bid-ask spread and transaction costs. These factors push investors to adopt the “Buy and Hold” strategy despite having different investment profiles. As a consequence, a significant diversity potential is underused.

3. Methodology

The aim of this section is to highlight that the “Buy and Hold” strategy does not always outperform investment strategies based on rebalancing. To attempt this target, we will illustrate this idea using an empirical example. Firstly, we will represent the studied Sukuk by their type, issued amount, sector and rating. Also, we will explicit the required parameters to compute portfolios' levels. Secondly, we will discuss the rebalancing effect and its impact on portfolios' performance. Thirdly, we will introduce some strategies based on rebalancing and explain the algorithm for calculating their weights. A portfolio level for each strategy will be calculated on a daily basis, based on Sukuk's price history and calculated quantities on each rebalancing date using strategy's algorithm. Nevertheless, the “Buy & Hold” portfolio Sukuk quantities will remain unchanged. At the starting date, all portfolios have 100 as initial value. At the end of this section, we will discuss the main results.

3.1. Presentation of Sukuk universe

We have opted for a sample of 65 Malaysian Sukuk. We chose a single country to avoid the currency risk. Among the different types of Sukuk, we only kept Sukuk Musharakah, Mudharabah and Ijarah in order to respect the Sharia principles. Indeed, as mentioned earlier, Murabaha and Salam Sukuk

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are based on debt and they cannot be exchanged in secondary market. Also, we opted for a maturity date greater than February 2017 and an issuance date before the beginning of 2012. Between February 2012 and October 2016, the selected Sukuk remain unchanged.

The Fig. 2 describes the composition of the targeted Sukuk by type, issued amount, sector and S&P rating (source of data is Thomson Reuters Eikon).

In the remainder of this work, we consider the following parameters used in the optimization problem for each investment strategy:

- N : Number of assets in the selected universe.
- $W_t = (W_{i,t})_{1\le i\le N}$: Weights vector of assets in a given portfolio at date t.
- $R_t = (R_{i,t})_{1\le i\le N}$: Returns vector of assets at date t.
- $\overline{R}_t = (\overline{R}_{i,t})_{1\le i\le N}$: Average returns vector of assets at date t.
- Σ_t : Returns covariance matrix at date t.
- $Q_t = (Q_{i,t})_{1\le i\le N}$: Quantities vector of assets at date t, constant between two rebalancing dates.
- $P_t = (P_{i,t})_{1\le i\le N}$: Prices vector of assets at date t.
- $C_t = (C_{i,t})_{1\le i\le N}$: Coupons vector of assets at date t.
- $Strat_t$: Portfolio level at date t. $Strat_0 = 100$.

On each rebalancing date, the vector W is calculated for a given strategy using its specific optimization algorithm. Using this vector, the quantity of each asset to be bought or sold is determined as follows:

$$Q_{i,rebal} = \frac{W_i * Strat_{rebal-1}}{P_{i,rebal}} \quad , 1 \le i \le N \tag{1}$$

The value of each portfolio is then calculated on daily basis using the following formula:

$$Strat_t = Strat_{t-1} * \left(1 + \sum_{i=1}^{N} Q_{i,t} * \left(\frac{P_{i,t} + C_{i,t}}{P_{i,t-1}} - 1\right)\right) \tag{2}$$

For an asset « i », the return at date « t » is calculated as follows:

$$R_{i,t} = \ln\left(\frac{P_{i,t} + C_{i,t}}{P_{i,t-1}}\right) * \sqrt{\frac{365}{Act(t-1,t)}} \quad , 1 \le i \le N \tag{3}$$

The average of returns for an asset « i » between two rebalancing dates is then:

$$\overline{R}_{i,rebal} = \frac{1}{window} \sum_{t=rebal-window}^{rebal} R_{i,t}, \quad 1 \le i \le N \tag{4}$$

« *window*» is the number of observations between two rebalancing dates. The covariance matrix is then computed with the following formula:

$$\Sigma_{rebal}(i,j) = \frac{1}{window} \sum_{t=rebal-window}^{rebal} \left(R_{i,t} - \overline{R}_{i,rebal}\right)\left(R_{j,t} - \overline{R}_{j,rebal}\right) \tag{5}$$

Portfolios' rebalancing takes place quarterly. At each rebalancing date, the allocation algorithm is applied to compute new weights and quantities based on the last quarter returns. The different choices are made without loss of generality. However, the results differ according to the size of the universe, the Sukuk type distribution, the rebalancing window and the historical data needed for each rebalancing date. Consequently, it is highly recommended for an investor to test several combinations before defining his investment strategy. This is beyond the scope of this paper since our aim is to show the diversity behind investment strategies.

3.2. Rebalancing effect

Several theoretical and empirical studies have shown the role of rebalancing in improving the return of portfolios compared to "Buy and Hold" ones. Through a disciplined practice of rebalancing based on frequency or on time interval, Buetow, Sellers, Trotter, Hunt, & Whipple, 2002 show improvement in portfolio performance and risk control. This improvement which is called "Rebalancing Bonus" by Bernstein & Wilkinson, 1997 helps to maintain the risk-return level of the portfolio against the drift of asset weights. Indeed, the non-rebalancing of the portfolio will cause a change of the initial asset weights following the market. As a result,

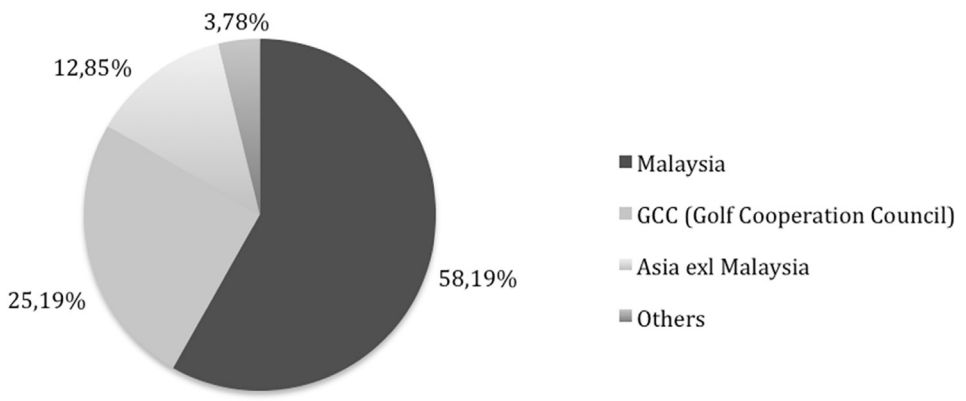

Fig. 1. Worldwide Sukuk market configuration up to the 3rd quarter of 2016. Source: Thomson Reuters, 2016

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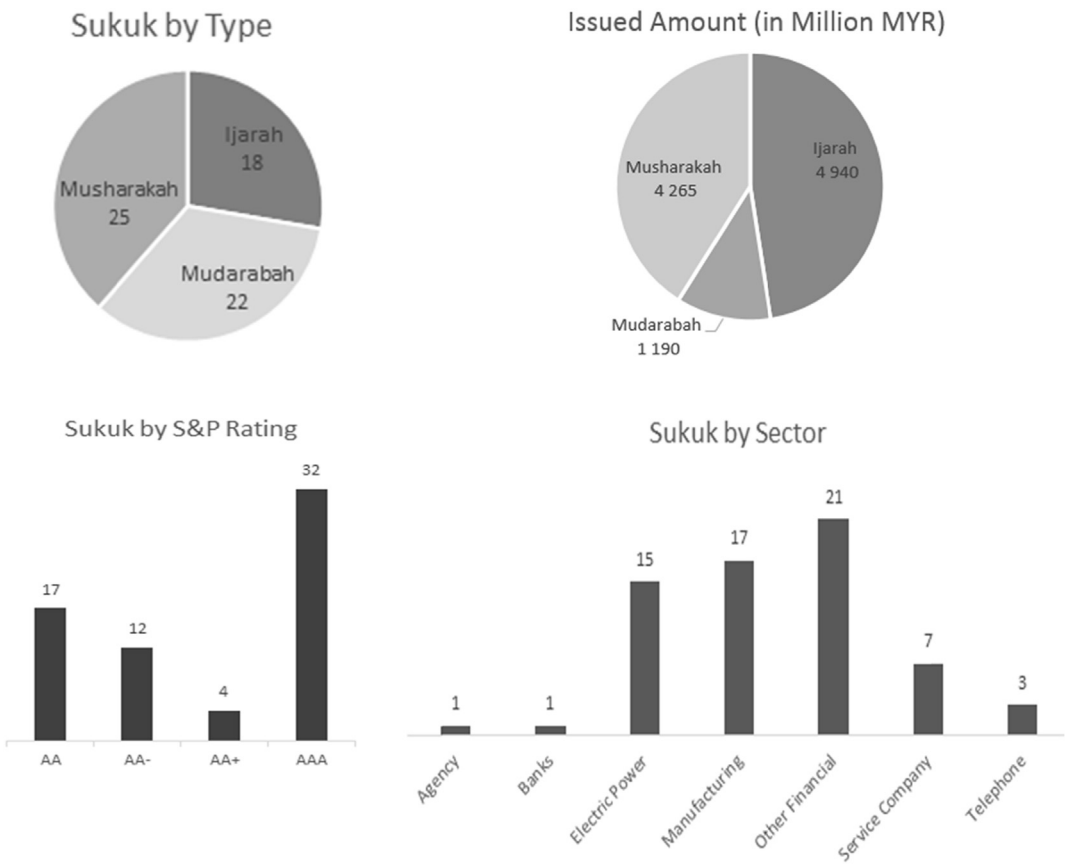

Fig. 2. Sukuk repartition by type, issued amount, sector and S&P rating.

rebalancing becomes a necessity and not an option for asset managers (Arnott & Lovell, 1993).

Comparing several rebalancing strategies, Dichtl, Drobetz, & Wambach, 2014 show in their empirical studies that all rebalancing strategies outperform the Buy and Hold portfolio. They also mention that the choice among the different strategies is of a minor importance.

It is likely that transaction costs due to rebalancing will negatively impact the performance of the portfolio. Masters, 2003 studies the optimal moment (The Trigger Point) to rebalance considering investor risk aversion, the difference in costs between different markets and the type of traded assets. Consequently, the rebalancing strategy can be tailored to investor preferences. Moreover, transaction costs, once integrated into the overall return calculation, can be neutralized.

The next section highlights different strategies used in our empirical illustration. We believe that they are Sharia compliant as they rely neither on short selling nor on leverage.

3.3. Capitalization weighted strategy (CW)

In 1952, Harry Markowitz's risk assessment, in addition to performance, were considered a revolution in the world of portfolio management (Bernstein, 2007). Mean-Variance optimizations are harvesting the trade-off between risk and return. Therefore, this principle generates a set of optimal portfolios that form the efficient frontier based on asset expected returns and volatilities (Markowitz, 1952). Few years later, Sharpe, 1964 introduces the tangent portfolio by analyzing the premium of assets over the market.

The tangent portfolio represents the allocation based on the market capitalization of assets (Roncalli, 2013). This weighting is the most used in indexing. Considering this strategy, it is assumed that all investors have the same perception of assets risk and return (Markowitz, 1952). Consequently, this portfolio is the efficient allocation from the point of view of all investors (Haugen & Baker, 1991). Usually, these portfolios are considered as benchmarks for the market despite the several studies proving their sub-optimality compared to other strategies (Arnott, Hsu, & Moore, 2005; Haugen & Baker, 1991; Hsu, 2006). Besides, even studies using random allocations have shown that they can outperform these benchmarks (Clare, Motson, & Thomas, 2013b, 2013a).

The calculation of weights at each rebalancing date will depend on the market capitalization of each asset as follows:

$$W_{i,rebal} = \frac{P_{i,rebal-1} * Issued\_Sukuk_i}{\sum_{j=1}^{N} P_{j,rebal-1} * Issued\_Sukuk_j} \quad , \; 1 \le i \le N \qquad (6)$$

With « $Issued\_Sukuk_i$ » as the number of issued Sukuk for asset « i ».

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3.4. Investment strategies independent of expected return

In order to manage risk concentration in some assets of CW portfolios, we will present some risk control-oriented investment strategies found in the literature. The aim of these algorithms is to allocate assets independently of the expected returns of targeted portfolios.

3.4.1. Equally weighted (EW)

It is often believed that the strategy which allocates equal weights (EW) to all assets in a portfolio is a naive strategy. However, several empirical studies have shown its effectiveness in terms of risk diversification and premium capturing (DeMiguel, Garlappi, & Uppal, 2009). Indeed, this strategy is by definition not concentrated. In addition, with the rebalancing mechanism, it pushes the investor to buy the assets that underperform and sell those that outperform. This is the "Volatility Pumping" phenomenon represented by the return of volatility, which is a part of the return due to rebalancing (Hallerbach, 2014).

At each rebalancing date, assets are reweighted with the same weights (Hallerbach, 2015):

$$W_{i,rebal} = \frac{1}{N} \quad , 1 \le i \le N \tag{7}$$

3.4.2. Minimum variance (MV)

The second strategy is the minimum variance portfolio (MV). In this case, variance is considered as a measure of risk without loss of generality. Other measures could be certainly used. It is about finding the weights of each asset to minimize portfolio's risk. The rationale for this strategy is that investors are not totally rewarded for the risk assumed while investing in CW portfolios (Haugen & Baker, 1991). Moreover, Blitz & Van Vliet, 2007 highlight in their empirical studies that this investment strategy has relatively less "drawdown", a lower beta and an anti-bubble behavior. Although MV strategy has several advantages, it is characterized by the effect of concentration as well (Maillard, Roncalli, & Teïletche, 2010). In fact, less volatile assets will have more weights in the portfolio. The optimization algorithm for this strategy is as follows (Hallerbach, 2015):

$$\begin{aligned} &\min_{W} W^{'} \Sigma \, W \\ &s.t. \quad \sum_{i=1}^{N} W_i = 1, \quad 0 \le W_i \le 1 \,, \quad 1 \le i \le N \end{aligned} \tag{8}$$

where $W^{'}$ is the transpose of the vector W.

3.4.3. Maximum diversification (MD)

In the quest for diversification, Choueifaty & Coignard, 2008 introduce a strategy that maximizes diversification within a portfolio (MD). The correlation of assets within the portfolio is taken as a measure of diversification. This portfolio is characterized by the same correlation between all assets and the portfolio (Choueifaty & Coignard, 2008; Choueifaty, Froidure, & Reynier, 2013). The same principle is defined by Tasche, 2007, using the diversification index of a portfolio to be minimized. Paradoxically, this portfolio can also be concentrated in terms of weight and risk contribution.

In order to compute targeted weights for this strategy, it is necessary to solve the following optimization problem (Hallerbach, 2015):

$$\begin{aligned} &\max_{W} \frac{\sum_{i=1}^{N} W_i \sqrt{\Sigma(i,i)}}{\sqrt{W^{'} \Sigma \, W}} \\ &s.t. \quad \sum_{i=1}^{N} W_i = 1, \quad 0 \le W_i \le 1 \,, \quad 1 \le i \le N \end{aligned} \tag{9}$$

3.4.4. Inverse volatility (IV)

There are also two risk parity strategies. The first one, considered as naive as well, is a strategy that gives each asset in the portfolio a weight inversely proportional to its volatility (IV). If the volatilities are identical, IV and EW become equivalent. At each rebalancing date, weights of assets are inversely proportional to their volatilities (Hallerbach, 2015):

$$W_{i,rebal} = \frac{\frac{1}{\sqrt{\Sigma(i,i)}}}{\sum_{j=1}^{N} \frac{1}{\sqrt{\Sigma(j,j)}}} \quad , 1 \le i \le N \tag{10}$$

3.4.5. Equal risk contribution (ERC)

The second risk parity strategy is the Equal Risk Contribution Strategy (ERC). Maillard et al., 2010 introduced the analytical features of this strategy in 2010 for the first time, even though Edward Qian had introduced this concept before (Qian, 2005, 2006). In the case of assets with the same correlation, ERC and IV become equivalent. In the case of minimal correlations, ERC and MV become equivalent as well (Roncalli, 2013). To compute the targeted weights for this strategy, it is necessary to find, at each rebalancing date, the optimal solution of the following problem (FTSE Global Equal Risk Contribution Index Series, 2016):

$$\begin{aligned} &\min_{W} f(W) = \sum_{i=1}^{N} \sum_{j=1}^{N} \left(W_i \left(\Sigma_{i,j} W^{'} \right)_i - W_j \left(\Sigma_{i,j} W^{'} \right)_j \right)^2 \\ &s.t. \quad \sum_{i=1}^{N} W_i = 1, \quad 0 \le W_i \le 1 \,, \quad 1 \le i \le N \end{aligned} \tag{11}$$

with $\Sigma_{i,j} = \Sigma \, (i, \, j)$.

3.5. Results and discussion

Each strategy has its own optimization philosophy, which naturally results in different Sukuk compositions. Indeed, even if they consider only historical returns and risk, assets weights differ within each strategy. These Sukuk compositions are summarized in Fig. 3. "B&H" is the "Buy and Hold" strategy that is constructed by buying, at an initial date, Sukuk

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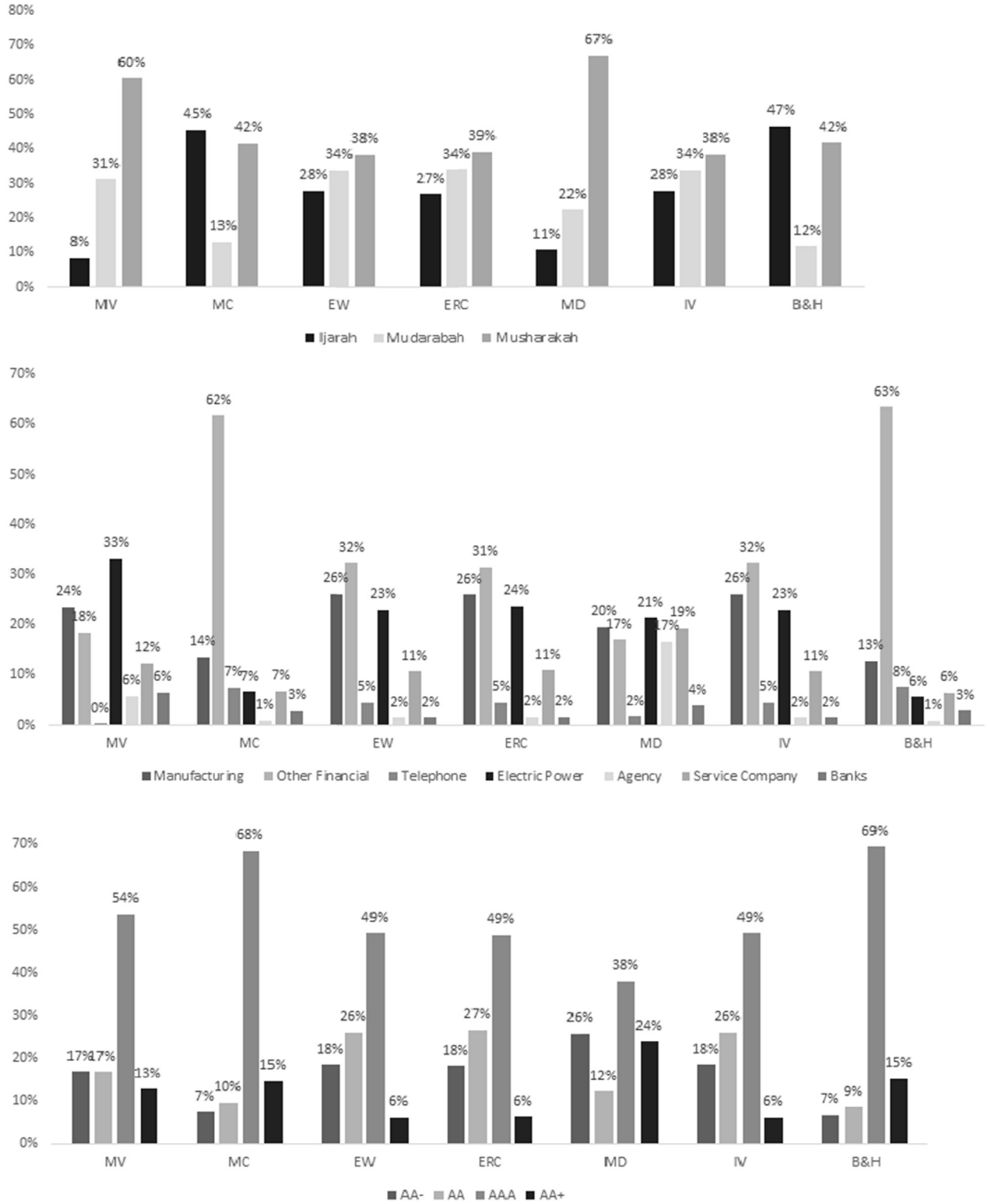

Fig. 3. Distribution of Sukuk by type, sector and S&P rating.

weighted by their market capitalization. Thereafter, quantities remain unchanged. This figure shows diversity in the portfolio composition of each strategy. It should be noted that these results depend on our previous assumptions such as Sukuk universe, historical data and the adopted risk measure.

As another diversity indicator between strategies, we use risk adjusted return ratio R/σ to highlight the existence of risk-profiles variety illustrated in Fig. 4.

The purpose of this study is not to compare the dominance of a given strategy over the others. Since we have established

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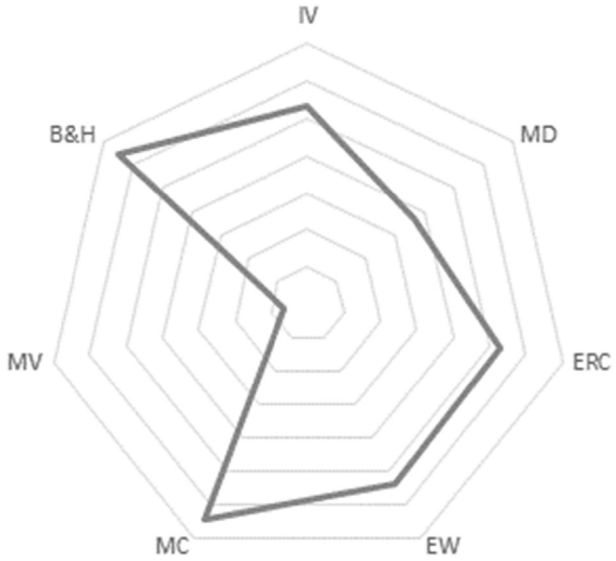

Fig. 4. Risk adjusted return ratio (R/σ) by strategy.

several assumptions in our empirical application, we cannot pretend that we found the best strategy. In order to find the dominant strategy rigorously, we should actually test every possible combination, which remains unrealistic.

Our aim is to illustrate, through the three situations highlighted in Figs. 5 and 6, that depending on the market trend, a "Buy and Hold" strategy is not necessarily the most appropriate one. In fact, Circle 1 in Fig. 5 shows that during the first period circle, a significant drop of prices occurs. "Buy and Hold" portfolio is hence deeply impacted since no adjustment is done to avoid this drop. However, MV portfolio is less affected. Indeed, asset weights under MV strategy are adjusted at each rebalancing date in order to reduce the impact of market fluctuations by minimizing the overall variance of the portfolio. For the same reason, a positive market trend (Circle 2 in Fig. 5) will not be beneficial for MV portfolio. This is due to the measure of risk used in our study, which considers negative and positive deviations as a risk. Nevertheless, an investor can get better performance in a positive trend by adopting another strategy than the "Buy and Hold" one (Fig. 6, Circle 3). As a conclusion for this illustration, there is no absolute dominant strategy. Instead, for each market trend, an investor would consider the most appropriate strategy. Moreover, the "Buy and Hold" attitude is vulnerable to the market fluctuations. The rebalancing process defeats this weakness by providing a better control on portfolios.

An investor can select a portfolio of strategies, thereby, each of them could be considered as a separate asset with a specific risk-return profile. Moreover, he can switch between them according to his future anticipation of the market regime, bullish or bearish.

In this illustration, we study the different investment strategies based on a static universe. However, in practice, investors would include new issues. In addition, the application of these strategies can be carried out on a multi-asset universe including shares, Sukuk or even other conventional products if the investor does not have religious constraints.

To dynamize the secondary market, rebalancing strategies can be constructed within investment vehicles in the form of indices and trackers that would be maintained by fund managers and financial institutions. We believe that their creation would facilitate the access of new investors to these strategies and would therefore stimulate the exchange in Sukuk market.

In practice, the rebalancing process is done gradually. In order to minimize price fluctuations due to large orders, the rebalancing takes place over several days depending on the liquidity level of assets. Also, each investor can have his own rebalancing window (weekly, monthly, quarterly, etc.), which creates diversity in placing trading orders in the secondary market. With the diversity of strategies combined to the diversity of investors' behavior, we believe that the rebalancing phenomenon may have a positive impact on Sukuk liquidity and price efficiency. Indeed, since rebalancing process reflects the anticipation of investors behind the chosen strategies, it will reflect the efficiency of information's transmission between buyers and sellers, which will impact directly the pricing of the underlying. Moreover, if investors were placing orders using the investment vehicles, market makers would

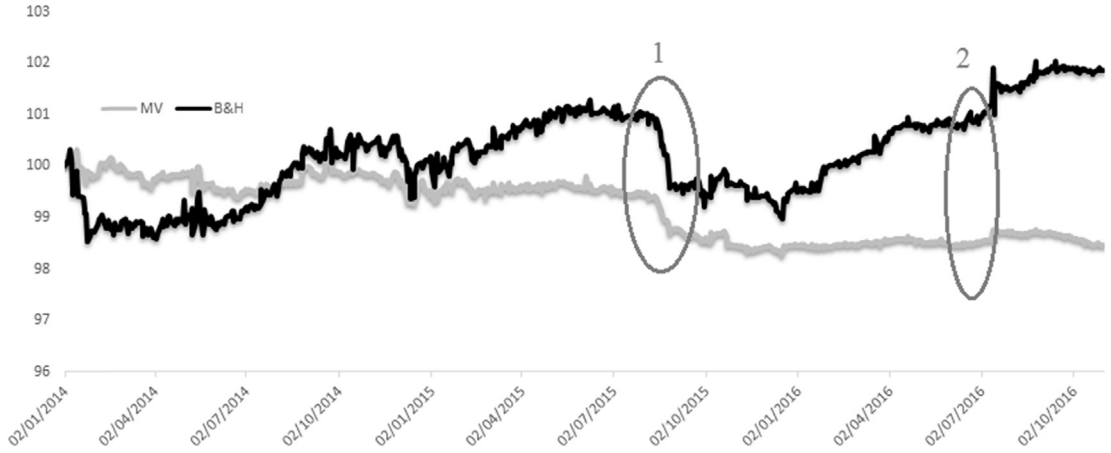

Fig. 5. MV vs B&H.

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Fig. 6. MD vs B&H.

aggregate these orders to obtain the fair price that will reduce the bid-ask spread and transaction costs.

The role of fund managers and financial institutions is beyond managing investment portfolios on a daily basis. Indeed, they must ensure a convincing commercialization for investors, in order to deploy different investment strategies. Choosing the appropriate strategy (universe, rebalancing window, risk measure, size, horizon etc.) should be supported by feasibility studies. Usually, strategies are presented to clients with back-tests. Therefore, strategy vendors must acquire the necessary skills in terms of marketing, research, quantitative analysis and information technology.

We believe that the extensive commercialization of rebalancing strategies will stimulate the Sukuk market dynamism. In fact, their coexistence will improve the number of submitted orders even if the number of the issued Sukuk remains unchanged. Indeed, during rebalancing process, orders are driven by targeted weights instead of targeted prices. Consequently, these orders are often of "Market Order" type. In our empirical illustration, a factor of sixteen (4 quarters and 4 years) is to consider between six investors adopting the "Buy and Hold" strategy and other six investors adopting each one of them an investment strategy based on rebalancing.

4. Conclusion

The development of Sukuk depends on the dynamic of their secondary market. Unfortunately, the "Buy and Hold" effect limits their potential. Through this study, we described the different strategies applicable in the Sukuk market, while remaining compatible with the Sharia. The purpose of these strategies is to boost Sukuk secondary market through the rebalancing process and to show up the diversity of investors' risk profiles. By applying these strategies to a Sukuk universe, we demonstrated that passive investment is not always beneficial for investors. We also showed, through our empirical application, that depending on the market trend, an investor is invited to readjust his investment strategy. Therefore, if all investors follow this principle, the effect under study will decrease mechanically. In order to achieve this objective, financial institutions should deploy additional efforts in marketing, quantitative analysis and information technology. In fact, we believe that the change of investor's behavior depends on the attractiveness of investment strategies based on rebalancing.

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