CHAPTER II :LITERATURE REVIEW

2.1 Introduction

This section covers the literature review of the research. It details the variations of downside beta over the years and the implications it has had. Furthermore, the literature surrounding the different methodologies used in the research were also highlighted.

2.2 Shariah Compliant and Conventional Stocks

In Malaysia, the Securities Commission (SC) is the central figure tasked with regulating the capital market, based on the principles of transparency and proportionality (SC, n.d.). The SC was established in 1993 under the Securities Commission Act 1993 (SCA). Part of the SC's obligation is to ensure proper conduct of all market institutions and licensed persons. Moreover, the SC is mandated to ensure there is fair play for all stakeholders in the capital market chain and also efficiencies in decreasing systematic risks are realised. As a body under the SC, the Shariah Advisory Council (SAC) is the authority responsible for the ascertainment of Shariah law for the purpose of Islamic financial business (SAC, n.d.). In addition, the recognition of securities as a Shariah compliant or conventional security is dependent on whether the company fulfills the stipulated requirements laid by the SAC (Malaysia International Islamic Financial Centre, n.d.). As such, the SAC implements a screening process for all securities listed in the FTBM KLCI Index.

The screening of securities involves a preliminary process where companies that adhere to Shariah complaint practices are directly listed as Shariah compliant. Also,

companies with core business that contradicts Shariah principles, such as firms engaged in interests or gambling, to name a few, are categorized under Shariah non-compliant (conventional) securities. However, there is a category of securities with a mixture of both permissible and non-permissible activities. The distinguishing criteria is based on benchmarking the contributions from permissible and non-permissible activities towards turnover and profit before tax. For securities that exceed the benchmark (5% to 25% depending on the type of business), they are listed as Shariah non-compliant (conventional) securities. Subsequent screening criteria include the brand perception of the company by the community as well as the company's financial management (Bursa Malaysia, n.d.). In relation to this study, the randomly selected firms were cross-referenced with FTSE Bursa Malaysia database listings on Bursa Market Place (2020), to establish whether the stock is considered Shariah-compliant or conventional. This was the basis through which the two portfolios were constituted.

Once the two asset classes are identified, assessments on beta and performance for the separate portfolios become measurable. As researchers continue to investigate the nature of beta in Shariah-compliant and conventional stocks, dissimilar findings continue to surface.

The reviews on publications that support the backdrop that Shariah compliant returns or indices provides a lower beta as compared to their conventional counterpart can be cited with Hassan, Aliyu, Saiti & Abdul Halim (2020). Their research was based on a literature survey of articles to explore three different areas of Islamic banking and finance, with greater attention on SCOPUS and Web of Science articles. Additionally, Rizvi & Arshad (2018), also examined the nature of time-varying beta for both Shariah-compliant and conventional indices. Their research studied the daily stock market return data of 10 global sectors and revealed that the sectoral beta for Islamic market is lower

than its conventional counterpart. Similarly, Muteba, Hammoudeh & Gupta (2017) focused on modelling the financial tail risks of four markets; the Dow Jones Islamic Market (DIJM), the S&P 500, S&P Europe (SPEU) and the Asian S&P (SPAS50). The block of maxima method (BMM) and the peak-over-threshold method (POT) of the extreme value distributions methods were used in analyzing the stock returns from January 1998 to September 2015. The study concludes that Islamic stock markets are less risky than their conventional counterparts during extreme events.

However, researchers such as Ben Rejeb & Arfaoui (2019) studied the comparative levels of Informational efficiency and risk for Islamic indexes and their conventional counterparts using GARCH (1,1). The findings support the fact that Islamic stocks are more volatile. However, they exhibit better performance in terms of informational efficiency. In addition, Habib & Ul Islam (2014) studied the performance of Shariah compliant indices and its conventional counterpart during financial turmoil in both Malaysia and India, from 2003 to 2013. Whereas Islamic indices outperformed its respective counterpart in Malaysia, the findings for India reported the contrary. The open ended discussion on beta and performance between Shariah compliant stocks/indices and their conventional counterparts is still undecided with the different conflicting results.

A few other researchers also contributed in the performance of Shariah compliant and conventional stocks. With isolated focus on financial meltdown, financial recovery and general downturns, Al-Khazali, Leduc & Alsayed (2016) outlines a progressive leap of Islamic performance indicators towards more efficiency, putting Islamic indices at par with its conventional counterparts.

Further investigation of Islamic stock indices, conventional indices and mixed (Islamic and conventional) stock indices was conducted by Trabelsi et al. (2020) from

2002 to 2017 using both the Markov regime-switching model and the Ledoit & Wolf (2008) methodology. Similarly, their results indicate a statistically insignificant difference in performance scores. In addition, Aarif et al. (2020) observed the monthly returns of Shariah-compliant index (Dhaka Stock Exchange Shariah index) and its conventional counterpart (Dhaka Stock Exchange broad index) from 2014 to 2018. The risk adjusted returns and Granger causality test were used in the process. Their findings reveal that Shariah-compliant index outperforms its conventional counterparts based on the risk adjusted returns. However, the difference is insignificant. Therefore, investors will not pay a penalty for subscribing to Shariah compliant principles for their businesses over their conventional counterparts. This is because the two separate indices provide no statistical difference between each other, as also evidenced by Bayram & Abdullah Othman (2019). Besides, Albaity & Ahmad (2008) also suggests an indifference in risk and return performance of Shariah index against its conventional counterpart after analysis on Kuala Lumpur Shariah Index (KLSI) and Kuala Lumpur Composite Index (KLCI) were studied, from 1995 to 2005.

However, the findings of Hashmi (2018) indicates Shariah compliant indices are more attractive for risk averse investors during and post the 2008 financial crisis (2008 to 2017) with the exception of Shariah indices for emerging markets during the crisis. Moreover, Alam & Ansari (2020) studied the returns of Islamic indices and their conventional counterparts in India, from December 2006 to 2018. While the CAPM, Fama-French three-factor model and Carhart four-factor models both reported an insignificant difference in performance of both portfolios, the Sharpe and Treynor ratios supports the over performance of Islamic/Shariah-compliant indices.

2.3 Investor Behaviour Towards Risk

Investors desire tangible information on downside beta because it provides extra avenues to inform on the extent to which investments need to be made. This serves as a good control mechanism to direct the pace of wealth management and generation. On a macroeconomic level, policies are geared towards attaining investor confidence and the achievement of such goals requires governments and policy makers to be able to regulate the level of business risk exposure to a desirable level. This encourages investors to keep investing and economies to continue thriving. And in vibrant economies, opportunities such as job creations surfaces, which positively impacts economic growth (Alper, 2018). To add on, investor's sentiments are crucial in dictating beta trends, with bearish sentiments resulting in lower returns and bullish sentiments in relatively better returns (Yang & Copeland 2014; Gupta, 2019). Investors reacting to market information also plays a role in dictating stock beta within and outside the investor's country. This is enhanced due to market integration (Mamtha & Srinivasan, 2016), essentially translating to a more productive and socially responsible society.

Investors are equally interested in monitoring the beta of their investments so as to manage exposure of bearing excess risk which can be detrimental to the investor. With the adage that the higher the risk the higher the expected reward, aggressive investors on the quest for higher rewards are becoming increasingly diligent in holding risks. Therefore, examining beta provides a broader knowledge base for investors to make sound judgments on their business supply chain because of the reactive nature of beta towards changing environmental, social and economic factors. Investors with a clearly mapped out beta trend can take advantage of this prospect over other investors. Moreover, an in-depth knowledge of beta trends allows for investors to leverage more information for better asset pricing of their products (Siriopoulos & Fassas, 2019).

Furthermore, a good grasp of beta also assists investors to be able to carefully evaluate market sentiments and expectations (Baran & Vorisek, 2020). As buttressed by Kim, Trimborn & Härdle (2019), trading strategies based on beta provides for better decision making in trading and option pricing. Consequently, more logical and progressive decisions can be made, granting investors a higher risk to return ratio.

2.4 Periods of Downside Returns

The risk averted nature of investors shapes the definition of downside returns. These includes moments where investors are negatively rewarded on their investments. The most prominent times the vast majority of investors experience this shortfall is during large scale economic downturns. During the 2008 financial crises, like many other countries, Malaysia inevitably experienced a decline in foreign direct invest. The severe decline as a result of the crises saw the KLCI index drop to 876 points in December 2008, from 1393 points in January of that same year (Ali & Hatta, 2013). In addition, Jawadi, Jawadi N & Louhichi (2014) also studied the impact of the 2008 financial crisis on Islamic markets and their conventional counterparts using the CAPM Garch model. The study covered periods 2000 to 2011 and suggests that Islamic markets are more resilient to the 2008-2009 financial crisis with similar implications that investors (in Europe, the USA and the World) can offer themselves interesting investment opportunities. Therefore, the preparedness of economies to handle financial crises is essential for economic survival and the computation of downside beta supplements such efforts. The contraction of the Malaysian economy was also prevalent in 1998 Asian financial crisis despite the different attributes of both crises (Goh & Lim, 2010).

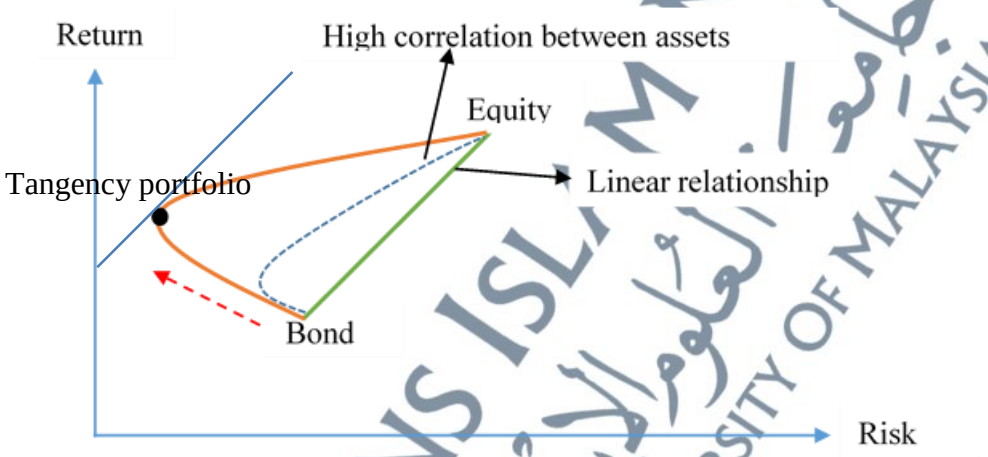
The more recent COVID outbreak has also significantly impacted the Asian countries, in fact, stock markets in the Asian countries reacted more quickly to the outbreak since supply chain was disrupted amongst other vital restrictions (Liu, Manzoor, Wang, Ahang & Manzoor, 2020). In Turkey, Erdoğan, Gedikli & Cevik (2020) showed that Islamic stock markets are more stable to the Covid-19 pandemic as opposed to their conventional counterparts and suggestions to support the development of Islamic financial systems was highly encouraged. The investigations were done using daily data from 2011 to 2020 and analyzed using the DCC-GARCH method. The significance of exploring stock beta is extremely valuable in preparing economies for unforeseen circumstances such as financial crisis amongst other mishaps.

2.5 Volatility Estimates

The orthodox method for measuring risk is the mean variance theory, rivaling the recent value-at-risk approach. While the latter is centered on analyzing the probabilities of loses as a standard measure of beta performance, the former (mean variance theory) dwells more on equating the mean and variances of the portfolio returns.

Essentially, idea that high beta yields high reward was flawed by the mean-variance portfolio theory, Markowitz (1952). The conventional belief was that there is a linear connection between beta to return relationship of assets in a portfolio. Assuming we have equities and bonds in a portfolio, the proposed hypothesis was that a combination of both assets will lie on the linear path. A 100% bond is the lowest beta and return point while a 100% equity is the highest beta and highest reward point, (see Figure 2.1).

However, the findings of the mean-variance portfolio theory indicate that this is not the case and the path is curvilinear and not linear. Hence, the efficient frontier. Given the fact that the curve spirals upwards, the return remains unaffected with the conventional theory. However, the variance of the portfolio decreases with diversification (Jayeola, Ismail & Firdaus, 2017). The more uncorrelated the assets, the more efficient the portfolio is. The efficient frontier is represented by Pedersen, Fitzgibbons & Pomorski (2020):



Source: Pedersen et al., (2020)

Figure 2.1: Efficient Frontier

Recently, attention is given to a new form of volatility estimation called VIX, also known as the CBOE Volatility Index. The VIX is fed with historical prices of the S&P 500 as input variables and a forecast of 30 days' volatility is given as output. The VIX contrasts the movements of the S&P 500 such that when the S&P 500 market index is experiencing a downfall in implied beta, the VIX is registering an uptrend (Ed, 2021). In addition to the implied volatility as a measure of beta, the CAPM Beta is also a widely used method, dating back to the improvement of the mean-variance portfolio theorem.

The CAPM beta builds on the assumption that investors exhibit a mean variance behavior and therefore, equal value is given to both upside gains and downside losses. However, investors are not likely to show dissatisfaction in upside beta and therefore,

the semi variance of returns is a better measure of beta (Estrada, 2002). In fact, the former researcher highlighted the superiority of Downside CAPM (D-CAPM) over the CAPM using the Morgan Stanley Capital Indices databases of emerging markets. The D-CAPM measures only scenarios the investor experiences losses (downside) as a measure of volatility.

2.6 Downside Beta

It is imminent that, so far, all financial structures device by man is susceptible to crisis. The most recent being the impact of COVID-19 pandemic on all economies. While collaborative efforts are being geared towards providing vaccines as published by Thanh Le, Andreadakis, Kumar, Gómez, Tollefsen, Saville, & Mayhew (2020), the fact remains that attention in investors to continuously monitor beta and device more resilient shock absorbers is equally becoming more valuable.

As part of the most highly practiced financial models, a good number of researchers put forth the argument that the parameters binding Shariah-compliant stocks makes it less appealing from a portfolio diversification standpoint. This consequently should result in slightly less returns for Shariah-compliant stocks over their conventional counterparts, as supported by Hussein & Omran (2005).

This premise becomes the cornerstone through which we investigate the interpretation of downside beta in Shariah-compliant stock and conventional stock using Malaysian securities as a case study. There have been numerous approaches to finding beta and downside beta.

The general CAPM beta is given as:

$$\beta_{im} = \frac{E\{[\big((R_i - R_f) - E(R_i - R_f\big)]\ x\ [\big(R_m - R_f\big) - E(R_m - R_f\big)]\}}{E\big[\big(R_m - R_f\big) - E(R_m - R_f\big)\big]^2} \qquad (2.1)$$

Where

R_i: Expected return on i^{th} Asset,

R_f : Risk free rate,

R_M : Return on the market,

$(R_M - R_f)$: Market risk premium.

The development of downside beta, and beta in general, has gained significant collaborations and improvements, with the likes of Hogan & Warren (1974) and Arzac & Bawa (1977). Shortly after, Bawa & Lindenberg (1977), Harlow & Rao (1989) and Estrada (2002) also made improvements to the Lower Partial Moment-CAPM or downside beta.

The research on downside beta by Hogan & Warren (1974) was set to differentiate between variance and semi variance for justifying the equilibrium price of risky assets. The aim is to provide a substitute to the expected return variance (EV) by a two parameter portfolio selection model called the Expected Value Semi Variance Model (E-S) Model. In this model, the introduction of the minimum operator acts on the market portfolio and seeks to choose the lowest possible value. The equation is given by:

$$\beta_{im}^{(HW)} = \frac{E\{[(R_i - R_f)]\, x\, min[(R_m - R_f), 0]\}}{E\{min[(R_m - R_f), 0]^2\}} \qquad (2.2)$$

Where

R_i : Return on the i^{th} asset,

R_f : Risk free rate,

R_m : Return on market portfolio.

Artavanis, Kumar & Patterson (2013) suggests that this method provides more precise estimates of downside beta over its alternative downside beta frameworks.

Harlow & Rao (1989) modified equation 2.2 by setting a defined target instead of the risk free rate. This target is generally set at the equity market mean return. The estimation of downside beta using this method, as showed by Rashid & Mehmood (2018), still proves to be efficient in demonstrating that investors who manage downside beta will enjoy better premiums. The equation for downside beta is given by:

$$\beta_{im}^{(HR)} = \frac{E\{[(R_i - u_i)]\ x\ min[(R_m - u_m), 0]\}}{E\{min[(R_m - u_m), 0]^2\}} \quad (2.3)$$

Where

R_i : Return on the i^{th} asset,

u_i : Mean asset return,

u_m : Mean market return,

R_m : Return on the market.

Subsequently, Estrada (2002) demonstrated that downside beta is a more responsive volatility test compared to normal beta in emerging markets. In this model, the minimum operator acts on both the returns of the individual share as well as the market portfolio. The downside beta is computed as:

$$\beta_{im}^{(E)} = \frac{E\{(min[R_i - u_i), 0]\ x\ min[(R_m - u_m), 0]\}}{E\{min[(R_m - u_m), 0]^2\}} \quad (2.4)$$

Where,

R_i : Return on the i^{th} asset,

u_i : Mean asset return,

u_m : Mean market return,

R_m : Return on the market.

The downside beta, as represented by Estrada (2002), is computed for Shariah compliant stocks and conventional stocks using HV, EWMA and GARCH (1,1) methods. The HV is recognized to be a weak model in accurately profiling downside beta. This is because it assigns equal weights to all the returns when estimating beta. However, it is quite evident that beta is highly influenced by more recent returns as opposed to long distant past returns. Therefore, the need for methods that cater for this requirement becomes mandatory and hence the EWMA and GARCH models.

The EWMA is inspired by Morgan (1996). The computation of downside beta using the EWMA allows for the influence of more recent returns to dictate beta as compared to long past returns. This method is favored over the HV due to the unpredictability of stocks which therefore necessitates the higher valuation of more recent returns for more accurate beta measures. Moreover, beta results for Shariah compliant and conventional stocks show a similar volatility trend, which is in line with the findings of Rizvi & Arshad (2018).

Shifting attention to the GARCH methods, there are different models that has been used in different fields for desired variable measurements (Bhowmik & Wang 2020; Ali 2013). As clearly highlighted by the latter researcher, the NGARCH stands for Nonlinear Asymmetric GARCH model which generally tends to give higher weightage to negative returns as opposed to equivalent positive values of similar magnitude. The IGARCH, representing Integrated GARCH, is modelled such that the persistent parameters sum to 1. The exponential GARCH (EGARCH) distinguishes itself from the general GARCH model by accounting for the log of the variance and was first modelled by Nelson (1991). The GARCH-in-Mean (GARCH M) as the name

applies, introduces a heteroskedastic term on the mean. The GJR GARCH or the Glosten-Jagannathan-Runkle GARCH as initially presented by Glosten, Jagannathan & Runkle (1993) and the QGARCH (Quadratic GARCH) as first introduced by Sentana (1995) work in an almost similar nature. They model the asymmetric effects of both upside and downside beta. The TGARCH (Threshold GARCH) model of Zakoian (1994) is similar to the GJR GARCH model except for the fact that TGARCH focus on standard deviation over variance.

The GARCH (1,1) and EWMA models have been recognized to be better models in computing downside beta. The superiority of the GARCH model over the EWMA has been recognized by Ayele, Gabreyohannes & Tesfay (2017). Moreover, the GARCH (1,1) model is arguably superior to other GARCH methods as evidenced by Ramlall (2010). Also, investigations on downside beta was researched by Galagedera & Jaapar (2008) and was found that the estimation of downside beta using the BEKK specification produced biased results, as such, GARCH Models was recommended as a robustness check. Therefore, for the purposes of this research, the GARCH (1,1) was highly vital and the HV and EWMA were complimentary measures of beta. The GARCH (1,1) is a highly regarded model in computing beta notably because of its high explanatory power over other models in measuring volatility for stock returns (Bhowmik & Wang, 2020).

2.7 Conclusion

This chapter covered the important literature surrounding Shariah compliant and conventional stocks. Additionally, the findings of downside beta over the years was also highlighted for the two portfolios. Moreover, details of how the two portfolios play an important role for investors was equally addressed.