

Is There A Place for A Shariah-Compliant Index on the Paris Stock Market?

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ABSTRACT

Inspired by the huge potential and the increasing role played by Islamic finance along with French specificities in the matter, this paper proposes the introduction of a *Shariah*-compliant index on the Paris Stock Exchange market as a benchmark for Islamic portfolio management in France. The screening process applied on the investment set represented by the stocks composing the SBF250 index leaves us with 25 companies that will be included in our market-weighted SBF *Shariah*-compliant index. The weighting procedure is based on the free float of each stock composing the index with a capping factor whenever necessary. In terms of risk-adjusted performance, this newly created index outperforms both its conventional counterpart and other existing *Shariah*-compliant and conventional indices, both on the short and long run.

JEL Classifications: G10, G11

Keywords: Islamic finance; Shariah-compliance; screening; performance measures

I. INTRODUCTION

In the aftermath of the WTC attacks on September 11, 2001, capital repatriation combined with a significant rise in oil prices contributed to a massive capital accumulation in the Gulf region. This huge amount of financial liquidities, estimated at around 5 trillion dollars (Soustras, 2008; Bouslama, 2009) represents a very promising financing and investment potential, which partly explains the outgrowing interest in what is now commonly called “Islamic finance”, especially in developed countries. The French financial market cannot afford being left aside in this field.

Following the “*Shariah*” rules that govern the Muslim economic, social and legal transactions, Islamic finance is built up on five pillars. The use of interest rates (*Riba*) is prohibited; speculative behaviour (*Maysir*), uncertainty regarding the characteristics of the contract (*Gharar*) as well as specific activities¹ (*Haram*) are banned. Moreover, the distribution of profits and losses is encouraged and so is the asset-backing. Based on these rules, a significant number of Islamic mutual funds and stock market indices were introduced over the last decade as an answer to the investment potential and portfolio diversification needs of wealthy Muslim investors².

The first Islamic mutual fund was created in 1968 in Malaysia. However, it is only in the 1990s that the investment in such funds was authorized by the Islamic case law. Since then, the number and amounts of assets under management (AuM) of such funds tremendously expanded; as such, from nine funds in 1996 with a total amount of AuM equal to 800 million dollars, one could count 130 funds in 2006 for a total of 7 billion of AuM. In March 2010, more than 350 Islamic equity funds were recorded worldwide with more than 25 billion dollars of AuM. Besides the reasons already mentioned, the different financial scandals and crisis (Internet bubble, subprimes) experienced by the more traditional/well known financial practices as well as the presence of a large and expanding Muslim population (more than one billion) and the emergence of a Muslim middle class especially in India and Pakistan, can explain the increasing interest in these funds. In the same line, the Dow Jones Islamic family of indices (DJIM) created in 1999 that includes today more than seventy indices differentiated by companies’ size, sector or geographic position, the FTSE Shariah Equity Index or the S&P Shariah Indices introduced in 2006 also show the growing potential of this new form of financial investment. There is no such an index on the Paris Euronext stock market.

For France, one major reason for playing an active role in the Islamic finance development comes from the importance of its Muslim community: with more than 6 million French citizens belonging to it, accounting for almost 10% of its total population, the French Muslim community is nowadays the most important in Europe. Contributing to the implementation and development of an Islamic finance investment policy may thus present a strong symbolic content. However, the financial implications of such a policy are not negligible: despite a certain delay in promoting these new financial practices, the simulation implemented by Pastré and Jouini (2009) shows that the Paris Stock Exchange market has the ability of attracting potentially up to 100 billion dollars until 2020 on the basis of a real market openness and an active communication policy. Henceforth, the creation of a French Islamic stock market index in Paris could enforce its competitiveness in the matter.

This paper explores the methodological issues behind the introduction of such an index in terms of stock eligibility criteria and their impact on the available investment set as well as in terms of index computation. Moreover, we also propose a comparison between the risk-adjusted performance of a *Shariah*-compliant index that we create with already existing comparable Islamic stock indices such as the S&P 500 *Shariah* Index and the S&P Europe 350 *Shariah* Index.

The balance of the paper is as follows. The next section provides a brief literature review of the Islamic finance investment and its financial characteristics. The third section presents the methodology we used to build up our index and measure its risk-adjustment performance along with our data. Section four summarizes our empirical evidence while the last section concludes and provides some further potential developments.

II. BRIEF LITERATURE REVIEW

Islamic finance can be considered as a particular form of ethical finance, which uses negative screening on investments to exclude specific industries or companies. Moral and social principles thus guide the stock selection and portfolio management practices (Cowton, 1994). However, unlike other forms of ethical finance such as socially responsible investments and other religious funds, Islamic finance strictly follows the *Shariah* principles enumerated above.

As a form of “constrained” finance, the performance of *Shariah* compliant investments can therefore be a part of a much broader debate that has animated the financial literature since the early works of Hall (1986) and Temper (1991). The financial orthodoxy advocated by their approach argues that the reduction of the investment set would translate into a null, or even negative effect on total returns, volatility and diversification potential of a portfolio. Hence, a whole strand of literature emerged over the past years in order to empirically check the risk-return characteristics of Islamic funds and indices.

As such, Elfakhani *et al.* (2005) measured the performance of a sample composed by 46 Islamic funds between 1997 and 2002 and found evidence that there were no statistically significant differences between these funds and their related benchmark indices. Meanwhile, the Islamic funds in their sample started recording better performances when their managers got more experienced. Hence, the diversification weaknesses characterising *Shariah* compliant funds could be explained both by a lack of transparency and a lack of management background. Using a sample of 59 Islamic equity funds (mostly Malaysian) over a time period stretching from 2001 to 2006, Hayat (2006) showed that, on average, they under performed their corresponding benchmarks – both classical and Islamic – by 2.99% and 2.19% per year respectively. Moreover, their associated betas with respect to the Islamic benchmark were on average below those characterising conventional funds; this in turn suggests a potential countercyclical performance of the Islamic investment. In line with these results, Abdullah *et al.* (2007) compared the performance of Islamic and conventional Malaysian funds between 1995 and 2001 and concluded that the former reacted better than the last during stressed/crisis periods while the opposite happened during economic recovery periods. This underlines the fact that *Shariah* constraints decrease the diversification potential of Islamic funds compared to their conventional

counterparts. Abderrazak (2008) studied the performance of Islamic versus other ethical funds from 1997 and 2002 and found no significant difference in terms of performance but stressed the fact that Islamic funds tended to include an important part of small caps and growth stocks in their portfolios. Finally, Nainggolan (2011) provided a deeply documented comparison of the performance of Islamic equity funds relative to non-ethical, ethical, and religious funds matched by country of domicile, region orientation, fund size, and age. His results pointed out the impact of *Shariah* constraints on the fund performance: more *Shariah*-compliant funds performed worse than less *Shariah*-compliant funds while Islamic investments did not perform significantly different from other ethical and religious funds. Therefore, Nainggolan (2011) concluded that investors had to give up to some return to satisfy their religious belief but that Islamic equity funds can be considered as an alternative form of ethical investment.

Regarding the performance of Islamic indices, Hussein (2004) studied the FTSE Global Islamic Index with respect to its corresponding benchmark, e.g. the FTSE All-World, on two sub periods: from July 1996 to March 2000 (bull market) and from April 2000 to August 2003 (bear market). He concluded that the risk-adjusted performance of the Islamic index was quite similar when the whole time period was considered; however, the former index outperformed its related benchmark during recession while the opposite was recorded during market recovery. When comparing the DJIM, the DJ World Index and a socially responsible index, the DJ Sustainability World Index, Hakim and Rashidian (2004b) showed that compliance with *Shariah* rules did not imply a loss of return for the Muslim investor. In the same line, Guyot (2008) provided an analysis of the DJIM family of Islamic indices with their conventional counterparts and concluded that the *Shariah* constraints led to a lower diversification power compensated by a higher performance.

Finally, Hakim and Rashidian (2004a) analyzed the relationship between the DJIM, the Wilshire5000 and the 3-months Treasury Bills between 1999 and 2002 and found evidence that the DJIM had a unique risk – return profile that was not affected by stocks that did not comply with *Shariah* principles.

All in all, a Muslim investor does not seem to record a significantly lower performance when his investment policy is guided by the principles of his faith.

III. METHODOLOGY AND DATA

Our investment set is represented by the 250 companies that compose the SBF250 French index on August 31, 2007. These stocks will then be screened out in order to identify the *Shariah* compliant ones that we will use afterwards to build up our index. We apply standard characteristics for nowadays indices: our *Shariah* compliant French index will be a market-value weighted index, composed by a selection among the most prominent French stocks ranked by market capitalisation with a composition and weights that will be adjusted yearly. The time period under study goes from August 31, 2007 to August 31, 2010. This time frame was imposed by data availability, namely the fact that annual reports are very often unavailable for French small caps before 2007.

A. The Screening Process

In practice, the creation of a *Shariah* compliant index is based on the investment screening performed by a *Shariah* Advisory Board. Such a Board is typically composed, on average, by one to ten Islamic scholars with an international reputation in matters linked to Islamic finance. The members of the Board are in charge with the screening of the stocks for *Shariah*-compliance as well as the monitoring of the different portfolio strategies and management that must be consistent with *Shariah* rules. The composition of the Board is thus one major issue in insuring the success of an index or fund. Therefore, the Paris Stock exchange market will have to be very careful in the choice of its own *Shariah* Advisory Board.

In this paper, we follow the general rules set by the existing *Shariah* Advisory Boards that allowed the introduction of the most important Islamic finance indices. Hence, we will screen the 250 French values based on two categories of criteria: one that is qualitative, also called extra – financial screening, and one that is quantitative, i.e. financial screening³. The qualitative screening is basically a negative screening.

The negative screening consists in excluding from the index companies that perform *Haram* activities. Muslim investors are allowed to only invest in clean (*Halal*) stocks which excludes firms dealing in pork-related products, alcohol, conventional financial services like banking and insurance, casinos/gambling, pornography, gold and silver trade, hotel industry. The non-Islamic banking industry is excluded because of its natural tendency of using and generating interest (*Riba*) while the insurance activities are penalized because of the uncertainty characterising the contract between the two counterparties.

Some specific activities are also excluded by the *Shariah* Advisory Boards even though they are not explicitly mentioned by the Islamic law; here we can include companies dealing with tobacco, defence and weapons, entertainment (cinema, advertisement and media, except for sports and news channels).

Firms with appropriate core business activities may also be excluded from the index because of their secondary activity, namely the fact that at least 5% of their cumulative revenue comes from prohibited business activities. In some cases, Islamic funds may *purify* this part of *Haram* revenues in charity donations⁴.

Finally, the members of the different *Shariah* Advisory Boards may also take into account the ethical behaviour of the companies that are considered for inclusion in an Islamic index. As such, Ghoul and Karam (2007) showed that following the well known financial scandals of these last years, companies like Enron, WorldCom or Tyco were excluded from the DJIM.

After removing firms with inappropriate core and secondary business activities, the remaining companies are screened on the basis of different financial ratios. Following the most observed rules applied in practice, we choose to apply the ratios mentioned by the S&P *Shariah* Indices guide (see also Nainggolan, 2011). More specifically, the financial ratio screens used here are:

- total debt to market capitalisation < 33%;
- accounts receivable to market capitalisation < 49%;
- interest-bearing securities to market capitalisation < 33%.

The presence of debt directly implies the existence of an interest rate, which explains the first ratio, i.e. total debt to market capitalisation. The 33% limit is not

explicitly mentioned in the *Quran*; however, there is a specific *Hadith*⁵ that is sometimes used to explain this exact figure.

The presence of the second ratio is founded on one of Islamic finance's pillars, namely the necessity of asset-backing. The idea is thus to privilege the investment in companies for which fixed assets dominate the balance sheet in contrast with those with important amounts of current assets. The *Shariah* Advisory Board of the DJIM family of indices is even more restrictive as it states a maximum value of 33% for this ratio. It is straightforward that this difference may have a significant impact on the eligibility of the different firms; this will therefore be one strategic choice that the members of a future Euronext *Shariah* Board will have to make.

Finally, as the interest rate is prohibited by the *Shariah* principles, firms' revenues coming from interest bearing assets have to be under control. As an example, Microsoft was excluded from the DJIM in 2000 following the rise in its recorded interest revenues.

The data used for the financial screening consists in the consolidated balance sheets of our sample of remaining companies - after the qualitative screening - over the three years under study: 2007, 2008 and 2009. The consolidated balance sheets provide the annual values of the three accounting variables enumerated previously. We also collect the monthly average market price over the same time period as well as the free float for each company composing the SBF250. Due to data collection difficulties but also to a quite low variation, we take into account the free float as on August 31 of each year. We are thus able to compute the market capitalisation that represents the denominator of the three ratios presented above. We will therefore end up with three annual values for each of the three ratios.

As a company might be *Shariah*-compliant during one time period while becoming non-compliant during the following period, we establish a simple decision rule: for each individual ratio, as long as two values out of three are below the specified threshold while the third value is above the fixed limit with less than 300 basis points, the company cannot be excluded from the index for the whole time period under study. A firm is part of the index over the whole time period of three years only if the three considered financial ratios are below the fixed thresholds. This *ad-hoc* rule contributed to excluding 27 companies as follows: eight firms were excluded as they recorded a debt ratio below 33% for one year only, for six firms the accounts receivable to market capitalization ratio was above the fixed threshold (for three of them this happened over two years, for the other three it happened during one year) and finally, fourteen firms did not comply with the interest-bearing securities to market capitalisation rule (nine only had one such ratio below 33%, while five had two such ratios below one third). One firm (Sodexo) did not fulfil two financial ratio screens, i.e. accounts receivable and interest-bearing securities to market capitalization. However, this rule also allowed the inclusion of one company in the index, namely Beneteau, for which the indebtedness ratio was higher than 33% in 2007; as the value of the ratio, i.e. 35%, is only 200 b.p. above the fixed threshold, we were able to take it into account in the composition of our index.⁶

B. The Index

The *Shariah*-compliant French index that we propose is a market-value weighted index computed as follows:

$$I_t = 1000 \times \frac{\sum_{i=1}^N Q_{i,t} F_{i,t} f_{i,t} C_{i,t}}{K_t \sum_{i=1}^N Q_{i,0} C_{i,0}} \quad (1)$$

with N being the number of constituent stocks in the index, $Q_{i,t}$ the number of shares of equity i in t , $F_{i,t}$ the free float of equity i in t , $f_{i,t}$ the capping factor of equity i in t , $C_{i,t}$ the market price of equity i in t and K_t the market capitalisation adjustment coefficient (divisor) in t .

The weighting procedure takes into account the free float of each stock composing the index with a capping factor whenever necessary, following the index rules implemented by Euronext Paris. We collect these data from the annual reports of each company, synthesised in the chapter “Shareholder structure”. The capping factor aims at avoiding any overweighting of a particular equity; hence, it insures the good representativeness of the index. We adopt the same capping factor as the Euronext CAC40 index, e.g. equal to 15%.

Once our *Shariah*-compliant French index⁷ built up, we can now analyse its performance.

C. Performance Measures

First we compute the logarithmic returns of our index in t , i.e. $R_t = \ln(I_t / I_{t-1})$, and their associated risk measured by the standard deviation, i.e. σ_t . Then we use three standard performance measures.

The first performance measure is the classic Sharpe ratio (Sharpe, 1966), derived from the Capital Market Line, that provides the excess return per unit of total risk (diversifiable and non diversifiable) for an index/portfolio i , i.e.,

$$SR_i = \frac{R_i - R_m}{\sigma_i} \quad (2)$$

where R_m stands for the return of the market portfolio that we proxy by the MSCI Europe (for the SBF and S&P 350 Europe families of indices) and World (for the S&P 500) Indices⁸. The Sharpe ratio thus measures the trade-off between return and risk.

The second performance measure is the Treynor ratio⁹ which also measures the excess return per unit of risk. However, contrary to the Sharpe ratio, the Treynor measure considers systematic risk instead of the total risk of a security. This measure provides a better picture of risk adjusted performance particularly in the case of a well diversified portfolio. The Treynor ratio is calculated as follows:

$$TR_i = \frac{R_i - R_m}{\beta_i} \quad (3)$$

where β_i proxies the systematic/non diversifiable market risk of index i .

Finally, we also compute the Jensen's alpha (Jensen, 1968) that allows determining the risk-adjusted under/over performance of a security/index with respect to a given benchmark. Jensen's alpha measures the excess ex-post return with respect to the required rate of return corresponding to the systematic risk:

$$\alpha_{i,t} = R_{i,t} - (r_{f,t} + \beta_i [R_{m,t} - r_{f,t}]) \quad (4)$$

We also use two other measures designed to capture the long-term performance of our index. The first one is the cumulative return for index i from the starting moment t to the date T calculated as follows:

$$CR_{i,t} = \sum_{t=1}^T R_{i,t} \quad (5)$$

The second corresponds to a "Buy-and-Hold" return for index i , i.e.

$$BHR_{i,T} = \prod_{t=1}^T (1 + R_{i,t}) - 1 \quad (6)$$

D. Data

Our dataset includes, besides the information needed to build up our index as previously described, the daily market prices for the 25 stocks composing our SBF25 *Shariah*-compliant index. For comparison purposes, we also collected daily prices for five more indices: the SBF250 as the direct benchmark of our index, the S&P350 Europe *Shariah* and its corresponding benchmark, i.e. the S&P350 Europe, as well as the S&P500 and its *Shariah*-compliant counterpart, i.e. the S&P500 *Shariah*, over the same time period under study, e.g. from August 2007 to August 2010. In order to compute the different performance measures, we use daily market data for the MSCI World Index, while daily 3-months Euribor rates and 3-months Treasury Bills rates are our proxies for the risk-free rate.

IV. EMPIRICAL EVIDENCE

A. The *Shariah*-compliant French Index

We first proceed to the screening of the 250 stocks composing the SBF250 index¹⁰ in order to identify those who comply with the *Shariah* principles. Within this investment set, 60 firms develop either core or secondary *Haram* business activities. Table 1, Panel A, provides a summary picture of the effects of this qualitative screening. One can observe that the negative screening mainly concerns companies developing conventional banking and insurance activities (19 firms are excluded) and those operating in the advertisement and media industries (18 firms). These two filters are the most restrictive ones. Thus, up to 75% of the companies included in the SBF250 qualify for the quantitative screen.

Table 1
Qualitative and quantitative screening

PANEL A: Firms with core and secondary <i>Haram</i> activities					
Finance/Insurance	Advertisement/Medias	Alcohol	Defence/Weapons	Hotel industry	
ABC ARBITRAGE	CANAL +	BELVEDERE	EADS	ACCOR	
CREDIT AGRICOLE	JC DECAUX	LANSON-BCC	ECA N	PIERRE ET VACANCES	
AXA	BOUYGUES	LAURENT PERRIER	THALES	CLUB MEDITERRANEE	
APRIL GROUP	EUTELSAT COMM.	LVMH	RADIALL		
BNP PARIBAS	HAVAS	REMY COINTREAU	SAFRAN		
BOURSORAMA	HIGH CO	PERNOD RICARD			
CNP ASSURANCES	HI-MEDIA	SUCRERIE PITHIVIERS			
DEXIA	ALTAMIR AMBOISE	VRANKEN-POMMERY			
EULER HERMES	LAGARDERE SCA N				
EUROSIC	M6 METROPOLE TV				
STE GENERALE-A-	NRJ GROUP				
NATIXIS	NETGEM				
LOCINDUS	NEXTRADIOTV				
LINEDATA					
SERVICES	PUBLICIS GROUPE				
FINANCIERE ODET	TELEPERFORMANCE				
SCOR SE	SES GLOBAL FDR				
TESSI	TF1				
UFI FRANCE	VIVENDI				
VIEL					
Number of excluded companies					
19	18	8	5	3	
% of the total number of firms					
7.76%	7.35%	3.27%	2.04%	1.22%	
% of the total number of excluded firms					
31.67%	30.00%	13.33%	8.33%	5.00%	
Pork	Gambling/Casinos	Pornography	Tobacco	Gold/silver trade	
FLEURY MICHON	BAINS MER MONAC N	DREAMNEX	ST DUPONT	EURO RESSOURCES	
LDC	GROUPE PARTOUCHE				
Number of excluded companies					
2	2	1	1	1	
% of the total number of firms					
0.82%	0.82%	0.41%	0.41%	0.41%	
% of the total number of excluded firms					
3.33%	3.33%	1.67%	1.67%	1.67%	
				Total excluded firms	60
				Whole sample of firms	245
				% of excluded firms	24.49%
PANEL B: Quantitative screening					
Screen	Indebtness ratio	Accounts receivable/market capitalisation	Interest bearing securities/market capitalisation		
Number of excluded firms	158	99	64		
% of the total number of Halal firms	85.41%	53.51%	34.59%		
Excluded other than indebness ratio			2		
% of the total number of Halal firms			1.08%		
				Total excluded firms	160
				Halal firms	185
				% of excluded firms	86.49%

As shown in Table 1, Panel B, among the three financial filters, the indebtedness ratio constraint is the most binding; 158 companies out of the 185 remaining ones after the negative screening do not qualify for *Shariah*-compliance due to the level of their debt ratio. It is, by far, the most restrictive condition. The second financial ratio screens out to 54% of the total number of companies having passed the qualitative screen, while the interest-bearing securities ratio is fulfilled by 65% of the firms. The 27 remaining firms after applying the indebtedness ratio rule also fulfil the accounts receivable ratio; however, two of them fail in fulfilling the third financial ratio.

All in all, we are left with 25 stocks that will compose our French *Shariah*-compliant index (SBF25 *Shariah* hereafter). Hakim and Rashidian (2004a) showed that out of the 5000 stocks included in the Wilshire5000 index in 1999, 75% were not *Shariah*-compliant in the sense advocated by the DJIM family of Islamic indices. Using a sample of 500 companies composing the Bombay Stock Exchange Index (BSE500) between 2001 and 2006, Khatkhatay and Nisar (2007) also report a rather high exclusion ratio, as only 28% of the companies make it to the list of eligible firms whose nature is *Shariah* compatible on the ground of the DJ *Shariah* compliance rules. In line with our conclusions, Khatkhatay and Nisar (2007) underline the role of the debt ratio as the most restrictive condition that contributes to eliminating almost 70% of the *Halal* firms. The S&P family of Islamic indices points out a screening process that conducts to excluding, on average, 60% of the stocks. Our screening process goes even further, as it only retains 10% of the stocks. This result can be explained both by the number of firms composing our investment set (only 250) as well as, potentially, by specific characteristics of the French market and companies. Table 2 presents the final composition of our SBF25 *Shariah* index.

Finally, 40% of the retained companies belong to the pharmaceutical and biotech industry, followed by the computer engineering and technologies sectors (24% of the firms). This composition is quite similar to those observed when analysing the other existing Islamic indices, e.g., pharmaceuticals and biotech companies represent 40% of the firms that compose the DJIM (Hayat, 2006).

We are now able to build up our index. We first compute the free floats of the 25 equities and observe that two stocks, namely Sanofi and L'Oreal, two big size companies – important constituents of the CAC40 index too – clearly dominate the investment set, as they account for more than 70% of the total market capitalisation of the firms composing the index. Therefore, we have to apply a capping factor in order to insure a good representativeness of our index. As mentioned in the previous section, we use a capping factor equal to 15%. Once this factor applied, the remaining weight is redistributed among the other 23 firms. The immediate result is the rise in the weights recorded by two other stocks, e.g., Hermes and Essilor. We thus have to repeat the procedure until all the weights are below 15%. The final composition with the corresponding weights¹¹ is also provided in Table 2.

Table 2
Firms composing the SBF25 *Shariah* Index with their related industrial sectors and associated weights

Company	Industry	Weights		
		31/12/07	31/12/08	31/12/09
AUDIKA	Health care	0.37%	0.26%	0.24%
BENETEAU	Consumer goods	1.31%	0.81%	0.87%
BIC	Consumer goods	2.12%	2.79%	2.21%
BIOMERIEUX	Health care	2.53%	3.12%	2.83%
BOIRON	Health care	0.31%	0.46%	0.53%
DASSAULT SYST.	Technology	5.40%	6.91%	5.77%
ERAMET	Basic materials	7.06%	4.47%	4.91%
ESSILOR INTL	Health care	15.00%	15.00%	15.00%
GAMELOFT	Technology	0.28%	0.11%	0.18%
GEMALTO	Technology	3.05%	4.08%	4.53%
HERMES INTL	Personal goods	13.47%	15.00%	15.00%
IPSEN	Health care	2.01%	2.19%	2.05%
L'OREAL	Personal goods	15.00%	15.00%	15.00%
MEETIC	Internet	0.44%	0.25%	0.42%
MERCIALYS	Real estate	1.52%	2.10%	1.88%
NICOX	Pharmaceutical & Biotech.	0.98%	1.11%	0.85%
PHARMAGEST INT	Software & Computer services	0.07%	0.09%	0.06%
SANOFI-AVENTIS	Health care	15.00%	15.00%	15.00%
SELOGER.COM	Internet	0.10%	0.04%	0.06%
SOITEC	Technology	1.40%	0.87%	1.93%
STALLERGENES	Pharmaceutical & Biotech.	0.71%	0.94%	0.98%
TRANSGENE	Biothechnology	0.34%	0.44%	0.52%
UBISOFT	Software & Computer services	1.18%	1.54%	0.74%
VALLOUREC	Industrials	10.28%	7.34%	8.25%
VIVALIS	Biothechnology	0.08%	0.07%	0.16%
Total		100%	100%	100%

B. Short and Long Run Performance of the SBF25 *Shariah* Index

First of all, as shown in Table 3, the average returns of the SBF25 *Shariah* index are systematically above those of its corresponding benchmark, i.e., the SBF250, independently of the time period considered (whole period or different subperiods). The same results are obtained for the S&P500 group of indices. The S&P350 Europe is the only one that seems to over perform its *Shariah* version. However, these results have to be interpreted with caution as the differences between the related indices are not statistically significant at the conventional confidence intervals. Finally, even though the average return over the whole time period under study is negative for our SBF25

Shariah index, it is however the “best” recorded return within the sample of indices that we compare. In terms of daily volatilities, as proxied by the standard deviations, the *Shariah* counterparts of both the SBF and the S&P500 indices seem to be less risky than their benchmarks. Moreover, these results are statistically significant in most of the cases either at the 5% or at the 10% confidence level. Again, the S&P350 Europe has a different behaviour, as its volatility is lower than the one recorded by its *Shariah* version. Over the whole time period, our SBF25 *Shariah* index has the lowest risk within our sample of six indices.

Table 3
Means and volatilities of the returns

Indices	2007	2008	2009	2010	2007-2010
	Means				
SBF 25 Shariah	14.84%	-37.88%	24.18%	9.78%	-1.09%
SBF 250	-4.00%	-56.90%	21.94%	-14.45%	-15.75%
Spread	18.84%	19.03%	2.24%	24.23%	14.67%
<i>p-value</i>	0.6876	0.7168	0.9476	0.5412	0.5302
S&P 500 Shariah	11.55%	-40.57%	22.20%	-21.67%	-8.99%
S&P 500	-1.20%	-49.93%	21.74%	-16.50%	-13.06%
Spread	12.75%	9.36%	0.46%	-5.17%	4.07%
<i>p-value</i>	0.7830	0.8707	0.9901	0.9007	0.8700
S&P 350 Europe Shariah	NA	-84.12%	26.54%	-37.84%	-18.50%
S&P 350 Europe	NA	-70.00%	28.89%	0.97%	-2.84%
Spread	NA	-0.05%	-0.01%	-0.15%	-0.06%
<i>p-value</i>	NA	0.8880	0.9506	0.5069	0.7200
	Standard deviations				
SBF 25 Shariah	16.89%	32.28%	19.96%	19.21%	24.41%
SBF 250	20.11%	40.66%	26.20%	26.20%	31.38%
Spread	-3.22%	-8.37%*	-6.23%*	-6.98%*	-6.97%*
<i>p-value</i>	0.1577	0.0461	0.0000	0.0141	0.0000
S&P 500 Shariah	17.77%	0.05%	23.56%	19.55%	28.74%
S&P 500	19.14%	41.67%	27.70%	20.83%	31.73%
Spread	-1.37%	-41.62%	-4.14%*	-1.27%**	-2.99%*
<i>p-value</i>	0.5517	0.3303	0.0488	0.0511	0.0500
S&P 350 Europe Shariah	NA	53.93%	27.36%	24.38%	35.77%
S&P 350 Europe	NA	46.76%	24.72%	20.83%	30.88%
Spread	NA	7.17%	2.63%**	3.55%	4.89%*
<i>p-value</i>	NA	0.4051	0.0533	0.1096	0.0300

* and ** stand for significance at the 5% and 10% conventional risk levels.

We are aware that these results characterize a particular context, namely the effect of the global financial crisis. However, they are in line with reported previous evidence, i.e., Hayat (2006), Abdullah *et al.* (2007), who emphasize a potential countercyclical performance of the Islamic investment. This tendency of *Shariah*-compliant investments to behave better than their conventional homologues in periods of market stress may indeed have been exacerbated during the current financial crisis, as the stocks that experienced the most severe losses were those belonging to financial sectors and assimilated, which represent “Haram” sectors for the Muslim investor and were therefore excluded from *Shariah*-compliant indices. In addition, the specific developments of this global turmoil can also be used in discussing the differences in the evolution of the SBF25 *Shariah* and the SBF250. The economic and financial meltdown of the past years did not have the same impact on five major sectors that are very differently represented in the composition of the two indices: health care, industry, energy, finance and services. We already underlined the importance of finance and assimilated companies. Moreover, as many market commentators pointed out, health services, which represent up to 40% of the SBF25 *Shariah* index composition, were only marginally touched by the recession. On the contrary, the industrial, energy and services (more specifically housing services) sectors experienced significant losses in/starting with 2007. As the weights of these sectors are very low in the portfolio of stocks that compose the SBF25 *Shariah* index (8%, 4% and 0% respectively) compared to its conventional counterpart (13%, 12% and 20% respectively) this might explain the differences in their evolution at least for 2007. In 2008, the bear market became general, affecting all sectors and markets, while the 2009 short lived recovery was also quite general. This is illustrated by the similar evolution of our two indices during these two years (depreciation in 2008 and appreciation in 2009). However, the abrupt market return in 2010, fuelled by the European debt crisis particularly in the financial sector, may be one potential cause of a contrarian evolution of the two indices over the last sub period under study.

When analysing the other main descriptive statistics of our sample of indices (results available upon request), we can also notice that over the different time periods, the skewness coefficients of the *Shariah* indices are either positive or not statistically significant, while results are more mixed for their corresponding benchmarks. The returns of the different indices are almost all leptokurtic and the values recorded by the Jarque-Bera tests allow rejecting normality for almost all the indices and time periods that we considered. Again, in terms of leptokurticity, the SBF25 *Shariah* has the least peaked distribution

We synthesise the risk adjusted performance of the different indices in Table 4 as measured by the Sharpe and Treynor ratios with respect to a world market portfolio illustrated by the MSCI World Index. As already suggested by the analysis of the means and volatilities, the SBF25 *Shariah* index records the best risk-adjusted performance when compared to its counterpart, the SBF250 index, but also with respect to the other indices included in our sample independently of the time period under study. It is only in 2009 that the S&P350 Europe and its *Shariah* version perform better than our index. The Treynor performance measure confirms the former conclusions: the SBF25 *Shariah* index records better systematic risk adjusted performance with respect to the other indices and particularly its benchmark. Again, these results are slightly different for 2009 and the S&P350 Europe family of indices.

Table 4
Sharpe and Treynor ratios

Indices	2007-2010	2007	2008	2009	2010
Sharpe Ratios					
SBF 25 Shariah	0.0331	0.0883	0.0462	-0.0034	0.0377
SBF 250	-0.0033	0.0161	0.0076	-0.0078	-0.0297
S&P 500 Shariah	0.0123	0.0214	0.0239	-0.0064	0.0079
S&P 500	0.0032	-0.0214	0.0092	-0.0065	0.0228
S&P 350 Europe Shariah	-0.0179	NA	-0.0063	0.0026	-0.0914
S&P 350 Europe	0.0107	NA	0.0115	0.0088	0.0086
Treynor Ratios					
SBF 25 Shariah	0.0006	0.0010	0.0012	-0.0001	0.0005
SBF 250	-0.0001	0.0007	0.0004	-0.0004	-0.0005
S&P 500 Shariah	0.0002	0.0002	0.0006	-0.0001	0.0001
S&P 500	0.0001	-0.0002	0.0002	-0.0001	0.0003
S&P 350 Europe Shariah	-0.0004	NA	-0.0002	0.0000	-0.0013
S&P 350 Europe	-0.0001	NA	0.0003	0.0001	0.0001

The results for the Jensen's alpha, summarized in Table 5, are rarely statistically significant and, if so, go in line with our previous conclusions. More specifically, our SBF25 *Shariah*-compliant index outperforms a European market portfolio as proxied by the MSCI Europe in 2007, while the S&P350 Europe does better than the same benchmark in 2008 and over the whole period under study. However, in general, the considered indices neither over perform, nor underperform a well-diversified market portfolio. In terms of sensitivity to the market, i.e. betas, the different *Shariah* indices seem to vary less than a world market portfolio, i.e. betas below one¹². This behaviour can be explained by the composition of the *Shariah* indices, generally dominated by defensive stocks, i.e. health care industries for example. The SBF250 family of indices records the lowest values for the beta, while over the whole time period under study it is the SBF25 *Shariah* who presents the lowest sensitivity to market risk.

As stated previously, following Hussein (2004) we use the cumulative and the buy-and-hold returns (BHR) to capture the long run performance of the different indices (Table 6). The index we proposed systematically outperforms its reference index, i.e., the SBF250, both in terms of cumulative and BHR returns, whatever the time period under study (whole period or subperiods). Moreover, in most of the cases, the SBF25 *Shariah* index also performs better than the other considered indices over the different subperiods, and namely on the whole period, 2007-2010.

Table 5
Jensen's alpha and indices' beta

Indices	2007-2010		2007		2008		2009		2010	
	$\alpha_{i,t}$	$\beta_{i,t0}$	$\alpha_{i,t}$	$\beta_{i,t}$	$\alpha_{i,t}$	$\beta_{i,t}$	$\alpha_{i,t}$	$\beta_{i,t}$	$\alpha_{i,t}$	$\beta_{i,t}$
SBF 25 Shariah	0.00035	0.7670*	0.0009**	0.8877*	0.00040	0.7829*	0.0003	0.6776*	0.0004	0.8441*
T-stat	1.4265	55.1653	1.8522	20.4492	0.6681	32.7635	0.0279	24.2045	1.4117	35.3986
R ²	0.80		0.84		0.81		0.74		0.88	
S&P 500 Shariah	0.00020	0.9521*	0.0002	1.0165*	0.0006	0.9910*	0.00002	0.8794*	0.00002	0.9243*
T-stat	0.5944	48.9820	0.3368	16.1043	0.8009	27.7605	0.0485	32.7044	0.0429	23.4904
R ²	0.77		0.76		0.75		0.81		0.82	
S&P 350 Europe Shariah	-0.00029	1.0280*	NA	NA	0.00002	1.0743*	0.0001	0.9432*	-0.0011*	1.0362*
T-stat	-0.6984	47.9910			0.0231	26.1375	0.1860	28.5114	-2.2120	28.7476
R ²	0.82		0.00		0.84		0.77		0.87	
SBF 250	-0.0003	0.4764*	-0.00004	0.3079*	-0.0011	0.4541*	0.0005	0.3045*	-0.0005	0.9821*
T-stat	-0.5426	13.1490	-0.0335	2.4769	-0.7649	7.2389	0.0089	53.8596	-0.6601	17.4506
R ²	0.19		0.07		0.17		0.08		0.65	
S&P 500	0.0001	1.0561*	-0.0003	1.0946*	0.0004	1.0755*	-0.0001	1.0401*	0.0003	0.9825*
T-stat	0.2901	50.0101	-0.4081	16.0954	0.5021	27.9914	-0.3244	33.7717	0.5539	23.2081
R ²	0.78		0.76		0.76		0.82		0.82	
S&P 350 Europe	0.0002*	0.9934*	NA	NA	0.0004*	1.0148*	0.0002	0.9602*	0.0001	0.9858*
T-stat	2.1070	227.5284			2.9228	223.3781	1.1314	99.7234	1.2335	144.7629
R ²	0.99				0.99		0.98		0.99	

* and ** stand for significance at the 5% and 10% conventional risk levels.

Table 6
Long-run performance measures

	2007	2008	2009	2010	2007-2010
Cumulative Returns					
SBF 25 Shariah	4.6789%	-37.1487%	22.9711%	6.3561%	-3.1425%
SBF 250	-1.2625%	-55.8082%	20.8416%	-9.3915%	-45.6205%
S&P 500 Shariah	-0.9566%	-48.5902%	21.0700%	-7.8696%	-35.7725%
S&P 500	3.6883%	-39.4826%	21.5128%	-10.3343%	-24.6157%
S&P 350 Europe Shariah	NA	-42.7057%	24.4611%	-16.7737%	-35.6662%
S&P 350 Europe	NA	-36.1474%	26.9968%	-2.2436%	-11.6622%
Buy & Hold Returns					
SBF 25 Shariah	4.3245%	-43.5075%	23.4663%	5.3405%	-11.0996%
SBF 250	-1.8734%	-47.2942%	19.1109%	-10.8878%	-45.1049%
S&P 500 Shariah	-1.0724%	-43.5075%	18.9577%	-8.5174%	-39.1097%
S&P 500	3.2402%	-37.3100%	20.7141%	-10.6364%	-30.1823%
S&P 350 Europe Shariah	NA	-39.4035%	23.1774%	-16.6515%	-38.1880%
S&P 350 Europe	NA	-34.1075%	27.1753%	-3.3146%	-19.1951%

Note: Cumulative and BHR returns are lower for 2007 and 2010 as we only consider six months of data for these two subperiods.

We notice that the differences between the cumulative returns for the whole time period of the SBF and its *Shariah* counterpart are considerably wider than between the S&P500 or the S&P350 Europe. This result is supported by the correlations between the three pairs of indices; while for the S&P families of indices the correlation coefficients equal 0.91 for the European pair and 0.98 for the American one, it only reaches 0.38 for the SBF group. The screening process might explain these differences. First of all, the investment set is much larger for the former pairs, i.e. 350 and 500 firms compared to 250 in our case. Second, the screening process excludes only 44% stocks in the case of the S&P350 Europe and 35% in the case of the S&P 500 respectively, while we exclude almost 90% of the companies composing the SBF250 to derive its *Shariah*-counterpart. All in all, this screening process impacts the industry composition of the different indices; when analysing the major sectors characterizing the different indices we notice that the health sector clearly dominates the SBF25 Shariah index with almost 40% invested in health care companies (compared to only 7% for its benchmark), while for the two other S&P *Shariah* indices, this industry represents less than 20% of the total portfolio. The energy sector is also differently represented in the three *Shariah* indices (4% in the SBF25 compared to 12% for its counterpart with respect to 15% in the S&P500 *Shariah* and even 20% in the S&P350 Europe *Shariah*). To sum up, there are much more differences in the portfolios of stocks composing the SBF family of indices than within the two other pairs of indices. The rules applied in

the screening process as well as the investment policy adopted by each *Shariah* Board are therefore crucial for the creation and performance of the different Islamic indices. Hence, it would be useful to proceed to a deeper analysis of the different eligibility criteria that help qualifying an investment as being *Shariah*-compliant and simulate the impact of small changes in these rules on the final composition and performance of such indices. We leave this topic for further research.

V. CONCLUSION

Inspired by the huge potential and the increasing role played by Islamic finance along with French specificities in the matter, this paper proposes the introduction of a *Shariah*-compliant index on the Paris Stock Exchange market as an opportunity to increase its ability to attract Muslim investors and capitals by providing them a useful portfolio benchmark. Our analysis underlines some emerging interesting points that deserve further exploration.

First of all, the screening process performed based on the practices introduced and developed by the different *Shariah* Advisory Boards that allowed the creation of existing Islamic indices, eliminates 90% of the stocks composing our benchmark index, i.e. the SBF250. Among the different screens, the level of debt condition appears as the most restrictive one. We thus end up with an index composed by 25 stocks. Maybe the use of a broader reference index, e.g. the CAC All Shares, could provide a larger sample of firms for its *Shariah*-compliant counterpart. Second, in order to insure a good representativeness of such an index, the use of a capping factor seems almost mandatory. We chose a threshold value of 15%, following the ordinary procedures implemented by the Paris stock exchange market when computing its major indices. As such, we manage to take into account the importance of small caps. This percentage can also be subject to debate. Finally, when looking at the final composition of our *Shariah* index, we can observe that the defensive “health care” and related sectors clearly dominate the index which is also a characteristic of other existing Islamic indices and explains the values of their betas.

In terms of return characteristics over the time period between 2007 and 2010, the SBF25 *Shariah* index seems more competitive and less risky than its conventional counterpart. This result is confirmed by the different performance measures, namely the Sharpe and Treynor ratios as well as the cumulative and BH returns. It is also worth noticing that when comparing the results obtained on the SBF family of indices to other pairs of indices (the S&P500 and its Islamic counterpart and the S&P350 Europe *Shariah* and its benchmark), each couple has a particular behaviour. All in all, despite these specificities, our SBF25 *Shariah* compliant index seems to emerge as an interesting investment tool in terms of performance. Moreover, if we consider that the time period under study globally corresponds to a bear period, the better risk-return characteristics of the Islamic index compared to its conventional reference also go in line with previous studies on both existing Islamic indices and funds as underlined in the literature review part. Finally, one may also explain the superior performance of Islamic indices by an increased awareness and interest in such investments that sustains an increased demand for such investment vehicles leading to a premium in the realised rates of return as suggested by Mallin *et al.* (1995) for ethical funds.

This paper aims at pointing out the potential interest and use of such an index on the French market hence opening the door to further potential research questions that emerge from the different limitations of the present analysis. For instance, the direct impact of the different screening criteria, as well as a deeper study of their interactions on the risk-adjusted performance of the index could be the subject of further investigations. An extension of the period under study so to include different market situations could also provide more insights on the behaviour of the index. Finally, the definition itself of the different screening ratios could also be discussed, while one could also think of more adapted/specific performance measures for Islamic compliant investments.

All in all, our analysis points out that the introduction of a *Shariah*-compliant index on the Paris Stock Exchange market can be more than a pure symbolic decision aiming at providing a positive signal to Muslim domestic and foreign investors. Indeed, such an index may also present interesting financial characteristics in terms of risk adjusted performance.

ENDNOTES

1. Details will be provided in the methodology section.
2. The “*Shariah*” principles do not ban investing in stocks under certain conditions that will be discussed later in the paper.
3. Despite the willingness of Islamic scholars to implement uniform rules on investment guidelines, the way the different *Shariah* Boards determine the financial criteria allowing to qualify an investment as being *Shariah*-compliant is rather subjective; it is significantly influenced by the various interpretations of the *Quran*. This heterogeneity may represent an impediment to a large scale development of Islamic finance.
4. In addition to the *Zakât*, which refers to the obligation of any Muslim to dedicate a part of his annual wealth to charitable causes in order to physically and spiritually purify the annual earnings above the level that insures the basic needs of a person or family.
5. A *Hadith* reports the sayings or actions of Muhammad or his companions, as well as the tradition of its chain of transmission. In this particular case, we refer to one that stipulates that the bequest should not exceed the bequeathable one-third (Al-Bukhârî and Muslim).
6. This is not an issue for the other existing *Shariah*-compliant indices, as they are all managed in a dynamic way. Given the huge computation time and data needed for such a management style, we were forced to implement a static procedure and hence, to use an *ad-hoc* rule in defining the composition of our index. We are aware that this might be a limitation of our study and could represent a potential future development.
7. It is a price-return index with no dividend purification (use of a dividend adjustment factor to all reinvested dividends for non-*Shariah* compliant income); however, the MSCI Islamic is the only benchmark that uses this dividend purification scheme.
8. We thank an anonymous Referee for this suggestion.
9. See Treynor and Mazuy (1966).

10. Because of data constraints, our final sample was reduced to 245 stocks.
11. The capping factor has a significant impact on the performance of an index. Beyond this, it also provides a signal in terms of the importance that is attributed to small caps. Depending on the capping factor that is retained, middle and small size companies are more or less represented in the resulting index. This is again a strategic choice that has to be made by Euronext Paris.
12. Even for those who are above one in absolute terms, the t-statistic does not allow rejecting the null hypothesis, i.e., $\beta = 1$. Results are available upon request.

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