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Developing a ranking methodology for Sharīʿah indices: the case of Borsa Istanbul

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Abstract

Purpose – This paper aims to develop a ranking methodology for the companies included in the Islamic indices in Turkey. Thus, this paper simplifies the decision-making process for investors with Islamic sensitivities to stock market investment when constructing their investment portfolio.

Design/methodology/approach – This paper uses a case study of 20 companies listed on Borsa Istanbul, drawing data from their 2017, 2018 and 2019 financial reports. These companies are scored and ranked according to their compatibility with the screening criteria used by Ziraat Katilim index in Turkey. In addition, this paper uses the quantitative screening process to calculate the ranking scores of these companies.

Findings – The findings show that some companies are highly compatible with the screening criteria, with ranking scores close to 100 points. However, some companies satisfied the criteria on the margin. This may not be a desirable result for some investors.

Research limitations/implications – Only 20 companies are included in the analysis. Since the conventional accounting system is used in Turkey, it was difficult to get exact information about the companies' Sharīʿah compatibility from the financial results.

Practical implications – The findings assist investors to determine which company is ethically more responsible than others within the Islamic framework. There are also implications for the companies in question, index providers and Sharīʿah scholars.

Social implications – The findings aim to simplify the decision-making process of investors who have Islamic sensitivities to stock exchange market investment when they constitute their portfolio.

Originality/value – To the best of the authors' knowledge, it is one of the first attempts to develop a ranking methodology for Sharīʿah-screened stocks in Turkey even though Sharīʿah screening has been on the agenda since the late 1990s. This paper also compares 11 indices based on their screening criteria.

Keywords Borsa Istanbul, Islamic capital markets, Ranking methodology, Sharīʿah-compliant investment, Ziraat Katılım index

Paper type Research paper

Introduction

In today's world, there are different options for investment such as direct participation in the equity shareholding of companies, investment in equities/stocks on the secondary market,

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investment in debt mutual funds, depositing money in fixed deposits with interest at the bank and investment in real estates, gold, foreign exchange market and so on (Dhawan, 2019). For investors who have Islamic concerns, some of these options – such as debt mutual funds and fixed deposit accounts at the bank – would be impermissible owing to the prohibition of *ribā* (interest or undeserved increment) and *gharar* (gambling-type activities). Thus, one of the most outstanding investment options among Muslims today is investment in stocks. The main reason direct equity investment is preferable to other permissible investments is that it has higher returns potential.

A question that arises when investing in stocks is whether all kinds of stocks are permissible from the perspective of Sharīʿah (Islamic law). The answer would be negative as many companies listed on stock exchanges worldwide are involved in impermissible activities, such as dealing with interest, alcohol, pork and so on. To evaluate whether a stock is permissible from the Sharīʿah perspective, indexation based on Sharīʿah screening criteria (details will be explained below) has developed. Thus, individual investors who adopt an ethical approach that aligns with the Islamic point of view commonly seek investment in Islamic indices which have been developed by index providers. These indices simplify stock market investment for those investors who are not specialized in screening annual reports to detect whether publicly traded companies have impermissible activities, whether financially or operationally.

The main problem of these indices is that they merely list the names of companies which are Sharīʿah-compliant. However, no detailed information is given about the extent to which these companies are compatible with Sharīʿah. For instance, by checking these indices, investors cannot distinguish between a company which has no interest-bearing security on its assets and another company which barely satisfies the screening criteria.

In this context, the aim of this paper is to develop a ranking methodology for companies which constitute Islamic indices. In doing so, a case study of 20 companies listed on Borsa Istanbul (BIST) in Turkey is examined by using 2017, 2018 and 2019 annual financial reports. These companies are then scored and ranked according to their compatibility with Sharīʿah screening criteria used by Ziraat Katılım (ZK) index in Turkey. Owing to the generality of the method, the process is applicable to all other companies that constitute different indices all around the world. It means that the results are generalizable. Thereby, this study aims to simplify the decision-making process of investors who have Islamic sensitivities to stock market investment when they develop their investment portfolios. Investors who have ethical concerns similar to Islamic investors can also be interested in the ranking of the Sharīʿah-compliant stocks. In this way, investors will be able to see which company is ethically more responsible than others within an Islamic framework.

According to the researchers' knowledge, this study is one of the first attempts to develop a ranking methodology for Sharīʿah-screened stocks even though Sharīʿah screening has been on the agenda since the late 1990s. The paper further contributes by comparing a dozen indices all around the world based on their qualitative and quantitative screening criteria. As far as we know, this is one of the few papers that includes such a large group of indices. It is also the only one that covers the Turkish indices.

Possible limitations of this paper are the following: only 20 companies are included in performing the analysis; the analysis is limited to annual financial reports for three years: 2017, 2018 and 2019.

The paper is structured as follows: the next section provides background information about Sharīʿah indexation in general and in Turkey in particular. A review of the related literature accompanies this section. The third section explains the methodology used in this

paper. The following section is then devoted to the analysis. Thereafter, the implications are discussed, and the last section concludes the paper.

Background information on related literature

Sharīʿah screening and indexation in general

The idea of establishing Islamic capital markets and Islamic equity investments developed in the 1990s. With this development, Islamic concerns arose about trading on stock exchanges and investing in shares. Even though buying a share of a company and becoming one of the shareholders of the company is not inherently against the Sharīʿah, it is important to know which companies' shares can specifically be described as Sharīʿah-compliant according to several screening criteria. Following this concern, Sharīʿah-compliant indices were developed. The first such index in the world was established by Dow Jones in 1999.

Following the example of Dow Jones, S&P launched GCC Sharia Indexes and the S&P Pan Asia Shariah Index in 2007. Today, there are different examples of Sharīʿah indices around the world such as FTSE Global Equity Shariah Index Series, and NIFTY Shariah indices. A detailed list of them will be shared in the third part of this section.

The general methodology is more or less the same for different indices, comprising two main steps as follows:

(1) qualitative screening in which the type of business activity and sector of a company is evaluated; and

(2) quantitative screening in which different financial ratios are calculated and examined.

In this context, comparison of different indices according to their screening processes is one of the most researched topics in the related literature. One of the most comprehensive studies in that regard belongs to Derigs and Marzban (2008), who cover nine indices (DJIM, FTSE, S&P, MSCI, HSBC, Amiri, DIB, Azzad and Meezan) in their paper. They find that there are only minor differences with respect to qualitative sector screens; for instance, whether to screen out companies with any involvement in the weapons sector or just companies that make it their core business. However, large dissimilarities exist in terms of quantitative financial screens. The authors summarize some of these dissimilarities as follows: use of market capitalization versus total assets as the denominator in financial ratios, and the range of threshold values for the acceptance level.

In another commonly cited study, Khatkhatay and Nisar (2007) compare the norms set by Dow Jones USA, Securities Commission (SC) Malaysia and Meezan Pakistan. These norms are compared using the companies that constitute the BSE-500 index of the Bombay Stock Exchange. It is found that Dow Jones is the most conservative index while SC Malaysia is the most liberal one. Pok (2012) further compares stock screening in Malaysia with DJIM, S&P and FTSE indices. In terms of qualitative screening, the differences arise at the following points: firstly, FTSE evaluates Sharīʿah compliance according to the core business of a company whereas any involvement in Sharīʿah non-compliant businesses is taken into account by Dow Jones and S&P. Secondly, while FTSE does not rule out the media sector (except newspapers), the other two indices rule out this sector as Sharīʿah non-compliant. Thirdly, trading of gold and silver is ruled out by S&P but not by the others. Lastly, the weapons and defence sector is not ruled out by S&P. Regarding quantitative screening, indebtedness, interest and other suspected earnings, and the extent of cash and receivables of the companies are calculated, and the final decision is given according to some criteria decided by the Sharīʿah boards. However, financial ratios are not calculated in the

same way by these three indices. The results of Pok (2012) are in line with those of Khatkhatay and Nisar (2007).

Similar to the previous studies, Mahfooz and Ahmed (2014) critically analyse five different Sharīʿah screening indices (Dow Jones, FTSE, S&P, MSCI, SC Malaysia) and list their criticisms under the following: credibility, inconsistency, changing the rules, financial ratios, tolerance threshold, the divisor (denominator), social responsibility and Shari'ah supervision. Kafou and Chakir (2017) also compare Moroccan All Shares Index with five other well-known indices (Dow Jones, S&P, MSCI, FTSE, STOXX). After investigation of 76 companies listed under the Bourse des Valeurs de Casablanca, namely, the Casablanca Stock Exchange, Kafou and Chakir (2017, p. 79) find that:

> While the activity-based screening leads to the same results, financial screening produces different results depending on the used ratio [. . .] For financial screening, the STOXX committee remains the most liberal [. . .] the screening of the Dow Jones Islamic remains the most conservative [. . .]

In one of the most comprehensive studies in terms of the comparison of Shari'ah indices, Ho (2015) compiles data from 34 global Islamic finance practitioners. He compares the indices according to qualitative and quantitative screening criteria. Among others, the paper finds that the strictest indices are the following: DJIM, Azzad and BM Hijrah. This is the only paper which includes more Sharīʿah indices in their analysis compared to ours, as far as we know.

The list can be extended but the point here is that such studies that compare different indices follow a similar method, i.e. comparing the indices according to their qualitative and quantitative screening criteria. In addition, many of the above-mentioned studies seem to find a similar result: that Dow Jones is one of the most conservative indices, among others. However, the studies in that group differ from each other according to which country they take into account and how many indices they cover.

Another investigated issue within this subject is the performance of the stocks included in such indices. In this respect, stocks traded at the level of different stock exchanges in different countries have been examined. For instance, Reddy and Fu (2014) collect data from the Australian Stock Exchange for the period 2001–2013 to test whether Sharīʿah stocks' returns and risks are significantly different from conventional ones. However, instead of using an existing Sharīʿah screen, they develop their own screening, which falls short of the aim. To compare the risk-adjusted returns, they use Sharpe ratio, Treynor ratio and Jensen's Alpha. In the end, risk is found to be statistically different according to *t*-test results, in which the Islamic stocks are riskier. However, they cannot find any statistically significant difference in terms of returns.

Rana and Akhter (2015) investigate the potential impact of Sharīʿah screening on the performance of KSE-Meezan Index (KMI-30) traded at the Karachi Stock Exchange against its conventional counterparts by using risk-adjusted performance measures such as Jensen's Alpha, Sharpe ratio and Treynor ratio. It is found that Sharīʿah screens do not negatively affect the KMI-30 index performance. It can be noticed that this study and the previous paper adopted similar research methods.

Agussalim *et al.* (2017) compare conventional and Islamic stock mutual funds taken from the composite index (IHSG) and Jakarta Islamic Index for the period 2007–2014. In the end, they also cannot find any statistical difference between the indices. However, in an Indian-based study, Natarajan (2011) compares the risk and return of the Nifty Shariah Index and Nifty Index for the period 2007–2010, and after using the methods of Sharpe index, Treynor index and Jensen's Alpha, it is found that Nifty Shariah has underperformed over the period.

Hilman (2017) further analyses the performance of Sharīʿah-screened stocks in Indonesia compared to the conventional ones by using Sharpe ratio only. The results show that conventional mutual fund performance is dominated by the performance of Sharia Rupiah Funds.

It can be summarized that the performance-related studies of Sharīʿah indices compare them with conventional indices. In addition, the methods used as the measure of performance are similar to each other, such as Treynor index and Jensen's Alpha. Differences arise based on country analysis, how many indices are taken into account and for how long the data are analysed. In the end, the studies seem to find different results, most probably owing to the aforementioned differences. Some find no difference in performance of conventional vs Islamic indices whereas some find major differences.

Fiqh (a systematic approach to understanding revealed knowledge) is of fundamental importance during this process as Sharīʿah screening is the backbone for establishing the indices. Despite this importance, there is not abundant literature regarding the *fiqhī* background of the process. Mohamad *et al.* (2018) clarify that up until now, there are two *ḥadīths* and three *fiqhī* principles used for Sharīʿah screening methodologies. In the end, the authors find that:

> [. . .] the principles of *al-aṣālah wa al-tabʿiyyah* (principle of primacy and dependency) and *al-aghlabiyyah* (principle of predominance) could be the main basis in assessing the Sharīʿah compliance of shares of a company whose activities are mixed with *ḥalāl* and *ḥarām* elements (Mohamad *et al.*, 2018, p. 2).

The International Shari'ah Research Academy for Islamic Finance (ISRA) is also involved in developing a Sharīʿah index called ISRA-Bloomberg. Hashim *et al.* (2017) analyse this newly developed index according to income cleansing methodology. Income cleansing is another aspect of indexation where there are discussions in terms of when and how much cleansing is required. However, this is another issue to be studied separately.

Yildirim and Ilhan (2018) make a critical reading on the aforementioned sources of *ḥadīth* and *fiqhī* principles and conclude that the screening criteria should be endogenous; thus, instead of market capitalization, total assets should be used in quantitative screening. Additionally, the authors suggest that instead of 33.33% maximum debt requirement, companies should be evaluated according to 66.66% minimum equity requirement.

As a well-known Sharīʿah scholar, Usmani (2001) argues that dealing in equity shares can be acceptable from the Sharīʿah perspective under the conditions that: the main business of the company is not in violation of the Sharīʿah, and income from interest-bearing accounts should be cleansed. The first part of his argument is an answer to the discussions in related literature regarding whether Sharīʿah indices should consider companies whose core business involves dealing in illegal activities or companies which have any involvement in impermissible activities. Azmi *et al.* (2017) take a different approach, conducting interviews with 90 people who have been involved in the indexation process in order to understand what kind of problems Sharīʿah scholars face in Saudi Arabia, the UK and Malaysia. One of the primary difficulties found is the low level of Islamic-related disclosures. Our study also finds a similar result.

The only study that shares a similar aim with our study belongs to Hanif (2019). The paper first critically reviews the existing screening methodologies and then suggests a Sharīʿah-compliant ranking mechanism. The ranking is based on the importance of the filtering criterion. The first difference from our work is that the paper does not apply the Sharīʿah-compliant ranking mechanism on any stock. Secondly, our weights on ranking

criteria are different from Hanif's (2019) study. The reason is that liquidity ratio is not included in our paper's methodology since Turkish indices do not use that criterion. Lastly, each ranking criterion is considered to be equally important in our study since Sharīʿah scholars do not make any distinction among the quantitative criteria as to which one is more important than the others.

Sharīʿah screening and indexation in Turkey

Turkey's experience with Islamic finance dates back to the early 1980s. In this sense, firstly, special finance houses were established. Even though they were functioning as banks, they did not have bank status owing to several reasons. These institutions gained such a status in 2005 when they were transformed into participation banks. Other developments in Islamic finance followed. In that regard, the first Islamic index in Turkey, called participation index, was officially introduced in 2014 when BIST (Borsa Istanbul) – the stock exchange of Turkey – and Bizim Securities (BMD) – an Islamic equity fund management company – signed an agreement to develop this index.

At present, these are the participation indices in Turkey: Participation 50, Participation 30, Participation 30 BYF (Stock Exchange Investment Fund), Participation Model Portfolio BYF and ZK Index. Two basic screening methodologies are currently used in Turkey:

(1) participation index developed by BMD; and

(2) ZK index developed by ZK participation bank.

The second Turkish index is a good example of a well-established relationship between the Islamic capital market and Islamic banking.

Like other world indices, the Turkish indices start with qualitative screening process followed by quantitative screening. According to the information shared by ZK index (Ziraat Portfoy, 2021), three basic financial ratios are used for quantitative screening criteria as follows:

(1) total credits with interest/market value $< 33\%$;

(2) cash and marketable securities with interest income/market value $< 33\%$; and

(3) income from activities specified in first screening/total revenue $< 5\%$.

Activities mentioned in the third point are detailed in Table 1. The only difference between ZK index and participation index (BMD, 2019) is the threshold level for the first and the second criteria, i.e. 30% instead of 33%. ZK index informed that leasing credits are not included in the first category as they are not a regular credit but a hiring activity. Additionally, what is meant by revenue is any income earned by companies such as sales revenue, interest income, other operating income, income from investment activities and financial income from non-operating activities. Qualitative screening is the same for both indices.

With the development of Sharīʿah-compliant indices, related literature has also developed in Turkey, even though the work is not substantial as yet. Thus, the paper aims to contribute to the related literature on the subject in Turkey. Ata and Buğan (2015) compare Dow Jones and Morgan Stanley Islamic and conventional indices for Turkey during the 2008 crisis. They find no significant statistical difference between the Islamic and conventional indices before and after the crisis period.

Tas *et al.* (2016) apply the second-order stochastic dominance (SSD) approach to find out which company is efficient (dominates another in terms of return performance). They analyse 24 companies quoted in BIST and form two portfolios (ethical and conventional)

from the SSD efficient selection. Their back-testing findings for the period November 2013–November 2014 suggest that the conventional efficient portfolio shows better performance than the ethical efficient portfolio and the benchmark (BIST 100 Index) during the testing period.

Bayram and Othman (2019) compare the performance of Participation 50 Index and BIST 100 by using the pairwise Granger test and *t*-test. They found that for the period 15 May 2015–31 December 2016, the indices do not have any statistical differences in terms of their returns. Causality was also not found between the indices. However, the paper does not compare the risk factor as others do.

In a recent study, Yıldız (2020) compares the performance of Turkey's participation and conventional indices by using the technique for order of preference by similarity to ideal solution method. The study covers the period 2015–2017. The author finds that the risk factor is smaller for participation indices while there was no statistical difference in terms of returns.

In the end, the Turkish studies on the subject are mostly about performance comparison. The studies generally cannot find any difference between conventional and Sharīʿah indices, especially in terms of returns. However, none of the studies has a similar aim as this paper.

Evaluation of Sharīʿah indices

The last two decades have witnessed the development of Sharīʿah-compliant indices in many countries. However, the existence of these indices in Turkey is more recent. These indices have differences according to the following aspects:

- There are differences of opinion regarding which sectors of business should be announced as Sharīʿah-impermissible. The mainly debated sectors are weapons and defence, media and hotels.
- It is not agreed whether companies whose core business activities are Sharīʿah non-compliant or companies which have any involvement in some Sharīʿah non-compliant sectors should be deemed impermissible. The opinion of Usmani (2001) was mentioned as an example of the first idea.
- There is no unanimity on how many financial ratios should be calculated for the quantitative screening. The commonly used ones are debt, interest and receivable ratios, whereas liquidity ratio is not used by all the Turkish indices.
- The denominator for debt and interest ratios is not agreed upon. There are two common approaches in that regard: market capitalization or total assets. Yildirim and Ilhan (2018) prefer the use of total assets.
- Data periods also vary depending on the choice of the index, i.e. 12 months, 24 months or even 36 months.
- Thresholds are set differently by different indices. The gap between minimum and maximum values can vary tremendously.

Tables 1 and 2 provide a summary of the comparison of qualitative and quantitative screening criteria used by the existing indices in the world, including the Turkish indices in the last two columns of the tables.

As can be seen from Table 1, since biotechnology is a new industry, most of the indices – except for HSBC – do not take it into consideration as yet. Besides, there are some other sectors about which there is a difference of opinion such as trading of gold and silver, and weapons and defence. For the former, S&P and the Turkish indices exclude the sector. For

Sector	Dow Jones	FTSE	S&P	MSCI	HSBC	Amiri	DIB	Azzad	Meezan	Participation index	ZK index
Alcoholic beverages	X	V	X	V	V	V	V	X	V	V	V
Biotechnology (genetic and foetus)					V						
Broadcasting and entertainment	X	V	X	V	V	V	V	X	V	V	V
Conventional financial services	X	V	X	V	V	V	V	X	V	V	V
Gambling	X	V	X	V	V	V	V	X	V	V	V
Hotels	X	V	X	V		V	V	X		V	V
Insurance	X	V	X	V	V	V	V	X	V	V	V
Meat production									V		
Media (except newspapers)	X		X		V			X	V	V	V
Pork-related products	X	V	X	V	V	V	V	X	V	V	V
Restaurants and bars	X	V	X	V	V	V	V	X	V	V	V
Tobacco	X	V	X	V	V	V	V	X	V	V	V
Trading of gold and silver			X							V	
Weapons and defence	X	V		V	V	V	V	X			

Source: Authors' own. Data collected were from different sources. X: Any involvement of the company in the sector is considered impermissible; V: When the sector represents the core business of the company, it is considered impermissible

Table 1.
Comparison of 11 indices from a qualitative screening perspective

the latter, interestingly, S&P and the Turkish indices do not exclude the sector. The reason why weapons and defence have been included recently in Turkish indices as Sharīʿah compatible business activities is the national development of these sectors in the country. In addition, for meat production, only Meezan takes it into account. The possible reason why the others do not have such a specific category is that the meat sector is included under the pork-related products criterion. The situation of media agencies is also debatable as FTSE, MSCI, Amiri and DIB do not include such activities as cause for exclusion. For MSCI, the reason for its acceptance is that it is treated as a public good.

Another important aspect to note in Table 1 is that indices such as Dow Jones, S&P, Azzad and the Turkish ones do not consider companies which have any involvement in problematic sectors; the others accept these companies if their involvement in such activities is to a minor extent. However, the degree of "minor" is different for each of the indices. A comparison of the indices regarding quantitative screening is provided in Table 2.

The difference between Table 1 and 2 is the inclusion of STOXX Islamic in the second table. As can be seen in Table 2, there are four main financial ratios which are calculated under the quantitative screening criteria. For debt ratios, indices use total debt as the nominator. The first three indices (Dow Jones, FTSE Shariah and S&P Shariah) use cash and interest-bearing securities as the nominator of the interest ratio. For accounts receivable ratio, the difference arises as follows: FTSE not only includes accounts receivable, as others do, in the nominator but also includes cash. Moreover, for non-compliant income, FTSE is different compared to others as follows: under impermissible income it includes interest income while others use impermissible income without interest. The reason for the others not to use interest income is to avoid double-counting due to the existence of an interest ratio.

For duration of the calculations, Dow Jones uses 24-month data and S&P uses 36-month data while in Turkish indices 12-month data is considered. STOXX, on the other hand, uses

Index	Debt ratio	Interest ratio	Accounts receivable ratio	Non-compliant income
Dow Jones Islamic	<33%**	<33%**	<33%**	
FTSE Shariah	<33%*	<33%*	<50%*	<5%***
S&P Shariah	<33%**	<33%**	<49%**	<5%***
MSCI Islamic	<33.33%*	<33.33%*	<33.33%*	
HSBC	<30%*		<50%*	<5%***
Amiri	<33%*	<33%*	<70%*	<5%***
DIB	<30%*, **	<30%*, **		<5%***
Azzad	<33%**		<45%**	
Meezan	<37%*	<33%*		<5%***
STOXX Islamic	<33%*, **		<33%*,**	
Participation index	<30%**	<30%**		<5%***
ZK index	<33%**	<33%**		<5%***

Source: Authors' own. Data have been collected from different sources such as Derigs and Marzban (2008), Mahfooz and Ahmed (2014); and Kafou and Chakir (2017). These ratios have been double-checked from index providers' websites. However, information for the following indices was not available: HSBC, Amiri, DIB and Azzad. In 2015, MSCI Islamic index launched a new additional approach called the MSCI Islamic index M-series for which they use market capitalization in the denominator. According to Derigs and Marzban (2008), the sum of accounts receivable and cash equivalents over total assets ratio is 70% for MSCI Islamic. Derigs and Marzban (2008) inform that Meezan has two different methodologies and two different thresholds in the calculation of interest ratio. *Total assets; **Market capitalization; ***Total revenue

Table 2.
Comparison of 12 indices from a quantitative screening perspective

a different approach for its denominator. Instead of deciding between total assets and market capitalization, it takes the maximum of either of them.

In addition, it can be seen that there is unanimity in terms of threshold regarding impermissible income, i.e. 5%. The only exceptions are Dow Jones and Azzad because they do not have any threshold. The reason for that is that they do not accept any involvement in problematic sectors.

Methodology

As is known, there are two main research methods in the literature: quantitative and qualitative. As the aim of this paper is to develop a ranking methodology which includes mathematical calculations, the quantitative research method is used.

In attaining the aim of this paper, firstly, among the above-mentioned two approaches regarding Sharīʿah screening processes followed in Turkey, ZK index is used in this paper. The main reason for this choice is the possibility of data and information exchange with ZK. The quantitative screening methodology used by ZK was shared above.

After deciding the index methodology, a decision about which companies are to be included in the study is to be made. In this context, 20 companies from BIST which are considered in ZK's list are selected out of 70 companies. Companies that have market capitalization of over 150 million Turkish Lira are used in the analysis.

As the next step, the above-mentioned three financial ratios are calculated for each of these companies. It should be noted here that ZK's calculations are not taken for granted, but instead, the authors did their own calculations. The authors also contacted ZK to crosscheck their calculations with those of ZK. In the case of mismatches, necessary corrections were made. As a note, owing to the fact that companies do not have a specific accounting system which includes necessary information in order for them to be evaluated according to Sharīʿah compatibility, it is difficult to get exact information about companies, especially in some aspects and thus to make exact calculations. Such a difficulty is also valid for ZK itself. However, the advantage of ZK compared to the authors is its direct contact with the companies, which assists them to obtain additional information whenever it is needed.

Details of the ranking methodology developed by this paper are as follows:

First step:

For all security i and given time t:

- Total credits with interest/Market value = $\alpha_{i,t}$ (Debt ratio)
- Cash and marketable securities with interest income/Market value = $\beta_{i,t}$ (Non-compliant investment ratio)
- Income from activities specified in first screening/Total revenue = $\gamma_{i,t}$ (Non-compliant income ratio)

The debt and the non-compliant investment ratio threshold level is applied as 33%, while the permissible level for non-compliant income ratio is 5%.

Second step (criteria score calculation):

$$\text{Avg}\left(\frac{\alpha_{\text{i,t}}}{0,33}, \frac{\beta_{\text{i,t}}}{0,33}, \frac{\gamma_{\text{i,t}}}{0,05}\right) = \lambda_{\text{i,t}} \tag{1}$$

Third Step (Ranking score calculation):

Given security i and time t, let $\psi_{i,t}$ be the ranking score function for i at t. Then,

$$\psi_{i,t} = \begin{cases} (1 - \lambda_{i,t}) \times 100 & \text{if } 0 \leq \lambda_{i,t} \leq 1 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

$$\frac{\sum_{t=1}^{T} \psi_{i,t}}{T}, \text{ for all i} \quad (3)$$

where T represents the number of years analysed. In this paper, T is 3 as financial reports for 2017, 2018 and 2019 are considered. Here, the ranking score of 2017 is taken as the first-year score for security i.

It means that the results of the calculations of the financial ratios in the first step are used in the formula in the second step. The logic in this step is to divide the result of each financial ratio by its threshold level and to take the average of them. The reason for using the average here is to give equal weights for each criterion. This gives us the criteria score for the given year. At the last step, the ranking score is found by subtracting the criteria score from 1 and multiplying the result by 100. The rule is: the higher the ratio, the better the ranking score. Otherwise, a methodology similar to the Gini coefficient should have been applied. After obtaining the ranking score for each selected year in the analysis, the average of these years' ranking scores is calculated to obtain the final result.

Finally, if one of the criteria mentioned above is violated during the analysis period, the company that exceeds the threshold level is excluded from the ranking.

Analysis

By following the method shared above, the analysis is conducted for 20 stocks that are included in the ZK index for the 2017 period in Turkey. An example of the calculation based on the above-mentioned three steps is shown below. In this example, 2017 data for FROTO is chosen, it having one of the largest market capitalizations in the sample.

First step

- $\alpha_{\text{FROTO,2017}} = 21.63\%$
- $\beta_{\text{FROTO,2017}} = 10.59\%$
- $\gamma_{\text{FROTO,2017}} = 1.04\%$

Second step (criteria score calculation)

$$\text{Avg} \left(\frac{0,2163}{0,33}, \frac{0,1059}{0,33}, \frac{0,0104}{0,05} \right) = \lambda_{\text{FROTO,2017}} = 39.46$$

Third step (ranking score calculation)

$(1 - \lambda \text{FROTO,2017}) \times 100 = \psi FROTO,2017$

$(1 - 0.3946) \times 100 = \psi FROTO,2017 = 60.54$

Following the same process for 2018 and 2019, each year's ranking scores are found as 65.36 and 48.37 for this company, respectively. After applying equation (3) (taking the

average of ranking scores for each year), the ranking score for FROTO is found to be 58.09 for the aforementioned periods. It should be reminded that the higher the score, the better the result is. Thus, it can be concluded that the situation of FROTO is not that brilliant compared to other companies that are listed in Table 3.

Table 3 presents the screening ratios and ranking scores for the given years. The results show that BIMAS has a ranking score close to 100. The reason behind the high score is that the company did not use any bank loan and they invest only in Sharīʿah-compliant instruments. Among these 20 companies, three of them are not ranked as they exceeded at least one of the threshold levels during the analysis period, which makes them non-compliant firms. Applying a three-year average ranking score method smoothens the sudden changes in the final score. For instance, the increased debt level for GOODY in 2018 caused a dramatic decrease in the company's ranking score during that year. After normalization of debt levels in 2019, the ranking score emerges to the 2017 levels. Thus, the average ranking score is not affected severely.

A lower boundary of zero is applied in the analysis to prevent obtaining negative ranking scores. Companies with negative scores assure that at least one ratio does not satisfy the threshold level. As an example, without applying the lower boundary, financial ratios of TMSN for 2019 would lead to a negative ranking score (−21.2). As it is not desired to have a score below zero, it is rounded to the minimum level. A positive ranking score might be calculated for those that are not ranked owing to failure of satisfying the criteria. TKNSA, which has a ranking score over 97.5 for 2017 and 2018, suffers from a sudden increase in short-term borrowing in 2019 where the threshold of the debt ratio was slightly in excess. Thus, the company is excluded from the ranking list in 2019 due to non-compliance with the debt ratio criterion.

Industrial effects on ranking methodology can be crucial. In the analysis, there is an example showing that there can be a positive relationship between industry and leverage level directly, and between industry and ranking score indirectly. Companies (ISDMR and EREGL) belonging to the iron and steel industry are examples in that regard. This can be because of the nature of their business model. However, companies in the cement manufacturing industry (KONYA and BUCIM) do not show a similar pattern since there is a difference in their leverage levels. Thus, to make a general conclusion on the relationship between industry and ranking scores, a larger sample size would be needed with further statistical analysis.

Finally, ranking scores have a downward trend on average. The reasons for this trend are lower market values of companies owing to the currency crisis that hit the stock market in August 2018 and high interest rates that attract companies to invest in interest-bearing instruments, which lead sampled companies to experience higher non-compliant investment ratios. It should be noted that in this study only 20 companies are chosen according to market capitalization from the ZK index. Thus, there might be other companies which can have better or worse results than the companies included in this study's sample. Such a case would change the ranking of companies represented in this paper. However, the aim here is to show the logic behind the ranking strategy. The rest is a matter of how many companies are included.

Implications

This paper attempts to develop a ranking methodology that is unique in the literature. In this regard, the previous section explained the suggested ranking methodology using the example of a specific Turkish Sharīʿah index, namely, the ZK index, and some selected company stocks. Such a unique suggestion can cause some important implications for both theory and practice.

Table 3.
Ranking score of companies included in the sample

Rank	RIC	Sector – TRBC	Debt ratio			Non-compliant investment ratio			Non-compliant income ratio			Ranking scores			
			2017	2018	2019	2017	2018	2019	2017	2018	2019	2017	2018	2019	*Avg.*
1	BIMAS.IS	Discount stores with grocery	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.10%	0.09%	0.16%	99.33	99.42	98.90	***99.22***
2	PETUN.IS	Meat processing	1.20%	1.55%	1.74%	3.41%	5.31%	13.01%	0.32%	0.60%	0.52%	93.19	89.10	81.61	***87.97***
3	KONYA.IS	Cement and concrete manufacturing	0.00%	0.00%	0.00%	6.22%	5.50%	6.22%	0.98%	0.89%	0.96%	87.21	88.49	87.30	***87.67***
4	ULUSE.IS	Switchgear	0.93%	0.50%	0.58%	4.76%	8.25%	0.97%	0.58%	1.12%	3.52%	90.39	83.70	74.94	***83.01***
5	GOODY.IS	Tire and tube manufacturers	9.00%	31.68%	8.12%	0.00%	0.00%	1.00%	0.08%	0.05%	0.00%	90.35	67.65	90.78	***82.92***
6	KARTN.IS	Paper packaging	0.00%	0.08%	0.10%	3.80%	9.68%	8.41%	1.65%	1.78%	2.21%	85.14	78.25	76.66	***80.02***
7	LOGO.IS	Application software	4.55%	9.46%	11.48%	0.64%	3.54%	8.88%	1.18%	1.73%	1.42%	86.93	75.37	69.95	***77.42***
8	MAVI.IS	Apparel and accessories	18.69%	20.91%	19.40%	4.76%	5.28%	7.44%	0.20%	0.63%	0.25%	75.02	69.36	71.21	***71.86***
9	ALKIM.IS	Industrial conglomerates	8.73%	8.50%	7.14%	10.44%	14.71%	20.28%	1.07%	0.92%	1.38%	73.50	70.42	63.13	***69.02***
10	TATGD.IS	Food processing	11.85%	24.75%	32.29%	1.47%	4.39%	1.54%	0.62%	0.96%	1.01%	82.40	64.16	59.06	***68.54***
11	SELEC.IS	Drug retailers	6.40%	18.88%	6.49%	5.01%	25.79%	32.89%	0.12%	0.34%	0.0.48%	87.70	52.61	57.03	***65.78***
12	EGEEN.IS	Auto, truck and motorcycle parts	3.66%	6.73%	4.68%	21.36%	17.47%	20.36%	1.33%	2.07%	1.44%	65.84	61.72	65.11	***64.23***
13	ORGE.IS	Construction and engineering	2.54%	10.99%	23.88%	15.83%	12.02%	15.66%	2.12%	1.52%	1.60%	67.32	66.63	49.40	***61.11***
14	FROTO.IS	Automobiles and multi-utility vehicles	21.63%	21.45%	29.53%	10.59%	6.52%	15.25%	1.04%	0.96%	0.96%	60.54	65.36	48.37	***58.09***
15	ISDMR.IS	Iron, steel mills and foundries	9.39%	8.18%	7.99%	27.22%	25.79%	26.50%	1.01%	1.71%	1.29%	56.31	54.31	56.53	***55.72***
16	BUCIM.IS	Cement and concrete manufacturing	20.91%	12.61%	16.53%	8.85%	2.84%	27.24%	3.58%	2.49%	2.48%	46.10	67.78	39.23	***5104***
17	YATAS.IS	Furniture and art	17.78%	25.73%	25.34%	16.43%	20.09%	31.84%	1.20%	1.27%	1.28%	57.43	45.27	33.74	***45.48***
NR	TKNSA.IS	Computer and electronics retailers	0.00%	1.80%	35.02%*	1.80%	0.00%	0.00%	0.06%	0.10%	0.14%	97.81	97.50	63.67	***NA***
NR	EREGL.IS	Iron and steel	15.64%	17.26%	24.16%	24.28%	24.13%	36.75%*	1.76%	2.42%	2.44%	47.96	42.04	22.19	***NA***
NR	TMSN.IS	Agricultural machinery	3.64%	24.47%	52.83%*	2.19%	7.22%	21.03%	1.20%	5.37%*	6.99%*	86.12	32.22	0.00	***NA***
Average**			***8.07%***	***11.88%***	***11.49%***	***8.28%***	***9.83%***	***13.97%***	***1.01%***	***1.13%***	***1.23%***	***76.75***	***70.57***	***66.06***	***71.12***

Source: Authors' own. The data is tabulated based on the authors' calculations by using annual financial reports that are announced in Public Disclosure Platform (KAP) in Turkey for the period 2017–2019. NR means company is unranked, RIC is Reuters Instrument Code, TRBC represents Thomson Reuters Business Classification.*shows ratios that exceed the threshold levels. **does not include unranked firms

In theory, the authors expect to further improve the suggested methodology in the future based on further suggestions from academics. Also, further empirical research can be done to test how such rankings can affect the market conditions.

In practice, the implications of the suggested methodology will impact different groups such as Sharīʿah scholars, index providers and so on. In our opinion, the group which can be affected most from the proposed ranking methodology is the companies that form part of the Sharīʿah indices or prospective companies to be included in the indices. In general, a high ranking is a good sign while a low ranking is a bad sign for investment. Thus, the reputation of the companies could be at stake if such a ranking is applied. In this way, the ranking methodology can increase "competition in goodness" among the companies.

Secondly, from the perspective of index providers, ranking would be a good tool to improve their indices and attract more investors. However, as a result of our discussions with ZK index providers, it became clear that the index providers cannot follow the necessary data, make the calculations and announce the results of the ranking periodically. Thus, a strong collaboration is required between index providers and academia.

As can be understood from the possible change in the position of companies and index providers, the situation of the investors can be improved by the existence of a ranking methodology because they can have more detailed information about the companies that they want to invest in.

Fourthly, although ranking methodology may not directly be a part of any related law or rule, it can help regulators to set Sharīʿah accounting standards, which would in turn help index providers in their ratio calculations for both Sharīʿah indices and rankings. This is currently one of the biggest problems on this subject.

Lastly, Sharīʿah indexation and ranking methodology have a close relationship with Sharīʿah advisors, whose main aim is to assess Sharīʿah compatibility – both in form and spirit. To improve the Sharīʿah compatibility, trustworthiness and effectiveness of such indices and rankings, there should be more and efficient collaboration among companies, regulators and Sharīʿah boards. Such collaboration can especially be in terms of data disclosure and transparency. As Azmi *et al.* (2017) found, Sharīʿah advisors generally are confronted with the problem of low levels of Islamic-related disclosures based on which they can make their decisions. The improved Islamic accounting standards and transparency for calculations of such a methodology and also the ranking itself can be a good tool in that regard. In addition, as explained above, there are some controversial *fiqhī* issues in developing Sharīʿah indices and depending on new decisions taken by Shari'ah scholars, the suggested ranking methodology can be re-evaluated.

Conclusion

The aim of this paper is to develop a ranking methodology for 20 companies that are listed on BIST and included in the Islamic index of ZK in Turkey. The reason why such a methodology is important to develop is that, although investors can usually get information about which company is Sharīʿah compliant by using Islamic indices, they cannot know the degree of Sharīʿah compliance from these indices.

To achieve the aim of this paper, 20 companies from the list provided in 2017–2019 by ZK index are selected according to their 12-month average market capitalization. Three quantitative screening criteria applied by the ZK index are then calculated for the selected companies. After the calculations, the ranking methodology developed by this paper is applied. In developing the ranking methodology, firstly, the result of each financial ratio is divided by its threshold level and the average of them is taken to get the criteria score. Then, to rank the companies from the highest to the lowest ratio, the criteria score is subtracted

from 1 and multiplied by 100. Finally, the ranking score of each company is calculated and listed for each selected year in the analysis. The average of these years' ranking scores is calculated to obtain the final result.

According to the findings, companies such as BIMAS and PETUN are highly compatible with ranking scores close to 100 points. However, it is found that some companies satisfy the criteria at the margin. This may not be a desirable result for some investors.

The ranking methodology can be generalized for any index in the world under the condition that the financial screening criteria are known. The suggested ranking methodology can have some important implications, both in theory and practice. In theory, it can be a good starting point for further studies such as carrying out empirical tests about the relationship between ranking and performance. In practice, the companies concerned can be affected by the existence of such a ranking methodology in terms of competition and transparency. Index providers are another group whose position can be strengthened because they can provide more detailed information to investors. Thus, investors' demands and expectations can be satisfied in that regard. On the other hand, regulators need to prepare more efficient Islamic accounting standards to assist index providers to calculate and announce the ranking. Lastly, Sharīʿah scholars would benefit from higher standards and transparency from the ranking process.

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